U.S. Food and Drug Administration Headquarters Consolidation Master Plan Update

Volume II: Appendices

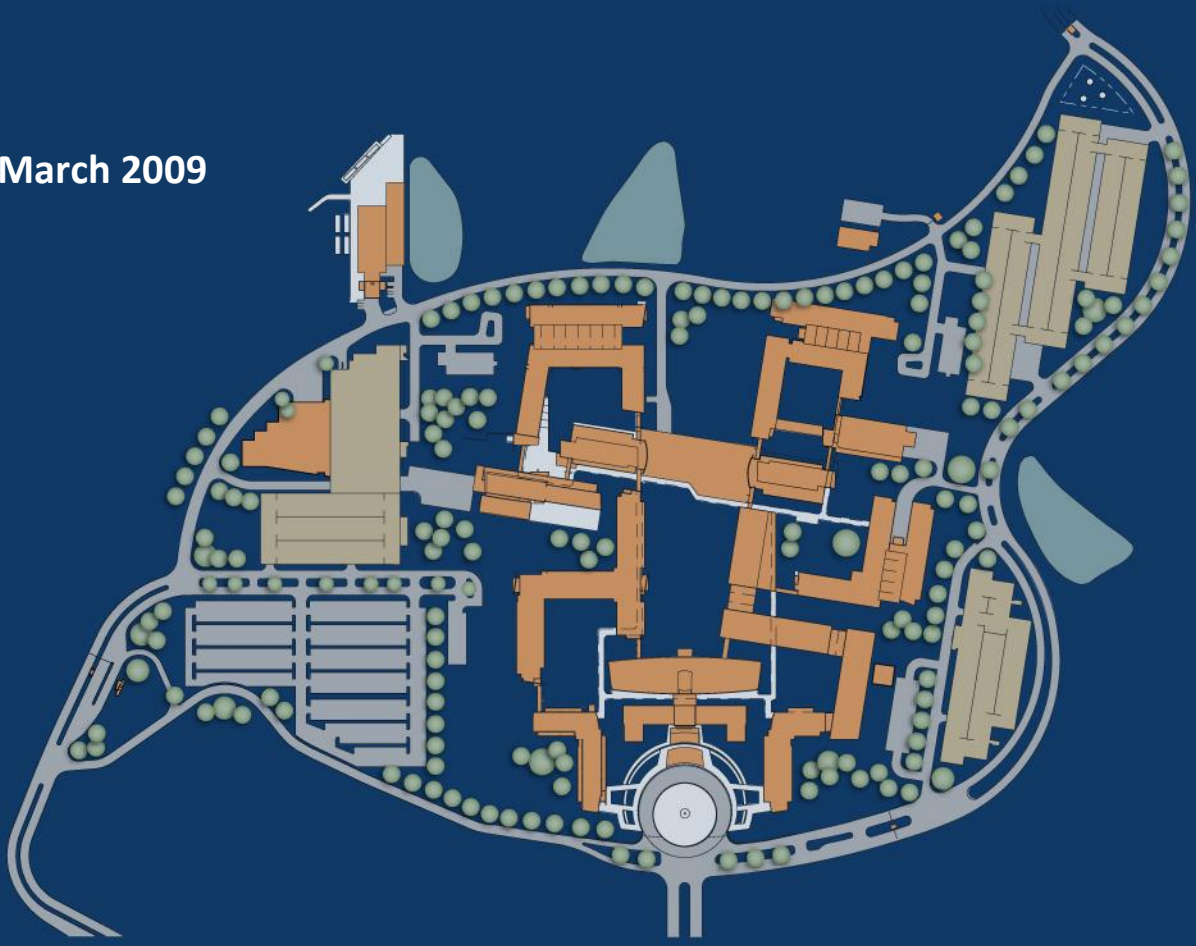
Prepared by:

The U.S. General Services Administration
National Capital Region

In cooperation with:

The U.S. Food and Drug Administration

March 2009



accommodating growth

protecting resources

Appendix A: Consultation Letters

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

June 12,2008

Elizabeth Estes
Greenhorne & O'Mara
6110 Frost Place
Laurel, MD 20707

RE: Proposed campus expansion to support the Food and Drug Administration (FDA) consolidation at the Federal Research Center (FRC) at White Oak in Silver Spring, Maryland

Dear Elizabeth Estes:

This responds to your letter, received May 28, 2008, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above reference project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.).*

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife ang Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands witliin the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide infonnation relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Devin Ray at (410) 573-4531.

Sincerely,

Mary J. Ratnaswarny, Ph.D.
Program Supervisor, Threatened and Endangered Species

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, *Governor*
Anthony G. Brown, *Lt. Governor*
john R. Griffin, Secretary
Eric Schwaab, *Deputy Secretary*

July 8, 2008

Ms. Elizabeth Estes
Greenhorne & O' Mara
6110 Frost Place
Laurel, MD 20707

RE: Environmental Review for Proposed Campus Expansion to Support The Food and Drug Administration (FDA) Consolidation at the Federal Research Center (FRC) at White Oak, Silver Spring, Montgomery and Prince George's Counties, Maryland.

Dear Ms. Estes:

The Wildlife and Heritage Service has detennined that there are no State or Federal records for rare, threatened or endangered species within the boundaries of the project site as delineated. As a result, we have no specific comments or requirements pertaining to protection measures at this time. This statement should not be interpreted however as meaning that rare, threatened or endangered species are not in fact present. If appropriate habitat is available, certain species could be present without documentation because adequate surveys have not been conducted. It is also important to note that the utilization of state funds, or the need to obtain a state authorized pennit may warrant additional evaluations that could lead to protection or survey recommendations by the Wildlife and Heritage Service. If this project falls into one of these categories, please contact us for further coordination.

We would like to bring to your attention that there is a remnant magnolia bog called "Powder Mill Bog" just off to the southeast of the project site, that is known to support several plant species listed as rare or endangered at the State level. Any activities on the project site that have potential to impact the hydrology of this nearby bog habitat should be avoided.

In addition, our analysis of the infonnation provided also suggests that the forested area on the project site contains Forest Interior Dwelling Bird habitat. Populations of many Forest Interior Dwelling Bird species (FIDS) are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by the Department of Natural Resources. In order to do so, the following guidelines could be incorporated into the site design to help minimize the project's impacts on FIDS and other native forest plants and wildlife:

I. Restrict development to nonforested areas.
2. If forest loss or disturbance is unavoidable, concentrate or restrict development to the following areas:
   a. the perimeter of the forest (i.e., within 300 feet of existing forest edge)
   b. thin strips of upland forest less than 300 feet wide

c. small, isolated forests less than 50 acres in size
d. portions of the forest with low quality FIDS habitat, (i.e., areas that are already heavily fragmented, relatively young, exhibit low structural diversity, etc.)

3. Maximize the amount if forest "interior" (forest area >300 feet from the forest edge) within each forest tract (i.e., minimize the forest edge:area ratio). Circular forest tracts are ideal and square tracts are better than rectangular or long, linear forests.
4. Minimize forest isolation. Generally, forests that are adjacent, close to, or connected to other forests provide higher quality FIDS habitat than more isolated forests.
5. Limit forest removal to the "footprint" of houses and to that which is necessary for the placement of roads and driveways.
6. Minimize the number and length of driveways and roads.
7. Roads and driveways should be as narrow and as short as possible; preferably less than 25 and 15 feet, respectively
8. Maintain forest canopy closure over roads and driveways.
9. Maintain forest habitat up to the edges of roads and driveways; do not create or maintain mowed grassy berms.
10. Maintain or create wildlife corridors.
11. Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS. This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present.
12. Landscape homes with native trees, shrubs and other plants and/or encourage homeowners to do so.
13. Encourage homeowners to keep pet cats indoors or, if taken outside, kept on a leash or inside a fenced area.
14. In forested areas reserved from development, promote the development of a diverse forest understory by removing livestock from forested areas and controlling white-tailed deer populations. Do not mow the forest understory or remove woody debris and snags.
15. Afforestation efforts should target a) riparian or streamside areas that lack woody vegetative buffers, b) forested riparian areas less than 300 feet wide, and c) gaps or peninsulas of nonforested habitat within or adjacent to existing FIDS habitat.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER # 2008.1119.mo/pg
Cc: K. McCarthy, DNR
D. Brinker, DNR

Appendix B: 2002 Memorandum of Agreement

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GSA National Capital Region

MEMORANDUM OF AGREEMENT AMONG THE GENERAL SERVICES ADMINISTRATION, FOOD AND DRU G ADMINISTRATION, THE MARYLAND STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE FOOD AND DRUG ADMINISTRATION CONSOLIDATION PROJECT AT WHITE OAK, MARYLAND

This Memorandum of Agreement (MOA) amends and replaces the Memorandum of Agreement, dated December 5, 2000, for the Food and Drug Administration consolidation Project at White Oak, Maryland. The effective date of this MOA is the latest date of execution by any signatory hereto.

WHEREAS, the General Services Administration (GSA) has received $146 million in Federal appropriations to design and build Phase I and II and to design Phase III of a five phase consolidation of 2.3 million square feet of laboratory and office space for the Food and Drug Administration (FDA) in the greater Washington, D.C. area, including over 6,500 employees, on 130 acres of the former U.S. Navy property currently administered as the Federal Research Center by the General Services Administration (GSA) at White Oak in Silver Spring, Maryland, and will request additional funding to construct subsequent phases of the Project from 2002 through completion (Project); and

WHEREAS, the overall design of the Project including the placement of laboratories, office buildings, and support facilities associated with the Center for Drug Evaluation and Research (CDER), the Center for Devices and Radiological Health (CDRH), the Center for Biologics Evaluation and Research (CBER), Office of the Commissioner (OC), and Office of Regulatory Affairs (ORA), is governed by the FDA Consolidation Revised Master Plan submitted by GSA and FDA to the National Capital Planning Commission for review on June 6, 2002, (attached as appendix I-A); and

WHEREAS, this undertaking, which is the Project, will be constructed according to the general plan included in the FDA Consolidation Revised Master Plan, dated March 8, 2002, as seen in Appendix I-A; and

WHEREAS, GSA, in its role as a custodian of the Federal Research Center and manager is assuming historic preservation responsibilities on behalf of FDA under 36 CFR Part 800; and

WHEREAS, GSA has received a separate $10 million Federal appropriation to be used for demolition of buildings within the 130 acre Project area to facilitate construction of the Project; and

U.S. General Services Administration
301 7th Street, SW
Washington, DC 20407-0001
www.gsa.gov

WHEREAS, GSA has detennined that this undertaking will have an effect on the U.S. Naval Ordnance Laboratory (NOL) Historic District, a property that lies within the Federal Research Center and is eligible for inclusion in the National Register of Historic Places, and has consulted with the Maryland State Historic Preservation Office (MD SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, through additional research and consultation, the planted buffer (1200 feet in depth, from the center line of New Hampshire Avenue to the front of the closest building of the U.S. NOL Historic District), established in 1945 to protect the Naval Ordnance Laboratory from electronic and other incursion, and to protect the surrounding residential community from what was considered an industrial facility, is detennined to be a contributing element within the U.S. NOL Historic District, GSA will detennine the effect of future Project phases on this buffer, and if the effect is found to be adverse, continue the consultation process to avoid or minimize the Project's effect, if possible, on this contributing element within the historic district. As a result of the Master Plan revisions, two buildings will be located in the historic buffer to create a forecourt with the remaining portion of Building One (the remaining portion of Building One is represented in Appendix I-B). This forecourt will provide a space for the location of the redesigned circle, outdoor garden in honor of WOL achievements, and flagpole. Consultation with the MD SHPO, the Council, FDA, WOLAA and LABQUEST has been conducted and is the basis for the revisions to this MOA; and

WHEREAS, a number of umbrella citizen and related historic preservation groups, including LABQUEST and the White Oak Laboratory Alumni Association, Inc. (WOLAA) have participated in the consultation and have been invited to concur in this MOA. The LABQUEST Resolution concerning the revised Master Plan is included in this amended MOA as Appendix 3; and

NOW THEREFORE, GSA, FDA, the MD SHPO, the Council, WOLAA and LABQUEST agree that the undertaking shall be administered in accordance with the following stipulations to satisfy GSA's and FDA's Section 106 responsibilities for all aspects of the Project.

STIPULATIONS

The GSA and the FDA will ensure that the following measures are carried out:

I. ADMINISTRATION

A. The GSA shall ensure that in completing the necessary provisions of this MOA that it will employ or contract with the appropriate qualified professionals who meet *The Secretary of Interior's Professional Qualifications Standards* at 36 CFR 61 (Professional Qualifications).

II. RETENTION OF CONTRIBUTING RESOURCES

The GSA will retain the following contributing resources: the remammg portion of Building One as depicted in Appendix I-B, the fire station portion of Building 100, and the flagpole within a redesigned circle to be located in the new forecourt. It should be noted that the wings of Building One will be not be preserved and will be removed. It should also be noted that the front entrance of the remaining portion of Building One will be modified to provide a visitor's entrance from the basement underneath the current every steps and decks. The main lobby of Building One will be preserved. The remaining portion of Building One and the Fire House portion of Building 100 are represented in Appendix I-B.

III. RECORDATION

A. Prior to demolition or alteration of any of the contributing buildings in the NOL Historic District, the GSA shall ensure that each of these buildings are documented to Historic American Buildings Survey (HABS)/Historic American Engineering
(HAER) standards. The GSA will contact the National Park Service (NPS) to determine the level and kind of documentation required:

> Ms. Kathleen Catalano Milley, National Park Service, Philadelphia Support Office, U.S. Custom House, 200 Chestnut Street, 3rd Floor, Philadelphia, PA 19106

B. All documentation must be accepted by the NPS. The GSA will notify the Advisory Council and the MD SHPO of HABS/HAER documentation acceptance, prior to the demolition and/or alteration of the contributing buildings. Copies of the HABS/HAER documentation will be provided to the MD SHPO and to the Montgomery County Historical Society within thirty (30) days of acceptance of the HABS/HAER documentation by NPS.

IV. ARCHITECTURAL SALVAGE

A. Prior to implementation of Project activities involving the demolition of the wings of Building One and the demolition of Buildings 2, 3, and 4 (scheduled for demolition in 2002), and the demolition of Building 5 (scheduled for demolition in 2005), GSA shall determine whether any architectural or decorative elements, such as wood wall paneling, flooring, fireplace mantles, granite stairs and marble may be salvaged for possible re-use.

B. To determine which elements are salvaged, GSA will conduct an on-site inspection of Buildings I, 2, 3, 4, and 5 with representatives of the MD SHPO to identify elements that may be potential candidates for salvage. The WOLAA has provided GSA and the MD SHPO with an updated candidate list of items to be

considered for architectural salvage. The previous and updated lists are provided in Appendix 4.

C. Prior to the implementation of this MOA it has been determined that such architectural elements do exist. The GSA will submit a salvage plan to the MD SHPO including an inventory of all the elements that it proposes to salvage, the manner in which they will be salvaged, and how they will be stored and eventually used. Within 20 days, the MD SHPO will provide its review comments in writing to the GSA. WOLAA and LABQUEST will be invited to review this plan and provide comments to GSA and WOLAA. GSA shall ensure that any elements that are removed are done so in a manner that minimizes damage. Following their removal, GSA shall further ensure that all salvaged elements are properly secured from vandalism and weather until such time as they can be used.

V. DESIGN REVIEW

A. All design elements of The Food and Drug Administration Consolidation at White Oak will conform to the March 2002 revised master plan as seen in Appendix 1-A, with the understanding that specific design elements may be modified andlor refined over time.

B. GSA will submit to the MD SHPO the proposed design plans for all phases of the project to ensure that the design of the proposed buildings will be compatible with neighboring historic buildings in terms of their height, scale, massing, and materials.

C. GSA shall ensure that the rehabilitation of remaining portion of Building One including its exterior and interior, any new construction added to the building, and all site improvements surrounding the building will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties.* Key character-defining features, as more fully described in Appendix 2, will be retained "in situ." Appendix 2, Character-defining features, has been amended to include notes regarding the exclusion of elements that will no longer be retained due to the removal of the wings of Building One.

D. Prior to any alteration of Building One, GSA will prepare a Historic Building Preservation Plan (HBPP) reflecting these character-defining features, according to GSA's approach described in "Historic Building Preservation Plan Comprehensive Building Report" (1992). GSA will ensure that the MD SHPO is invited to review and comment on the HBPP and will request comments from LABQUEST and WOLAA that will be forwarded to the MD SHPO.

E. GSA shall further ensure that the GSA's Project Architect will submit to the MD SHPO for its review and comment complete Project plans and specifications for the rehabilitation of the remaining portion of Building One including its exterior (which includes new entries at the sides and a new basement entry way for visitors under the front of the existing main entrance) and interior (which includes a memorial room for the WOL achievements), any new construction added to the building including plans for the redesigned entrance and canopy, all site improvements surrounding the remaining portion Building One, and the approved commemoration and interpretation plan referenced in stipulation VI-B. GSA's Project Architect will submit such plans to the MD SHPO at the schematic and at the 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

F. GSA shall ensure that the exterior rehabilitation of the fire station portion of Building 100 will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Prior to any alteration of the fire station, GSA will prepare a Historic Building Preservation Plan according to GSA's approach for the preparation of such reports, as referenced in Stipulation V. C above. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

G. GSA shall further ensure that the Project Architect will submit to the Maryland SHPO for its review and comment Project plans and specifications for the exterior rehabilitation of the fire station portion of Building 100. GSA's Project Architect will submit such plans at the schematic and at 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

H. GSA will also submit a copy of the proposed landscaping plan for the entire Project site to the MD SHPO for review and comment. The GSA will submit these plans for review and comment at a 30 percent and 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

VI. COMMEMORATION AND INTERPRETATION/EDUCATION ACTIVITIES

A. Within one month of effective date of this MOA, the GSA shall form a committee to guide the development of a plan for the commemoration and interpretation of the history of the NOL and its personnel. At a minimum, the committee will include representatives of the following: GSA, FDA, the MD SHPO, LABQUEST, and theWOLAA.

B. Development ofthe commemoration and interpretation plan (plan) will be guided by principles included in the National Register Bulletin "Telling the Stories: Planning Effective Interpretive Programs for Properties Listed in the National Register of Historic Places" (2000), the NPS's "Planning for Interpretation and the Visitor Experience" (1998), and the National Park Service's Director's Order # 28 "Cultural Resource Management Guideline" (1997). Components ofthis Plan will be passive, i.e. not staffed, rather than active (i.e., staffed). These components will be limited to indoor exhibits, exterior exhibits and signs, publications (e.g., brochures) and may include indoor exlribits, exterior exhibits and signs, publications (e.g., brochures), and electronic media (e.g., web page).

C. The GSA shall ensure that the Plan will be developed within three to six months of the affective date of the MOA. One portion of the Plan will outline how a commemorative area for the WJrite Oak Laboratory personnel should be developed. The Plan will provide details about an outdoor garden and indoor memorial space, and about the number, type, and content of interpretive panels to be erected in the commemoration. The interpretive section of the Plan will outline how artifacts associated with the property, including salvaged architectural elements, tools, objects, and other historical source materials from the NOL Historic District along with the recordation photographs described in Stipulation III should be incorporated into an interpretive exhibit or exhibits. The Plan will also describe how information about the historic and architectural context of the NOL Historic District will be included in the interpretive exlribit or exhibits. The plan for an indoor memorial space will be prepared to include public access to the remaining portion of Building One.

D. The GSA shall ensure that the Plan incorporates recommendations about how related public education materials about the NOL will be developed including the The Legacy of the White Oak Laboratory book that was written by the WJrite Oak History Corporation, published by the Naval Surface Warfare Center, Dahlgren Division, and printed by the Govemment Printing Office in 2000.

E. The GSA shall ensure that the Plan incorporates the recommendations of the committee such as in what buildings and spaces the commemorative exlribit or exhibits will be placed, what artifacts and other materials should be exlribited, and

exhibited, and how the public may gain access to the exhibit. GSA will coordinate the commemorative plan with other design programs, such as Art in Architecture.

F. The GSA shall notify the Council of the measures that will be taken to fulfill this stipulation and provide progress updates to the Council as work is completed.

G. The GSA shall ensure that the Plan will be installed prior to the completion of the Project.

VII. DISCOVERY

A. During the course of this undertaking, the GSA will ensure that the MD SHPO is informed of any newly identified potential historic properties discovered within the Project's area of potential effect during the construction. Potential historic properties are herein considered to be any building, structure, object, or archaeological site to which the National Register of Historic Places Criteria of Eligibility (36 CFR 60.4) has not already been applied. The GSA will not take any actions that would adversely affect such properties until such time as it has taken the following actions and resolved or mitigated all of its Section 106 responsibilities regarding such late-identified sites:

I. Upon notification that a potential historic site or object previously unidentified during the course of its Section 106 compliance has been identified within the undertaking's area of effect during the implementation of the undertaking, the GSA will undertake the steps outlined in 36 CFR 800.13(b through d) in order to ensure compliance with Section 106 of the National Historic Preservation Act.

2. In accordance with 36 CFR 800.l3(b), the identification of additional, late-identified historic resources discovered during the implementation of the undertaking does not require the GSA to stop work on the overall undertaking, but to make reasonable efforts to avoid or minimize harm to the property until the requirements of 36 CFR 800.13 are met.

VIII. DISPUTE RESOLUTION

A. If the MD SHPO objects within 30 days to any plans and documents required pursuant to the terms of this MOA, the GSA shall consult with the MD SHPO and other Parties to resolve the objection. If the GSA determines that the objection cannot be resolved through consultation, the GSA shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of pertinent documentation, the Council will either:

1. Provide the GSA with recommendations, which the GSA shall take into account in reaching a final decision regarding the dispute; or

2. Notify the GSA that it will comment pursuant to 36 CFR Part 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the GSA in accordance with 36 CFR Part 800.6(b)(2) with reference to the subject of the dispute.

3. Any recommendations or comment provided by the Council will be understood to pertain only to the subject of the dispute; the GSA's responsibility to carry out all actions under this MOA that are not the subject of the dispute will remain unchanged.

IX. REVIEW OF PUBLIC OBJECTIONS

A. At any time during implementation of the measures stipulated in this MOA, if any objection to any such measure or its manner of implementation be raised by a member of the public, LABQUEST; or WOLAA, the GSA shall take the objection into account, notify the MD SHPO of the objection, and consult as needed with the objecting party, the MD SHPO, and the Council to resolve the objection.

X. MONITORING AND REPORTING

A. The MD SHPO may monitor any activities carried out pursuant to this MOA and the Council may review any activities if requested. The GSA will cooperate with the MD SHPO and the Council if they request to monitor or to review Project files or visit Project sites for activities at specific Project sites.

B. The GSA shall provide the MD SHPO, LABQUEST, and WOLAA with a report that summarizes activities carried out under the terms of this MOA six (6) months from the effective date of the MOA's execution and again at one (I) year from the effective date of execution. Thereafter, the GSA shall provide the MD SHPO, LABQUEST and WOLAA with an annual report until completion of the Project. Reports shall include information regarding preservation activities, information on any public objections and their status, any other activities undertaken pursuant to this MOA, and information on overall project funding and construction phases.

XI. RECORD KEEPING

A. The GSA shall maintain records of all activities undertaken pursuant to this MOA which shall become part of the Environmental Review Record for the Project including:

I. All records related to the selection of professionals who perform the work stipulated in the provisions of this MOA, in order to clearly document adherence to the Professional Qualifications (36 CFR 61);

2. All records of correspondence and findings letters provided by the MD SHPO to the GSA;

3. All records indicating all mitigation measures taken in accordance with the provisions of this MOA;

4. All records related to consultations GSA has with the MD SHPO and/or the Advisory Council following the ratification ofthis MOA;

5. All records of public comments received during public hearings and written or telephonic comments received from the public at all other times; and

6. All of the above records shall be maintained for a minimum of three (3) years after completion of the Project and shall be made available to the general public and additional parties with a demonstrated interest in the undertaking upon request during this time frame.

XII. AMENDMENTS

A. Any party to this MOA may request that it be amended or modified, whereupon the GSA, the SHPO, and the Council will consult in accordance with 36 CFR Part 800.6(c) (7) & (8) to consider such revisions.

B. Any resulting amendments or modifications shall be developed and executed among GSA, FDA, the MD SHPO, the Council, LAB QUEST, and WOLAA in the same manner as this MOA.

XIII. TERMINATION

FDA, GSA, the Council and the MD SHPO may terminate the MOA by providing thirty (30) days notice to the other Parties, provided that the Parties to the MOA will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

XIV. FAILURE TO COMPLY WITH THIS AGREEMENT

In the event that the GSA does not carry out the terms of this MOA, the GSA will comply with 36 CFR Parts 800.4 through 800.6 with regard to individual undertakings covered by this MOA.

XV. SUNSET

Provisions of this MOA will be carried out from the date of execution of this MOA through completion of the FDA Consolidation.

XVI. COMPLIANCE WITH 106

Execution of this MOA by the GSA, FDA, the MD SHPO, and the Council, and the implementation of its tenns by GSA, evidence that GSA and FDA have afforded the Council an opportunity to comment on the proposed FDA Consolidation Project and its effects on historic properties, that the GSA and FDA have taken into account the effects of the proposed Project on historic properties, and that GSA has complied with Section 106.

GENERAL SERVICES ADMINISTRATION

By: _____
Anthony E. Costa
Assistant Regional Administrator

Date: 2 July 202

FOOD AND DRUG ADMINISTRATION

By: _____
Jeffrey M. Weber
Senior Associate Commissioner for Management and Systems

Date: 7/2/02

MARYLAND STATE HISTORIC PRESERVATION OFFICE

By: _____
J. Rodney Little
Maryland State Historic Preservation Officer

Date: 7-3-02

ADVISORY COUNCIL ON **HISTORIC** PRESERVATION

By: _____
lohnFowler
Executive Director

Date: 7/10/02

CONCURRING PARTIES

LABQUEST

By: M. J. Levin

Meyer J. Levin

Date: 7/01/02

WHITE OAK LABORATORY ALUMNI ASSOCIATION, INC

By: James J. Tinto

M. John Tinto

Date: 7/2/02

APPENDIX 1

- A. Revised Master Plan (May 2002)
- B. Site Plan depicting the Remaining Portion of Building One and the Fire Station Portion of Building 100

APPENDIX 2

- Character-Defining features-amended

APPENDIX 3

- LABQUEST Resolution

APPENDIX 4

- WOLAA updated candidate list for architectural salvage
- WOLAA original candidate list for architectural salvage

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Appendix C: Air and Noise Technical Report

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U.S. Food and Drug Administration Headquarters Consolidation Master Plan Update

Air and Noise Quality Technical Report

Prepared for:

The U.S. General Services Administration
National Capital Region

In cooperation with:

The U.S. Food and Drug Administration

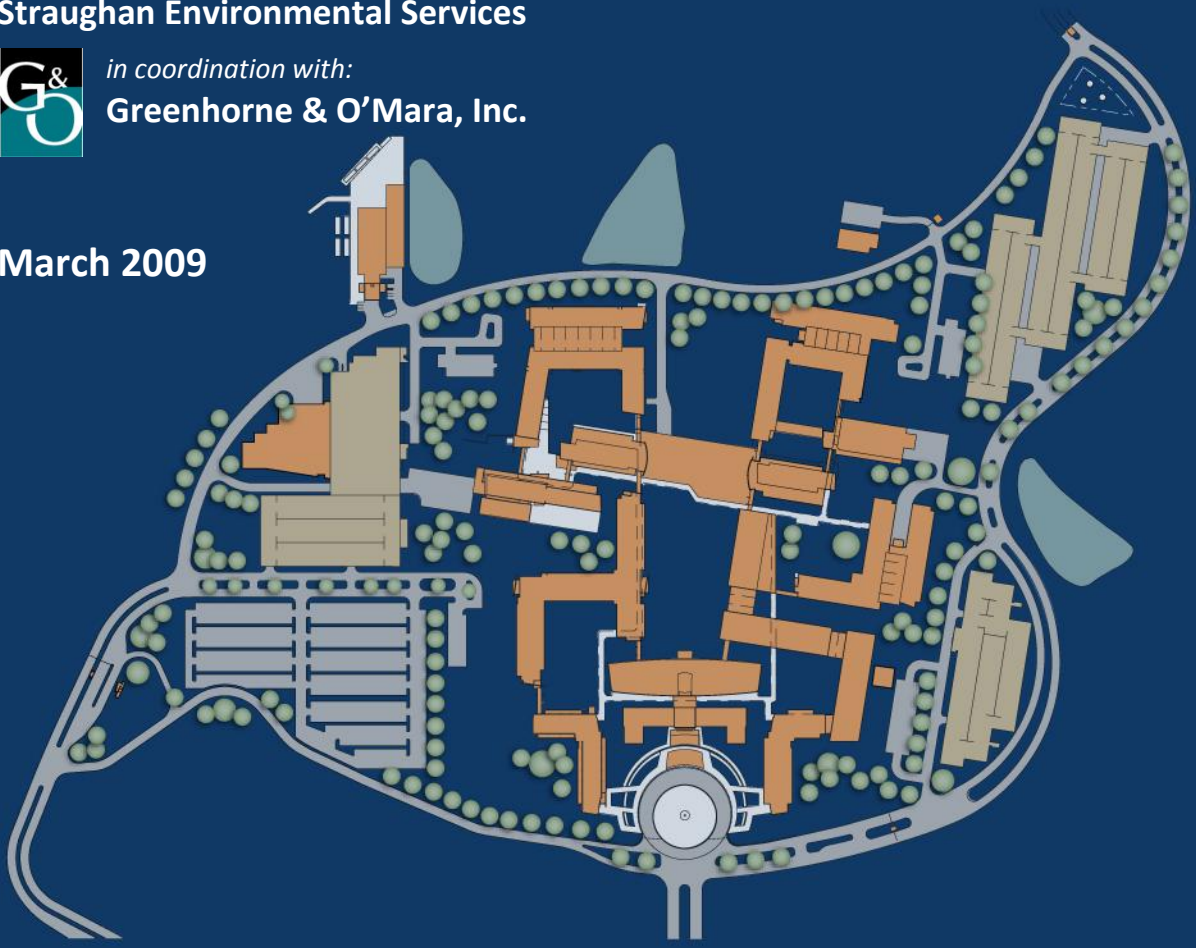
Prepared by:

Straughan Environmental Services

in coordination with:

Greenhorne & O'Mara, Inc.

March 2009



accommodating growth

protecting resources

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Introduction

This air and noise quality technical report has been prepared by Straughan Environmental Services, Inc. for the General Services Administration (GSA) to assess and report potential noise and air quality impacts resulting from revisions to the U.S. Food and Drug Administration (FDA) Master Plan for the consolidation of their headquarters facilities at the Federal Research Center at White Oak (FRC). The results of the air and noise quality analyses are summarized in the Supplemental Environmental Impact Statement (SEIS) being prepared for the project.

GSA is proposing to update the FDA Headquarters Master Plan to accommodate an increase of 1,170 FDA employees to support new FDA programs. The project will involve the development of 1,254,922 additional gross square feet of office and laboratory space, construction of a fitness center, and expansion of the Central Utility Plant (CUP) to serve the FDA Campus. In addition, GSA plans to relocate the Child Care Center and the Broadcast Studio from the locations proposed in the 2006 FDA Headquarters Master Plan.

As mentioned, the update to the FDA Headquarters Master Plan would include the expansion of the CUP. This would include a 50,000 square foot building expansion and the addition of a thermal water storage tank to provide for utilities infrastructure needs for the increase in lab and office space at the FDA Campus. Two 15-Megawatt (MW) generators, five 1.980-ton chillers, a 300mbh (thousands of British Thermal Units) boiler, and eight additional cooling towers would be installed. (The 300-mbh boiler will not be needed if dual fuel generators are installed.) In addition, at full build-out of the FDA campus, a 6,000-kilowatt (KW) capacity steam turbine generator is anticipated to utilize waste heat.

The project alternative selection process is described fully in the SEIS and the alternatives are summarized below.

- **Alternative 1:** This is the "No Action" Alternative. Under this alternative, the FDA White Oak Consolidation would be executed according to the 2006 Master Plan, and development to accommodate new FDA programs or additional FDA employees and visitors would not occur.

- **Alternative 2: Dispersed Density Action Alternative** – Under this alternative, building heights would follow existing building heights, thereby keeping uniformity across the campus. This would allow for more dispersed density across the campus and allow for better interaction between FDA employees. This alternative would also add a northwest parking garage; a fitness center on the southern portion of the campus; relocation of the broadcast studio to the southeastern portion of the campus; relocation of the Child Care Center to the south side of the campus, and the central utility plant (CUP) would be expanded to the north of the existing CUP. A thermal water storage tank would be placed in the vicinity of the CUP expansion, the exact location has not been determined at this time.

- **Alternative 3: Southeast Quadrant Density Action Alternative** – Under this alternative, building heights would be greater than currently seen on the FRC, thereby allowing most of the density

to be in the southeastern portion of the campus. This alternative would also add a fitness center on the southern portion of the campus, relocation of the broadcast studio to the southeastern portion of the FDA Campus, relocation of the Child Care Center on the south side of the campus, and the CUP would be expanded north of the existing CUP. A thermal water storage tank would be placed in the vicinity of the CUP expansion, the exact location has not been determined at this time.

The noise and air quality analyses consider the potential effects of campus expansion on air- and noise-sensitive residential, institutional, and recreational facilities. The noise and mobile air quality analysis considers the effects of added commuter trips on area roadways to the air quality and noise environment. The stationary air analysis considers the effects of emissions from two different Master Plan development alternatives, each with three different options (referred to as Options A, B, and C) for the expansion of the Central Utility Plant, on these same facilities. The air quality analysis also considers the combined effects of emissions from all stationary and mobile sources on air-sensitive receptors. A qualitative analysis was conducted to identify whether noise-sensitive areas would be potentially impacted by stationary sources such as the CUP.

1 Air

1.1 Affected Environment

In accordance with guidelines set forth by 23 CFR Part 771, 49 CFR Part 622, the Clean Air Act (CAA U.S.C. Title 42, Chapter 85, 1970, as amended 1990), and the National Environmental Policy Act (NEPA), an air quality analysis is necessary to document existing air quality conditions in the vicinity of the FDA's White Oak Campus in Silver Spring, Maryland to evaluate potential changes that would be likely to occur as a result of development of the action alternatives. According to the Metropolitan Washington Council of Governments (MWCOG), existing air quality in the vicinity of the White Oak Campus, and in the region, is influenced primarily by transportation-related mobile sources (predominantly motor vehicle traffic on adjacent roadways).

1.1.1 National Ambient Air Quality Standards

Under the authority of the CAA, the U.S. Environmental Protection Agency (EPA) has developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants (criteria pollutants) deemed harmful to public health and the environment. These criteria pollutants include: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), particulate matter ($PM_{2.5}$/PM_{10}), and lead (Pb). The concentration standards for each of these criteria pollutants are presented in Table 1-1.

Table 1-1. National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour (1)	None	
	35 ppm (40 mg/m^3)	1-hour (1)		
Lead	0.15 µg/m^3 (2)	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour (3)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (4) (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour (5)	Same as Primary	
Ozone	0.075 ppm (2008	8-hour (6)	Same as Primary	

Table 1-1. National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
	std)			
	0.08 ppm (1997 std)	8-hour [7]	Same as Primary	
	0.12 ppm	1-hour [8] (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour [1]
	0.14 ppm	24-hour [1]		

Source: United States Environmental Protection Agency (www.epa.gov/air/criteria.html)

[1] Not to be exceeded more than once per year.
[2] Final rule signed October 15, 2008.
[3] Not to be exceeded more than once per year on average over 3 years.
[4] To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
[5] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
[6] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
[7] (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
[8] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

1.1.2 National Ambient Air Quality Standard Attainment Status

Areas where concentrations of criteria pollutants are below the NAAQS are designated by EPA as being in "attainment" and areas where a criteria pollutant level exceeds the NAAQS are designated as being in "nonattainment." Ozone (O_3) nonattainment areas are categorized based on the severity of pollution: marginal, moderate, serious, severe, or extreme. CO and PM_{10} nonattainment areas are categorized as moderate or serious. The FDA White Oak Campus is located in Montgomery County, Maryland, which is designated as a non-attainment area for $PM_{2.5}$ and as a moderate non-attainment area for O_3 under the 8-hour standard.

MWCOG is the regional agency that prepares the State Implementation Plan (SIP), which documents how the Washington region will meet the NAAQS. The SIP provides an inventory of existing air emissions and accounts for planned projects within the region that have potential to increase pollutant emissions. The SIP accounts for general increases in vehicular travel throughout the region, as well as anticipated changes in land use and demographic/employment patterns.

1.2 Environmental Consequences

New development can affect air quality in three ways: 1) through airborne dust generated by the construction process; 2) by introducing new stationary sources of pollutants, such as power plants or heating plants and boilers for new buildings; and 3) through increasing vehicular traffic to the site, which raises vehicle emission levels near the site, and possibly in the region.

The purpose of this evaluation is to identify and quantify the potential direct, indirect and cumulative emissions related to the proposed development and operation of the Master Plan Update Alternatives as well as the 2006 Master Plan (No Action) Alternative. For this analysis, the emission inventories of mobile and stationary sources for each alternative were evaluated for conformity with the SIP for the Washington metropolitan region.

1.2.1 Background Levels of Criteria Pollutants

Under the 2006 Master Plan Alternative (Alternative 1), the FDA would continue its headquarters consolidation under its current Master Plan to achieve 4,735,012 gross square feet (GSF) of development to accommodate 7,719 employees. No new sources of stationary or mobile air emissions would be created. Therefore, there would be no direct, indirect, or cumulative impacts to air quality resulting from the 2006 Master Plan implementation. Although Alternative 1 would not induce additional air emissions, there would be traffic increases from predicted general growth in the community. The amount of traffic increase would vary depending on whether the Intercounty Connector (ICC) is constructed; therefore, the 2006 Master Plan Alternative was studied both with and without ICC-influenced traffic in the campus vicinity. These increases are reflected in the projected 2006 Master Plan alternative analysis results.

1.2.2 Proposed Action

The air quality analysis was performed in accordance with guidelines set forth by 23 CFR Part 771, 40 CFR Part 93, 49 CFR Part 622, the Clean Air Act (CAA), and the National Environmental Policy Act (NEPA), as they appropriately apply. The analysis addresses both mobile and stationary sources of air pollutant emissions. There are two Master Plan Update alternatives (Alternatives 2 and 3) that propose two different development configurations, each of which results in 5,989,934 GSF of development to serve an employee population of 8,889. These two alternatives have been paired with three options (A, B, and C) for expanding the quantities and types of gas turbines to be used in the CUP Expansion that serve the FDA White Oak Campus. The options include:

- Option A: 5-Megawatt Mercury 50 Gas Turbines
- Option B: One Mercury 50 Gas Turbine; two Taurus 70 Gas Turbines

- Option C: One Mercury 50 Gas Turbine; two Titan 130 Gas Turbines

In addition to these different scenarios for on campus development which affect the emissions of stationary air pollutant sources, the White Oak Consolidation project also includes traffic projections that vary depending on whether or not the project would go forward with the ICC in place. These varying traffic projections affect the analysis of mobile air emissions.

1.2.2.1 Mobile Source Analysis

This analysis evaluates the impact of emissions from mobile sources as a result of proposed Master Plan Update alternatives. These alternatives would increase daily traffic to and from the campus, both with and without the ICC coming online. Each alternative has identical traffic counts for "with ICC" and "without ICC" traffic. The analysis performed includes conformity of the anticipated increase in traffic with the SIP on a regional basis and the potential for localized CO emissions to violate the NAAQS concentration standards. Evaluations of the potential for localized $PM_{2.5}$ and Mobile Source Air Toxics (MSAT) impacts are also included.

1.2.2.1.1 Conformity with the SIP and the Mobile Emission Budget

As stated previously, Montgomery County, Maryland is in an area classified as non-attainment for O_3 and $PM_{2.5}$. The approved SIP for the region includes a mobile source emission budget for CO and the O_3 precursors – volatile organic compounds (VOC) and nitrogen oxides (NO_x), and a plan for achieving attainment. This budget was developed based on planned land uses and anticipated development within the region. Proposed projects within the region must not exceed the mobile source emissions budget outlined in the approved SIP. Proposed projects that do not exceed the emissions budget would be considered in conformity and would be approved for development. Conformity can also be demonstrated by showing that the proposed project was accounted for in the original development SIP emission budgets. Growth at the FDA White Oak Campus was accounted for in the Round 7 Cooperative Employment Forecasts prepared by the Maryland National Capital Parks and Planning Commission (MNCPPC) and MWCOG for the years 2000-2030. The Round 7.0 forecasts, which were used as the basis for the current SIP, accounted for 7720 personnel at the White Oak Campus by 2010 followed by relatively flat growth. This is a difference of 1,169 employees compared to that proposed under each Master Plan Update Alternative.

1.2.2.1.2 Localized CO Emissions and NAAQS Concentrations

The analysis of CO differs from the analysis of other criteria pollutants because it is localized and directly relates to traffic patterns that will be affected by future site development. This analysis was prepared in

accordance with guidance set forth by the U.S. Environmental Protection Agency (EPA) in *A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* (EPA 1995).

The steps taken to perform this air quality analysis included the following:

- Identify the intersection near the FDA White Oak campus that would have the lowest Level of Service (LOS), the highest traffic volumes, and the closest proximity to air quality sensitive areas, thereby signifying the worst-case scenario to be evaluated;
- Identify air quality receptor locations based on project mapping that would be affected by the worst-case intersection scenario;
- Determine the background CO concentrations from nearest air quality monitoring station;
- Obtain the basic regional emission rates using MOBILE6 from MWCOG;
- Using CAL3QHC, calculate final CO concentrations for each air quality receptor in the worst-case alternative; and
- Compare final CO concentrations to the 1-hour and 8-hour NAAQS for CO to determine if any violations would occur.

The air quality receptors predict levels of CO at their particular location. According to the CAL3QHC Guideline for Modeling Carbon Monoxide from Roadway Intersections, air quality receptors should be located in:

- places of expected 1-hour and 8-hour maximum concentrations;
- places where the general public has continuous access (i.e. public sidewalks); and
- reasonable places, where reasonableness is defined in terms of proximity to the intersection, but not on the roadway itself.

Worst Case Intersections

Two intersections were identified as being possible worst-case scenarios for CO emissions under the Master Plan Update Alternatives. Using the above steps, it was determined that the intersection of US 29/Stewart Lane and US 29/Musgrove Road had similar Level of Service and traffic volumes. The Level of Service for both intersections was LOS F, which is considered failing. Both intersections also had unique air quality sensitive areas in close proximity (Julia Brown Montessori School at Stewart Lane/Milestone Drive, Arden Courts Assisted Living and Rehabilitation Center, and Musgrove Medical Arts Building at Musgrove Road).

Tables 1-2 and 1-3 show the levels of service and the traffic volumes for the intersections under the 2006 Master Plan Alternative with and without the construction of the ICC and the Master Plan Update Alternatives with and without the construction of the ICC.

Table 1-2. Levels of Service by Alternative

	Musgrove Lane		Stewart Lane	
	morning	evening	morning	evening
Alternative 1 - 2006 Master Plan without ICC	F[1]	F	F	F
Alternative 1 - 2006 Master Plan with ICC	F	F	F	F
Alternatives 2 and 3 – Action without ICC	F	F	F	F
Alternatives 2 and 3 - Action with ICC	F	F	F	F

[1] According to the American Association of State Highway and Transportation Officials (AASHTO), Level of Service (A through F) describes flow characteristics at intersections, with A representing freeflow traffic and F representing severely congested traffic. LOS F indicates a long traffic delay (more than 80 seconds for a signalized intersection; more than 50 seconds in an unsignalized intersection).

Table 1-3. Peak Hour Traffic Volume by Alternative

	Musgrove Lane		Stewart Lane	
	morning	evening	morning	evening
Alternative 1 - 2006 Master Plan without ICC	6,100	6,895	7,260	7,615
Alternative 1 - 2006 Master Plan with ICC	7,160	7,505	7,605	8,800
Alternatives 2 and 3 – Action without ICC	6,180	6,975	7,260	7,625
Alternatives 2 and 3 - Action with ICC	7,315	7,660	7,585	8,885

1.2.2.1.3 Traffic Data

The traffic data used for this air quality analysis included peak hour volumes and percent daily distributions represented as a diurnal traffic curve (i.e. traffic volumes over a 24-hour period). The diurnal curve was developed from 24-hour traffic counts on Maryland Route 650 and US 29, approximately 0.3 miles south of the Stewart Lane/US 29 intersection. The diurnal curve, or daily distribution percentages, is presented in Table 1-4. The projected peak hour traffic volumes at each intersection for both a.m. and p.m. are presented in Table 1-5 for Stewart Lane and Table 1-6 for Musgrove Road.

1.2.2.1.4 Emission Factors

Mobile source emission factors were obtained for use in the CAL3QHC CO prediction models using the EPA Mobile Source Emission Factors Model, MOBILE6 (v.12/13/02) which was released in October 2002. The emission rates associated with individual vehicles are influenced by factors such as ambient air temperature, engine temperature, operation mode, average speed, and maintenance. The average emission rate for a fleet of vehicles operating on a highway is further influenced by the composition of the fleet, vehicle type, and vehicle age. The fleet emission rate reflects changes in vehicle, engine, and emission control system technologies; changes in applicable regulations and emission standards; and

realistic driving patterns. Winter months are evaluated in the model because violations of the NAAQS for CO are more likely to occur in the colder months.

The assumptions and factors used for this project's MOBILE6 models were generated and obtained from the MWCOG air quality staff. MWCOG does not generate MOBILE6 output for every future year annually, and a current year 2012 output was unavailable. MOBILE6 outputs for years 2010 and 2020 were the nearest outputs available. Outputs for year 2012 were derived by interpolating rates from year 2010 and year 2020 MOBILE6 outputs. The interpolated rates were compared to the MOBILE6 Emission factors for the year 2010 to the interpolated rates. CAL3QHC air analysis models were run using both sets of emission factors. The 2010 MOBILE6 output rates resulted in slightly higher results from CAL3QHC. These higher results were used to reflect a worst case scenario.

Emission factors vary by traffic speed. The roadway speeds used to determine the emission factors for the free-flow traffic were 50 miles per hour (mph) on US 29, 25 mph on Musgrove Road, and 30 mph on Stewart Lane. One mile per hour was used for idling traffic. These speeds correlate to the following emission factors from MOBILE6 and were used for inputs into this CAL3QHC analysis; 3.6 for 50mph US 29, 2.9 for 25 and 30mph on Musgrove Road and Stewart Lane, and 12.1 for the idling traffic.

Table 1-4. Diurnal Traffic Curve

Hour	% of Average Daily Traffic (ADT)	Ratio of Hour to Peak Hour
12m - 1am	0.8	0.137
1am-2am	0.4	0.074
2am-3am	0.3	0.056
3am-4am	0.3	0.054
4am-5am	0.8	0.137
5am-6am	2.5	0.421
6am-7am	5.5	0.941
7am-8am	5.4	0.932
8am-9am Peak Morning Hour	**5.8**	**1.000**
9am-10am	5.8	0.999
10am-11am	4.7	0.811
11am-12n	4.7	0.811
12n-1pm	5.3	0.682
1pm-2pm	5.2	0.667
2pm-3pm	5.7	0.731
3pm-4pm	6.5	0.842
4pm-5pm	7.1	0.908
5pm-6pm Peak Evening Hour	**7.8**	1.000
6pm-7pm	7.2	0.923
7pm-8pm	5.4	0.698
8pm-9pm	4.4	0.563
9pm-10pm	3.9	0.504
10pm-11pm	2.8	0.367

Table 1-4. Diurnal Traffic Curve		
Hour	**% of Average Daily Traffic (ADT)**	**Ratio of Hour to Peak Hour**
11pm-12m	1.6	0.210
Source: Maryland State Highway Administration, Highway Information Services Division		

Table 1-5. Projected Worst Case Peak Hour Traffic Volumes for US 29 at Stewart Lane – Action with ICC		
Traffic Segment	**morning**	**evening**
Stewart Lane Eastbound Approach	230	110
Stewart Lane Eastbound Departure	320	665
Stewart Lane Westbound Approach	95	85
Stewart Lane Westbound Departure	140	140
US 29 Northbound Approach	4150	4895
US 29 Northbound Departure	4045	4645
US 29 Southbound Approach	3110	3795
US 29 Southbound Departure	3080	3435

Table 1-6. Projected Worst Case Peak Hour Traffic Volumes for US 29 at Musgrove Road – Action with ICC		
Traffic Segment	**morning**	**evening**
Musgrove Drive Eastbound Approach	110	495
Musgrove Drive Eastbound Departure	110	335
Musgrove Drive Westbound Approach	275	105
Musgrove Drive Westbound Departure	360	185
US 29 Northbound Approach	2585	4820
US 29 Northbound Departure	2440	4770
US 29 Southbound Approach	4345	2240
US 29 Southbound Departure	4415	2370

1.2.2.1.5 CAL3QHC Analysis

The mathematical model used to estimate future CO concentrations is the current version of the EPA's CAL3QHC dispersion model, released in June 1993. The CAL3QHC dispersion model is a microcomputer-based modeling methodology developed to predict the level of CO or other inert pollutant concentrations for motor vehicles traveling near roadway intersections.

The CAL3QHC program requires that roadways be modeled as segments known as links. Links can be either free-flow links for vehicles moving at a constant velocity or queue links for idling vehicles. Each can be one of four types of links based on the roadway geometry – at-grade, fill, bridge, or depressed. The required inputs for free-flow links are the endpoints, traffic volume, the emission factor, source

height, and mixing zone width. A queue link is defined as a straight segment of roadway with a constant width and emission source strength, where vehicles are idling for a specified period of time. Required inputs for queue links are the endpoints, approach traffic volume, emission factor, average cycle length, average red time length, number of travel lanes, clearance lost time, source height, signal type (pre-timed, actuated, or semi-actuated), and arrival rate.

CAL3QHC also requires the input of meteorological factors. These factors are average timing, surface roughness coefficient, settling velocity, deposition velocity, wind speed, mixing height, stability class, and wind angle range. The values used for these factors are summarized in Table 1-7.

Table 1-7. CAL3QHC Input Assumptions

Input Variable	Assumption and/or Value
Averaging Time	60 minutes
Background CO Concentrations (2006 Background concentration highest of second high readings of last three years)	108 cm
Surface Roughness	0 cm/s
Settling Velocity	0 cm/s
Deposition Velocity	0 m (at grade)
Source Height	1 m for Pretimed
Signal Type	142 s
Average Cycle Length	38 s on US 29; 118 s on Stewart Lane and Musgrove Drive
Average Red Time Length	4 s
Clearance Lost Time	3 s (average progression) – default value
Arrival Rate	1.0 m/s
Wind Speed	0^{o}
Wind Direction	D(4)
Atmospheric Stability Class	1000 m
Mixing Height	Y
Multiple Wind Directions	5^{o}
Wind Direction Increment Angle	0
First Increment Multiplier	72
Last Incremental Multiplier	60 minutes

Air quality receptor locations represent sensitive air quality locations (i.e. areas where people are likely to be exposed to CO) within the study area. For this study, 18 receptor sites were identified at Musgrove Road and US 29, and 18 receptor sites at Stewart Lane (see Figure 1-1).

The maximum 1-hour CO concentrations were modeled using the morning and evening peak hour traffic volumes. The maximum 8-hour average CO concentration was determined by using the peak-hour traffic volumes and daily traffic distributions (diurnal curve), which were used to establish hourly traffic volumes. The hourly time segments were analyzed at each receptor to determine the CO concentrations. The highest eight consecutive hourly concentrations were averaged to obtain the 8-hour average CO concentration.

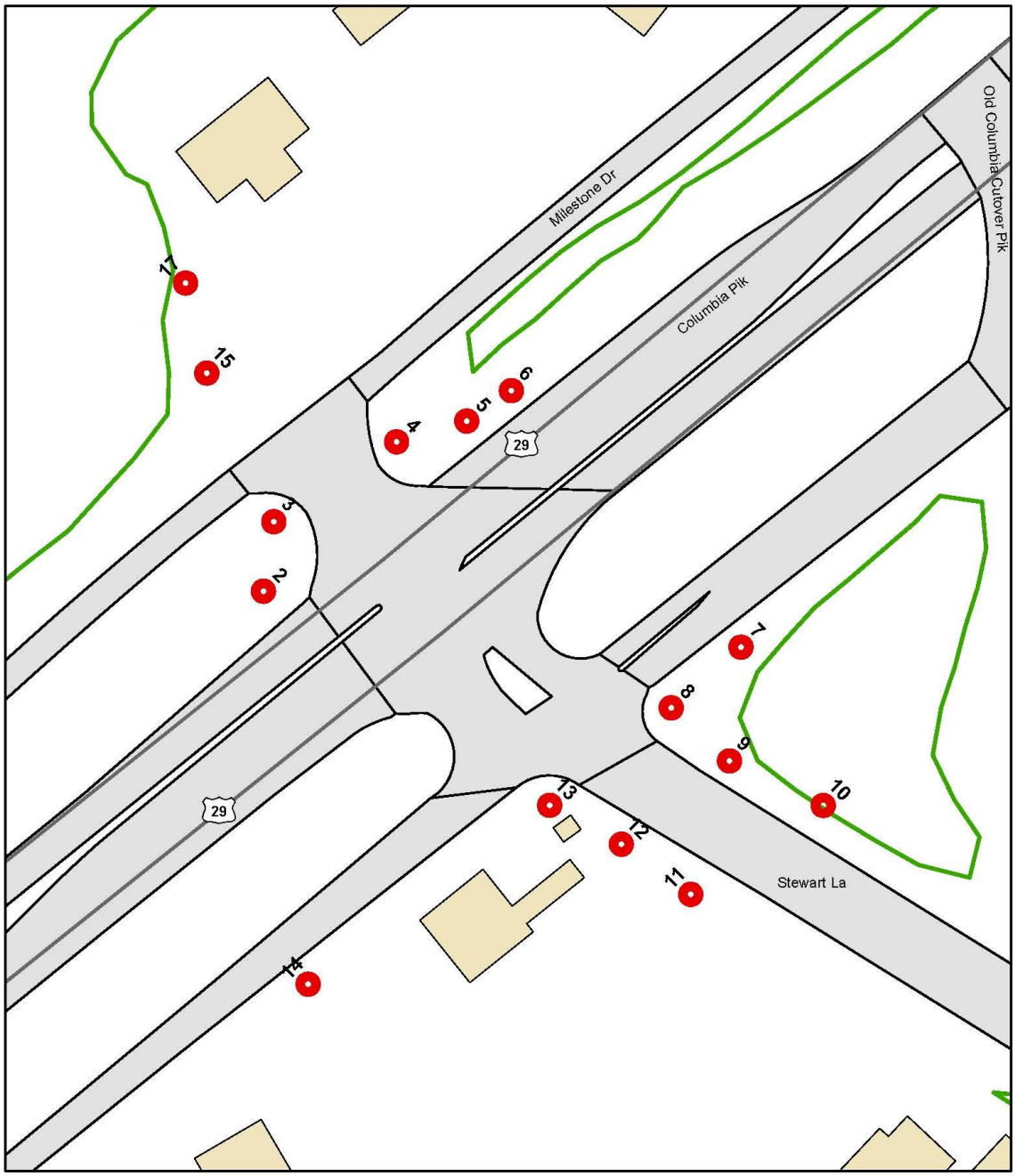

Figure 1-1
Air Quality Receptor Locations
US 29/Stewart Ave Intersection

White Oak Federal Center
US Food and Drug Administration

Legend
- Air Quality Receptors
- Buildings
- Roadways
- Tree Outlines

1.2.2.1.6 Analysis Results

Analysis Results for US 29 at Musgrove Drive

Table 1-8 presents the results of the 1-hour analysis using projected a.m. and p.m. hourly peak traffic for at the US 29 and Musgrove Road intersection. For the projected hourly peak-traffic volume, results indicated the range of CO concentrations in the a.m. hour would be 4.3 to 5.1 ppm. The range of CO concentrations for the p.m. hour would be 4.3. to 5.2 ppm. Under the worst-case scenario, none of the CO concentrations for the peak morning and evening hours would exceed the NAAQS of 35 ppm.

Table 1-8. Peak Hour Analysis for CO (in ppm) at Musgrove Lane and Route 29 Intersection.

		2006 Master Plan with ICC				Action with ICC					
		morning Peak		evening Peak		morning Peak		evening Peak			
Receptor	Background Concentration	CAL3QHC	Total	CAL3QHC	Total	CAL3QHC	Total	CAL3QHC	Total	S/NAAQS (ppm)	Violations
1	4.0	0.3	**4.3**	0.3	**4.3**	0.3	**4.3**	0.3	4.3	35	**No**
2	4.0	0.4	**4.4**	0.3	**4.3**	0.4	**4.4**	0.3	4.3	35	**No**
3	4.0	0.6	**4.6**	0.4	**4.4**	0.6	**4.6**	0.5	4.5	35	**No**
4	4.0	1.0	**5.0**	0.7	**4.7**	1.1	**5.1**	0.8	4.8	35	**No**
5	4.0	0.4	**4.4**	0.3	**4.3**	0.5	**4.5**	0.4	4.4	35	**No**
6	4.0	0.7	**4.7**	0.6	**4.6**	0.7	**4.7**	0.6	4.6	35	**No**
7	4.0	0.9	**4.9**	1.2	**5.2**	0.9	**4.9**	1.2	5.2	35	**No**
8	4.0	0.7	**4.7**	1.2	**5.1**	0.7	**4.7**	1.2	5.2	35	**No**
9	4.0	0.6	**4.6**	0.7	**4.7**	0.7	**4.7**	0.7	4.7	35	**No**
10	4.0	0.6	**4.6**	0.5	**4.5**	0.6	**4.6**	0.5	4.5	35	**No**
11	4.0	0.4	**4.4**	0.4	**4.4**	0.4	**4.4**	0.4	4.4	35	**No**
12	4.0	0.4	**4.4**	0.5	**4.5**	0.4	**4.4**	0.5	4.5	35	**No**
13	4.0	0.7	**4.7**	0.7	**4.7**	0.7	**4.7**	0.7	4.7	35	**No**
14	4.0	0.7	**4.7**	0.9	**4.9**	0.7	**4.7**	0.9	4.9	35	**No**
15	4.0	0.7	**4.7**	1.0	**5.0**	0.7	**4.7**	1.0	5.0	35	**No**
16	4.0	0.3	**4.3**	0.3	**4.3**	0.3	**4.3**	0.3	4.3	35	**No**
17	4.0	0.3	**4.3**	0.4	**4.4**	0.3	**4.3**	0.4	4.4	35	**No**
18	**4.0**	**0.2**	**4.2**	**0.2**	**4.2**	**0.2**	**4.2**	**0.2**	**4.2**	**35**	**No**

Table 1-9 presents the results of the 8-hour analysis at the US 29 and Musgrove Lane intersection. The model results indicate for the peak 8-hour period, the range of the average CO concentrations would be 3.5 to 4.3. ppm. The maximum average concentration of CO would not exceed the 9 ppm NAAQS.

Table 1-9. Projected 8-Hour Analysis Results (in ppm) for CO at Musgrove Lane, Action with ICC

Receptor	Background Concentration	8-Hour Average		S/NAAQS	Violation
		CAL3QHC	Total		
1	3.3	0.3	**3.6**	9	**No**
2	3.3	0.3	**3.6**	9	**No**
3	3.3	0.4	**3.7**	9	**No**
4	3.3	0.8	**4.1**	9	**No**
5	3.3	0.3	**3.6**	9	**No**
6	3.3	0.5	**3.8**	9	**No**
7	3.3	1.0	**4.3**	9	**No**
8	3.3	0.9	**4.2**	9	**No**
9	3.3	0.6	**3.9**	9	**No**
10	3.3	0.5	**3.8**	9	**No**
11	3.3	0.3	**3.6**	9	**No**
12	3.3	0.4	**3.7**	9	**No**
13	3.3	0.5	**3.8**	9	**No**
14	3.3	0.7	**4.0**	9	**No**
15	3.3	0.7	**4.0**	9	**No**
16	3.3	0.3	**3.6**	9	**No**
17	3.3	0.3	**3.6**	9	**No**
18	3.3	0.2	**3.5**	9	**No**

Analysis Results for US 29 at Stewart Lane

Table 1-10 presents the results of the 1-hour analysis using projected a.m. and p.m. hourly peak traffic at the US 29 and Stewart Lane intersection. For the projected hourly peak-traffic volume, results indicated the range of CO concentrations in the a.m. hour would be 3.0 to 3.7 ppm. The range of CO concentrations for the p.m. hour would be 3.0 to 4.0 ppm. Under the worst-case scenario, none of the CO concentrations for the peak a.m. and p.m. hours would exceed the NAAQS of 35 ppm.

Table 1-10. Peak Hour Analysis for CO (in ppm) at Stewart Lane and Route 29 Intersection.

		2006 Master Plan with ICC				Action with ICC					
		morning Peak		evening Peak		morning Peak		evening Peak			
Receptor	Background Concentration	CAL3QHC	Total	CAL3QHC	Total	CAL3QHC	Total	CAL3QHC	Total	S/NAAQS	Violations
1	2.7	1.0	**3.7**	1.2	**3.9**	1.0	**3.7**	1.2	**3.9**	35	**No**
2	2.7	0.9	**3.6**	1.0	**3.7**	0.9	**3.6**	1.0	**3.7**	35	**No**
3	2.7	0.6	**3.3**	0.6	**3.3**	0.6	**3.3**	0.7	**3.4**	35	**No**
4	2.7	0.7	**3.4**	0.8	**3.5**	0.7	**3.4**	0.8	**3.5**	35	**No**
5	2.7	1.0	**3.7**	1.2	**3.9**	1.0	**3.7**	1.2	**3.9**	35	**No**
6	2.7	1.0	**3.7**	1.3	**4.0**	1.0	**3.7**	1.3	**4.0**	35	**No**
7	2.7	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	35	**No**
8	2.7	0.4	**3.1**	0.5	**3.2**	0.4	**3.1**	0.5	**3.2**	35	**No**
9	2.7	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	35	**No**
10	2.7	0.3	**3.0**	0.3	**3.0**	0.3	**3.0**	0.3	**3.0**	35	**No**
11	2.7	0.3	**3.0**	0.3	**3.0**	0.3	**3.0**	0.3	**3.0**	35	**No**
12	2.7	0.3	**3.0**	0.4	**3.1**	0.3	**3.0**	0.4	**3.1**	35	**No**
13	2.7	0.4	**3.1**	0.5	**3.2**	0.4	**3.1**	0.5	**3.2**	35	**No**
14	2.7	0.5	**3.2**	0.5	**3.2**	0.5	**3.2**	0.5	**3.2**	35	**No**
15	2.7	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	0.4	**3.1**	35	**No**
16	2.7	0.6	**3.3**	0.5	**3.2**	0.6	**3.3**	0.5	**3.2**	35	**No**
17	**2.7**	**0.4**	**3.1**	**0.4**	**3.1**	**0.4**	**3.1**	**0.4**	**3.1**	**35**	**No**

Table 1-11 presents the results of the 8-hour analysis at the US 29 and Stewart Lane intersection. The model results indicate for the peak 8-hour period, the range of the average CO concentrations would be 2.4 to 3.1 ppm. The maximum average concentration of CO would not exceed the 9 ppm NAAQS.

Table 1-11. Projected 8-Hour Analysis Results for CO (in ppm) at Stewart Lane Action with ICC

Receptor	Background Concentration	8-Hour Average		S/NAAQS	Violation
		CAL3QHC	Total		
1	2.1	0.9	**3.0**	9	**No**
2	2.1	0.8	**2.9**	9	**No**
3	2.1	0.6	**2.7**	9	**No**
4	2.1	0.7	**2.8**	9	**No**
5	2.1	1.0	**3.1**	9	**No**
6	2.1	1.0	**3.1**	9	**No**
7	2.1	0.4	**2.5**	9	**No**
8	2.1	0.4	**2.5**	9	**No**
9	2.1	0.3	**2.4**	9	**No**
10	2.1	0.3	**2.4**	9	**No**
11	2.1	0.3	**2.4**	9	**No**
12	2.1	0.3	**2.4**	9	**No**
13	2.1	0.4	**2.5**	9	**No**
14	2.1	0.4	**2.5**	9	**No**
15	2.1	0.4	**2.5**	9	**No**
16	2.1	0.5	**2.6**	9	**No**
17	2.1	0.3	**2.4**	9	**No**

1.2.2.1.7. Mobile Source Air Toxic (MSAT) Analysis

The Federal Highway Administration (FHWA) Interim Guidance on Air Toxic Analysis in NEPA Documents requires analysis of MSATs under specific conditions. The following language is taken from this guidance. The EPA has designated six prioritized MSATs, which are known or probable carcinogens or can cause chronic respiratory effects. The six prioritized MSATs are: Benzene; Acrolein; Formaldehyde; 1,3-Butadiene, Acetaldehyde; and Diesel Exhaust (Diesel Exhaust Gases and Diesel Particulate Matter). The FDA Headquarters Consolidation at White Oak would not increase capacity on local roadways and is not likely to meaningfully increase emissions of air pollutants. Therefore, the project would be considered a Project with Low Potential MSAT Effects.

Unavailable Information for Project Specific MSAT Impact Analysis

Included is a basic analysis of the likely MSAT emissions impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with any of the Master Plan Update Alternatives. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts from MSAT on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSAT in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model – emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of evening under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects

Even if emission levels and concentrations of MSAT could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions

about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis. Research into the health impacts of MSAT is ongoing. For the different MSAT emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust (DE)** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

Project Specific MSAT Discussion

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSAT at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSAT, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the Master Plan Update Alternatives.

The qualitative assessment presented is derived in part from the FHWA study: *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

The FDA project falls into the category of a project that facilitates new development that may generate additional MSAT emissions from new trips, truck deliveries, and parked vehicles. Many of these activities will be attracted from elsewhere in the Washington DC metropolitan region. Thus, on a regional scale, there will be a minimal net change in emissions. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in vehicles miles traveled (VMT), the Federal Highway Administration predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project.

1.2.2.1.7 Fine Particulate Matter ($PM_{2.5}$)

The FDA White Oak Campus is located in a $PM_{2.5}$ nonattainment area. The area was designated as nonattainment on January 5, 2005 by EPA. This designation became effective on April 5, 2005, 90 days after EPA's published action in the Federal Register. Transportation conformity for the $PM_{2.5}$ standards applied on April 5, 2006, after the one-year grace period provided by the CAA.

Projects that require hotspot analysis for $PM_{2.5}$ are those projects that are Projects of Air Quality Concern as enumerated in 40CFR93.123 (b)(1) and restated below:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
- Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The following analysis concerning $PM_{2.5}$ has been developed for the proposed project:

- The FDA White Oak Consolidation Project does not meet the criteria set forth in 40 CFR 93.123(b)(1) as amended to be considered a Project of Air Quality Concern primarily because the project does not include improvements to project area roadways or highways, and vehicles added to area roadways would primarily be gasoline rather than diesel powered vehicles.
- The FDA White Oak Consolidation Project does not have a significant increase in diesel vehicles due to construction of the project. In accordance with FHWA guidance, "40 CFR 93.123(b)(1)(i) should be interpreted as applying only to projects that would involve a significant increase in the number of diesel transit busses and diesel trucks on the facility". The percent of trucks is not expected to change between either of the Master Plan Update Alternatives and 2006 Master Plan conditions.

Based on the preceding review and analysis, it is determined that the FDA White Oak Consolidation Project, meets the CAA and 40 CFR 93.109 requirements. These requirements are met for particulate matter without a project-level hot-spot analysis, since the project has not been found not to be a Project of Air Quality Concern as defined under 40 CFR 93.123(b)(1). Since the project meets the CAA and 40 CFR 93.109 requirements, the project will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, or increase the frequency or severity of a violation.

1.2.2.2 Stationary Source Analysis

Development of the FDA White Oak Campus under either of the Master Plan Update alternatives would increase energy demands and air pollutants emitted by on-site facilities required to accommodate the projected demand. Under the Proposed FDA Master Plan Update, the FDA Headquarters Campus at White Oak would be developed to include 5,989,934 square feet of new office and laboratory facilities. The existing CUP capacity is insufficient to serve the needs of the proposed development under either of the Master Plan Update alternatives. Therefore modifications to the system and increases in electrical generation, cooling, and heating, would be required.

The potential-to-emit (PTE) air emissions inventory was developed based on the assumption that each of the two Master Plan Update alternatives would include three possible options for the use of gas turbines within the CUP to accommodate energy demands of the campus. The estimated annual fuel usage was used to estimate expected maximum air pollutant emissions of nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), volatile organic compounds (VOC), and sulfur dioxide (SO_2).

The stationary source analyses (New Source Review Applicability, NAAQS Screening Modeling Assessment, and the Federal Conformity Analysis) address potential stationary source emissions related to the proposed facility development included in the FDA White Oak Campus Master Plan Update alternatives. The first analysis is to determine if any of the alternatives would be considered a new major source of emissions. The second analysis is to determine if any of the alternatives would create a

potential violation of the NAAQS. The third analysis is to determine if the alternatives would be in conformity with the SIP.

1.2.2.2.1 New Source Review Applicability

Under provisions of the CAA, proposed new construction of a major stationary source of air pollution or major modification to an existing stationary source of air pollution may require that a "major source" New Source Review (NSR) air pollution permit be obtained. Under the NSR regulations, permits for major sources located in attainment areas are referred to as Prevention of Significant Air Quality Deterioration (PSD) permits; while permits for major sources located in nonattainment areas are referred to as Non-Attainment Review (NAR) permits. Montgomery County, MD is located in a non-attainment area for O_3 (8 hour standard) and $PM_{2.5}$. Because oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) are regulated as O_3 pre-cursor pollutants, the PTE emissions of these pollutants and other air pollutants associated with the combustion of natural gas were evaluated for each of the proposed alternatives to determine whether NSR major source permitting would be required. The PTE emissions for each applicable NSR regulated air pollutant for each Master Plan Update alternative was determined and compared to the NSR major source emission threshold. To determine the "major source" NSR emission threshold applicable to this project, it was estimated that the new boiler for each of the Master Plan Update Alternatives would require more than 250 million Btu per hour heat input. As a result, it was determined that the NSR "major source" threshold of 100 tons per year of any regulated NSR pollutant was applicable to this project.

Annual PTE emissions of each applicable regulated NSR pollutant for each Master Plan Update Alternative were assessed using either EPA AP-42 pollutant emissions factors for natural gas fired boilers with greater than 100 MMBtu/hr heat input or boiler specific emissions in the case of NO_x. In addition it was assumed that as the facility is within a non-attainment area for NO_x, that Selective Catalytic Reduction (SCR) would be applied, where applicable, as a control technology. Total NO_x emissions for each option were provided by the GSA's energy consultant:

- Option A: 24.6 tons per year for five Mercury 50 turbines;
- Option B: 12.4 tons per year for one Mercury 50 turbine and two Taurus 70 turbines; and
- Option C: 18.8 tons per year for one Mercury 50 turbine and two Titan 130 turbines.

The standard AP-42 emission factors used to estimate CO, SO_2, and Particulate Matter emissions include:

- CO: 84 pounds per million standard cubic feet (lbs/mmscf)
- SO_2: 0.6 lbs/mmscf
- Particulate Matter: 7.6 lbs/mmscf.

The annual PTE emissions for applicable criteria air pollutants (tons/year) are presented in Table 1-12. Due to limitations in modeling capabilities for $PM_{2.5}$, and because $PM_{2.5}$ is a subset of PM_{10}, the reported PM_{10} emission values represent both $PM_{2.5}$ and PM_{10} emissions. Air emissions from mobile sources are excluded from NSR applicability.

Table 1-12. Annual PTE Emissions for Applicable Criteria Pollutants (tons/yr)

Alternatives	SO_2	NO_x	CO	PM_{10}	VOC
Alternative 1	3.5	32.5	54.9	28.9	12.5
Alternative 2-A	4.0	57.1	**127.4**	35.5	17.3
Alternative 2-B	4.0	44.9	**123.6**	35.1	17.0
Alternative 2-C	4.4	51.3	**174.3**	39.7	20.4
Alternative 3-A	4.0	57.1	**127.4**	35.5	17.3
Alternative 3-B	4.0	44.9	**123.6**	35.1	17.0
Alternative 3-C	4.4	51.3	**174.3**	39.7	20.4
New Source Review Major Source Threshold	100	100	100	100	100

As identified in Table 1-13, when compared to the 100 ton/year threshold, Master Plan Update Alternatives 2 and 3, with each of their CUP scenario options, are expected to exceed the major source NSR thresholds for CO. Therefore, the Master Plan Update Alternatives considered would be classified as a major source under the NSR regulations and therefore would potentially require a PSD permit. An NSR applicability analysis for the Master Plan Update Alternatives follows, examining the incremental increase of emissions as a result of the CUP expansion.

Table 1-13. NSR Applicability for Annual PTE Emissions for Applicable Criteria Pollutants (tons/yr)

Alternatives	SO_2	NO_x	CO	PM_{10}	VOC
Alternative 2-A	0.5	24.6	72.5	6.6	4.8
Alternative 2-B	0.5	12.4	68.8	6.2	4.5
Alternative 2-C	0.9	18.8	**119.4**	10.8	7.8
Alternative 3-A	0.5	24.6	72.5	6.6	4.8
Alternative 3-B	0.5	12.4	68.8	6.2	4.5
Alternative 3-C	0.9	18.8	**119.4**	10.8	7.8
New Source Review Significance Threshold	40	25*	100	15	25*
* standard is 25 tons/year as a result of ozone non-attainment status.					

Table 1-13 demonstrates that for Master Plan Update Alternatives 2-C and 3-C, CO exceeds the New Source Review Significance Threshold and thus would be required to undergo a full NSR review. A full NSR review for CO, with accompanying Best Available Control Technology (BACT) determination and

NAAQS and PSD air quality modeling, would be conducted prior to construction, if final project design and equipment choice continue to indicate a significant finding. No other pollutant would be required to undergo this analysis in any alternative. The AP-42 pollutant emissions factors are conservative. GSA is working with its energy consultant to use the advanced technology to reduce emissions of criteria pollutants.

In addition, the Master Plan Update would require GSA to obtain a Title V operating permit (under Title V of the Clean Air Act) under Maryland's Part 70 Permit Program.

1.2.2.2.2 NAAQS Screening Modeling Assessment

The alternatives were assessed to determine whether the project would exceed the NAAQS. The EPA approved AERMOD model was used to perform the NAAQS screening modeling assessment. To perform the NAAQS screening modeling assessment, the PTE air emissions from the existing stacks associated with the central plant were modeled as individual point sources. For Alternatives 2 and 3, there were 3 options that included 3 to 5 additional gas turbine exhaust stacks. As part of this assessment, potential building downwash effects were also evaluated. Additionally, PTE emissions generated from vehicles using the above-ground parking garages for each Alternative were modeled as area sources. Maximum modeled impacts of each air pollutant were added to representative background ambient air quality data for NO_x, SO2, and PM_{10} for the year 2004 and 2005 to determine compliance with corresponding NAAQS. The background ambient air quality data for CO was obtained by using the second-highest concentration data from the District of Columbia's monitoring stations since 2006. This urban monitor is considered to be a highly conservative observation for background concentrations. The results of this analysis each the Master Plan Update Alternative/CUP Option combination and the 2006 Master Plan (No Action) Alternative are presented in Tables 1-14 through 1-21. It should be noted that there is very little difference among each Alternative/Option combination from a NAAQS impact perspective, as the maximum impact results largely from the existing sources. There is no significant difference between the NAAQS impact of Update Alternatives 2 and 3, as the changes in structures and parking distribution did not play a role in the maximum NAAQS impacts.

Table 1-14. NAAQS Compliance Summary - Alternative 2-A

Pollutant	Modeled Maximum Impacts (µg/m3)					Background (µg/m3)	Total Impact (µg/m3)	NAAQS (µg/m3)
	1-Hour	3-Hour	8-Hour	24-Hour	Annual			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.5	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.6	-	64	67.6	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.79**	**32**	**32.79**	**50**

Table 1-15. NAAQS Compliance Summary – Alternative 2-B

Pollutant	Modeled Maximum Impacts (µg/m3)					Background (µg/m3)	Total Impact (µg/m3)	NAAQS (µg/m3)
	1-Hour	3-Hour	8-Hour	24-Hour	Annual			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.5	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.5	-	64	67.5	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.77**	**32**	**32.77**	**50**

Table 1-16. NAAQS Compliance Summary - Alternative 2-C								
	Modeled Maximum Impacts (µg/m3)					Background (µg/m3)	Total Impact (µg/m3)	NAAQS (µg/m3)
Pollutant	1-Hour	3-Hour	8-Hour	24-Hour	Annual			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.6	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.6	-	64	67.6	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.78**	**32**	**32.78**	**50**

Table 1-17. NAAQS Compliance Summary - Alternative 1 (2006 Master Plan)								
	Modeled Maximum Impacts (µg/m3)					Background (µg/m3)	Total Impact (µg/m3)	NAAQS (µg/m3)
Pollutant	1-Hour	3-Hour	8-Hour	24-Hour	Annual			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.5	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	85.0	-	-	3,114	3,199	**10,000**
SO_2	-	8.3	-	-	-	107	115.3	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.3	-	64	67.3	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.68**	**32**	**32.68**	**50**

Table 1-18. NAAQS Compliance Summary – Alternative 3 –A								
Pollutant	**Modeled Maximum Impacts (µg/m3)**					**Background (µg/m3)**	**Total Impact (µg/m3)**	**NAAQS (µg/m3)**
	1-Hour	**3-Hour**	**8-Hour**	**24-Hour**	**Annual**			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.5	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.6	-	64	67.6	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.79**	**32**	**32.79**	**50**

Table 1-19. NAAQS Compliance Summary - Alternative 3-B								
Pollutant	**Modeled Maximum Impacts (µg/m3)**					**Background (µg/m3)**	**Total Impact (µg/m3)**	**NAAQS (µg/m3)**
	1-Hour	**3-Hour**	**8-Hour**	**24-Hour**	**Annual**			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.5	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.6	-	64	67.6	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.79**	**32**	**32.79**	**50**

Table 1-20. NAAQS Compliance Summary - Alternative 3-C								
Pollutant	**Modeled Maximum Impacts (µg/m3)**					**Background (µg/m3)**	**Total Impact (µg/m3)**	**NAAQS (µg/m3)**
	1-Hour	**3-Hour**	**8-Hour**	**24-Hour**	**Annual**			
NO_x	-	-	-	-	12.1	40	52.1	**100**
CO	307.6	-	-	-	-	4,029	4,338	**40,000**
CO	-	-	101.8	-	-	3,114	3,216	**10,000**
SO_2	-	10.6	-	-	-	107	117.6	**1300**
SO_2	-	-	-	3.4	-	43	46.4	**365**
SO_2	-	-	-	-	0.85	16	16.85	**80**
PM_{10}	-	-	-	3.6	-	64	67.6	**150**
PM_{10}	**-**	**-**	**-**	**-**	**0.78**	**32**	**32.78**	**50**

All of the pollutant impacts associated with each of the Master Plan Update Alternatives would be below all applicable NAAQS. The CO hot spot receptors were also modeled and the impacts are shown in Table 1-21.

Table 1-21. CO Hot Spot Receptors				
Alternative	**Modeled Maximum Impacts ($µg/m^3$)**		**Location (UTM Meters)**	
	1-Hour	**8-Hour**	**Easting**	**Northing**
Alternative 1	78.4 (1.92 ppm)	12.3 (0.30 ppm)	328130.6	4323773.5
Alternative 2-A	91.4 (2.24 ppm)	12.7 (0.31 ppm)	328130.6	4323773.5
Alternative 2-B	91.4 (2.24 ppm)	12.8 (0.31 ppm)	328130.6	4323773.5
Alternative 2-C	91.4 (2.24 ppm)	13.2 (0.32 ppm)	328130.6	4323773.5
Alternative 3-A	79.5 (1.95 ppm)	12.7 (0.31 ppm)	328130.6	4323773.5
Alternative 3-B	79.5 (1.95 ppm)	12.8 (0.31 ppm)	328130.6	4323773.5
Alternative 3-C	79.7 (1.96 ppm)	13.2 (0.32 ppm)	328130.6	4323773.5

Each model run (one year of meteorological data) yielded a highest 2nd high receptor value (H2H). The highest of these five values (one per year of meteorological data) is shown in Tables 1-14 through 1-21.

1.2.2.2.3 Federal Air Conformity Analysis

Section 176(c) of the CAA prohibits Federal entities from taking actions in non-attainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. In November 1993, the EPA promulgated the General Conformity Regulations (58 FR 63214) to assure that Federal actions conform to the SIP. The Washington, DC area is classified as moderate nonattainment for the 8-hour O_3 NAAQS. Specifically, Section 51.853 (b)(1) of the General Conformity Regulations stipulates that a general conformity determination is required for moderate ozone nonattainment areas if VOC PTE emissions exceed 50 tons per year and NO_x emissions exceed 100 tons per year.

The Washington, DC area has been classified as non-attainment for $PM_{2.5}$. Conformity regulations pertaining to $PM_{2.5}$ were released on July 17, 2006. Under that guidance, the emissions threshold of 100 tons a year for primary $PM_{2.5}$ should be used. Secondary $PM_{2.5}$ is evaluated using a standard for fine particulate precursors, and is shown in Table 1-20.

As demonstrated by Table 1-22, PTE emissions of all pollutants fall well below the emission thresholds. The PTE emissions of $PM_{2.5}$ reflect AP-42 emission factors that state that particulate combustion emissions from natural gas as assumed to be smaller than 1 micron, and thus all particulate emissions are in the $PM_{2.5}$ subgroup. As a result, a conformity determination is not required for any of the Master Plan Update Alternatives.

Table 1-22. Annual PTE Emissions for Applicable Criteria Pollutants (tons/yr) for Additional Boiler Capacity

Alternative	NO_x	VOC	PM_{10}	$PM_{2.5}$	NO_x	VOC	SO_2
Alternative 2-A	24.6	4.8	6.6	6.6	24.6	4.8	0.5
Alternative 2-B	12.4	4.5	6.2	6.2	12.4	4.5	0.5
Alternative 2-C	18.8	7.8	10.8	10.8	18.8	7.8	0.9
Alternative 3-A	24.6	4.8	6.6	6.6	24.6	4.8	0.5
Alternative 3-B	12.4	4.5	6.2	6.2	12.4	4.5	0.5
Alternative 3-C	18.8	7.8	10.8	10.8	18.8	7.8	0.9
General Conformity Regulations Emission Thresholds	100	50	100	100	100	100	100

Table 1-23. Projected 1-Hour Peak Analysis Results for CO (in ppm) at Hot Spot Receptor Locations, Musgrove Lane at US 29 Action With ICC

Alternative	Background Concentration	Stationary CO Output	morning		evening		S/NAAQS	Violation
			CAL3QHC	*TOTAL*	CAL3QHC	*TOTAL*		
Alternative 1	4.0	0.069	0.6	**4.67**	0.5	**4.57**	35 ppm	No
Alternative 2-A	4.0	0.080	0.6	**4.68**	0.5	**4.58**	35 ppm	No
Alternative 2-B	4.0	0.080	0.6	**4.68**	0.5	**4.58**	35 ppm	No
Alternative 2-C	4.0	0.080	0.6	**4.68**	0.5	**4.58**	35 ppm	No
Alternative 3-A	4.0	0.070	0.6	**4.67**	0.5	**4.57**	35 ppm	No
Alternative 3-B	4.0	0.070	0.6	**4.67**	0.5	**4.57**	35 ppm	No
Alternative 3-C	4.0	0.070	0.6	**4.67**	0.5	**4.57**	35 ppm	No

Table 1-24. Projected 8-Hour Peak Analysis Results for CO (in ppm) at Hot Spot Receptor Locations, Musgrove Lane at US 29 With ICC

Alternative	Background Concentration	Stationary CO Output	8-Hour Average		S/NAAQS	Violation
			CAL3QHC	*TOTAL*		
Alternative 1	3.3	0.011	0.5	**3.81**	9 ppm	No
Alternative 2-A	3.3	0.011	0.5	**3.81**	9 ppm	No
Alternative 2-B	3.3	0.011	0.5	**3.81**	9 ppm	No
Alternative 2-C	3.3	0.012	0.5	**3.82**	9 ppm	No
Alternative 3-A	3.3	0.011	0.5	**3.81**	9 ppm	No
Alternative 3-B	3.3	0.011	0.5	**3.81**	9 ppm	No
Alternative 3-C	3.3	0.012	0.5	**3.82**	9 ppm	No

Table 1-25. Projected 1-Hour Peak Analysis Results for CO (in ppm) at Hot Spot Receptor Locations, Stewart Lane at US 29 Action With ICC

Alternative	Background Concentration	Stationary CO Output	morning		evening		S/NAAQS	Violation
			CAL3QHC	*TOTAL*	CAL3QHC	*TOTAL*		
Alternative 1	4.0	0.069	0.3	**4.37**	0.3	**4.37**	35 ppm	No
Alternative 2-A	4.0	0.080	0.3	**4.38**	0.3	**4.38**	35 ppm	No
Alternative 2-B	4.0	0.080	0.3	**4.38**	0.3	**4.38**	35 ppm	No
Alternative 2-C	4.0	0.080	0.3	**4.38**	0.3	**4.38**	35 ppm	No
Alternative 3-A	4.0	0.070	0.3	**4.37**	0.3	**4.37**	35 ppm	No
Alternative 3-B	4.0	0.070	0.3	**4.37**	0.3	**4.37**	35 ppm	No
Alternative 3-C	4.0	0.070	0.3	**4.37**	0.3	**4.37**	35 ppm	No

Table 1-26. Projected 8-Hour Peak Analysis Results for CO (in ppm) at Hot Spot Receptor Locations, Stewart Lane at US 29 With ICC

Alternative	Background Concentration	Stationary CO Output	8-Hour Average		S/NAAQS	Violation
			CAL3QHC	*TOTAL*		
Alternative 1	3.3	0.011	0.3	**3.61**	9 ppm	No
Alternative 2-A	3.3	0.011	0.3	**3.61**	9 ppm	No
Alternative 2-B	3.3	0.011	0.3	**3.61**	9 ppm	No
Alternative 2-C	3.3	0.012	0.3	**3.62**	9 ppm	No
Alternative 3-A	3.3	0.011	0.3	**3.61**	9 ppm	No
Alternative 3-B	3.3	0.011	0.3	**3.61**	9 ppm	No
Alternative 3-C	3.3	0.012	0.3	**3.62**	9 ppm	No

1.2.2.2.4 Combined Mobile and Stationary Co Analysis

CO emissions from stationary sources must be combined with mobile source CO emissions and CO background concentrations. The sum of these values must not exceed the NAAQS for the peak-hour or 8-hour emissions. As demonstrated by Tables 1-21 through 1-24, for the US 29/Stewart Lane intersection and the US 29/Musgrove Road intersection, emissions of CO for peak hour and 8-hour analysis fall below these emissions thresholds.

1.2.2.3 Direct Impacts

Minor increases in emissions from mobile and stationary sources would occur as a result of the proposed development on the FDA White Oak Campus. Growth of employment from 7,719 employees to 8,889 employees is not yet accounted for in the SIP, but would be included in the next round of Cooperative Employment Forecasts prepared by MNCPPC and MWCOG. New Source Review indicates that under the stationary analysis, both Master Plan Update Alternatives would qualify as major sources under New Source Review. The NAAQS Screening Modeling Assessment indicates that all of the pollutant impacts associated with each of the Master Plan alternatives would be below all applicable NAAQS. The project meets $PM_{2.5}$ requirements without a project-level hot-spot analysis, since the project would not be considered a Project of Air Quality Concern as defined under 40 CFR 93.123(b)(1).

1.2.2.4 Temporary Construction Impacts

Air quality may be temporarily impacted by construction activities. Fugitive dust would be generated during the demolition of existing structures, site grading, construction, wind erosion, and vehicular activities. Emissions from construction equipment including earth moving equipment, demolition equipment, and paving equipment, would generate VOCs and NOx. The intensity, duration, location, and type of construction activity would vary over time. These impacts could be considered significant, even on a temporary basis, if the local construction regulations and BMP control measures are not implemented. With the implementation of control measures, construction activities would be expected to have short-term, minor, adverse impact on air quality.

1.2.2.5 Indirect Impacts

Air emissions associated with development on the FDA White Oak Campus are not anticipated to affect the overall health, welfare, or financial base of the communities within the vicinity of the campus. Therefore, no indirect impacts to air quality would occur under the development alternatives.

1.2.2.6 Cumulative Impacts

Past, present, and future development within the Washington DC metropolitan region will continue to produce additional traffic and new emission sources which would cumulatively affect air quality. Development of any of the Master Plan Update Alternatives would result in additional emissions. However, newer vehicles and building mechanical equipment operate with cleaner systems reducing the potential effect new sources of emissions would have on air quality.

1.2.2.7 Mitigation Measures

Short term construction impacts can be mitigated through the use of control measures including maintenance of emission controls on all construction equipment and covering/wetting exposed soils to reduce fugitive dust.

To further reduce NO_x and $PM_{2.5}$ emissions from the proposed stationary sources beyond the already proposed SCR control technology for NO_x, the following control options can be instituted:

- limits on permitted hours of operation per year,
- incorporate control technology.

To further reduce stationary source CO emissions, the GSA will work with its energy consultant to refine the operating parameters of the equipment used to operate the CUP. The following control options can be instituted:

- limits on permitted hours of operations per year
- limits on annual fuel consumption
- equipment choice that would minimize CO impacts

It should be noted that any long term impacts within the region will also be offset by the advancement in automobile technology and Federal emission regulations and controls.

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2 Noise

2.1 Affected Environment

2.1.1 Noise Fundamentals

The purpose of the noise study is to determine whether the traffic generated by future development scenarios and reconfiguration of roads would cause the noise levels to approach or exceed the Federal Highway Administration (FHWA) Noise Abatement Criteria. In addition, the potential for noise generated by gas turbines within the proposed expansion of the Central Utility Plant and its impact on nearby residences and employees was considered.

The extent to which individuals are affected by noise is controlled by several factors, including:

- the duration and frequency of sound;
- the distance between the sound source and the receptor;
- the intervening natural or man-made barriers or structures; and
- the ambient environment.

The level of roadway traffic noise depends upon:

- the volume of traffic,
- the speed of traffic, and
- the number of trucks in the flow of traffic.

Generally, a combination of high traffic volumes and speeds results in high levels of traffic noise. The level of noise is also dependent on the percent of trucks in the vehicle mix. Vehicle noise is a combination of the noises produced by the engine, exhaust system, and tire-roadway interaction. For the purposes of traffic noise analyses, FHWA has established the following vehicle classifications: heavy trucks, medium trucks, automobiles, buses, and motorcycles. Heavy trucks, or vehicles having three or more axles, typically produce more noise than medium trucks, which have two axles and six wheels; medium trucks typically generate more noise than automobiles. Table 2-1 presents common noise sources and sound levels.

Table 2-1. Common Sound Levels

Source	Sound Level (dB(A))
Near large jet at takeoff	140
Air-raid siren	130
Threshold of pain	120
Thunder or sonic boom	110
Garbage or trailer truck at roadside	100
Power lawnmower at 5 feet	90
Alarm clock or vacuum cleaner	80
Freeway traffic at 50 feet	70
Conversational speech	60
Average residence	50
Bedroom*	40
Soft whisper at 15 feet	30
Rustle of leaves	20
Breathing	10
Threshold of hearing	0

*includes HVAC system, conversation, walking, doors opening and closing

Traffic noise is measured and described in accordance with FHWA guidelines, which prescribe the use of equivalent sound levels, (Leq) as the primary descriptor for noise analysis. Leq is defined as the equivalent steady state sound level, which contains the same acoustic energy in a specified time period as the time-varying sound level during the same specified time period. The FHWA and every state's department of transportation use the Leq(h) (hourly equivalent sound level) descriptor to estimate the degree of nuisance or annoyance arising from changes in traffic noise. Because the principal noise-related concern raised by the proposed action is traffic-induced noise, the Leq(h) descriptor is used in this analysis. The unit of measure for Leq is the "A-weighted" decibel (dB(A)). The dB(A) scale de-emphasizes the very low and the very high frequencies and emphasizes the middle frequencies, thereby closely approximating the frequency response of the human ear.

Human ability to perceive change in noise levels varies widely from person to person, as do responses to perceived changes. Generally, a three dB(A) change in noise level would be barely perceptible to most listeners, whereas a ten dB(A) change is typically perceived as a doubling (or halving) of noise levels and is considered a substantial change. These thresholds (summarized in Table 2-2) permit direct estimation of an individual's probable perception of changes in noise levels.

Table 2-2. Perceptions of Changes in Noise Levels

Change in dB(A)	Perception
0	Reference
3	Barely perceptible change
5	Readily perceptible change
10	Twice or half as loud
20	Four times or ¼ as loud
40	Eight times or 1/8 as loud

Source: Federal Highway Administration, June 1995 (*Highway Traffic Noise Analysis and Abatement Policy and Guidance*)

The determination of traffic noise impacts is based on the relationship between the ambient noise levels, the predicted noise levels, and the established noise abatement criteria. The effects of highway traffic noise are based on criteria established by FHWA in Title 23 of the Code of Federal Regulations, Part 772 (23 CFR, Part 772) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* and the Maryland State Highway Administration's *Sound Barrier Policy* (May 1998). The Federal Noise Abatement Criteria (NAC) are based on specific land use categories and are used to determine the need for studying noise abatement. Table 2-3 presents the land use categories and their noise impact levels. Noise-sensitive land uses surrounding the FDA White Oak Campus include residential and recreational areas that meet the standards of Land Use Activity Category B, which has a noise impact threshold of 67 dB(A). The NAC states that noise abatement must be considered when highway noise levels approach or exceed 67 dB(A).

Table 2-3. Noise Abatement Criteria (NAC), 23 CFR, Part 772 - Hourly A-Weighted Sound Levels in Decibels (dB(A))[1]

Activity Category	L_{eq} (h)	L_{10}(h)	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreational areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (Exterior)	75 (Exterior)	Developed lands, properties or activities not included in Categories A or B above
D	--	--	Undeveloped lands
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

[1]Either L_{eq}(h) or L_{10}(h) (but not both) may be used on a project.

2.1.2 Study Area Noise Environment

The study area is located within a suburban environment with noise sources typical for suburban areas. Common sources of community noise include roadway traffic, sirens from emergency vehicles, airplanes and other human and animal activities. Existing high traffic volumes and speeds on freeways and arterial roads in the study area contribute to the noise environment. The roadways with the highest volumes and speeds surrounding the FDA White Oak Campus include:

- I-495
- I-95
- US Route 29/ Columbia Pike,
- MD Route 650/ New Hampshire Avenue,
- MD Route 212/ Powder Mill Road,
- Cherry Hill Road,
- Fairland Road,
- Lockwood Drive, and
- Broadbirch Drive.

Noise Sensitive Resources. Existing noise-sensitive resources on the FDA White Oak Campus and within the area of traffic influence for the Master Plan Update alternatives include:

- residential areas adjacent to:
  - US Route 29/ Columbia Pike between Fairland Lockwood Drive and Fairland Avenue,
  - MD Route 650/ New Hampshire Avenue between US Route 29/ Columbia Pike and MD Route 212/ Powder Mill Road,
  - MD Route 212/ Powder Mill Road between MD Route 650/ New Hampshire Avenue and I-95,
  - Cherry Hill Road between US Route 29/ Columbia Pike and MD Route 212/ Powder Mill Road, and
  - Lockwood Drive between US Route 29/ Columbia Pike and US Route 650/ New Hampshire Avenue.
- Southeast Hebrew Congregation synagogue off of Lockwood Drive,
- Shaare Tefila Congregation synagogue on Lockwood Drive,
- Young Israel of White Oak Congregation synagogue on Burnt Mills Avenue,
- Unitarian Universalist Church of Silver Spring on New Hampshire Avenue,
- Episcopal Church of Our Saviour on Powder Mill Road
- Hillandale Baptist Church on Powder Mill Road,
- Paint Branch Unitarian Universalist Church on Powder Mill Road,
- St. Mark's Episcopal Church on Old Columbia Pike,
- Burnt Mills Elementary School off of Columbia Pike,
- High Point High School on Powder Mill Road, and
- Hillandale Park.

2.1.3 Noise Assessment Methods

The goal of the qualitative noise analysis for this technical report was to identify whether noise-sensitive areas would be potentially impacted by project-related traffic increases on noise sensitive areas adjacent to the FDA White Oak Campus or by noise generated by the proposed expansion of the Central Utility Plant. In general, the Master Plan Update alternatives will alter traffic volumes and patterns, and this noise analysis will address the potential for those changes to exceed FHWA-established noise abatement criteria and Maryland State Highway Administration (SHA) Noise Abatement Policy criteria. Traffic volume data for the existing, 2006 Master Plan, and Master Plan Update alternatives were compared for all study area roadway segments to determine if noise-sensitive (primarily residential) areas would experience the growth in traffic volumes significant enough to result in traffic noise increases. Data was taken from intersection diagrams to determine the traffic volumes from the links between the intersections. Figure 2 shows the location of the intersections. See Appendix A for the Traffic Analysis Diagrams and the Traffic Analysis Summary Table.

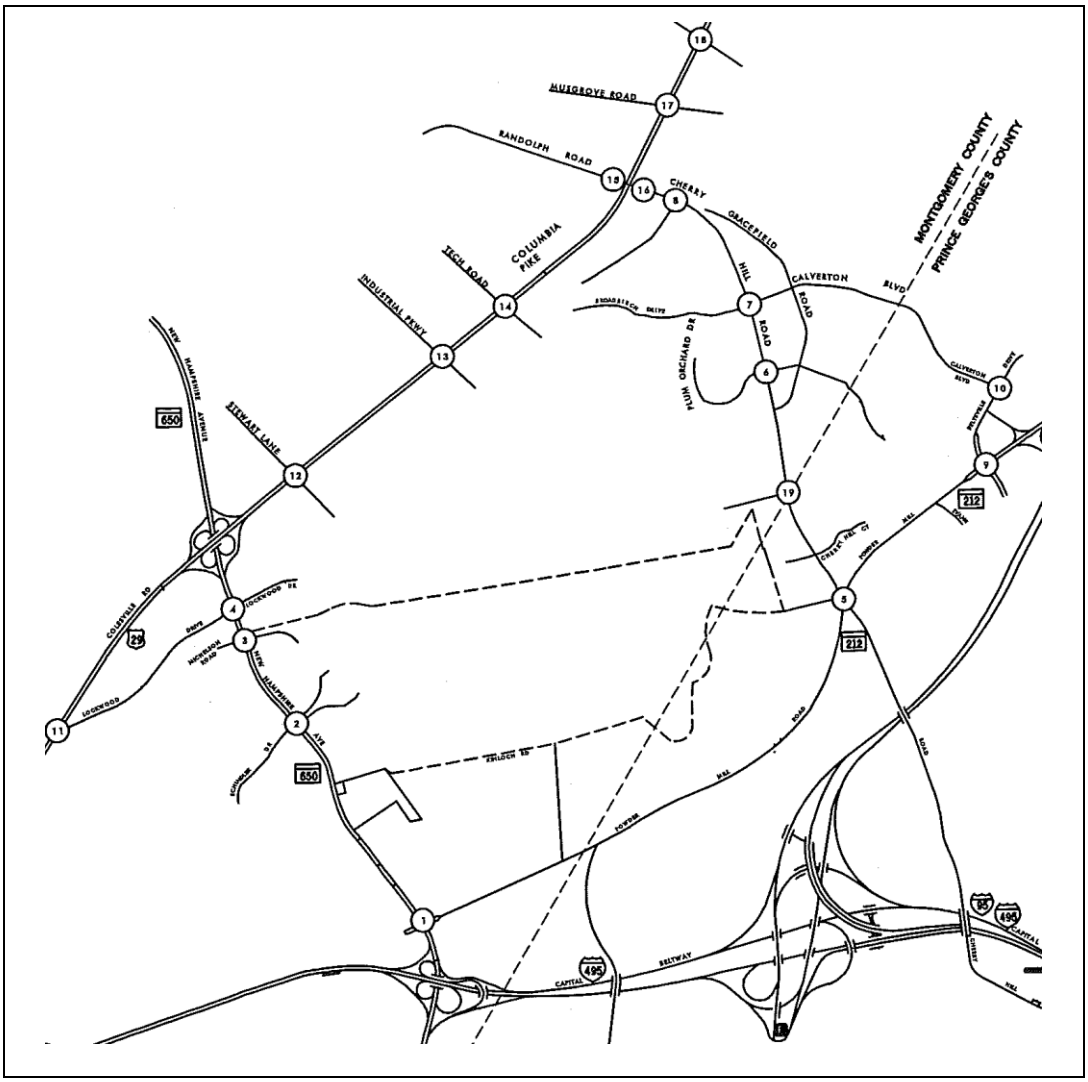

Figure 2. Traffic Analysis Intersection Diagram Location Map.

2.2 Environmental Consequences

2.2.1 2006 Master Plan Alternative (No Action): Direct, Indirect, and Cumulative Impacts

Under the 2006 Master Plan Alternative, the FDA consolidation on the FRC would continue. Buildings would continue to be grouped around the research and administrative functions with pedestrian scaled courtyards. The FDA would not generate additional traffic over the traffic levels studied in the 2005 Final EIS (GSA, 2005). Although the property would not induce additional traffic volumes on study area roadways, there would be traffic increases from predicted general growth in the community, including potential development of the ICC in the project vicinity. CUP expansions planned as part of the 2006 Master Plan would generate new noise impacts. These impacts would be mitigated through the use of acoustic blocks in the engine halls, sound attenuation walls, as necessary, around outside gas compressors and turbines, variable frequency drives to slow the fan speed in the cooling towers, and placement of turbines in cabinets. With these measures, the 2006 Master Plan Update would have minor, long-term, adverse impacts to noise levels.

2.2.2 Master Plan Update Alternatives

2.2.2.1 Direct Impacts

Traffic associated with the FDA Master Plan Update Alternatives, overall, is anticipated to cause minor, likely imperceptible increases in noise. Traffic volume comparisons revealed that the Master Plan Update alternatives would result in increases over 2006 Master Plan traffic volumes up to 6.3 percent with the construction of the ICC and up to 7 percent without the construction of the ICC. With the construction of the ICC, the area of greatest forecast traffic increase is on MD 650 between the MD 650/ Michelson Road intersection and the MD 650/ Lockwood Drive intersection. Without the construction of the ICC, the area of greatest forecast traffic increase is on Lockwood Drive between US 29/ Colesville Road intersection and the MD 650/ Lockwood Drive intersection. Therefore, residential areas along these corridors, such as Burnt Mills Hills along Lockwood Drive, would be anticipated to experience the greatest increase in traffic noise levels. Other neighborhoods in the study area are closer to roadways with heavier traffic volumes (such as US 29 and MD 650) and therefore are louder overall than the Burnt Mills Hills area, but these areas will not experience as much proportional increase in traffic and will experience less increase in traffic noise.

A doubling of existing traffic volumes, of the same vehicle mix composition, would be necessary to result in a three decibel increase in noise levels, which is generally the smallest increment of noise increase or decrease that can be perceived by the human ear. As noted earlier, the traffic increases anticipated with development under the FDA Master Plan Update project would be much smaller than a doubling of traffic volumes – there would not be more than a seven percent increase in any area, which would result in noise increases of not more than a few tenths of a decibel anywhere in the study area.

The CUP expansion has potential to result in noise increases that would affect employees on the campus and nearby residents. Under the Master Plan Update alternatives, an addition would be constructed on the rear of the CUP to house additional generating equipment. Some of the equipment being added under the 2006 Master Plan would be moved inside this new expansion. The CUP addition, like the

existing CUP building, would have acoustic blocks to mitigate noise from the generating equipment. Cooling tower fans would include variable frequency drives to reduce noise, and new fans would have a different blade configuration that would reduce fan speed and thus noise. Lastly, sound attenuation walls would be provided, as necessary, between the CUP and residential areas outside of the FDA Campus to mitigate noise impacts. Quantitative noise levels from the CUP cannot be determined until specific equipment and configurations are chosen, but the facility would be required to comply with the Montgomery County Noise Ordinance (Montgomery County Code, Chapter 31B). The noise control measures described above would be designed to ensure compliance with the Montgomery County ordinance. With these mitigation measures, the CUP expansion would have a moderate, long-term, direct adverse impact to noise levels.

2.2.2.2 Indirect Impacts

The Master Plan Update Alternatives would result in negligible, direct, long-term increases in noise levels that would be imperceptible, or barely perceptible, to human ears. Because of the minor nature of impacts, noise increases associated with the project would not result in adverse indirect impacts.

2.2.2.3 Cumulative Impacts

Past, present, and future development within the Washington metropolitan region will continue to produce additional traffic and noise sources that will cumulatively affect noise levels. The minor increases in noise resulting from development associated with the FDA Master Plan Update would not be significant when combined with past and present development, creating imperceptible or barely perceptible increases in traffic noise in a suburban environment that already experiences varying noise levels. Future development projects have potential to generate additional traffic and other sources of noise. Traffic increases could result in higher noise levels that would cumulatively result in readily perceptible noise increases of three decibels or more for receptors that are adjacent to both the FDA White Oak Campus and other future development locations.

2.2.2.4 Construction Noise

Construction would be limited to the FDA White Oak Campus, and therefore, potential noise associated with the project would be limited to noise-sensitive areas on and adjacent to the campus. The following measures should be used to reduce construction noise. This list is not comprehensive and should be evaluated in detail once a development alternative is selected.

- All construction equipment powered by an internal combustion engine should be equipped with a properly maintained muffler.
- Air compressors should meet current US EPA noise emission standards.
- Newer model construction equipment should be used as much as possible since it is generally quieter than older equipment.
- Nighttime construction activities should be minimized.
- Portable noise barriers within the equipment area and around stationary noise sources should be established.

- Tools and equipment should be selected to minimize noise.

2.2.2.5 Mitigation Measures

Traffic noise mitigation measures were not considered for this project, as none of the Master Plan Update Alternatives considered for the FDA White Oak Consolidation Project result in noise impacts to noise-sensitive resources. The CUP would be required to comply with the Montgomery County Noise Ordinance that would include, if appropriate, the following:

- Include acoustic blocks in the CUP expansion
- Include variable frequency drives on cooling tower fans
- Use different blade configuration on new fans
- Sound attenuation wall shall be constructed, as required, to meet local noise ordinance

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4 References

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Appendix A

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Table X.X Traffic Analysis Summary

Roadway Link, Intersection No. to Intersection No.	Direction	AM/PM	With the Construction of the ICC					Without the Construction of the ICC				
			No Build		Build		% Increase (Build-No Build)/ (No Build)	No Build		Build		% Increase (Build-No Build)/ (No Build)
			VPH	Total	VPH	Total			Total		Total	
1 - 2	EB	AM	2890	5150	2905	5335	3.6%	2665	4880	2680	5120	4.9%
	WB		2260		2430			2215		2440		
	EB	PM	2930	5120	3085	5290	3.3%	2540	5200	2760	5440	4.6%
	WB		2190		2205			2660		2680		
2 - 3	EB	AM	3190	5140	3295	5140	0.0%	2895	4700	2985	4860	3.4%
	WB		1950		1845			1805		1875		
	EB	PM	2585	5010	2635	5145	2.7%	2105	4955	2175	5115	3.2%
	WB		2425		2510			2850		2940		
3 - 4	EB	AM	3925	5515	4255	5860	6.3%	3555	4960	3835	5260	6.0%
	WB		1590		1605			1405		1425		
	EB	PM	2500	5725	2525	6065	5.9%	2030	5660	2055	5960	5.3%
	WB		3225		3540			3630		3905		
4 - 11	NB	AM	440	1005	475	1040	3.5%	605	1210	685	1295	7.0%
	SB		565		565			605		610		
	NB	PM	570	1015	575	1040	2.5%	660	1160	670	1215	4.7%
	SB		445		465			500		545		
1 - 5	EB	AM	670	1565	670	1575	0.6%	700	1605	700	1605	0.0%
	WB		895		905			905		905		
	EB	PM	1150	1880	1150	1880	0.0%	1240	2020	1240	2020	0.0%
	WB		730		730			780		780		
5 - 19	WB	AM	1475	3090	1565	3185	3.1%	1830	3545	1910	3630	2.4%
	EB		1615		1620			1715		1720		
	WB	PM	1055	2875	1065	2975	3.5%	1385	3600	1390	3650	1.4%
	EB		1820		1910			2215		2260		
5 - 9	EB	AM	1050	2740	1055	2825	3.1%	1150	3080	1155	3130	1.6%
	WB		1690		1770			1930		1975		
	EB	PM	1595	2485	1675	2575	3.6%	1680	2760	1720	2805	1.6%
	WB		890		900			1080		1085		
6 - 19	WB	AM	1315	2800	1330	2955	5.5%	1695	3310	1705	3495	5.6%
	EB		1485		1625			1615		1790		
	WB	PM	1280	2925	1410	3070	5.0%	1635	3705	1805	3890	5.0%
	EB		1645		1660			2070		2085		
6 - 7	WB	AM	950	2770	965	2925	5.6%	1230	3150	1240	3335	5.9%
	EB		1820		1960			1920		2095		
	WB	PM	1455	2775	1585	2920	5.2%	1850	3465	2020	3650	5.3%
	EB		1320		1335			1615		1630		
8 - 7	WB	AM	1510	3615	1525	3770	4.3%	1840	3950	1850	4135	4.7%
	EB		2105		2245			2110		2285		
	WB	PM	1850	3250	1980	3395	4.5%	2365	4065	2535	4250	4.6%
	EB		1400		1415			1700		1715		
8 - 16	WB	AM	1380	3880	1395	4035	4.0%	1710	4215	1720	4400	4.4%
	EB		2500		2640			2505		2680		
	WB	PM	1965	3330	2095	3475	4.4%	2480	4125	2650	4310	4.5%
	EB		1365		1380			1645		1660		
17 - 15/16	NB	AM	2575	6835	2585	6990	2.3%	1635	5790	1640	5870	1.4%
	SB		4260		4405			4155		4230		
	NB	PM	4680	7035	4820	7190	2.2%	4380	6440	4455	6520	1.2%
	SB		2355		2370			2060		2065		
17 - 18	NB	AM	2430	6630	2440	6785	2.3%	1485	5580	1490	5660	1.4%
	SB		4200		4345			4095		4170		
	NB	PM	4630	6855	4770	7010	2.3%	4230	6155	4405	6335	2.9%
	SB		2225		2240			1925		1930		
14 - 15/16	NB	AM	2305	5205	2305	5285	1.5%	3530	5075	3540	5085	0.2%
	SB		2900		2980			1545		1545		
	NB	PM	3750	5860	3830	5945	1.5%	1870	4935	1870	4960	0.5%
	SB		2110		2115			3065		3090		
14 - 13	NB	AM	3700	6445	3700	6705	4.0%	2905	6250	2905	6260	0.2%
	SB		2745		3005			3345		3355		
	NB	PM	4290	7700	4370	7785	1.1%	3550	6485	3560	6495	0.2%
	SB		3410		3415			2935		2935		
12 - 13	NB	AM	4045	7075	4045	7155	1.1%	3045	6890	3045	6900	0.1%
	SB		3030		3110			3845		3855		
	NB	PM	4565	8355	4645	8440	1.0%	3840	7360	3850	7370	0.1%
	SB		3790		3795			3520		3520		
12 - Rt650	NB	AM	4150	7150	4150	7230	1.1%	3085	6845	3085	6855	0.1%
	SB		3000		3080			3760		3770		
	NB	PM	4815	8245	4895	8330	1.0%	3900	7095	3910	7105	0.1%
	SB		3430		3435			3195		3195		
11 - Rt650	NB	AM	2635	5320	2670	5355	0.7%	2375	5945	2455	6035	1.5%
	SB		2685		2685			3570		3580		
	NB	PM	4205	7025	4205	7080	0.8%	3555	6440	3560	6555	1.8%
	SB		2820		2875			2885		2995		

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Legend:

X(X) = AM (PM) peak hour traffic volume

← = Intersection lane geometry

X/X = AM (PM) Intersection Level of Service

= Signal

ACC = Acceptable

UNACC = Unacceptable

MD 650/Powder Mill Road (1) ACC/ACC

165(200)
238(800)
20(30)
140(280)
10(15)
125(460)
25(70)
10(25)
60(110)
180(310)
55(50)
595(240)

MD 212/Cherry Hill Rd (5) B/C

230(330)
810(785)
495(345)
175(255)
705(440)
300(200)
175(240)
680(750)
110(125)
180(410)
445(725)
50(75)

MD 212/Beltsville (9) B/C

660(865)
10(15)
215(210)
1045(560)
930(1215)
1351(175)
240(280)
725(710)
20(20)
40(60)
5(30)
5(5)

Columbia Pike/Industrial Pkwy (13) ACC/ACC

3020(1840)
15(45)
15(515)(330)
210(365)
70(75)
275(280)

Columbia Pike/Musgrove Rd (17) ACC/UNACC

200(70)
3240(1690)
5(10)
10(25)
65(25)
180(50)
15(255)
15(170)
75(160)
90(85)
1335(1455)
85(230)

MD 650/Schindler Dr./Mahan Rd (2) ACC/ACC

10(25)
5(5)
15(125)
30(10)(30)
2595(800)
15(40)
45(50)
5(0)
15(5)
160(10)
430(2535)
10(10)

Cherry Hill Rd/Plum Orchard Dr (6) ACC/ACC

40(35)
970(975)
1051(155)
50(50)
30(35)
40(115)
75(160)
15(170)
150(430)
10(130)
730(915)
240(235)

Beltsville/Calverton Blvd (10) A/A

30(45)
260(220)
5(0)
0(0)
0(35)
0(80)
15(20)
10(10)
655(805)
820(730)
1351(330)
25(10)

Columbia Pike/Tech Rd (14) ACC/ACC

140(30)
2820(1430)
100(85)
3(0)(0)
185(115)
95(80)
130(300)
1180(2615)
275(290)
50(140)
120(190)
120(315)

Columbia Pike/Fairland Rd (18) UNACC/UNACC

445(330)
3200(1995)
25(95)
3455(305)
160(210)
85(100)
105(155)
245(165)
60(115)
(3)
50(150)
1265(1465)
45(20)

MD 650/Michelson Rd (3) ACC/ACC

2680(820)
5(10)
10(190)
0(5)
0(40)
5(0)
5(0)
20(25)
60(0)
445(2600)
40(10)

Cherry Hill Rd/Calverton Blvd/ Broadbirch Dr (7) ACC/ACC

230(305)
850(915)
1155(200)
475(180)
400(215)
230(50)
60(310)
110(360)
35(140)
30(80)
745(985)
80(60)

Columbia Pike/Lockwood Dr (11) ACC/ACC

80(0)
3240(1800)
5(10)
5(15)
15(0)
565(355)
10(115)
0(0)
0(5)
0
1275(3170)
280(345)

Columbia Pike SB/Randolph Rd (15) ACC/ACC

360(130)
640(420)
1055(1075)
40(40)
1005(940)
2200(180)

Cherry Hill Rd/Eastern Access (19)

MD 650/Lockwood Dr (4) ACC/ACC

110(130)
225(115)
285(390)
2140(2170)
180(75)
40(90)
115(325)
95(250)
175(155)
90(275)
90(205)
185(140)

Cherry Hill Rd/Prosperity Dr (8) ACC/ACC

1435(1335)
215(190)
95(205)
95(190)
141(1435)
225(90)

Columbia Pike/Stewart Lane (12) ACC/UNACC

90(60)
3225(1960)
195(325)
55(35)
345(35)
140(30)
5(5)
10(5)
50(45)
40(75)
1665(3380)
80(240)

Columbia Pike NB/Randolph Rd (16) ACC/ACC

165(260)
1530(1235)
320(580)
1190(1060)
35(60)
120(190)

Figure 2
Existing Traffic Volumes, Lane Geometries, & LOS Results

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
ANNAPOLIS,MD-BALTIMORE,MD-ATLANTA,GA-TAMPA,FL-FAIRFAX,VA-WEST PALM BEACH,FL
ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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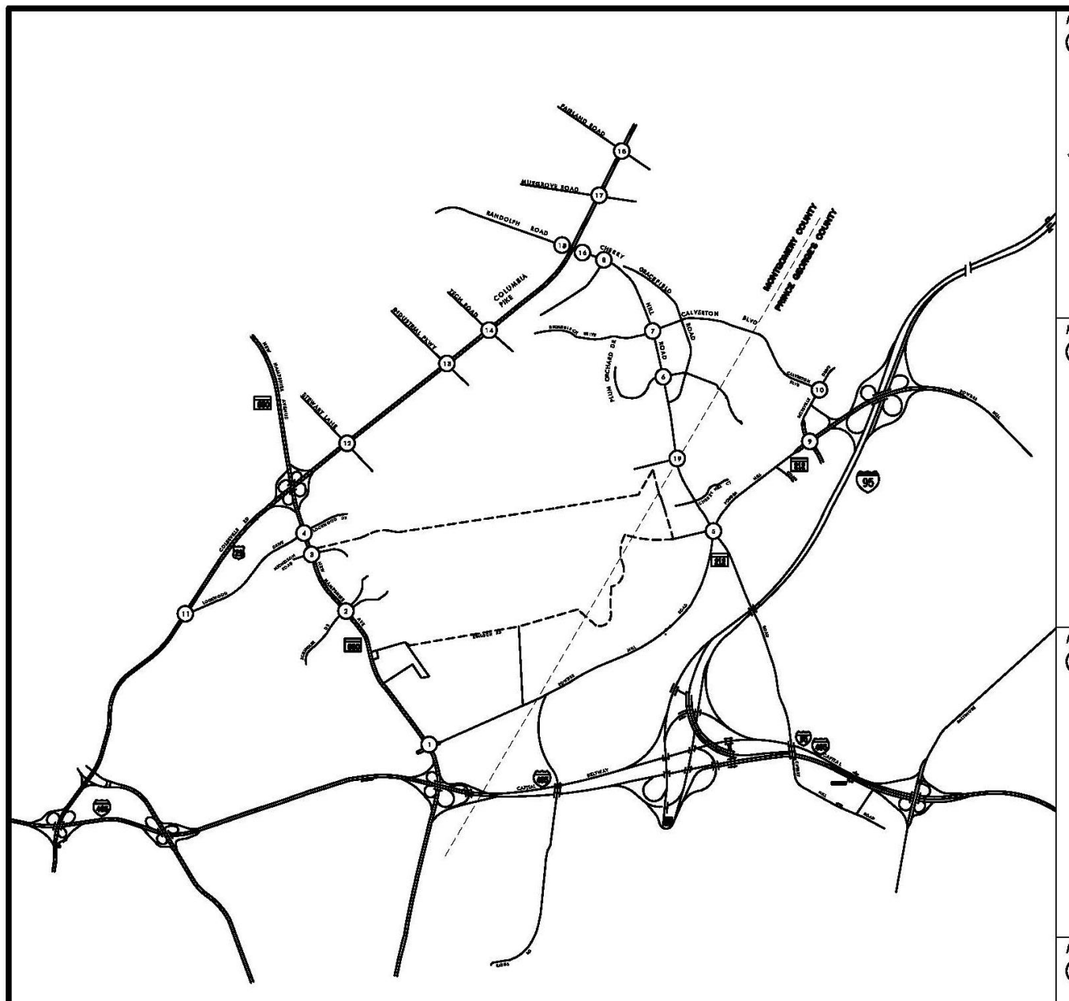


Legend:

X(X) = AM (PM) peak hour traffic volume

← = Intersection lane geometry

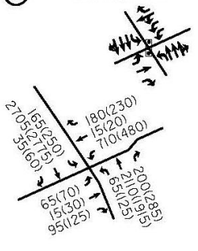
X/X = AM (PM) Intersection Level of Service

= Signal

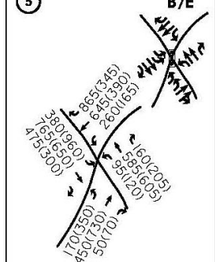
ACC = Acceptable

UNACC = Unacceptable

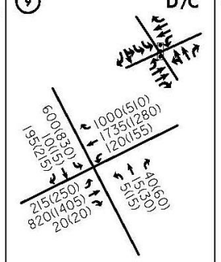
MD 650/Powder Mill Road — ① ACC/ACC



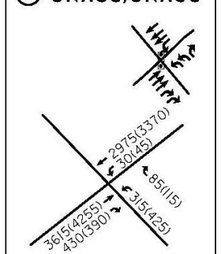
MD 212/Cherry Hill Rd — ⑤ B/E



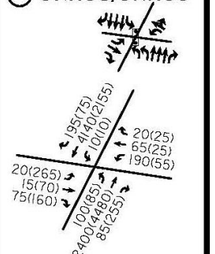
MD 212/Beltsville — ⑨ D/C



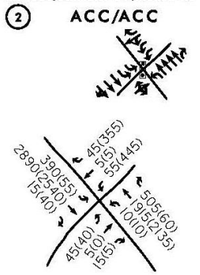
Columbia Pike/Industrial Pkwy — ⑬ UNACC/UNACC



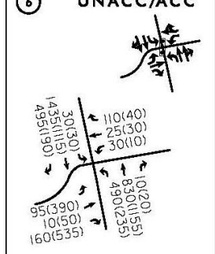
Columbia Pike/Musgrove Rd — ⑰ UNACC/UNACC



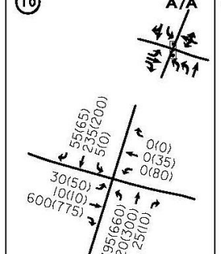
MD 650/Schindler Dr./Mahan Rd — ② ACC/ACC



Cherry Hill Rd/Plum Orchard Dr — ⑥ UNACC/ACC



Beltsville/Calverton Blvd — ⑩ A/A



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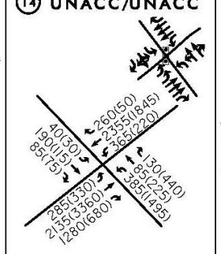
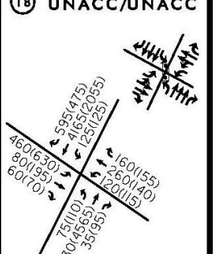
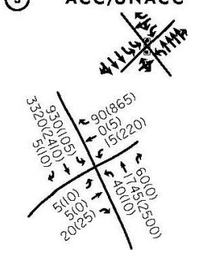


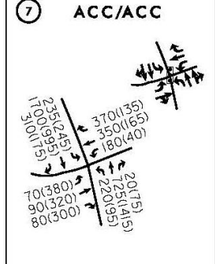
Columbia Pike/Fairland Rd — ⑱ UNACC/UNACC



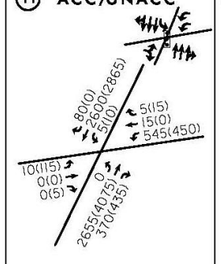
MD 650/Michelson Rd — ③ ACC/UNACC



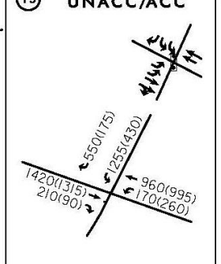
Cherry Hill Rd/Calverton Blvd/ Broadbirch Dr — ⑦ ACC/ACC



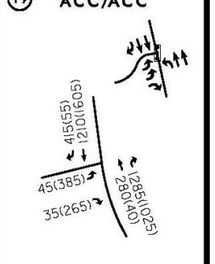
Colesville Rd/Lockwood Dr — ⑪ ACC/UNACC



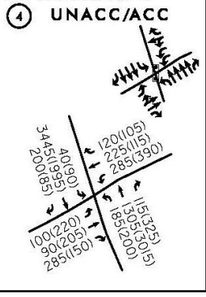
Columbia Pike SB/Randolph Rd — ⑮ UNACC/ACC



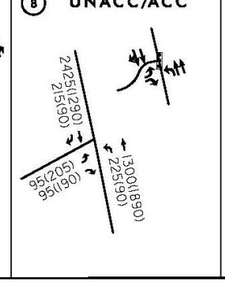
Cherry Hill Rd/Eastern Access — ⑲ ACC/ACC



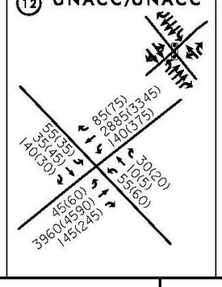
MD 650/Lockwood Dr — ④ UNACC/ACC



Cherry Hill Rd/Prosperity Dr — ⑧ UNACC/ACC



Columbia Pike/Stewart Lane — ⑫ UNACC/UNACC



Columbia Pike NB/Randolph Rd — ⑯ ACC/ACC

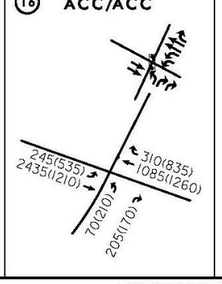


Figure 14
Action Traffic Volumes, Lane Geometries, & LOS Results (With ICC)

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ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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Legend:

X(X) = AM (PM) peak hour traffic volume

← = Intersection lane geometry

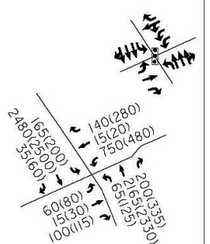
X/X = AM (PM) Intersection Level of Service

= Signal

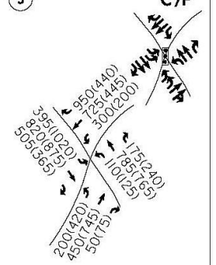
ACC = Acceptable

UNACC = Unacceptable

MD 650/Powder Mill Road — (1) ACC/ACC



MD 212/Cherry Hill Rd — (5) C/F



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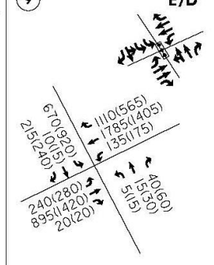
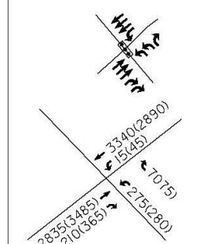
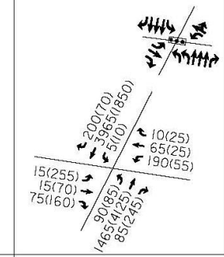


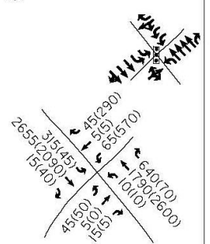
Columbia Pike/Industrial Pkwy — (13) ACC/UNACC



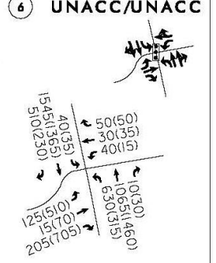
Columbia Pike/Musgrove Rd — (17) UNACC/UNACC



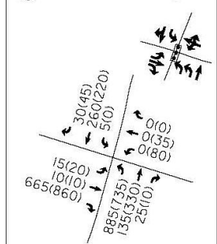
MD 650/Schindler Dr./Mahan Rd — (2) ACC/ACC



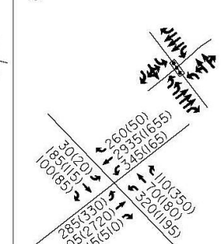
Cherry Hill Rd/Plum Orchard Dr — (6) UNACC/UNACC



Beltsville/Calverton Blvd — (10) A/A



Columbia Pike/Tech Rd — (14) UNACC/UNACC



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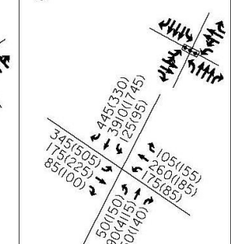

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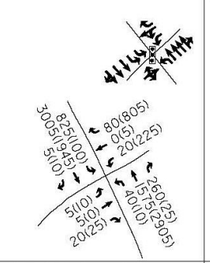
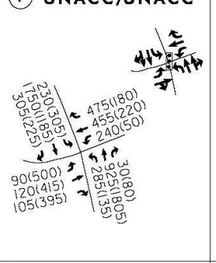
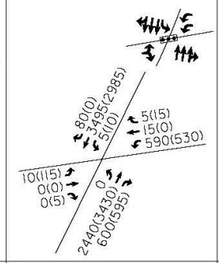


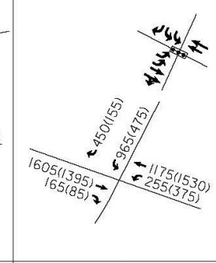
Cherry Hill Rd/Calverton Blvd/ Broadbirch Dr — (7) UNACC/UNACC



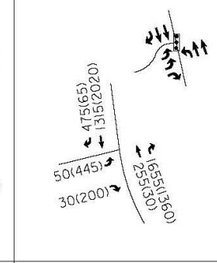
Columbia Pike/Lockwood Dr — (11) UNACC/UNACC



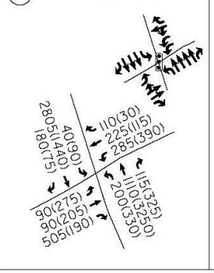
Columbia Pike SB/Randolph Rd — (15) UNACC/ACC



Cherry Hill Rd/Eastern Access — (19) ACC/ACC



MD 650/Lockwood Dr — (4) UNACC/ACC



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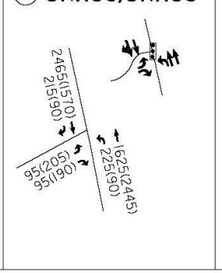
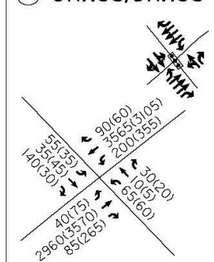


Columbia Pike/Stewart Lane — (12) UNACC/UNACC



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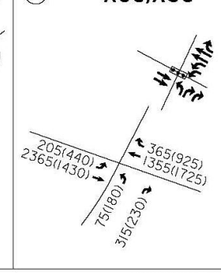

Figure 13
Action Traffic Volumes, Lane Geometries, & LOS Results (Without ICC)

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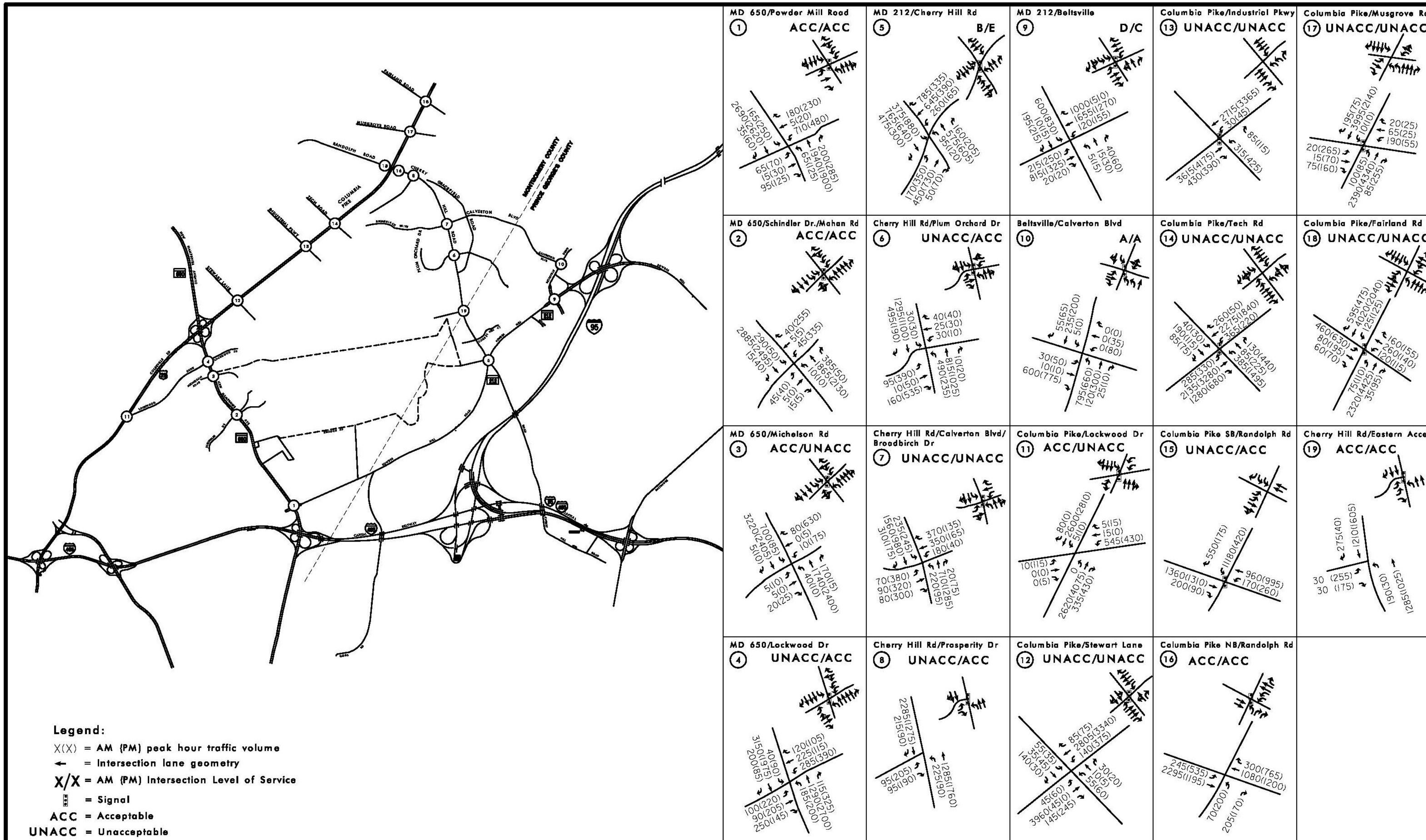

Figure 8
No Action Traffic Volumes, Lane Geometries, & LOS Results (With ICC)

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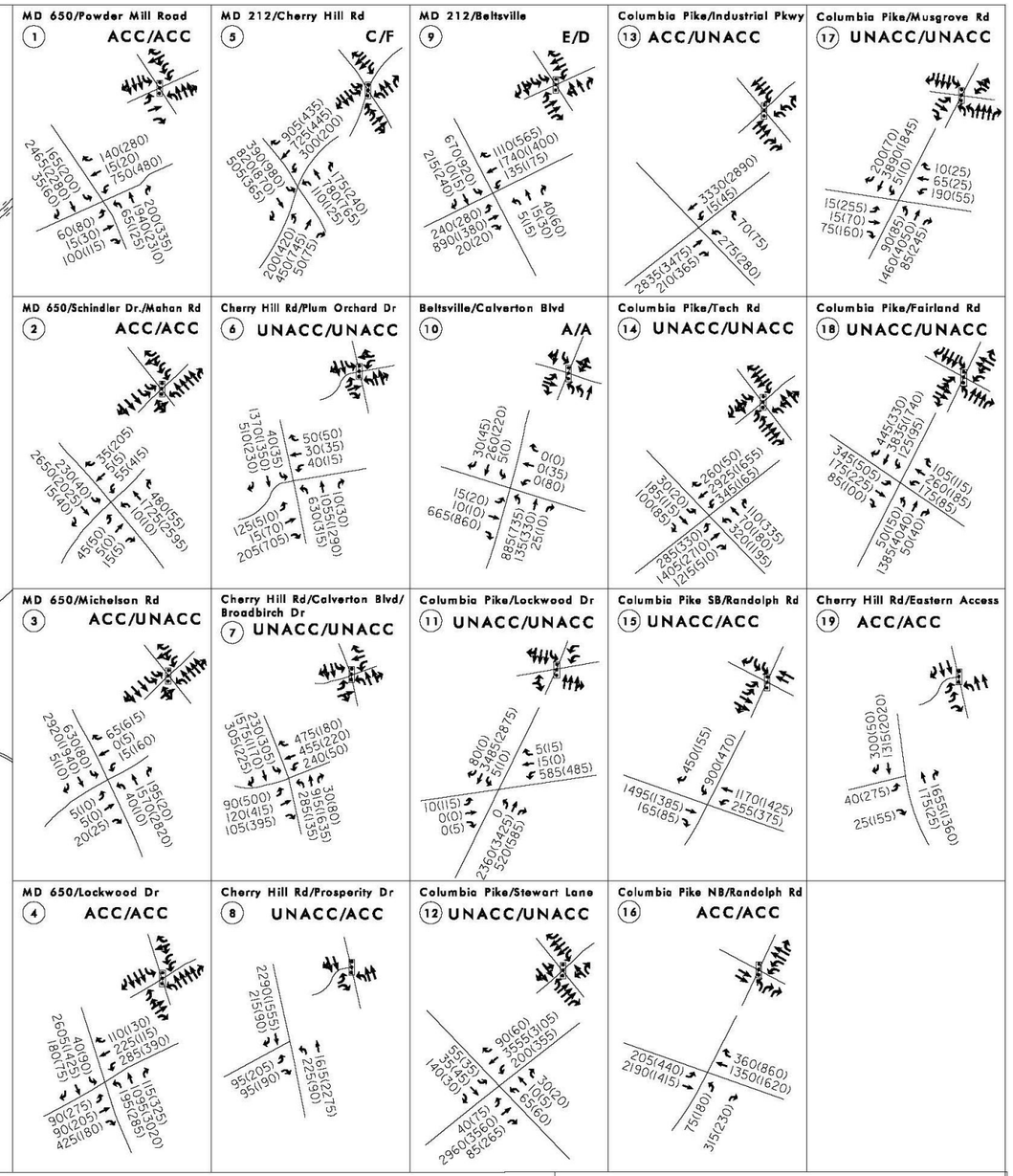

Figure 7
No Action Traffic Volumes, Lane Geometries, & LOS Results (Without ICC)

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Appendix D: Transportation Management Plan

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U.S. Food and Drug Administration Headquarters Consolidation
Transportation Management Plan Update

Prepared for:

The U.S. General Services Administration
National Capital Region

In cooperation with:

The U.S. Food and Drug Administration

Prepared by:

Greenhorne & O'Mara, Inc.
6110 Frost Place
Laurel, MD 20707

March 2009

accommodating growth

protecting resources

EXECUTIVE SUMMARY

The 2006 U.S. Food and Drug Administration (FDA) Transportation Management Plan (TMP) is being updated due to a proposed increase in the FDA population at the FDA Campus. The increase in the FDA population is a result of recent legislation passed by Congress, which has expanded the mandates of the FDA.

This report represents an update to the 2006 TMP, which was prepared by the U.S. General Services Administration (GSA) and FDA in June 2006. In the 2006 TMP, 7,719 employees were slated to be relocated to the FDA Campus. The recent congressional legislation will require an additional 1,170 employees, which bring the total number of employees on-site to 8,889. This revised TMP has considered this increase in the number of FDA employees at the FDA Campus.

A TMP is required as part of a federal agency's planning submission for undertaking any project that will increase the employment level on a worksite to 100 or more employees. A TMP is an employer's active program to foster more efficient employee commuting patterns. The plan includes specific strategies to encourage change in employee travel mode, trip timing, frequency, and length and travel routes so as to reduce traffic congestion and improve air quality. A TMP also offers the benefit of reduced demand for parking spaces.

This updated TMP evaluates the 2006 TMP strategies and their effectiveness by analyzing the commuting pattern of existing FDA employees who have already relocated to the FDA Campus. Overall, FDA is exceeding the mode split goals set in the 2006 TMP. The agency is meeting/exceeding the goals set for transit, telecommuting, and walking/biking. However, as more employees relocate to the FDA Campus, employee participation in carpooling and vanpooling programs may become more critical as FDA strives to meet the higher mode split goals. Opportunities remain to increase the number of employees participating in the carpooling/vanpooling program to meet higher mode split goals.

Based on a survey of relocated employees and analysis of the results, this plan will review and modify the previous strategies to provide the greatest reduction in single occupancy vehicles and minimize the need for on-site parking.

EXISTING CONDITION

As of May 2008, approximately 2,080 employees were located on site at the FDA Campus. Of these employees, 190 were contract service employees (working in the cafeteria, mailroom, security, etc.), and 1,890 were FDA employees and FDA contractor employees. The 1,890 employees were asked to participate in an employee survey from November through December 2007 to gain an understanding of their commuting patterns. Of the 1,890 employees, 523 or approximately 23 percent completed the survey.

Based on the zip codes of employees residences 1,154 or 61 percent of the employees live in Montgomery County and the remaining employees are evenly distributed among Washington, D.C. and other counties in Maryland and Virginia. Survey results indicate that approximately 11 percent of

these employees moved their residence closer to the FDA Campusdue to the change in job location and approximately 6 percent are planning to move their residence closer to the FDA Campus.

Of the 523 employees who responded to the survey, approximately 80 percent drive alone to work and 20 percent use other modes of transportation. The average vehicle occupancy (AVO) of these employees is 1.27 employees per vehicle. This AVO is greater than the 1.17 which was reported in 2004 when the last survey was conducted. The results indicate that the TMP strategies that FDA is implementing are effective.

PROPOSED CONDITION

A second survey was completed for the 5,345 FDA employees who are scheduled to relocate to the FDA Campus. Of these employees 1,083 completed the survey. The zip codes of these employees residences indicate that 61 percent live in Montgomery County. Approximately 4 percent of the employees who participated in the survey are planning to move their residence closer to the FDA Campus and approximately 10 percent are somewhat likely to move their residence closer to the FDA Campus.

Approximately 80 percent of the employees who responded to the survey drive alone to work and 20 percent use the other modes of transportation. Employees who have already relocated to FDA Campus are carpooling/vanpooling more than other off-site employees, but the off-site employees are using more bus and Metrorail than employees located at the FDA Campus. Thus, even though the number of employees who drive alone to work has remained the same for FDA employees located at the FDA Campus and the FDA employees who work off-site, there is a shift within the alternative modes of transportation that each group uses. It is expected that as employees relocate to the FDA Campus there will be more carpool and vanpool usage, which will help reduce the percentage of employees who drive alone.

The employees who are slated to relocate to the FDA Campus have an AVO of 1.28 which is greater than the 2004 AVO of 1.17.

EFFECTIVENESS OF STRATEGIES IMPLEMENTED

In the 2006 TMP, various strategies were included to encourage FDA employees to use other modes of transportation to reduce the drive alone percentage. Goals were set, using the parking ratio for each year from 2007 to build-out of the FDA Campus. Goals were set using the parking ratio. Due to the ongoing construction activity on site it is harder to calculate AVO because it is difficult to separate construction traffic from employee traffic.

The following strategies helped meet the parking ratio goal of 1.29 which was set as the 2007 goal in the 2006 TMP.

- Hiring an Employee Transportation Coordinator (ETC)
- Carpool/Van Pool Incentives
- Transit Incentives

- Telecommuting Program
- Bicycling/walking to work Incentives

Overall, the FDA is meeting its mode split goals as set forth in the 2006 TMP, including the goal of a parking ratio of 1.29. At the time of the 2007 employee survey, the parking ratio for the FDA Campus is 1.31.

PROPOSED TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

The previous TMP outlined strategies in order to achieve an aggressive parking ratio goal of 1.5 at full build out of the FDA Campus. At present, the existing parking ratio at the FDA Campus is 1.31 which has exceeded the goal set forth in the 2006 TMP. The telecommuting program has played a large role in surpassing the parking ratio for 2007 even though the carpool/vanpool participation was less than expected. In order to continue to meet the future goals, the participation in telecommuting will need to continue, and carpool/vanpool programs will need to be expanded.

In order to increase the parking ratio from the current 1.31 to 1.5 at full build-out, FDA will continue to make significant aggressive efforts to encourage employees to use the ride share program, on-site shuttle service, and computer matching of employees looking for other carpoolers/vanpoolers in their home area. In addition, FDA will use incentives, such as transit subsidies, guaranteed ride home program, and preferred parking for carpools/vanpools to help meet this goal. The following Transportation Demand Management (TDM) measures are expected to have an effect on increasing the parking ratio and thus decreasing the single vehicle occupancy numbers:

- Employee Transportation Coordinator
- Carpool/Vanpool Incentives
- Transit Incentives
- Telecommuting Program
- Bicycling/Walk-to-work Incentives

VISITOR PARKING

The *2006 White Oak Master Plan Update* calls for 500 visitor parking spaces at the build-out of the FDA Campus by 2012. Based on the recent visitor survey and several key factors, 500 parking spaces will be inadequate to satisfy future visitor parking demand. Thus, FDA is requesting an additional 500 visitor parking spaces, bringing the total number of visitor parking spaces to 1,000.

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Table of Contents

Appendix

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List of Acronyms

AM	Ante Meridiem
AVO	Average Vehicle Occupancy
CBER	Center for Biologics Evaluation and Research
CDER	Center for Drug Evaluation and Research
CDRH	Center for Devices and Radiological Health
CLV	Critical Lane Volume
CVM	Center for Veterinary Medicine
DC	District of Columbia
DOT	Department of Transportation
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FRC	Federal Research Center
GSA	U.S. General Services Administration
ICC	Intercounty Connector
LOS	Level of Service
MARC	Maryland Rail Commuter Service
M-NCPPC	Maryland National Capitol Park and Planning Commission
MOA	Memorandum of Agreement
mph	miles per hour
MWCOG	Metropolitan Washington Council of Governments
NCR	National Capital Region
OC	Office of the Commissioner
SHA	State Highway Administration
TMP	Transportation Management Plan
WMATA	Washington Metropolitan Area Transit Authority

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1. INTRODUCTION

The General Services Administration (GSA) is constructing the U.S. Food and Drug Administration (FDA) Headquarters at the Federal Research Center at White Oak (FRC) in Silver Spring, Maryland. Various studies have been previously performed that evaluated the impacts of this consolidation on the surrounding roadway systems and general resources in the area (see Figure 1). Studies completed to date include:

Final Environmental Impact Statement, Greenhorne & O'Mara, April 1997
Parking Demand Report, Gorove-Slade, April, 1997
White Oak Transportation Study, Gorove-Slade, May 1997
Review of Transportation Improvements along New Hampshire Avenue, Gorove-Slade, March 1998
FDA Traffic Access Plan, Gorove-Slade, April 1998
Transportation Improvement Study, BMI, March 1999
Transportation Management Plan (TMP) for the FDA Consolidation, Greenhorne & O'Mara, April 2002
Findings of No Significant Impact Final Section 4(f) Evaluation – MD 650 from Powder Mill Road to North of US 29, Federal Highway Administration, April 2003

The above reports were completed to determine the potential transportation impacts of consolidating the FDA Headquarters at the FRC. These reports also proposed mitigation for these impacts based upon 6,000 employees and providing 4,000 parking spaces. In July 2002, congressional legislation was passed that expanded FDA's mandate to support the Prescription Drug User Fee Amendments (PDUFA) and the Medical Devise User Fee and Modernization Act (MDUFMA). Based upon these mandates, the number of employees anticipated to occupy the FDA Campus was increased to 7,719. Due to this increase in the number of employees, the 2002 Master Plan was revised and a Supplemental Environmental Impact Statement (SEIS) (G&O, 2005) was completed which analyzed the impact of the additional employees that would relocate to White Oak and the addition of a new eastern access road into the FDA Campus. The 2002 TMP was updated by Greenhorne & O'Mara, Inc. in June 2006 to evaluate the changes that had occurred since the initial TMP was released.

The purpose of the 2006 TMP was to update the previous TMP to reflect the change in population at the FDA Campus and to have a transportation management plan that includes viable strategies to discourage the use of single occupant vehicle trips to the site. The revised TMP was submitted to the National Capital Planning Commission (NCPC) as part of the *2006 Master Plan Update - FDA Consolidation*. The 2006 TMP proposed was approved for a parking ratio of 1:1.5 consistent with NCPC's Transportation Element of *The Comprehensive Plan for the National Capital.* Specifically, the FDA Headquarters Consolidation at White Oak falls into the category of "Suburban areas beyond 2,000 feet of Metrorail." For this category "a phased approach linked to planned improvements" is recommended by NCPC for the implementation of a parking ratio of 1:1.5 to 1:2 (NCPC, 2004).

Since the approval of the *2006 FDA Master Plan Update* and TMP, recent legislation has again expanded the mandates of FDA programs necessitating a projected increase of FDA employees on the

FDA Campus by 1,170 bringing the anticipated total number of employees to 8,889. These additional employees are currently being hired and are housed in leased facilities. As of May, 2008, approximately 1,890 FDA employees had relocated to the FDA Campus.

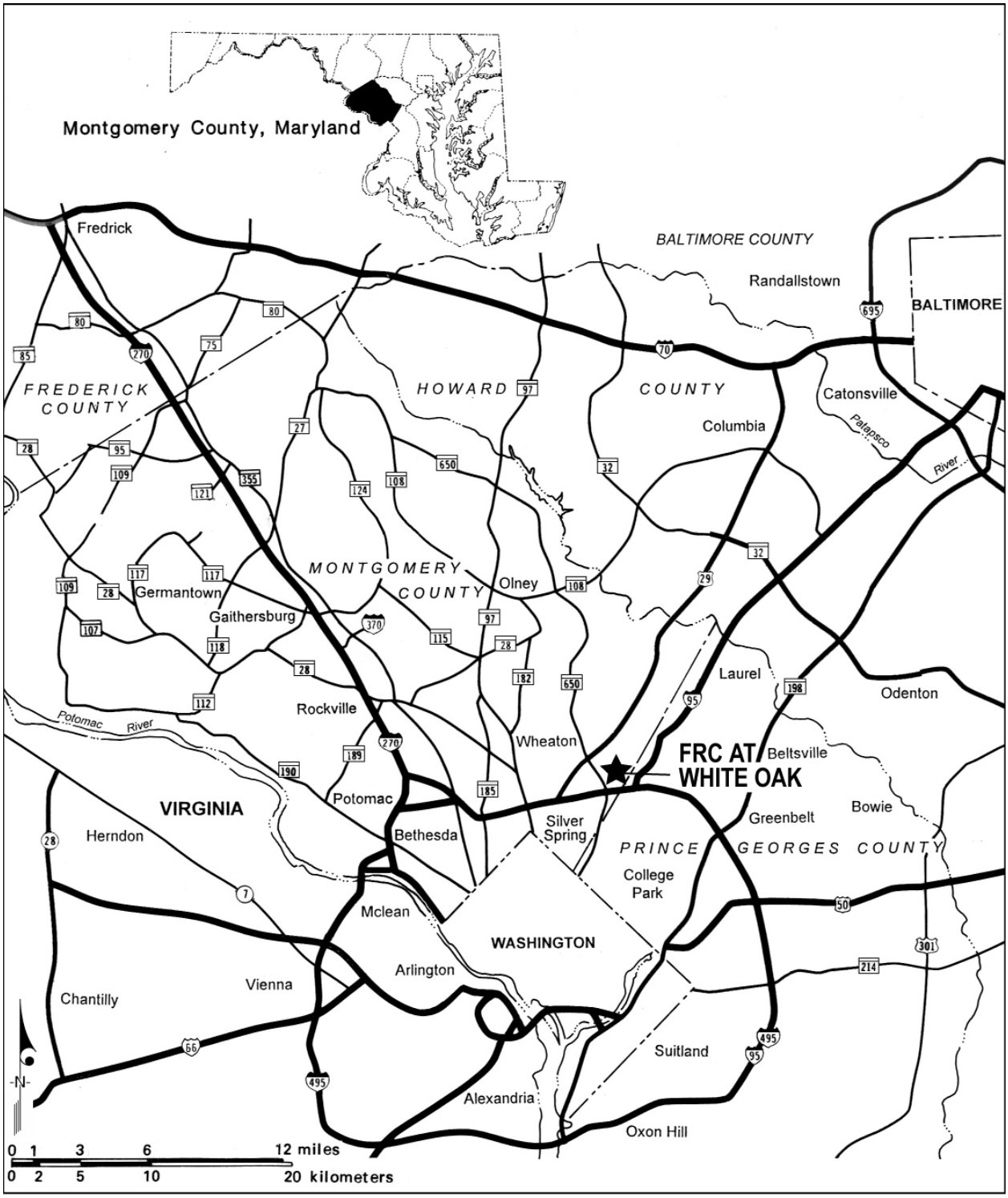

Figure 1. White Oak Site Location Map

1.1 Purpose of Study

As defined in the Federal Transportation Management Program Handbook, "a Transportation Management Plan (TMP) is an agency's active program to promote more efficient employee commuting patterns. It involves specific strategies to encourage changes in employee travel modes, trip timing, frequency and length, and travel routes so as to reduce traffic congestion and improve air quality" (GSA, 1999). The main objective of the TMP is to develop and implement strategies which will provide the greatest reduction in single occupancy vehicles, thereby minimizing the need for on-site parking.

GSA and FDA are revising the *2006 Master Plan Update – FDA Consolidation*. As part of the overall revisions to the FDA Master Plan, this report evaluates the 2006 TMP based on changes which have occurred since the initial report and presents a TMP which includes viable strategies to discourage the use of single occupant vehicles. Commuting patterns of employees who have already moved to the FDA Campus is discussed and the strategies which are in place are examined.

This TMP is a living document and will be updated when modifications to the FDA Master Plan are made to evaluate which strategies have worked and which strategies need to be modified. This version is an update of the 2006 TMP. Commuting patterns of FDA employees at the site are being used to evaluate the effectiveness of strategies in the 2006 TMP. This TMP also seeks to modify existing strategies and to develop new strategies to meet the goals and objectives as FDA employees continue to relocate to the FDA Campus and as the additional 1,170 employees begin working at the FDA Campus in the future.

1.2 Data Collected

The basis for this report is an employee survey which was conducted via the internet in November 2007. The employee survey was conducted for both the employees who have already moved to the FDA Campus and those employees slated to move. The survey was active from November 22, 2007 through December 14, 2007. In addition, the following information was collected for this study or provided by the FDA:

- Zip code of employees by work building
- Shuttle bus schedules and ridership
- Visitor counts
- Traffic counts
- Parking lot counts
- Employee numbers
- Strategies implemented

1.3 TMP Goals and Objectives

The 2006 TMP outlined the following goals for the FDA Headquarters at White Oak:

- Identify Transportation Demand Management (TDM) strategies that will allow the employee-parking ratio to realistically approach the NCPC goal of 1 parking space for every 1.5 employees at build-out.

- Identify methods that will increase employees' awareness of the different options available to them for their commute and encourage them to try new travel options.

- Minimize the impact of the FDA development on the surrounding roadway network and the local communities.

Based on these goals, the 2006 TMP had the following objectives:

- Increase the existing Average Vehicle Occupancy (AVO) of 1.17 to 1.5 by the end of complete occupancy in year 2011 by meeting the following targets:
    - Increase AVO to 1.2 by year 2005,
    - Increase AVO to 1.3 by the end of 2007,
    - Increase AVO to 1.35 by the end of 2008,
    - Increase AVO to 1.4 by the end of 2009, and
    - Increase AVO to 1.5 by the end of 2011.

  Due to the fact that the FDA Campus will be populated in several phases, the AVO can realistically be increased in gradual steps. As more FDA employees move to the FDA Campus, the higher the chances that transit services can be increased and more opportunities for carpool/vanpool partners will be available.

- Increase the percent of transit usage to 10 percent by full occupancy in 2011. It should be noted that the percent of transit use by the year 2011 has been estimated to be 10 percent due to several factors such as the proximity of Metrorail stations, travel time, and the residential distribution of the employees.

- Increase employees using carpools from an existing 7.2 percent to 24 percent by the end of 2011. The biggest jumps in carpoolers should be planned to coincide with the largest number of employee relocations which are expected to occur between 2008 and 2011. Thus, the goal is to increase the number of employees participating in carpools to 10 percent by the end of 2005, to 16 percent by the end of 2008, and to 24 percent by the end of 2011. As of May 2008, the FDA employees are located at various sites in and around the Metropolitan DC area. As they are consolidated in one location, the opportunity to carpool and vanpool is expected to increase.

- Increase employee participation in vanpools from approximately 2 percent to 3 percent by the end of 2005 and to 5 percent by the end of 2011.
- Reduce the number of employees who drive alone to 56 percent by the build out of the site.

This TMP update still strives to meet the goals and objectives set in the 2006 TMP. The following sections evaluate the goals set in the 2006 TMP and outline the strategies needed to meet or continue to meet these goals.

1.4 Measurement

The following are used to measure the effectiveness of the TDM strategies identified:

- Average Vehicle Occupancy (AVO)
- Mode Split
- Vehicle Trip Reduction (VT)

Average Vehicle Occupancy (AVO)

The AVO represents the ratio of employees to vehicles. The AVO ratio is calculated as follows:

AVO = No. of employees reporting to the worksite / No. of vehicles at worksite

As indicated in the formula above, the AVO is increased by decreasing the number of vehicles traveling to the work site. Some of the vehicles, such as vanpools with seating for nine or more, buses, and bicycles, count as zero vehicles (i.e. are not used to calculate the AVO). Employees who work on compressed schedules also count as zero vehicles on the days that they do not report to the worksite. Telecommuters are included in the AVO calculation as employees reporting to the FDA Campus but with zero vehicles.

Vehicles left at park and ride lots or transit terminals two or more miles away from the work site also count as zero. Carpool vehicles are counted as a fraction of a vehicle depending on the number of carpoolers per vehicle.

Mode Split

Mode split is the percentage of people using each mode of travel (e.g. bus, carpool, bicycle). This data was collected through the employee survey.

Vehicle Trip (VT) Reduction

Vehicle Trips (VT) measure the number of trips into/out of the site and can be measured as a daily total or peak hour total. As the TMP strategies are implemented, assessment of the vehicle trips entering and exiting the FDA Campus can help determine the impact of the strategies. Furthermore, this method can be a fairly quick, un-intrusive, and cost effective measure since there will only be three

access points to the FDA Campus. Tubes can be laid at the entrance points to determine how many vehicles are entering and exiting the site and this can be repeated on a regular basis. By knowing the number of employees on site, and the number of vehicles entering and exiting, the average vehicle occupancies can be determined. However, as the FDA Campus is not fully occupied and there is ongoing construction, VT could not be used as an evaluation method for this study. The presence of construction vehicles and workers on site would not allow for an accurate count.

2. EMPLOYEE SURVEY

An employee survey was conducted via the internet in November and December 2007 to understand the commuting patterns of employees and to determine if the TMP goals were being met. The employee survey was conducted for both the employees who have already relocated[1] to the FDA Campus and those employees slated to relocate. The survey was active from November 22, 2007 through December 14, 2007 and asked employees the likelihood of using various modes of transportation to travel to the FDA Campus. A copy of the survey is included in Appendix A.

Of the approximately 7,235 employees asked to respond to the survey, approximately 22 percent, or 1,605 employees, completed the survey. Of the approximately 1,890 employees at the FDA Campus at the time of the survey, 523 or approximately 23 percent completed the survey and of the 5,345 employees slated to relocate to the campus 1,083 or approximately 20 percent completed the survey. This represents a statistically significant sample of the population.

2.1 Characteristics of Employees at the FDA Campus

As of November and December 2007 (the time frame of the employee survey), approximately 1,890 FDA employees and contractor employees were located at the FDA Campus and were asked to participate in the employee survey. Of the 1,890 employees, 523 completed the survey. There are an additional 190 service contractors on-site who work in different areas such as the cafeteria, mailroom, security, etc. These contractors were not included in the survey.

a. Existing Location of Residences

Zip codes of employee residences were provided by FDA. Table 1 shows the counties in which employees reside based on the zip codes provided. A majority of the employees live in Montgomery County. The remaining employees are evenly split between Washington, DC and the other counties in Maryland and Virginia.

[1] The word “relocate” or “relocation” refers to job relocation, whereas, the word “move” refers to employees moving or changing their residential location.

Table 1. Residential Location of Employees Working at the FDA Campus

Montgomery County	1,154	61%
Prince George's County	118	6%
Other Maryland	158	8%
Virginia	138	7%
Other	57	3%

b. Change in Residential Location

As shown in Table 2, of the employees surveyed who have already relocated to the FDA Campus, approximately 11 percent moved their residence due to the change in job location. In comparing the zip code data from the employees that have relocated to White Oak and have moved their residence to the 2006 zip code data, it appears that most of the employees who relocated to White Oak lived along the I-270 corridor or in the Bethesda area prior to moving their residence closer to the FDA Campus.

Table 2. Change in Residential Location: Employees Working at the FDA Campus

	11.5%	60
	88.5%	463

Furthermore, as shown in Table 3, approximately 6 percent of the respondents who were working at the FDA Campus at the time of the survey indicated that they were planning to move their residence in order to be closer to the FDA Campus.

Table 3. Planning Residential Change in Location: Employees Working at the FDA Campus

	6.1%	32
	93.9%	491

In the 2004 survey, about 5.5 percent of the respondents indicated that they were “very likely” to relocate after FDA moves to the FDA Campus. Approximately 7.5 percent had indicated that they were “somewhat likely” to relocate. Thus overall, approximately 13 percent had indicated that they may move residences. Based upon the new Employee Survey this percentage has

increased. The recent results indicate that approximately 17.6 percent have either already moved or are planning to move to be closer to the FDA Campus.

c. Existing Travel Mode of Employees

Most of the 523 employees who have relocated to the FDA Campus drive alone to work. Table 4 shows the mode of transportation being used by these employees to get to work. As can be seen, approximately 20 percent use other modes of transportation including carpools, Metrorail, and bus.

Table 4. Existing Travel Modes of Employees Working at the FDA Campus

Drive alone	79.7%	417	417
Registered Vanpool	1.1%	6	2
Bus	3.1%	16	0
Commuter Rail (MARC/VRE)	2.5%	13	0
Bike	0.8%	4	0

Note: Assumed 2 persons in a carpool and 3 persons in a vanpool

d. Current Work Schedule

Employees were asked about their work schedules. Table 5 shows the work schedules of the employees that responded. Of the 523 employees who answered, 81 percent indicated that they typically work normal work schedules of 5 days and 40 hours per week. Figures 2 and 3 show the start and finish time of the employees, respectively.

As can be seen from Figure 2, a majority of the employees begin work between 7 a.m. and 9 a.m. A significant number of employees, approximately 10 percent, begin work at 6 a.m. and approximately 5 percent begin work around 10 a.m.

Table 5. Existing Work Schedule of Employees Working at the FDA Campus

Typically work consistent hours (5 days/40 hours per week)	81.6%	427
Alternate work schedule – 9 days 80 hours (you have a day off every other week)	1.7%	9
Part time	0.8%	4

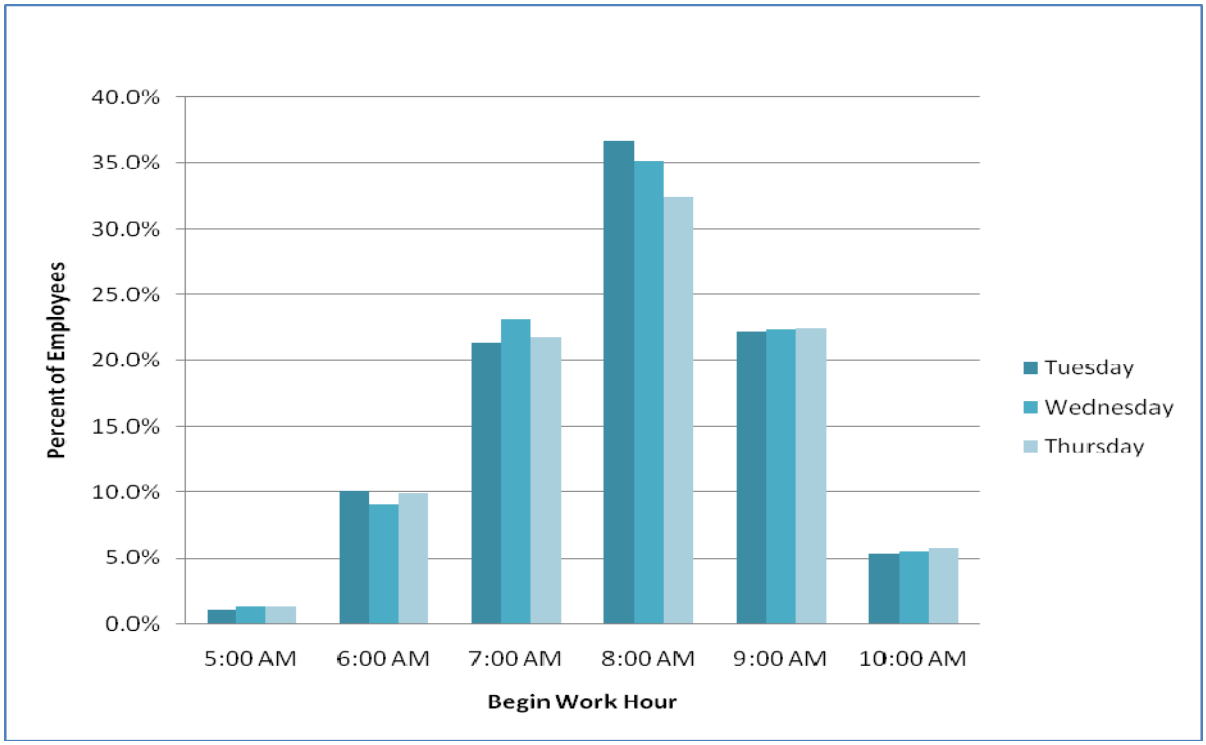

Figure 2. Begin Work Schedule of Employees Working at the FDA Campus

Similarly, Figure 3 indicates the finish time of employees working at the FDA Campus ranges between 4 p.m. and 6 p.m. with approximately 10 percent leaving work at 3 p.m. Although there is some peak hour spreading (i.e. employees do not leave at the same time but are spread out over the peak period), it is not very significant. Based on the traffic counts, the heaviest volumes on the adjacent streets are from 4 p.m. to 6 p.m. which indicates that most employees

will be leaving during this peak period. Overall, approximately 80 percent of the employees who work at the FDA Campus are leaving work between 4 p.m. and 6 p.m.

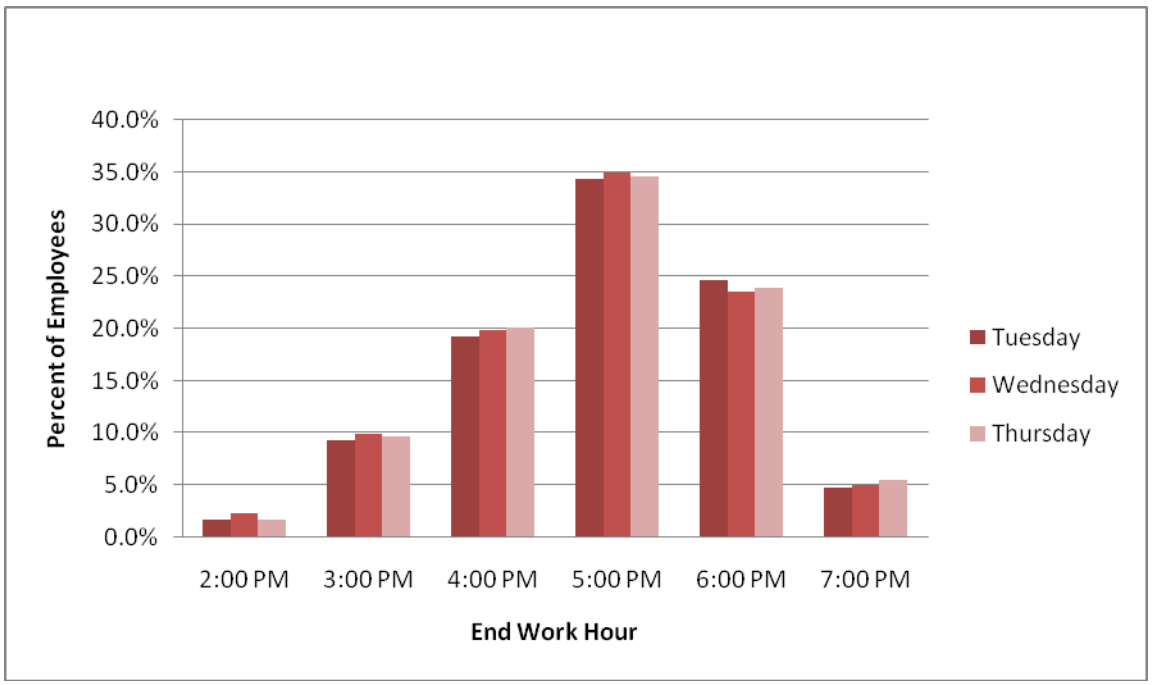

Figure 3. Finish Work Schedule of Employees Working at the FDA Campus

e. Telecommuting

As shown in Table 6, of the 523 employees working at the FDA Campus, approximately 50 percent of the employees telecommute. Of those who telecommute approximately 70 percent telecommute one day a week and approximately 25 percent telecommute two days a week. If these telecommuters are spread out evenly over a 5-day work week, 14 percent would telecommute on an average day. However, it was assumed that approximately half of the 14 percent of the telecommuters may have to come to work on days when they are scheduled to be telecommuting. Therefore, under a worst-case scenario assumption only 7 percent would telecommute on any given day.

Table 6. Telecommuting – Employees Working at the FDA Campus

1	70.3%	182
3	2.3%	6
5	2.3%	6

f. Existing Average Vehicle Occupancy (AVO)

The AVO is defined as the average number of people in a vehicle. Telecommuters were included in the AVO calculation at a rate of 7 percent per day. Therefore, for the purposes of this report AVO was calculated as follows:

Average vehicle occupancy = No. of employees/No. of vehicles to the site

AVO = (523+37) /439

AVO = 1.27

Thus, the employees who work at FDA Campus have an AVO of 1.27. This is a slightly higher occupancy rate than the results from the 2004 survey where the AVO was 1.17.

2.2 Characteristics of Employees Moving to the FDA Campus

Approximately 5,345 FDA employees who are slated to move to the FDA Campus were asked to participate in the employee survey. Of the 5,345 employees, 1,083 completed the survey. Some of the highlights from this survey are outlined below. The entire survey results are provided in Appendix A.

a. Existing Location of Residences

Table 7 summarizes the existing location of the residences for FDA employees that will be relocated to the FDA Campus. Based on the zip codes of the employees' home residences, a majority of the employees who will be relocating to the FDA Campus live in Montgomery County.

Table 7. Residential Location of Employees to be Relocated to the FDA Campus

	3,272	61%
	302	6%
	170	3%
	463	9%
	208	4%
	423	8%
	53	1%
	47	1%
	5,347	100%

b. Change in Residential Location

FDA employees who work at the FDA Campus were asked if they have or will move their residence. In addition, employees that are to be relocated to the FDA Campus were asked the likelihood of moving their residence. As shown in Table 8, of the 5,345 employees who are slated to relocate to the FDA Campus, approximately 4 percent are very likely to move their residence due to the change in job location and approximately 10 percent are somewhat likely to move their residence. These percentages are similar to the employees who are presently working at the FDA Campus, where 13 percent stated that they are very likely (5.5 percent) or somewhat likely (7.5 percent) to relocate their residence to be closer to the FDA Campus.

Table 8. Residential Location Change – Employees to be Relocated to the FDA Campus

	4.4%	48
	85.9%	930

This survey result is similar to the responses received in the 2004 survey (the survey conducted for the 2006 TMP) where approximately 5.5 percent of the respondents indicated that they were "very likely" to move their residence after they relocate to the FDA Campus and approximately 7.5 percent had indicated that they were "somewhat likely" to move their residence. Thus overall, based on the results of the 2004 survey, approximately 13 percent had indicated that they may move residences.

c. Existing Travel Mode of Employees

Table 9 shows that of the 1,083 employees who responded to the employee survey and are to relocate to the FDA Campus, most (approximately 80 percent) drive alone to work. Approximately 7 percent participate in either carpools or vanpools and approximately 8 percent use either Metrorail or bus.

The employees who are working at the FDA Campus are participating more in carpools/vanpools (approximately 9 percent) as compared to the existing travel patterns of those who are slated to relocate to the FDA Campus (7 percent). Furthermore, employees who are working at the FDA Campus are using bus more (4.6 percent) and Metrorail less (1.7 percent) than those employees who are slated to relocate (2.3 percent and 6.4 percent, respectively). These results are consistent with expectations. The employees who are working at the FDA Campus do not have the same access to Metrorail, as the closest station is over 3 miles away from the FDA Campus. Instead of driving alone, however, employees who work at the FDA Campus are looking for other means to travel, and approximately 13 percent are carpooling/vanpooling or taking the bus.

Table 9. Existing Travel Modes of Employees to be Relocated to the FDA Campus

Drive alone	80.4%	871	871
Registered Vanpool	1.2%	13	4
Bus	1.4%	15	0
Commuter Rail (MARC/VRE)	1.8%	20	0
Bike	0.9%	10	0

Note: Assumed 2 persons in a carpool and 3 persons in a vanpool

d. Current Work Schedule

Employees were asked about their existing work schedules. Table 10 shows that of the 1,083 employees who answered the survey, approximately 77 percent indicated that they typically work consistent hours.

Table 10. Existing Work Schedule of Employees to be Relocated to the FDA Campus

Typically work consistent hours (5 days/40 hours per week)	77.5%	839
Alternate work schedule – 9 days 80 hours (you have a day off every other week)	3.3%	36
Part time	3.0%	32

Figures 4 and 5 show a comparison of the start and end times of the employees who work at the FDA Campus versus those that are to be relocated. Of the employees who are to be relocated over 60 percent start between 8:00 a.m. and 10:00 a.m. with over 30 percent starting before 8:00 a.m.

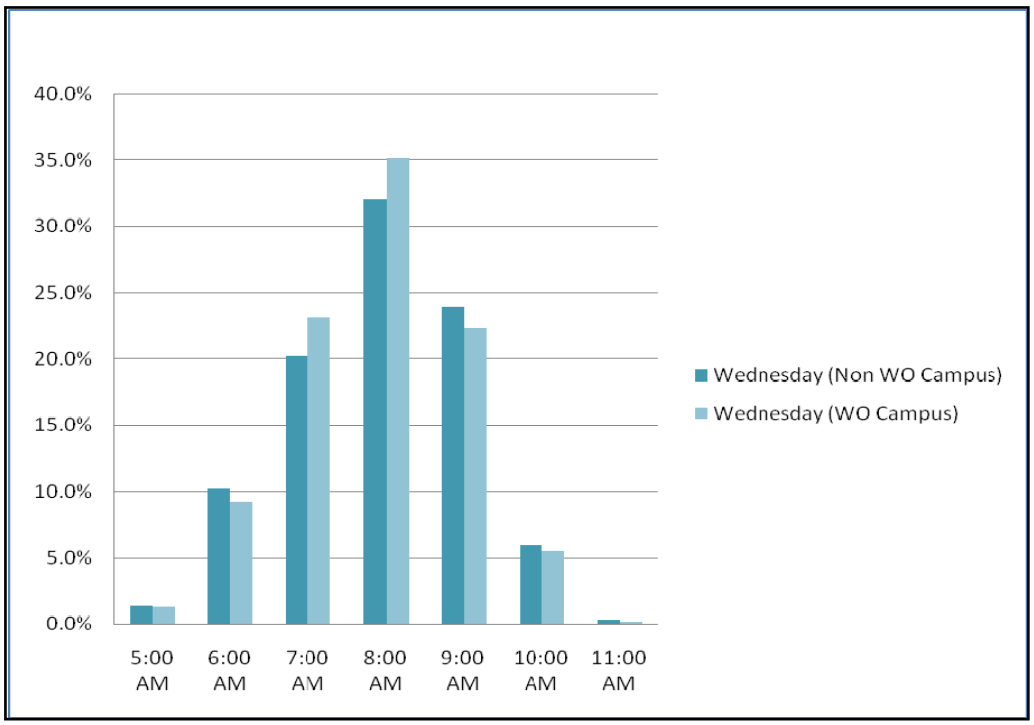

Figure 4. Begin Work Schedule of Employees Working at the FDA Campus versus Employees to be Relocated to the FDA Campus

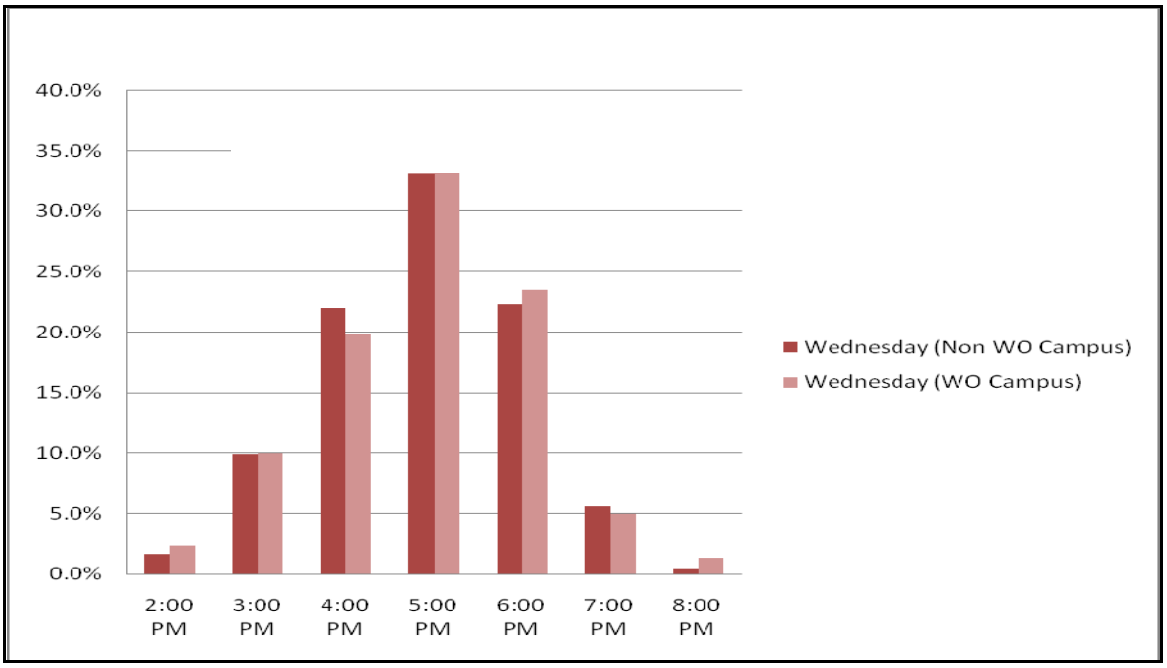

Figure 5. End Work Schedule of Employees Working at the FDA Campus versus Employees to be Relocated to the FDA Campus

Comparing the results from the employees working at the FDA Campus and the employees slated to relocate to the FDA Campus indicates that more employees working at the FDA Campus start work between the hours of 7 a.m. to 9 a.m. For example, on average approximately 35 percent of the employees working at the FDA Campus begin work at 8 a.m. versus approximately 32 percent of the employees who are slated to relocate to the FDA Campus.

Overall, it appears employees working at the FDA Campus begin work earlier than employees who have not yet relocated to the FDA Campus. Similarly it also appears that employees working at the FDA Campus are leaving work later than those who have not yet relocated to FDA Campus.

e. Telecommuting

Table 11 shows that of the 1,083 employees who completed the employee survey and who are slated to relocate to the FDA Campus, approximately 38 percent telecommute. Of those who telecommute, approximately 64 percent telecommute one day a week and approximately 30 percent telecommute two days a week. Assuming this is spread evenly over a 5 day work week, approximately 13 percent would telecommute on any given day. However, it was assumed that approximately half of the 13 percent of telecommuters may have to come to work on days when they are scheduled to be telecommuting. Therefore, under a worst-case scenario assumption only 7 percent would telecommute on any given day.

Table 11. Existing Telecommuters – Employees to be Relocated to the FDA Campus

1	64.2%	265
3	2.2%	9
5	2.9%	12

f. Existing Average Vehicle Occupancy

The AVO is defined as the average number of people in a vehicle. Telecommuters were included in the AVO calculation and again it has been assumed that on any given day 7 percent of the people telecommute. Thus, for the purposes of this report, AVO was calculated as follows:

Average vehicle occupancy = Number of employees/Number of vehicles to the site

AVO = (1,083+76) /905
AVO = 1.28

Therefore, the employees who are slated to relocate to the FDA Campus have an AVO of 1.28. This is a higher occupancy than the results from the 2004 employee survey where the AVO was 1.17.

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3 EFFECTIVENESS OF TMP STRATEGIES IMPLEMENTED

The 2006 TMP identified a variety of strategies for encouraging the use of alternative modes of transportation including the following:

- Hiring an Employee Transportation Coordinator (ETC)
- Carpool/Vanpool Incentives
  - Preferred Parking
  - Employee Matches
  - Employee Leased Vehicles (Vanpooling)
  - Guaranteed Ride Home
  - Shuttle Service
- Transit Incentives
  - Subsidies
  - Shuttle Service
  - Guaranteed Ride Home
  - On-site Passes
  - On-site Transit Stops
  - Coordination with Transit Agencies
- Telecommuting Program
- Bicycling/Walking to Work Incentives

The progress of each of these strategies is discussed in this section.

3.1 Employee Transportation Coordinator (ETC)

The most important element of implementing a TMP is to provide employees with the information they need to make a decision. This includes identification of transit services available, carpool riders, and various programs available. To perform these functions, FDA has established a position for an Employee Transportation Coordinator (ETC) within the Office of White Oak Services, Division of Logistic Services and Facilities Operations. The ETC is responsible for administering the TMP and facilitating the implementation of strategies. The ETC duties include the administration of ridesharing programs; parking programs; preparation of promotional and informational materials for employees and visitors; and coordination with local and regional transportation agencies. The ETC will also be responsible for monitoring the various programs and measuring progress towards meeting the TMP goals.

FDA's Fiscal Year 2009 budget provides for the hiring of an ETC and the FDA is actively recruiting for the ETC position. Until the ETC position is filled, an acting ETC has been appointed and is performing these functions. The acting ETC has implemented a shuttle bus service and is actively working to provide bicycle facilities on site. The acting ETC has hosted bicycle-to-work days with the employees. The acting ETC has also worked with Montgomery County Transit to increase the frequency of bus service and supplemented this service with the FDA shuttle.

3.2 Carpool/Vanpool Incentives

Of the 1,890 FDA employees working at the FDA Campus as of May 2008, approximately 9 percent are carpooling/vanpooling. The goal in the 2006 TMP was to have 18 percent of the employees carpooling/vanpooling. The lower percentage of employees actively carpooling/vanpooling than was estimated can be attributed to the fact that only 25 percent of the 7,719 employees that are to be relocated/located are presently working at the FDA Campus, thereby limiting the number of potential riders. The number of employees in carpools/vanpools is expected to rise as additional FDA employees relocate to the FDA Campus.

To encourage/facilitate carpooling/vanpooling, several strategies were outlined in the 2006 TMP. These strategies and the progress achieved are discussed below:

a. Preferred Parking

2006 TMP Strategy:

1) Reserve carpool and vanpool parking spaces at locations which provide more convenient access to the buildings than will be provided for single occupant vehicle spaces.
2) Guarantee parking spots for employees who carpool/vanpool. Special stickers or passes should be issued to monitor the use of these spaces.
3) In order to meet the Phase IIIA goals of the FDA Master Plan which calls for 2,056 employees to be relocated to the FDA Campus by 2007, approximately 123 carpool and 12 vanpool spots need to be reserved.

Progress:

1) Parking signs indicating which spaces are reserved for carpooling/vanpooling vehicles were installed in September 2008.
2) Carpool/vanpool parking permits are issued to each carpool/vanpool.
3) As of May 2008, population at the FDA Campus has not yet reached Phase IIIA levels.

b. Facilitating Employee Matching

2006 TMP Strategy:

1) Create a central list of all the employees interested in carpooling and vanpooling.
2) The ETC will match people according to their residential proximity and work schedule.
3) The ETC will also facilitate the employees meeting each other by organizing the first meeting. This is especially important for the FDA Campus, because there will be a large number of employees, and thus many employees who may potentially match up may not know each other.

4) The ETC will also follow up with the employees to determine if the employees are a good fit and/or if new arrangements need to be made. Furthermore, if the ETC takes an interest in the employees finding "good" pool partners, employee matching will most likely be self promoting and may facilitate other employees taking this option under consideration. This will be an iterative process as each batch of employees moving to the White Oak FDA Campus will need to be matched with potential carpoolers/vanpoolers.

Progress:

1) A computer application which automatically creates a database of carpools and vanpool participants has been created. The application automatically adds employees to the database when an employee submits an application.

   A request for carpool and vanpool applications was issued in March 2008 after the newest building, Building 51, was occupied. The new building brought approximately 1,000 additional employees.

   FDA has a signed Memorandum of Understanding (MOU) with the Metropolitan Washington Council of Governments (MWCOG) and is working closely with MWCOG technical database experts in order to be able to interface with the database of potential carpoolers in order to match employees who live and work in the same zip codes with each other.

2) In situations where individuals are seeking to ride with a carpool/vanpool, the acting ETC has been matching riders on a limited basis by providing a bulletin board for ride matching.

3) FDA has held a commuter brown bag meeting promoting alternative modes of transportation. A Washington Metropolitan Area Transit Authority (WMATA) registered vanpool leasing company participated and explained the economics of a registered vanpool.

4) The ETC will continue to match riders and help find "good" pool partners as more employees move to the FDA Campus.

c. Employee Leased Vehicles (Vanpooling)

2006 TMP Strategy:

1) The ETC will encourage employees to participate in vanpooling by facilitating a vanpool meeting to willing FDA employees. A group of employees can lease a van on a month-to-month basis from a vanpool leasing company. The vanpool leasing company usually covers the insurance and regular upkeep of the van.

2) Employee operated vanpools may qualify as transportation fringes and may be eligible for transit subsidy.

3) The ETC will play a very important role in introducing employees living in the same residential area to each other.

4) The ETC will identify vanpool leasing companies.

5) A cluster of 12 to 15 people located within a 3-mile radius will be identified who are committed to using the van at least three or four days per week.

Progress:

1) FDA has held a commuter brown bag meeting promoting alternative modes of transportation. A MWCOG registered vanpool leasing company participated and explained the economics of a registered vanpool.

2) Registered vanpools are eligible for federal transit subsidies which will reimburse employees for using transit up to $120 per month.

3) A computer database of carpools and vanpool participants has been created. This will aid the ETC in matching employees who want to participate in carpooling or vanpooling.

d. Guaranteed Ride-Home Service

2006 TMP Strategy:

1) Zipcars® are a means of providing vehicles to employees who do not drive to work but may need to have a vehicle in case of an emergency or if they need to run errands during their lunch hours. Zipcars® must be picked up at a specified parked location, and returned to that same location at the end of the rental period. If there is demand for these vehicles, the ETC will work to have several vehicles located on site.

2) Another option for the ETC is joining the MWCOG "Guaranteed Ride Home" regional program. It will guarantee a ride home if an emergency arises or an employee has to work overtime.

Progress:

1) The acting ETC has looked into Zipcars® and determined that due to the fact that Zipcars® must be picked up and returned to the same location they may not be a financially desirable means of transportation. The Silver Spring Metrorail Station has several Zipcar® locations and employees can use Zipcars® from this station if needed. Zipcar® has indicated that they continually do market research and they may add new locations in the future.

2) FDA has a signed a MOU with MWCOG and subscribes to MWCOG's Commuter Connections Program, which includes the "Guaranteed Ride Home" program.

   FDA intends to initiate outreach to its carpoolers, shuttle passengers and transit passengers to encourage them to register with "Guaranteed Ride Home."

e. Shuttle Service/FDA Owned Cars for FDA Business

2006 TMP Strategy:

1) Reduce the percentage of employees having to commute to other FDA offices through providing:

   - FDA External (Commuter) Shuttle which serves the local transit stations

- FDA Internal Shuttle to circulate through the site and other FDA sites
- FDA Vehicles for business use

The implementation of these services decreases the need for employees to drive to the site.

Progress:

1) FDA has implemented a three-bus, three route commuter shuttle bus system that is carrying more then 400 passengers per week. In addition to connecting the FDA Campus to major rail links with one route serving the Twinbrook Metrorail Station, one route serving the east red line at the Silver Spring Metrorail Station, and the third route serving the green line at the College Park Metrorail Station, the shuttle bus system also provides services to other FDA offices. These routes also connect routes of the Maryland Area Rail Commuter (MARC) train - the Brunswick and the Camden Lines and the Parklawn and Wiley Buildings.

   An internal circulator shuttle has recently been added to allow employees to easily access their buildings from one central drop off point (see Figure 6). The circulator shuttle carries more than 500 passengers per week.

3.3 Transit Incentives

The physical location of the FDA Campus is a constraint for the use of transit by FDA employees that have relocated to the Campus. The closest Metrorail Station is over three miles away. However, of the 523 employees who completed the employee survey and that are located at the FDA Campus, approximately 20 percent use transit facilities.

A major focus of this TMP is to increase the number of employees using transit to get to work. Therefore, several strategies were outlined in the 2006 TMP to encourage/facilitate employees using transit. Below is a listing of these strategies and their current progress.

a. Transit Subsidy

2006 TMP Strategy:

1) Transit passes will be sold at the FDA Campus so that employees can make their purchase at their convenience.

Progress:

1) FDA facilitates the distribution of the Federal Transit Subsidy to employees which meet the program requirements. The distribution is done on site at the FDA Campus. This subsidy amounts to as much as $120 per month per participant. FDA is looking into a program that would allow employees to buy Fare Media on site.


Legend
2006 Master Plan Development
Surface Parking
Parking Garage
Storm Water Management Pond
FDA Commuter Shuttle
Internal Shuttle – 6 a.m. to 7 p.m., every 15 minutes
Metro Ride-On
2006 Master Plan Parameters
Population 7,719
Parking Ratio 1:1.5
Employee Parking 5,141
Visitor Parking 500
Total Parking Required 5,641
Parking Provided 5,641
Building 100
Surface Parking 7
Northeast Loop
Distribution Center
Northeast Parking Garage 927
North Parking Garage 831
Surface Parking 362
Surface Parking 450
Surface Parking 20
Building 66
Building 64
Building 62
Building 10 (Below Grade)
Building 22
Surface Parking 34
Building 21
Building 2
Building 1
Building 31
Building 52
Building 71
Building 72
Building 51
Building 32
Surface Parking 32
Broadcast Studio
Surface Parking 20
Surface Parking 24
Child Care Center
Gate
East Loop
Southeast ParkingGarage 1,695
Antenna Farm
Southeast Loop
Southwest Parking Garage 1,229
Southwest Loop
Main Entrance
Gate
Truck Screening Facility
Gate
Michelson Road
Mahan Road
Existing FDA Campus Bus Routes
February 2009
0 50 100 Meters
Figure 6

b. Shuttle Service

2006 TMP Strategy:

1) Shuttles from Silver Spring, Twinbrook, and College Park Metrorail stations are being provided to/from the FDA Campus. Peak hour trips are not made to the Silver Spring Metrorail station by the shuttles because Montgomery County's Ride On 22 bus route provides this service. However, there is no service during the midday. The shuttle service is designed to supplement this service in order to accommodate employees needing access to the Silver Spring Metrorail Station during this time period.

Progress:

1) Shuttle ridership is expected to expand as a result of the increase in population on the FDA Campus. Over 400 passengers use the shuttle service on a weekly basis and just recently a third shuttle bus has been added. Once employees arrive at the FDA Campus, the internal shuttle bus helps employees get to their respective buildings (see Figure 6).

   The acting ETC continues to work closely with Montgomery County and WMATA transit planners to have heavier used shuttle bus links taken over by public transit. The FDA shuttle will be used to fill in the gaps in the mid-day and evening to provide maximum flexibility to FDA shuttle and transit passengers. FDA is also evaluating the possibility of two additional shuttle trips in the evening after the Ride On 22 has finished its last run. These trips would occur at approximately 7:15 p.m. and 8 p.m.

   In a formal public hearing, held on April 17, 2007, the FDA provided testimony with regard for the need to increase transit service to the FDA Campus. This resulted in a 75 percent increase in service by the County Transit Buses directly into the FDA Campus (Ride-On 22). This increase in service has been received favorably by the FDA transit passengers.

c. Guaranteed Ride-Home Service

See the discussion under carpool/vanpool.

d. On-Site Transit Stop

2006 TMP Strategy:

1) Develop a transit stop on-site which will achieve the optimum convenience for shuttle and transit passengers and minimize the time that public transit vehicles divert onto the site.

Progress:

1) A transit stop has been set up at the entrance to FDA, in front of Building 1. It is able to accommodate, WMATA and Montgomery County Ride On buses, and the FDA Shuttle. This location is a central place for all employees to be able to gain access to all the transit services, and also to maximize shuttle efficiency (see Figure 6).

e. Coordination with Other Agencies

2006 TMP Strategy:

1) The ETC will contact the local transit agencies. The ETC will monitor the employees and work with local transit agencies and update the FDA shuttle service schedule to provide continually better service as demands increase. It is anticipated that the frequency of Ride On 22 will need to be increased as the employees take the MARC into the Silver Spring Metrorail Station.

2) The ETC will also monitor the transit services being provided to minimize any overlap of services.

3) There is bus service from the Silver Spring and Twinbrook Metrorail Stations which could be routed to the site. These buses run at 30 minute headways during the peak hours. As the demand for these services increases, the ETC will work with Montgomery County Transit to decrease the headways and provide express service.

4) There are a number of park and ride lots in Montgomery County. The lot at I-270 and MD 124 would be a prime location for providing express service (via the Maryland Transit Administration (MTA)) to the FDA White Oak. The ETC will need to coordinate with the employees and Montgomery County and/or MTA to determine the feasibility of this service.

Progress:

1) As a result of the growing population at the FDA Campus, and coordination between the acting ETC and public transit agencies, the present Ride On 22 service was increased by 75 percent with 15 minute headways during peak hours.

   FDA has worked closely with local transit agencies to ensure a location for public transit buses to conveniently divert into the FDA Campus and pick up passengers.

2) The acting ETC continues to work closely with Montgomery County and WMATA transit planners to have heavier used shuttle bus links taken over by public transit and to ensure that there is no overlap of services.

3) FDA continues to engage in discussions with transit planners from Montgomery County and WMATA to discuss possibilities for enhancing service to the site by diverting additional bus lines into the FDA Campus.

4) The ETC will continue to work closely with Montgomery County and WMATA transit planner to determine the feasibility of strategies to get people to and from the FDA Campus.

3.4 Telecommuting Program

2006 TMP Strategy:

1) Encourage each organization to investigate if there are any positions that can be successfully completed from either home or a telecommuting work center.

2) Investigate options such as satellite work centers. Given the nature of the work, it is understood that many sections especially the labs may find it difficult to undertake the

telecommuting option. Thus, the FDA's goal is for each of the organization offices to identify between 10 and 20 employees who can be telecommuters bringing the total number of telecommuters to approximately 2 percent.

Progress:

1) FDA experiences a very high rate of participation in the Flexible Workplace Program. Participants work as many as three days a week from remote locations with the majority of the participants working off site one to two days per week.

   Recent survey results indicate that approximately 70 percent of the employees who work at the FDA Campus telecommute at least one day a week.

2) Most FDA employees who telecommute work from home. As computers come up for replacement, FDA is issuing laptops, making it very convenient for employees who can and want to telecommute to work from home. Thus, satellite work centers are no longer needed as working from home has become the chosen option for telecommuters.

3.5 Bicycling to/Walk-to-Work Incentive

2006 TMP Strategy:

1) Encourage employees living in close vicinity of the FDA Campus to walk to work or bicycle to work. Facilitate this by providing shower facilities on site.
2) Provide sheltered bicycle racks at all buildings so that employees will have the ease of parking their bicycles at work.
3) Design internal roadways to be bicycle and pedestrian friendly.

Progress:

1) FDA holds up to three bicycle commuter meetings per year during the summer months, to advertise this as a means for commuting. GSA has provided showers in the FDA buildings and lockers in some locations.

   The bicycle commuter group maintains regular communications with its participants and its accomplishments include effective advocacy for a County Sidewalk Project. This resulted in supplemental funding that allowed the project to be built. This project opens up a vital link to the campus that is critical to all cyclists traveling to the FDA Campus from the south. Without this sidewalk the route would have been an extreme hazard to the bicycle commuter.

   Additionally, through the acting ETC, bicycle commuters participated in a mapping exercise that resulted from the County Office of Commuter Services initiative. They participated in identifying formal and informal bicycle routes that assist individuals considering this mode in developing a route to work.

2) Areas are being set aside in the parking garages for bicycle parking and racks are provided in these locations.
3) Sidewalks are provided along internal roads and internal roadways are being designed to accommodate bicycles.

Over 1 percent of the employees at the FDA Campus walk or bike to work.

3.6 Analysis of the Strategies Implemented and their Effectiveness

In the 2006 TMP, the overall goal for the end of 2007 and with 2,056 employees on-site was to achieve a parking ratio of 1.29. The 2006 TMP parking ratio/goal was expected to be achieved by heavily stressing carpool and vanpools as a mode of transportation. Based on our data, this goal is being achieved through other transportation strategies which have proven to be more successful, such as telecommuting. Table 12 summarizes the modal split as suggested in the 2006 TMP compared with the existing mode split.

Overall, the FDA is meeting its mode split goals as set forth in the 2006 TMP. The goal was to achieve a parking ratio of 1.29 and the existing parking ratio for the FDA Campus is 1.31.

Table 12. Mode Split

No. of total employees		2,056			2,080	
Vanpool	3%	62	12	1%	21	7
Telecommute	2%	41	0	7%**	146	0
Absent	2%	41	0	2%**	42	0
SOV			1,460			1,497
Parking Ratio	**1.29**			**1.31**		

**Number of employees includes the 1,890 FDA employees and contractor employees on-site and the 190 service contractors*

***Note: Actual Mode split % are rounded up to nearest whole number*

2% absentees has been assumed • 7% telecommuting has been assumed

According to the employee survey results, approximately 9 percent of the employees who work at the FDA Campus are using carpools or vanpools. The TMP goal was to obtain approximately 15 percent carpool/vanpool participation at this stage of occupancy.

With the influx of an additional 1,170 employees, the number of people participating in carpools/vanpools is expected to rise as there will be more potential carpool/vanpool matches. Furthermore, with the assignment of preferred parking spaces for the carpoolers and vanpoolers, employees are expected to be more inclined to use this mode of travel as parking becomes limited. It has been difficult to implement some of the parking restriction strategies due to construction on-site,

influx of construction related contractors, and an increased number of visitors, but designated carpool/vanpool spaces have been assigned. To help increase the number of carpool/vanpool users, an employee carpool/vanpool database has been set up which will facilitate the matching of employees. This will become increasingly useful as the number of employees on site increase and carpool/vanpool permits are issued.

The FDA shuttle runs three routes and connects the FDA Campus to the Metrorail, commuter rail, and other FDA offices. Over 400 employees use it on a weekly basis. The TMP goal was to have approximately 6 percent of the FDA Campus population use transit. The survey results indicate that approximately 9 percent of the employees use transit as their primary mode of travel (a combination of bus, Metrorail, commuter rail, and commuter bus). FDA is exceeding the goals set in the 2006 TMP. The addition of the FDA shuttle and the change in frequency of Montogmery County Ride On 22 has had a significant positive impact on providing employees with ways to use transit to get to/from the FDA Campus.

Similarly, FDA is significantly exceeding the telecommuting goal of 2 percent set in the 2006 TMP. Approximately 50 percent of the employees indicate that they telecommute at least one day a week. In fact, approximately 12 percent of the employees telecommute two days a week. Therefore, any day of the week has at least 14 percent telecommuters indicating that there are a significant number of telecommuters midweek. The day with the highest number of employees telecommuting is Friday.

It should be noted that for the purposes of this TMP update, 7 percent telecommuter ratio has been assumed for existing conditions (year 2007), even though the actual number of telecommuters is much higher. Due to the nature of the work at the FDA, it is likely that telecommuters may have to come to work on certain days when they are supposed to be telecommuting, or more telecommuters may be telecommuting on Monday/Friday which would mean that more parking spaces will be needed during the midweek. It is believed that a lower telecommuter rate will produce a more conservative analysis and to account for these types of variables.

Approximately 1 percent of the FDA Campus employees are either walking or biking to work. FDA is meeting the walk/bike goal set in the 2006 TMP which aimed at a one percent participation. The acting ETC has been very instrumental in providing the tools for the employees to use this mode of travel.

Overall, FDA is exceeding the mode split goals set in the 2006 TMP. The agency is meeting/exceeding the goals set for transit, telecommuting, and walking/biking. However, carpools/vanpools are not forming at the rate that was originally projected. When the TMP was first developed for the FDA Campus, it was projected that carpools/vanpools would be the catalyst for meeting the goals of the TMP. However, as time has shown, FDA's Flexible Workplace Program and the FDA Shuttles have been the most beneficial in helping the agency meet its goals. Participants work as many as three days a week from remote locations with the majority of the participants working off site one to two days per week. This is due in part to a shift in FDA's emphasis over time to telecommuting as an alternative to the traditional work place. The FDA has begun issuing laptops as old desk top computers come up for replacement, making it very convenient for employees who can and want to telecommute to work

from home. FDA has also put more emphasis on providing subsidies for internal and external shuttles to help employees use transit to get to/from work. This emphasis has allowed FDA to exceed its transit goals. The telecommute availability and success may also be reducing the opportunities to form carpools as employees schedule at work is less consistent than in more traditional working arrangements. As more employees relocate to the FDA Campus, FDA will continue to look for opportunities to make gains in the area of carpool and vanpool formation.

FDA is meeting the goals outlined in the 2006 TMP. Based on the results of the recent employee survey, it will be necessary to adjust/modify some of the strategies to meet the overall parking ratio goal of 1:1.5 by build out.

4 EXISTING TRANSPORTATION SYSTEM

In addition to evaluating the effectiveness of existing TMP strategies, this TMP update also assesses the current conditions of the transportation system.

This section describes the existing site characteristics at the FDA Campus, as well as the roadways and public transportation serving the site. An in-depth analysis of the existing transportation system was conducted in the transportation section of the 2005 Supplemental Environmental Impact Statement (SEIS). Many of the changes originally proposed in the 1997 EIS have either already been constructed or are under construction. As many of the improvements necessary to support this consolidation have been programmed, this section focuses on the site characteristics at the time of full build-out.

4.1 Site Characteristics

The FDA Campus is located just north of the Capital Beltway (I-495). It is bound on the western edge by New Hampshire Avenue and by the Hillandale neighborhood on the southern side. The U.S. Army Adelphi Laboratory is also located to the south of the site. Apartments and the Percontee Quarry are located to the east and north of the site, respectively. Land to the west of New Hampshire Avenue is mostly developed with single family homes as is the land to the east of Cherry Hill Road. However, there are various commercial developments, such as strip malls and gas stations, along both New Hampshire Avenue and Cherry Hill Road.

Three access points are proposed for the site. Primary access will be provided from New Hampshire Avenue via the main gate at Mahan Road. Access will also be provided via a northern gate along New Hampshire Avenue at Michelson Road (Relocated). A new eastern access road is under construction to connect the FDA Campus to Cherry Hill Road, north of the Powder Mill Road intersection. The site will be a secure facility with gates provided at each access point. A ring road will be constructed around the FDA campus to serve the parking and buildings, and thus access to each building will be provided internal to the site. Figure 7 shows the existing site plan for the FDA Campus.

a. Roadways

A number of studies have been performed to identify the roadway improvements recommended to accommodate the projected traffic at an acceptable level of service. The existing roadway network is shown in Figure 8 and the key roadways are discussed below.

- Interstate 495 (I-495). In the vicinity of the site, I-495, also known as the Capital Beltway, is an eight-lane, divided, interstate highway which runs in an east-west direction. It carries approximately 218,000 vehicles per day (VPD). The posted speed limit near the FDA Campus is 55 miles per hour (mph).
- New Hampshire Avenue (MD 650). This is a six-lane, divided roadway with a posted speed limit of 35 mph. The road runs in a north-south direction and has a grade separated interchange with both I-495 and US 29. New Hampshire Avenue carries approximately 60,200 VPD. Its intersections with Elton Road, Powder Mill Road, Schindler Drive/Mahan Road, Michelson Road, and Lockwood Drive are signalized. There are auxiliary turn lanes present along this roadway at all signalized intersections.


Legend
2006 Master Plan Development
Surface Parking
Parking Garage
Storm Water Management Pond
2006 Master Plan Parameters
Population 7,719
Parking Ratio 1:1.5
Employee Parking 5,141
Visitor Parking 500
Total Parking Required 5,641
Parking Provided 5,641
Antenna Farm
East Loop
Surface Parking 24
Gate
Child Care Center
Southeast Parking Garage 1,695
Building 100
Surface Parking 7
Building 66
Building 71
Southeast Loop
Northeast Loop
Surface Parking 20
Surface Parking 20
Distribution Center
Northeast Parking Garage 927
Building 64
Building 10 (Below Grade)
Building 52
Building 72
Building 62
North Parking Garage 831
Building 22
Building 51
Surface Parking 362
Surface Parking 450
Surface Parking 34
Building 32
Southwest Parking Garage 1,229
Broadcast Studio
Gate
Truck Screening Facility
Building 2
Surface Parking 32
Building 1
Building 21
Building 31
Southwest Loop
Main Entrance
Gate
Michelson Road
Mahan Road
Green Buffer Zone
Green Buffer Zone
2006 Master Plan
0 50 100 Meters
Figure 7

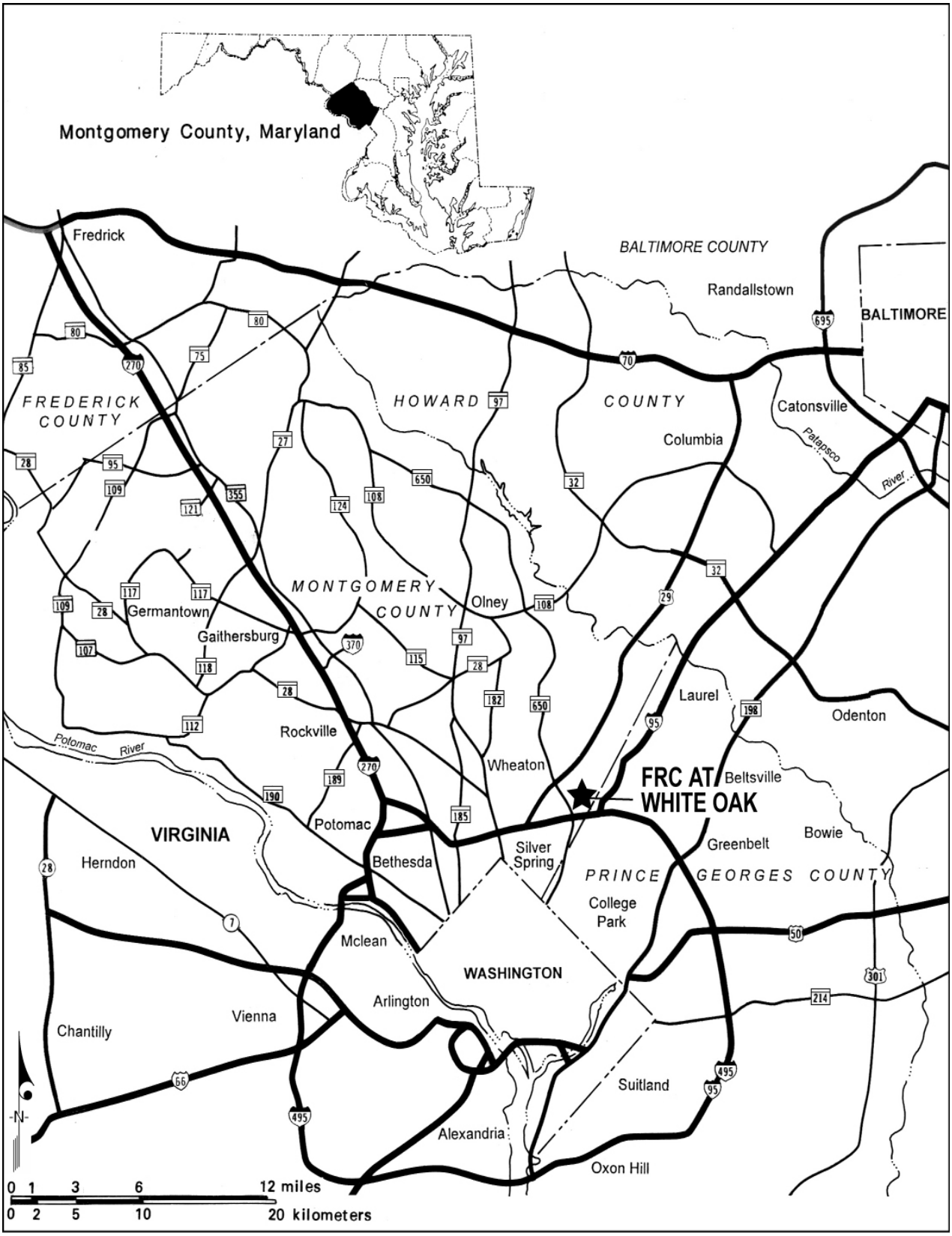


Figure 8. Existing Roadway Network

- Powder Mill Road (MD 212). This is a two-lane roadway between New Hampshire Avenue and Cherry Hill Road, with a posted speed limit of 35 mph. It runs in an east-west direction, with signalized intersections at New Hampshire Avenue and Cherry Hill Road. East of Cherry Hill Road, it becomes a four-lane roadway and has an interchange with I-95. The east leg, at New Hampshire Avenue, consists of two exclusive left turn lanes, a shared left/through lane and an exclusive right turn lane. The west leg consists of an exclusive left turn lane, a shared right/through lane, and an exclusive right turn lane. In 2006, it carried approximately 26,000 VPD.

- Columbia Pike (US 29). This is a six-lane highway with a posted speed limit of 50 mph. It runs in a north-south direction, parallel to I-95, and ends at I-70 to the north. It has an interchange with New Hampshire Avenue and a newly constructed grade separated interchange at Cherry Hill Road/Randolph Road. It carries approximately 70,000 VPD.

- Cherry Hill Road. This roadway runs in a north-south direction and has a posted speed limit of 40 mph. In the vicinity of the White Oak Site it has a four-lane cross-section. Its intersections with Powder Mill Road, Plum Orchard Drive, Calverton Drive, and Prosperity Drive are signalized. Its intersection with US 29/Randolph Road is a grade separated interchange.

- Randolph Road. North of Columbia Pike (US 29), Cherry Hill Road becomes Randolph Road. It is a four-lane undivided highway that runs in an east-west direction. The posted speed limit is 35 mph.

- Plum Orchard Drive. This is a two-lane roadway which runs in an east-west direction. Its intersection with Cherry Hill Road is signalized. It is developed with multi-family homes east of Cherry Hill Road and a large shopping center exists on the northwest quadrant. The speed limit for this roadway is not posted.

- Calverton Boulevard/Broadbirch Drive. This is a two-lane roadway which connects Cherry Hill Road to Powder Mill Road (MD 212) via Beltsville Drive. Similarly, Broadbirch Drive connects Cherry Hill Road to Columbia Pike via Tech Road. It is a two-lane roadway to the east of Cherry Hill Road and becomes a four-lane facility to the west. To the west of Cherry Hill Road, this roadway serves a shopping center and other office/commercial developments. To the east of Cherry Hill Road, this roadway serves as the primary access point to a neighborhood. Its intersection with Cherry Hill Road is signalized. The posted speed limit is 30 mph.

- Prosperity Drive. This roadway runs in an east-west direction, teeing into Cherry Hill Road and extending past Tech Road. Its intersection with Cherry Hill Road is signalized. Land along Prosperity Drive is developed with either retail or office developments. The posted speed limit is 30 mph.

- Lockwood Drive. This roadway runs in an east-west direction from US 29 (Columbia Pike) to east of New Hampshire Avenue. It provides access to several commercial and residential developments located along it. There is a large shopping center at the northeast corner of its intersection with New Hampshire Avenue. The posted speed limit is 30 mph. The southbound approach of this intersection provides an exclusive left turn lane, two through lanes and a shared right/through lane. The northbound approach provides a shared right/through lane and two through lanes. The east leg of this intersection provides two exclusive left turn lanes and a shared left/right lane. There is a parking lot to west of this intersection.

- Michelson Road. This roadway provides a secondary entrance from New Hampshire Avenue into the FDA Campus. Its intersection with New Hampshire Avenue has been relocated to the southeast as part of the New Hampshire Avenue widening and the FDA consolidation. The east leg of Michelson Road at New Hampshire Avenue provides an exclusive left turn lane, a shared left/through lane and an exclusive right turn lane.

- Schindler Drive/Mahan Road. This roadway runs in an east west direction. To the west of New Hampshire Avenue, it provides access to a neighborhood and to the east it is the main access point for the FDA Campus. Its intersection with New Hampshire Avenue is signalized. The posted speed limit is 25 mph. The east leg of Mahan Road at New Hampshire Avenue provides two exclusive left turn lanes, a shared left/through lane and an exclusive right turn lane.

Most of the road improvements along Cherry Hill Road, New Hampshire Avenue, Powder Mill Road and US 29 have been completed and these roads are open to traffic. Table 13 shows the proposed schedule for other roadway improvements. As the design proceeds, some changes or modifications in the improvements may occur.

b. Analysis of Traffic Conditions

Existing traffic conditions were evaluated at study intersections near White Oak and they are presented in Table 14. It should be noted that existing traffic conditions, as of January 2008, took into consideration the 2,080 FDA employees and contractors working at the FDA Campus.

Analysis was performed using the Critical Lane Analysis Technique as directed by both the Montgomery County and Prince George's County guidelines. The Critical Lane Analysis outputs a Level of Service (LOS). LOS is described in the Highway Capacity Manual (HCM) as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorist and/or passengers." The HCM defines six levels of service ranging from A to F, with A representing the optimal operating conditions with minimal delays and F representing congestion.

The Critical Lane Analysis Technique determines the overall operational LOS for an entire signalized intersection. Unsignalized intersections are assumed to be simple two-phase signalized intersections for the analysis. The analysis examines the combination of vehicular streams with conflicting movement during a peak period. This maximum number of conflicts is termed the

critical lane volume (CLV). This CLV value is then compared to a range of values, to determine the approximate LOS at an intersection.

Table 13. Scheduled Roadway Improvements

IMPROVEMENT	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
MD 650 Intersections (SHA)					**OT**					
MD 212 @ C. H. (SHA)	**OT**									
US 29 @ E. R./C. H. (SHA)				**OT**						
Inter-County Connector (SHA)							**UC**			OT
Cherry Hill Road Ph 1 (PGCDPWT)		**OT**								
Cherry Hill Ph 2 Bridge (PGCDPWT)							UC OT			
Cherry Hill Ph 2 Road (PGCDPWT)							UC	OT		
Cherry Hill @ 47th Av. (PGCDPWT)							OT			
Ammendale Road (PGCDPWT)						**OT**				
Mahan Road (GSA)							**UC** **OT**			
Michelson Road (GSA)				**OT**						
Northeast Access (GSA)							NTP		OT	

Note: **NTP**=Notice to Proceed; **UC**=Under Construction; **OT**=Open to Traffic

Bolded Years - FDA Site improvements/Roadway improvements are complete

Intersections in Montgomery County with a CLV of 1,475 or lower are considered to be operating at an acceptable level of service. Intersections in Prince George's County with a CLV of 1,600 (LOS E) or lower are considered to be operating at an acceptable level of service. Montgomery County's standards do not provide breakdowns for LOS A through E. They only provide a CLV limit beyond which the intersection is said to be operating at an unacceptable LOS according to the 2007 *Local Area Transportation Review and Policy Area Mobility Review Guidelines* (M-NCPPC).

With approximately 2,080 employees and contractors working at the FDA Campus, many of the intersections are operating at or below capacity conditions in either or both the AM and PM peak hours. The intersections of US 29/Fairland Road, US 29/Musgrove Road and US 29/Stewart Lane are operating at or above capacity.

The surrounding roadways carry heavy traffic volumes during the peak hours. Three intersections are at unacceptable levels of service and another seven are approaching unacceptable levels (see Table 14). Traffic volumes will increase as more employees shift to the FDA Campus. However, with the construction of the Inter-County Connector (ICC), several of the study intersections are expected to experience a shift in traffic and thus an overall, improvement in LOS.

Table 14. Existing Levels of Service (2007/2008)

Intersection	AM (CLV)	PM (CLV)
Cherry Hill Road/Powder Mill Road*	B (1,128)	C (1,251)
Cherry Hill Road/Plum Orchard Drive	Acceptable (951)	Acceptable (1,055)
Cherry Hill Road/Calverton Boulevard/Broadbirch Drive	Acceptable (1,101)	Acceptable (1,419)
Cherry Hill Road/Prosperity Drive	Acceptable (1,195)	Acceptable (1,050)
MD 650/Michelson Road	Acceptable (1,073)	Acceptable (1,008)
MD 650/Powder Mill Road	Acceptable (1,272)	Acceptable (1,400)
MD 650/Schindler Drive/Mahan Road	Acceptable (1,048)	Acceptable (870)
MD 650/Lockwood Drive1	Acceptable (1,223)	Acceptable (1,207)
Beltsville Drive/Powder Mill Road*	B (1,044)	C (1,299)
Beltsville Drive/Calverton Boulevard*	A (797)	A (846)
US 29 /Fairland Road	Unacceptable (1,591)	Unacceptable (1,769)
US 29 /Musgrove Road	Acceptable (1,448)	Unacceptable (1,593)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (875)	Acceptable (819)
US 29 S.B. Ramp/Cherry Hill Road	Acceptable (1,096)	Acceptable (951)
US 29/ Tech Road	Acceptable (1,448)	Acceptable (1,460)
US 29/ Industrial Parkway	Acceptable (1,343)	Acceptable (1,396)
US 29/Stewart Lane	Acceptable (1,423)	Unacceptable (1,681)
US 29/ Lockwood Drive	Acceptable (1,475)	Acceptable (1,448)

*indicates intersections in Prince Georges County

c. Future Roadway Projects

Several roadway projects are either in the planning stage or construction state, which will impact access to the site. With the exception of the InterCounty Connector (ICC), most of the roadway projects are not programmed for construction. Most of these projects will not be completed until after the relocation of all employees, however, some will coincide with the build out date of the FDA Campus. The projects include:

- The ICC will provide a new freeway facility connecting I-270 in Montgomery County and US 1 in Prince George's County. The ICC will be a limited access, toll facility. This project is under construction and is expected to be completed by 2012. The ICC is expected to have several interchanges including ones with MD 97 (Georgia Avenue), MD 650 (New Hampshire Boulevard), US 29, and I-95. It is also expected to have bicycle paths adjacent to portions of it that will tie into the bicycle path networks in Montgomery and Prince George's Counties. It is also likely that transit service will be greatly improved due to the ICC construction as buses will be able to use this roadway to get passengers to their destinations much faster.

- I-495 Beltway Improvements: Alternatives for increasing capacity on I-495 including potential managed lanes are being considered by SHA.

- US 29/Tech Road interchange: A grade separated interchange at US 29 is being considered by SHA.

The above improvements will have both positive and negative impacts on transit usage. The construction of the ICC and I-495 will improve congestion on the beltway and could make driving more attractive to employees.

The ICC will provide an east-west highway which will facilitate travel from western Montgomery County to the east and in turn to the FDA Campus. Similarly, the use of tolls and managed lanes may provide opportunities for improved transit service, as well as, encourage carpooling. As these improvements come closer to construction, the ETC will need to coordinate with the employees and local transit agencies to identify potential demands for service.

4.2 Public Transportation

The existing public transportation facilities and routes, including Metrorail, commuter rail, buses, and bicycle are shown in Figures 9 through 12. The following describes the transit routes and schedules which serve the FDA Campus.

a. Metrorail System

The Metrorail system connects downtown Washington, DC to the adjoining areas in Maryland and Virginia (Figure 9). The Metrorail operates five lines of which two lines, the red and the green, have

stations within 5 miles of the FDA Campus. Trains operate at seven minute intervals during the peak hours and 12 minutes intervals during the non-peak hours as well as on weekends.

The Metro Red Line operates west of the site, from the Glenmont Station to the Shady Grove Station, in Montgomery County. The Silver Spring Station is the closest station on the red line to the FDA Campus. It is located approximately 3.4 miles from the FDA Campus off of Colesville Road (US 29). Access to the station can be obtained by traveling south on US 29. The Forest Glen and Wheaton Stations are located approximately 4 miles to the west of the FDA Campus.

The Metro Green Line operates east of the site from the Greenbelt Station to the Branch Avenue Station in Prince George's County. Two of the stations along Green Line that are near to the FDA Campus are the Greenbelt Station, located approximately 4.2 miles from the site, and the College Park Station which is located 4.6 miles from the site.

b. MARC Rail System

MARC is a commuter rail system that connects Washington, D.C. to surrounding counties in Maryland and West Virginia. The MARC operates three lines: namely the Brunswick Line, the Camden Line, and the Penn Station Line (See Figure 10).

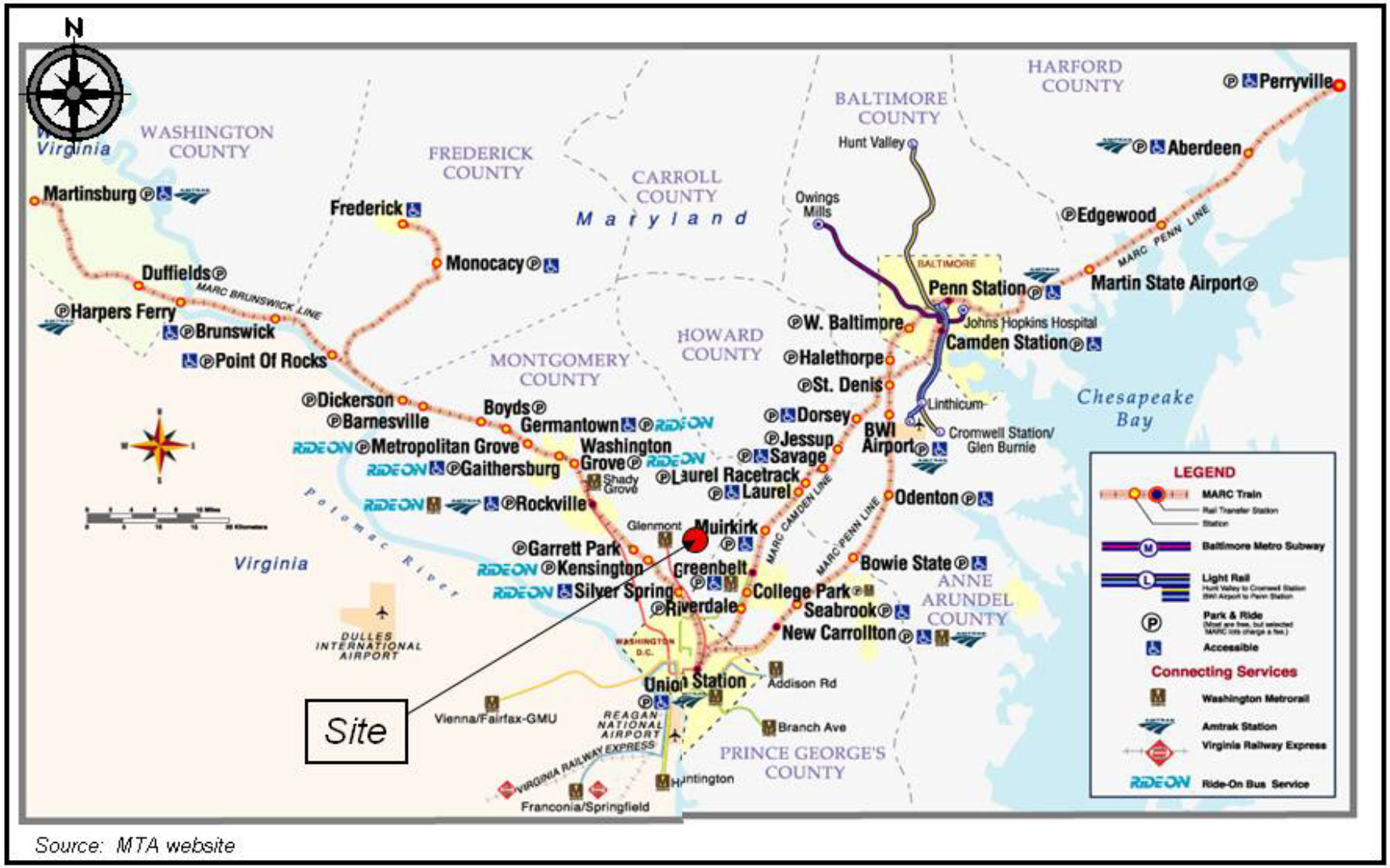
The MARC Brunswick Line operates from Martinsburg, WV to Union Station in Washington, D.C. This line has a stop at the Silver Spring Metro station and thus is connected to the Metro Red Line. Trains only operate in the eastbound direction in the AM peak hours beginning at 5 a.m. and only operate in the westbound direction in the PM peak hours beginning at 1:45 p.m.

The MARC Camden Line operates from Camden Station in Baltimore, MD, to Union Station in Washington, D.C. The MARC stations near to the FDA Campus include the Muirkirk, College Park, and Greenbelt Stations, with the Greenbelt Station being the closest to the FDA Campus. The College Park and Greenbelt Stations are located at the College Park and Greenbelt Metrorail Stations, respectively. The Camden Line trains run approximately every 30 to 50 minutes during the AM and PM peak period. There are six southbound trains in the AM peak period which start at 5:10 a.m. and stop at 8:15 a.m. and in the northbound direction there are six PM peak period trains beginning at 4:13 p.m. and ending at 7:35 p.m. There are also some mid-day trains in each direction.

The Penn Station Line operates from Perryville, MD to Union Station in Washington, D.C. Most of the trains; however, do not begin in Perryville; instead they operate between the Baltimore/Penn Station and Union Station. The trains start at 4:47 a.m. in the southbound direction and continue until 10:18 p.m. In the northbound direction, trains start at 5:54 a.m. and stop at 10:45 p.m. Trains are more frequent during the AM and PM peak periods; however, there are several mid-day trains, as well.

Commuters have the option of purchasing various combinations of tickets/cards which allow them to use the MARC, Metrorail, and Montgomery County Ride On, MTA, and WMATA buses more cost effectively. For example, they can buy a $65 MARC Train Link Card (TLC) which allows them to use the Metrorail on an unlimited basis for one month.

Figure 9. Washington Metro Rail System Map



Source: MTA website

Figure 10. MARC System Map

c. Buses

Several bus routes presently provide service along New Hampshire Avenue and US 29 in the vicinity of the FDA Campus. These routes are shown in Figure 11 and presented in Table 15. GSA and FDA can request for the adjustment of these routes to serve the FDA Campus, if there is sufficient demand. It should also be noted that, bicycle racks are available on all Ride On and Metro busses. The Silver Spring Metrorail Station is considered the primary transit station for the FDA Campus due to the number of buses which use US 29, the proximity of the Silver Spring Metrorail Station to the site, and also the accessibility of the Silver Spring Metrorail Station to the MARC Train System.

A number of meetings have been held with Montgomery County Transit and WMATA to discuss potential transit service to the site. Quarterly meetings are held with all stakeholders to review the status of the improvements and relocations. Transit agencies have indicated a willingness to provide increased services once sufficient demand exists. This enthusiasm for cooperation has led to a significant increase in The Montgomery County Ride On 22 service which connects the Silver Spring Metrorail Station to the FDA Campus. Furthermore, there are also discussions on providing express bus service from Montgomery County.

d. Park and Ride Lots

An inventory of the existing park and ride lots was provided by Montgomery County and is summarized below. On average, there are approximately 4,000 spaces provided at these facilities. As shown in Table 16, a majority of these lots operate below capacity conditions and thus there are approximately 1,540 parking spaces available at these lots. A majority of the lots along the I-270 corridor have approximately 50 percent available capacity. Figure 12 presents the locations of the park and ride lots in Montgomery County. This type of parking availability is very beneficial for carpooling as it will allow small clusters of people to park and share rides.

e. Bicycle/Pedestrian Facilities

Sidewalks are provided along New Hampshire Avenue and Cherry Hill Road. Sidewalks are also provided along Lockwood Drive between US 29 and New Hampshire Avenue. A bicycle lane is provided along New Hampshire Avenue. The Silver Spring Green Bicycle/Hiking Trail ties into downtown Silver Spring and will provide a connection to the Sligo Creek Trail which runs near the FDA Campus. Figure 13 shows bikeways in the vicinity of the FDA Campus.

A sidewalk along US 29, approximately a half mile long between Lorain Avenue and Burnt Mills Shopping Center is expected to be completed this year. The sidewalk will provide FDA employees bicycling and pedestrian connectivity to residential areas to the south of the FDA Campus. The supplemental funding needed to start and complete this project was provided by the Montgomery County Executive and the Montgomery County Council. The completion of the project was actively supported through collaboration between FDA employees and local residents of the adjoining community who articulated the need for the additional funding for the project.

As part of the FDA Campus Master Plan, sidewalks will be constructed on site. Bicycle lanes will be provided on internal campus roadways. Sidewalks will connect thee buildings to parking lots and to New Hampshire Avenue.

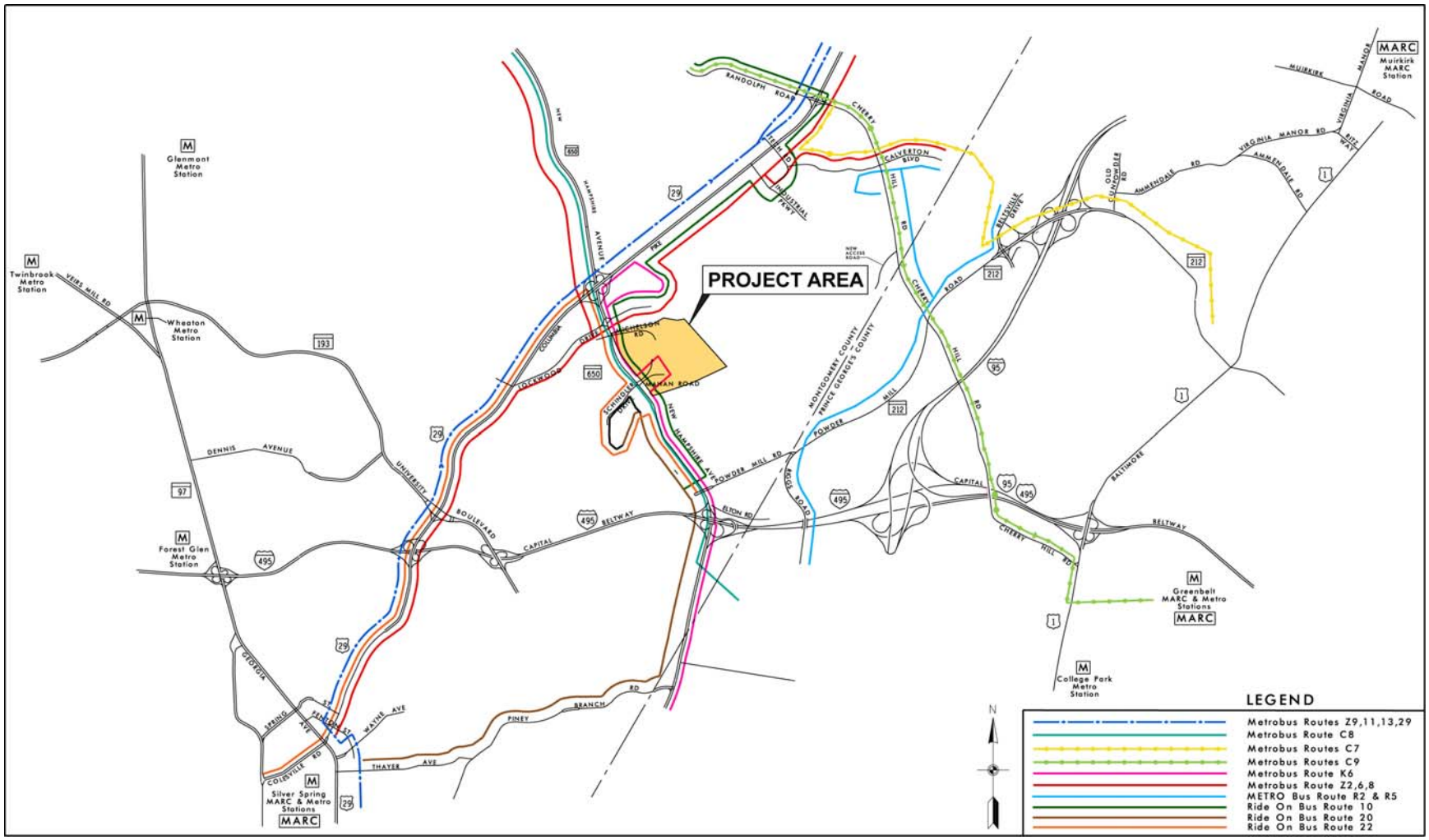


Figure 11. Existing Bus Routes in the vicinity of the FDA Campus

Table 15. Vicinity Bus Route Detail

Route No.	Route Name	Closest Metrorail Station	Weekday Peak Hour Frequency (approximate)	First Stop (Closest Metrorail Station)	Last Stop (Closest Metrorail Station)
MetroBus					
Z2	Colesville-Ashton Line	Silver Spring	30 min	5:59 a.m. 12:01 p.m.	11:31 a.m. 7:14 p.m.
Z6	Colesville-Westfarm Line	Silver Spring	30 min	5:33 a.m. 12:11 p.m.	11:41 a.m. 9:47 p.m.
Z11, Z13	Greencastle-Briggs Chaney Express Line	Silver Spring	10-30 min	6:21 a.m. 3:35 p.m.	8:01 p.m. 7:35 p.m.
Z8	Fairland Line	Silver Spring	30 min	5:21 a.m. 12:21 p.m.	11:51 a.m. 11:46 p.m.
Z9, Z29	Laurel-Burtonsville Express Line	Silver Spring	20 min	6:11 a.m. 4:11 p.m.	6:51 a.m. 8:01 p.m.
K6	New Hampshire Avenue-Maryland Line	Fort Totten	10 - 20 min	5:03 a.m. 12:00 p.m.	11:30 a.m. 11:55 p.m.
R2, R5	Riggs Road Line	Fort Totten	20 - 40 min	5:07 a.m. 12:39 p.m.	11:59 a.m. 10:30 p.m.
C7	Greenbelt – Glenmont Line	Greenbelt	30 min	5:51 a.m. 3:05 p.m.	8:35 a.m. 6:34 p.m.
C8	College Park – White Flint Line	College Park	35 min	5:32 a.m. 12:32 p.m.	11:57 a.m. 7:37 p.m.
C9	Greenbelt – Glenmont Line	Greenbelt	30 min	6:02 a.m. 3:09 p.m.	7:37 a.m. 5:58 p.m.
Montgomery County Ride On					
10	Twinbrook Hillandale	Glenmont	30 min	5:42 a.m. 12:12 p.m.	11:42 a.m. 10:12 p.m.
20	Hillandale Silver Spring	Silver Spring	10-30 min	5:33 a.m. 12:00 p.m.	11:45 a.m. 11:30 p.m.
22	Hillandale Silver Spring	Silver Spring	15-30 min	5:45 a.m. 3:45 p.m.	9:00 a.m. 6:45 p.m.

Table 16. Park and Ride Lots

Lots		Average Usage					
	Capacity	2001	2002	2003	2004	2006	2007
Briggs Chaney	250	225	157	156	142	154	72
Burtonsville	388	218	233	230	270	345	354
Colesville/NH	180	39	29	28	46	27	22
Comus	32	13	15	15	20	27	19
Germantown Transit Center	171	0	16	57	58	171	171
Greencastle	159	5	10	7	54	44	29
Kingsview	217	0	0	2	10	30	
Lake Forest	300	207	205	175	118	99	126
Mid Pike	607	273	180	157	205	-	
Milestone	257	109	126	134	157	192	212
Mont. Mall	345	43	29	5	175	166	166
Norbeck	248	15	15	17	11	11	14
Tech Road	157	49	51	48	55	61	52
Urbana	193	192	236	269	258	314	343
I-270/MD 124 Lot	505	192	530	401	208	250	228
I-270/MD 117	368	-	-	-	-	27	31
Montrose Rd/MD 355	543	-	-	-	-	148	108
Germantown MARC	676	-	-	-	-	471	499
Damascus	51	-	-	-	-	26	24
Total	**4,009**	**1,580**	**1,832**	**1,701**	**1,787**	**2563**	**2470**
% Occupancy		***39.4%***	***45.7%***	***42.4%***	***44.6%***	***63.9%***	***61.6%***

Note: "—" indicates a lack of available data

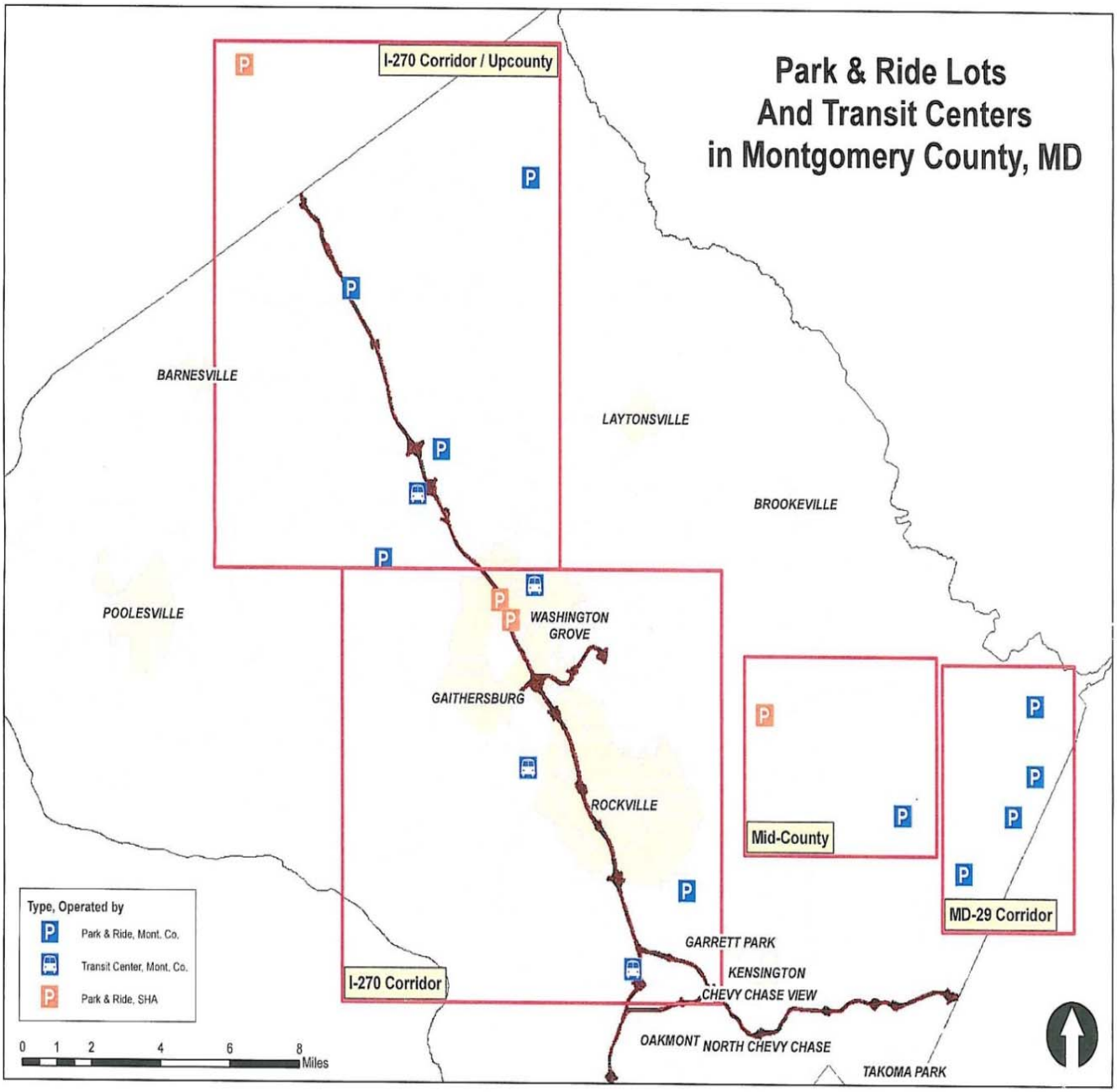


Figure 12. Park-n-Ride Lots

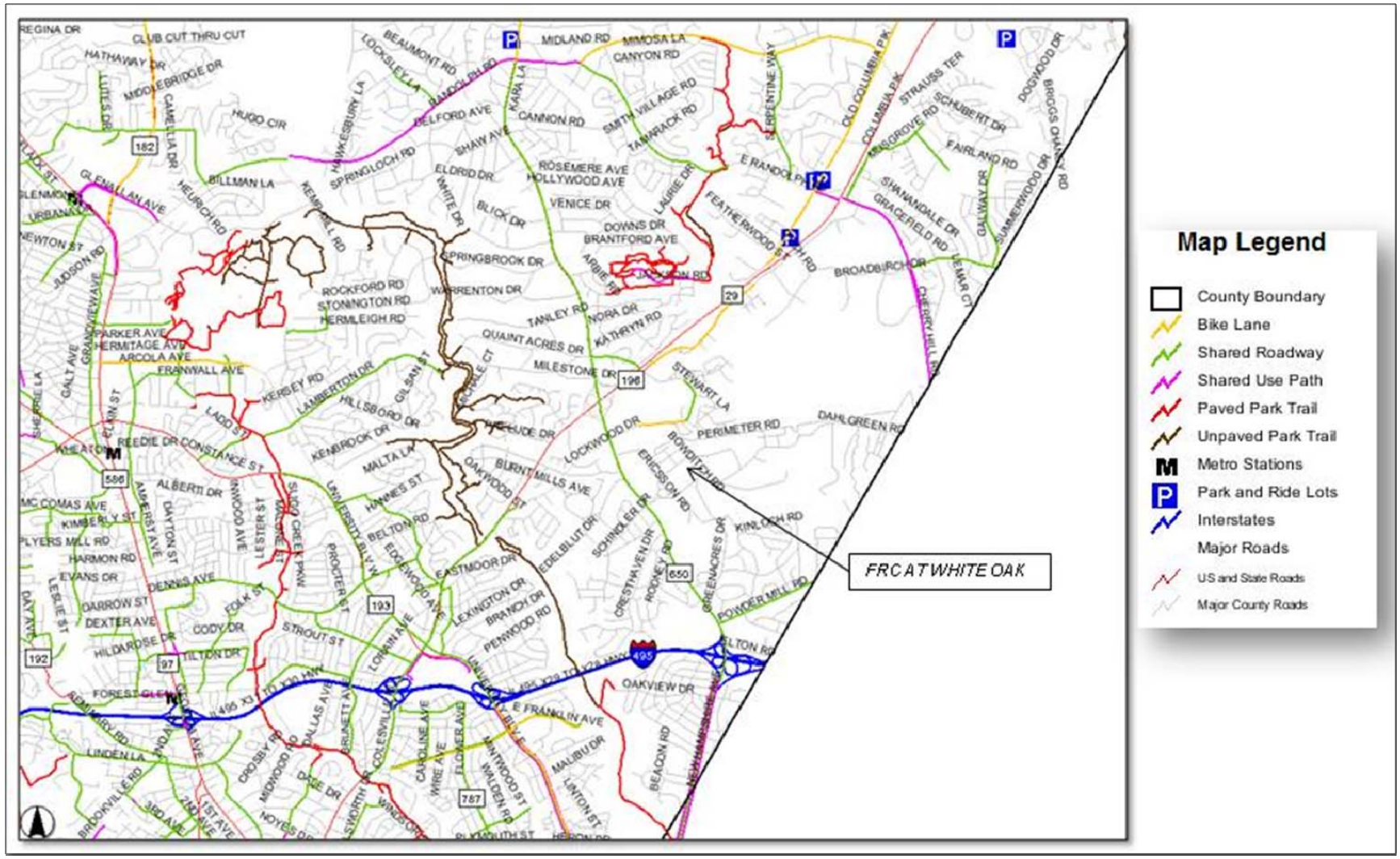


Figure 13. Existing Bikeways

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5 PROPOSED TDM STRATEGIES

GSA and FDA have been successful at meeting and/or exceeding several of the key benchmarks of this TMP. They have met or exceeded transit, ridesharing, telecommuting, and biking/walking goals and are aggressively working towards increasing carpool/vanpool use. The employee participation in the telecommuting program is very high at 50 percent and this has helped FDA exceed the parking ratio goal.

In order to continue to increase the parking ratio from the current 1.31 to 1.5 at build out, FDA will continue to make significant aggressive efforts to encourage employees to use the ride share program, on-site shuttle service, and computer matching of employees looking for other carpoolers/vanpoolers in their home area. In addition, FDA will use incentives, such as transit subsidies, guaranteed ride home, and preferred parking for carpools/vanpools to help meet this goal. This will provide many opportunities for FDA employees to use alternative modes of transportation.

People choose their mode of travel based on several factors, with the primary factors being convenience, cost, time, and habit. Any TDM strategy will have to affect one or more of these factors in order for travel patterns to change. The following TDM measures are expected to have an effect on increasing the parking ratio and thus decreasing the single vehicle occupancy numbers:

- Employee Transportation Coordinator - A “champion” for this cause
- Carpool/Vanpool Incentives
- Transit incentives
- Telecommuting Program
- Bicycling/Walk-to-work Incentives

5.1 Employee Transportation Coordinator (ETC)

An acting ETC is working to implement the strategies outlined in the 2006 TMP, while a full time ETC is being recruited. The FDA is currently recruiting for a full time employee to be the ETC.

5.2 Carpool/Vanpool Incentives

Due to the location of the White Oak Campus, taking transit to and from work can be a laborious process depending on the employee’s home location. Although bus service to the site has improved, transit is still a fairly complicated way to get to work for many employees. Therefore, the TMP will continue to look towards the use of carpools/vanpools, in addition, to other travel modes to meet its parking ratio goals. As more employees relocate, the opportunities for ridesharing will increase as well as the potential for additional transit services.

The primary incentives to reduce single ridership for employees and encourage employees to seek alternative modes of transportation include: financial savings from lowering fuel costs and transit

subsidies; reduced stress from avoiding driving in traffic; and enhanced health from walking or cycling to work.

In order to meet the parking ratio goal of 1:1.5 at full build-out of the FDA Campus, the percentage of employees participating in carpools/vanpools will need to be increased from approximately 9 percent of the employees participating to approximately 20 percent (17 percent in carpools and 3 percent in vanpools) participating. The percentage of employees participating in carpools/vanpools has been adjusted, since the 2006 TMP, based on the survey results of the employees already at the FDA Campus. The results of the survey indicate that not as many people are using carpools/vanpools as was projected due to a lower number of employees that have actually relocated to the FDA Campus than was anticipated making it harder to match employees with each other, onsite construction restrictions, influx of construction related contractors, and higher number of visitors. With the influx of a proposed additional 1,170 employees, the number of people participating in carpools/vanpools is expected to rise as there will be more potential carpool/vanpool matches. Furthermore, with the assignment of preferred parking spaces for carpoolers/vanpoolers, employees are expected to be more inclined to use this mode of travel in the future.

It is likely that many of the employees who are participating in the carpool/vanpools will continue to rideshare. As stated in the Federal Transportation Management Program Handbook, conditions "that encourage ridesharing are: having no available car, a long commute, tight parking supply, availability of nearby HOV lanes, limited transit service, high concentration of employees in the general work area, and/or residential concentration of employees." Many of these conditions exist for the FDA employees. There will be a restricted parking supply, most will have longer commutes, and there will be a large pool of employees who will live and work in the same area. In fact survey results indicate that more employees are using carpools/vanpools since moving to the FDA Campus as compared to before their move. Approximately 6.7 percent of employees were using carpools/vanpools before their move as compared to the approximate 9 percent after moving.

Zip code data collected during the Employee Survey, indicates that a large concentration of employees who have relocated to the FDA Campus live within specific zip codes. Approximately 55 percent of the FDA employees who have moved to the FDA Campus live in zip codes with 20 or more employees. Furthermore, approximately 27 percent of these employees live in zip codes where 50 or more FDA employees reside. There is also a greater concentration of employees slated to relocate to the FDA Campus within certain zip codes. Approximately 40 percent of these employees live in zip codes where 100 or more FDA employees reside. The zip codes with the highest concentration of employees are shown in Table 17.

Table 17. Zip Codes with largest number of employees

Zip codes	No. of Employees Moving to White Oak	No. of Employees at White Oak	Total No. of employees
20878	309	116	425
20850	245	78	323
20874	212	58	270
20852	196	88	284
20854	177	92	269
20832	159	70	229
20853	152	37	189
20904	117	49	166
20906	114	40	154
20814	111	44	155
20817	107	42	149
20855	103	26	129
20879	100	31	131
Total	**2,102**	**771**	**2,873**

As of November/December 2007, approximately 9 percent of the 1,080 FDA employees at the FDA Campus, or 187 employees, participate in carpools/vanpools. Given the concentration of employees in certain zip codes, it is expected that the carpool/vanpool participation should increase with the help of a strong marketing program.

Thus, if 20 percent of the total FDA employees participate in the either a carpool or vanpool, then the goal of one parking space for every 1.5 employees will be met at build-out. As a greater number of FDA employees move to the FDA Campus, the goal of surpassing the 1 to 1.5 parking ratio and moving towards 1 to 2 parking ratio should be more achievable.

As a proposed additional 1,170 employees are added to the FDA employee roster (new hires), bringing the total population to 8,889, additional opportunities will become available for existing employees as the number of people who may be potential matches increases. Furthermore, flextime, which is open to most FDA employees, will allow employees to make their work schedules fit with each other.

There are several ways FDA will encourage/facilitate employees carpooling/vanpooling:

a. Preferred Parking

As part of the site plan, carpool and vanpool parking spaces will be reserved at locations, which provide more convenient access to the buildings than will be provided for single occupant vehicle spaces. Furthermore, parking spots will be guaranteed for vehicles used for carpooling/vanpooling. Overall, approximately 756 carpool and 89 vanpool spots would need

to be reserved. Due to the phasing of this project, the number of spaces reserved for the preferred carpool/vanpool parking will vary over time and with each phase and will be consistent with the number of carpools/vanpools there are at the FDA Campus. In keeping with the goals and objectives outlined previously, the number of reserved spaces for each phase and year has been estimated and is provided in the next section.

The ETC is responsible for coordinating this program, and ensuring that sufficient parking spaces are set aside for the carpools/vanpools. Furthermore, the ETC is also responsible for having a program to monitor these spaces to ensure that they are being used by registered vehicles used for carpools/vanpools

b. Facilitating Employee Matching

A central list has been created of all the employees interested in carpooling and vanpooling. This list is created via an application which employees fill out. The ETC will match people according to their residential proximity and work schedule.

The ETC will also facilitate the employees meeting each other by organizing the first meeting. This is especially important for the FDA Campus, because there will be a large number of employees, and thus many employees who may potentially match up may not know each other. The ETC will also follow up with FDA employees to determine if the employees are a good fit and/or if new arrangements need to be made.

This will be an iterative process as each batch of employees moving to the FDA Campus will need to be matched with potential carpoolers/vanpoolers. Employees interested in this program should be matched prior to their relocation so that they are participating in this program from the start.

c. Employee Leased Vehicles

The ETC will continue to encourage employees to participate in vanpooling. A group of employees can lease a van on a month-to-month basis from a vanpool leasing company. No long-term commitment is required as it operates on a month-to-month basis. The vanpool leasing company usually covers the insurance and regular upkeep of the van. One member of the vanpool usually volunteers to drive and collect the rider's fare. The driver gets personal use of the van and in many groups doesn't have to pay the monthly fee. Furthermore, as stated on the Federal Transit Administration website and verified by the ETC, registered vanpools are eligible for transhare subsidy.

Commuting costs of employees would be reduced and their personal time would be increased. The employees would have time to read, sleep, and/or socialize during the commute. As mentioned previously, the ETC will play a very important role in introducing employees living in the same residential area to each other.

The ETC will continue to identify several vanpool providers and bring them to the FDA Campus for informational sessions. As a next step, using the established database the ETC will identify a cluster of people located within a three-mile radius who are committed to using the van at least three or four days per week.

d. Guaranteed Ride-Home Service

This service allows employees who either use transit, or are non-driving members of a carpool/vanpool, to be able to go home in case of an emergency. The acting ETC has already joined the MWCOG Commuter Connections program. This is a regional program which applies to all employees who commute by any mode other than a single occupancy vehicle. Registration and use of this program is free (with some exceptions). This program guarantees a ride home if an emergency arises or an employee has to work overtime. The ETC will provide information sessions for all the employees who are participating in carpools, vanpools, or taking transit to sign up for this program and use it as needed. When the ETC holds carpool/vanpool group information sessions and will provide this information so that potential carpoolers and vanpoolers know that they have an option to get home in an emergency. The ETC will also make it easy for employees to sign up for the guaranteed ride home service by providing registration forms and instructions on filling them out.

e. Shuttle Service/FDA Owned Cars for FDA business

During normal business hours there are shuttles running between the FDA Campus and other FDA sites, as well as to transit facilities. Employees also have access to FDA owned vehicles to make business trips. This allows employees who have business at other sites to be able to take advantage of this service, and not feel the need to bring in their own vehicles.

Approximately 27 percent of the FDA employees at the FDA Campus indicate that they travel for work related purposes outside the FDA Campus and 21 percent indicate that they travel between other FDA buildings. Those employees who are presently using their cars for such travel should cease to do so and perhaps can be persuaded to travel by other means.

5.3 Transit Incentives

According to the employee survey conducted in November/December 2007, approximately 9 percent of the FDA employees at the FDA Campus use transit facilities. It is anticipated that in order to meet the goal of the one parking space for every 1.5 employees at the full build out of the FDA Campus, transit use should be approximately 10 percent.

When comparing the primary mode of transportation of those employees who have relocated to the FDA Campus with the mode they used before their relocation, not as many employees are using transit. However, the Employee Survey results indicate, 9 percent of the employees use transit as their primary mode of travel (a combination of Metrorail, commuter rail, and commuter bus) which is an increase over the 2006 TMP goal of having 6 percent of the FDA Campus population using transit. The

ETC will have to continue working to keep the transit usage at 9 percent while striving for 10 percent going forward.

As previously noted in Table 1, a majority of the FDA employees (those who have relocated to FDA Campus and those who are relocating) reside in Montgomery County. Many of the employees residing in Montgomery County may take the Red Line of the Washington Metrorail System. Because the Red Line travels through Washington, DC, it adds approximately 30 minutes to the employees commute time. It is estimated that employees who take the Metro and then a bus to reach the FDA Campus will be spending approximately 1.5 hours commuting each way. Taking a direct bus, such as the ones from the Fort Totten Station, might be a more attractive option as this is only expected to take between 40 to 45 minutes.

As noted in Table 17, there are 13 zip codes which will have more than 130 employees of the FDA Campus residing within them. Through coordination with WMATA and Montgomery County Transit, it may be possible to provide express bus service from park-n-ride lots near these zip codes directly to the FDA campus. See Section 5.3.g for further discussion on express buses from these zip codes.

The following provides a list of transit incentives to encourage FDA employees to use transit.

a. Transit Subsidy

Transit subsidies will continue to be paid to eligible employees as allowed by the Federal Government under applicable law to cover employee-commuting costs to the FDA Campus. Based on the survey, approximately 9 percent of the employees who are at the FDA Campus receive transit subsidies. Of the employees who are slated to move to the FDA Campus, approximately 11 percent receive a transit subsidy. Approximately 604 FDA employees collect transit subsidy and a majority of these employees receive the full amount of $120.

It is anticipated that this incentive, combined with preferred parking and longer travel distances, will encourage increased demands for transit service.

b. Shuttle Service

The FDA provides three shuttles: one from the Silver Spring Metrorail Station, one from College Park Metrorail Station, and one from the Twinbrook Metrorail Station. At the FDA Campus, a circulator shuttle within the campus connects all buildings within the campus to each other.

The College Park and Silver Spring Metrorail stations tie into the regional MARC rail system. The Camden line of the MARC ties into the College Park Station and the Brunswick line ties in at the Silver Spring Station. Thus, by providing shuttle service from these stations, the employees from Baltimore County, outer Montgomery County, Frederick County, and West Virginia are tied into the Surface Rail Transportation System enabling them to make their trips to the White Oak site by rail. Table 18 provides the current shuttle schedule from the Rockville area which includes the Twinbrook Station and Parklawn. Similarly, shuttle service is also provided from the College Park and Silver Spring Metrorail stations to White Oak. Tables 19 and 20 show the current shuttle service schedule.

Peak hour trips are not made to the Silver Spring Metrorail station by the shuttles because Ride On 22 provides 20 trips to and from the Silver Spring station to White Oak. However, during the mid-day, when Ride On 22 trips are less frequent, the shuttle service is designed to switch over to accommodate employees needing access to the Silver Spring Metrorail station. Montgomery County has increased the frequency of the Ride On 22 route from only 8 trips to the current 20 trips per day.

The shuttle has also increased its ridership significantly. On average, as of May 2008, approximately 245 employees use the White Oak – Rockville (Twinbrook Metrorail Station) route and 75 employees use the White Oak – College Park – Silver Spring (College Park and Silver Spring Metrorail Stations) route. Of the employees who are working at the FDA Campus, approximately 14 percent indicated that they use the FDA Shuttle. As can be seen by the actual ridership numbers, a majority of the survey respondents indicated that they use the White Oak to Rockville route.

The survey results indicate that the current shuttle bus users would like to see the following improvements:

- Increase the frequency of service
- Increase the hours of operations of the Shuttle
- Better coordination with employee work schedules because with the current shuttle bus schedule, they find it difficult to work an 8 hour day.
- Solution to the overcrowding of the 4:25 p.m. shuttle from White Oak to Rockville

These results combined with the shuttle ridership numbers and several comments made by the shuttle bus riders, indicate that an express bus from the Rockville/Germantown area to the FDA Campus may be a prudent idea. This will be discussed further in the following sections.

Table 18. Shuttle Service (White Oak-Rockville)

Stop	Arrival time	Departure Time
Twinbrook Metro	6:00 a.m.	6:10 a.m.
Parklawn Building	6:15 a.m.	6:20 a.m.
White Oak Site	6:55 a.m.	7:10 a.m.
Twinbrook Metro	7:45 a.m.	7:55 a.m.
Parklawn Building	8:00 a.m.	8:05 a.m.
White Oak Site	8:40 a.m.	8:55 a.m.
Twinbrook Metro	9:30 a.m.	9:40 a.m.
Parklawn Building	9:45 a.m.	9:50 a.m.
White Oak Site	10:15 a.m.	10:30 a.m.
Twinbrook Metro	10:55 a.m.	11:05 a.m.
Parklawn Building	11:10 a.m.	11:15 a.m.
White Oak Site	11:40 a.m.	12:10 p.m.
Twinbrook Metro	12:35 p.m.	12:45 p.m.
Parklawn Building	12:50 p.m.	12:55 p.m.
White Oak Site	1:20 p.m.	1:35 p.m.
Twinbrook Metro	2:00 p.m.	2:10 p.m.
Parklawn Building	2:15 p.m.	2:20 p.m.
White Oak Site	2:45 p.m.	3:00 p.m.
Twinbrook Metro	3:25 p.m.	3:35 p.m.
Parklawn Building	3:40 p.m.	3:45 p.m.
White Oak Site	4:10 p.m.	4:25 p.m.
Twinbrook Metro	5:00 p.m.	5:10 p.m.
Parklawn Building	5:15 p.m.	5:20 p.m.
White Oak Site	5:55 p.m.	6:15 p.m.
Twinbrook Metro	6:50 p.m.	n/a

Table 19. Shuttle Service (White Oak-College Park)

Stop	Arrival time	Departure Time
College Park Metro	6:00 a.m.	6:10 a.m.
Wiley Building	6:15 a.m.	6:20 a.m.
White Oak Site	6:50 a.m.	7:05 a.m.
College Park Metro	7:35 a.m.	7:45 a.m.
Wiley Building	7:50 a.m.	7:55 a.m.
White Oak Site	8:25 a.m.	n/a
White Oak Site	10:35 a.m.	10:50 a.m.
College Park Metro	11:10 a.m.	11:20 a.m.
Wiley Building	11:25 a.m.	11:30 p.m.
White Oak Site	11:50 p.m.	n/a
White Oak Site	2:10 p.m.	2:25 p.m.
College Park Metro	2:45 p.m.	2:55 p.m.
Wiley Building	3:00 p.m.	3:05 p.m.
White Oak Site	3:25 p.m.	3:40 p.m.
College Park Metro	4:00 p.m.	4:10 p.m.
Wiley Building	4:15 p.m.	4:20 p.m.
White Oak Site	4:40 p.m.	4:55 p.m.
College Park Metro	5:15 p.m.	5:25 p.m.
Wiley Building	5:30 p.m.	5:35 p.m.
White Oak Site	5:55 p.m.	6:15 p.m.
College Park Metro	6:35 p.m.	n/a

Table 20. Shuttle Service (White Oak-Silver Spring

Stop	Arrival time	Departure Time
White Oak Site	8:25 a.m.	8:40 a.m.
Silver Spring Metro	9.00 a.m	9:10 a.m.
White Oak Site	9:40 a.m.	9:55 a.m.
Silver Spring Metro	10:10 a.m.	10:20 a.m.
-	-	-
White Oak Site	11:50 p.m.	12:20 p.m.
Silver Spring Metro	12:40 p.m.	12:50 p.m.
White Oak Site	1:10 p.m.	1:25 p.m.
Sivler Spring Metro	1:45 p.m.	1:55 p.m.
White Oak Site	2:10 p.m.	n/a

c. Guaranteed Ride-Home Service

As mentioned previously, this service would allow employees who either use transit or are non-driving members of a carpool/vanpool to be able to go home in case of an emergency. The acting ETC is exploring various options for this program.

d. On-Site Passes

Transit passes are sold at the FDA Campus so that employees can make their purchase at their convenience. The ETC will set up a central location to purchase these and will provide announcements and posters to inform employees of the availability of these passes.

e. On-Site Transit Stop

An on-site transit stop has been provided on the FDA Campus, which is currently located in the circle of Building 1. Buses will be diverted to this stop so that employees would be able to conveniently board the buses. This combined with the on-site circulator bus would provide employees better and faster access to buses by reducing their walking time to and from their offices. Thus they would be more inclined to use transit.

f. Coordination with Other Agencies

The acting ETC has been working with the local agencies to reroute/divert buses onto the FDA Campus. Furthermore, these efforts have increased the Ride On 22 bus service from only 8 trips when the FDA employees started relocating to FDA Campus to over 20 trips as of May

2008. The survey results however indicate that the Ride On 22 service is not very reliable. The ETC will work with the Montgomery County Transit staff to determine how to address this issue.

g. Express Bus Service

The results of the survey and the geographical location of most of the relocated and yet to be relocated employees indicate that express buses from several areas in Montgomery County to the FDA Campus may be feasible. Montgomery County Transit and WMATA have indicated that they would be willing to discuss alternative express bus services should the demand arise. The cost to ride on the express bus would likely range from $5 to $10 per direction per day. The clustering of the FDA employees and the demand for increased shuttle bus service from the Rockville area to the FDA Campus indicates that there would be demand for an express bus. Furthermore, over 50 percent of the employees who have already relocated to the FDA Campus stated that they would take an express bus service from a park and ride lot near their home to the FDA Campus.

As shown previously, there are a number of park and ride lots in Montgomery County and a majority of them have excess capacity. There are seven park and ride lots along the I-270 corridor. Table 21 presents the driving time from several zip codes to the closest park and ride lots.

Table 21. Potential Express Bus Service Locations

Zip Code	No. of Employees in Zip Code	Closest Park-n-Ride Lot	Available Parking Space*	Distance from Zip Code to Park n-Ride Lot (minutes)
20878	425	MD 124 & I-270	277	5.5
20850	323	MD 124 & I-270	277	6.5
20874	270	Kingsview P & R**	187	2.5
20852	284	Midepike Plaza***	402	0.5
20854	269	Montgomery Mall TC	179	6
20832	229	Norbeck Road	234	3.5
20853	189	Norbeck Road	234	2
20814	155	Montgomery Mall TC	179	3.5
20817	149	Montgomery Mall TC	179	2.5
20855	129	Lake Forest	174	5
20879	131	Lake Forest	174	2.5

* Capacity minus average usage in 2007
** Average usage data used is from 2006
*** Average usage data used is from 2004

Thus, express bus service can be potentially offered from the MD 124 & I-270, Kingsview, Montgomery Mall TC, Norbeck Road, and Lake Forest park and ride lots. These lots are within 5 to 6 miles of most of the zip codes with a high concentration of FDA employees. Most of the park and ride lots have parking spaces available and should be able to accommodate the FDA employees.

It should be noted that once the ICC is completed, express buses can use this roadway and should be able to provide FDA employees with considerable time savings. In fact, the ICC Effects on Transportation Report (SHA) shows that the average relative time savings when traveling from Gaithersburg to White Oak during the AM peak hours is expected to be approximately 10 minutes and during the PM peak hours is expected to be approximately 20 minutes.

5.4 Telecommuting Program

FDA employees have a high level of participation in telecommuting. In fact, it appears that approximately 50 percent of employees telecommute at least one day a week. Table 22 presents the current telecommuting patterns.

Table 22. Telecommuting Patterns

Telecommuting Days	Employees at White Oak Campus	Employees Who will Move to White Oak Campus
	% of Employees	% of Employees
Monday	14.1%	14.9%
Tuesday	26.0%	21.3%
Wednesday	20.4%	13.7%
Thursday	24.9%	23.3%
Friday	51.3%	27.0%

5.5 Bicycling/Walk-to-Work Incentives

Employees living in close vicinity of the FDA Campus will be encouraged to walk-to-work or bicycle to work. It is possible that some of the employees may move closer to the FDA Campus, and/or that the new hires will either be from the surrounding area or will move closer to the work site. In such cases, employees who live within a 3-mile radius will be encouraged to either walk or bike to work. The acting ETC has been working with the architects of the FDA Campus to provide locker and shower facilities on site. Sheltered bicycle racks are also being provided at all buildings so that employees will have the ease of parking their bicycles in front and Bike Repair Boxes have also been provided at two locations to allow bicyclists fix flat tires on site. Furthermore, the internal roadways are being designed to be bicycle and pedestrian friendly.

6 IMPLEMENTING THE TRANSPORTATION DEMAND MANAGEMENT (TDM) STRATEGIES

As mentioned previously the ETC is extremely important to the success of the TMP. The ETC will be responsible for implementing, evaluating, and monitoring the TMP.

Because the FDA buildings will be constructed and thus occupied in different years, the TMP goals will be different during each phase. As the number of FDA employees increases at the FDA Campus, the possibility of employees finding carpooling, vanpooling, and telecommuting partners should increase and thus with each phase the nature and success of the strategies will change.

The relocation of the employees is scheduled to occur over the next four years. The number of employees and years of occupation are found in Table 23.

Table 23. Employee Phasing

Buildings	Department	Completion Date	Employees in year	Total Employees at White Oak
Life Sciences Lab & Vivarium Phase I	CDER & CDRH	2003	99	99
Office Buildings	CDER	2005	1,765	1,864
Central Shared Use		2006	83	1,947
Engineering & Physics Laboratory	CDRH	2007	133	2,080
Office Buildings	CDER, OC, CDRH	2008	1,075	3,155
Office Buildings	CDRH & CDER, OC	2009	2,470	5,625
Distribution Facility	OC	2010	40	5,665
Office Buildings & Daycare Facility	OC	2011	501	6,166
Life Sciences Lab & Vivarium Phase II; Office Buildings; TV Studio	CBER, CDER, CBER, CVM, CDRH	2012	2,723	8,889

In implementing the TMP, the strategies will need to be phased to coincide with the relocation of employees. This will include limiting the parking spaces available during the initial phases to encourage carpool/transit usage from the outset. During construction of the FDA Campus, it has been difficult to limit parking and to determine an exact ratio of employees/parking provided due to the construction activity on site. As the construction activity on the campus decreases or is moved to locations farther away from the already constructed buildings/parking structures, it will become easier to control the amount of parking provided.

As parking will be provided in parking structures which must be constructed at one time, the employee to parking ratio will vary from the staging plan. These additional spaces may be set aside or designated for carpools. At the outset of the relocation, the number of parking spaces per employee will be greater as the opportunities to use other modes will be limited. As more employees are relocated, the ability to match carpoolers and provide transit services increases, thereby reducing the need for parking. Table 24 presents the mode split ratio goals for each phase and year. The following is a suggested implementation plan:

6.1 Implementation Plan

As of May 2008, there were approximately 2,080 FDA and contractor employees working at the FDA Campus with 1,600 parking spaces provided. Some of these spaces have been designated as carpool/vanpool spaces.

As the additional employees are relocated to the FDA Campus, steps will be taken to ensure that they maintain their current travel modes and some single occupancy vehicle users shift modes. The most aggressive efforts will be made as each department is about to move to the FDA Campus as that is the time that employees are likely to be susceptible to mode change and will be looking for ways to travel to their new office location. The ETC must provide these employees with viable alternative modes of travel to the new site.

The biggest jump in employees is expected to be 2009 (2,470 employees) and then in 2012 (2,723 employees). As each group of employees move, the following actions will be carried out:

a. Employee Transportation Coordinator (ETC)

The ETC will work with the relocated employees prior to moving to identify ride sharing and transit opportunities. The ETC will develop a package for distribution to all employees and perspective hires showing transit routes. The ETC is located within a centralized location within the FDA Headquarters at White Oak where all transportation information is located and easily available to employees. The acting ETC has also set up a site on the FDA intranet so that employees can access transportation information online.

b. Carpooling

- Identify potential carpool clusters for employees are interested in carpooling.
- Hold meetings for these carpoolers and help them identify meeting spots and resolve any potential issues.
- Stress that parking would be provided for each carpool vehicle and that the parking would be close to the building entrances.

Table 24. Mode Split Goals

	2003	2007			2008			2009			2010			2011			2012		
			No. of Emp.	Parking Spaces		No. of Emp.	Parking Spaces		No. of Emp.	Parking Spaces		No. of Emp.	Parking Spaces		No. of Emp.	Parking Spaces		No. of Emp.	Parking Spaces
No. of emp. in each year			133			1,075			2,470			40			501			2,723	
No. of total employees	99	2,080	2,080		3,155	3,155		5,625	5,625		5,665	5,665		6,166	6166		8,889	8,889	
Carpool		8%	166	83	9%	284	142	12%	675	338	12%	680	340	14%	863	432	17%	1,511	756
Vanpool		1%	21	7	1%	32	11	2%	113	38	2%	113	38	2%	123	41	3%	258	86
transit		9%	187	0	10%	316	0	10%	563	0	10%	567	0	10%	617	0	10%	889	0
telecommuting*		7%	146	0	9%	284	0	10%	563	0	10%	567	0	10%	617	0	10%	880	0
walk/bike/dropped off		1%	21	0	1%	32	0	1%	56	0	1%	57	0	1%	62	0	1%	89	0
absent		2%	42	0	2%	63	0	2%	113	0	2%	113	0	2%	123	0	2%	178	0
total no. of employees (other means)			582	90		1,010	152		2,081	375		2,096	378		2,405	473		3804	841
SOV	99			1498			2,145			3,544			3,569			3,761			5,085
total No. of parking needed	99			1588			2,298			3,919			3,947			4,234			5,926
Parking ratio	**1**	**1.31**			**1.37**			**1.44**			**1.44**			**1.46**			**1.50**		
* Although the survey results indicate a higher participation rate - we have assumed a lower percentage in order to take a conservative approach																			

c. Vanpooling

- As more employees get ready to move to the FDA Campus, provide information on vanpool leasing companies for vanpoolers.
- Hold a brown bag lunch session for these relocated employees and provide them with vanpooling information.
- Based on employee zip codes/addresses, identify clusters of employees and hold meetings with these clusters to introduce them to vanpooling.
- Stress the fact that the vans would lower their commuting costs.
- Stress that parking for vans would be guaranteed and that the parking would be conveniently located.

d. Transit

- Provide bus schedules and routes for employees especially from the Silver Spring Station to the site and the FDA shuttle service schedule. The ETC will work with Montgomery County to evaluate the need for additional service.
- Include in FDA budget, reimbursement to employees of up to the maximum amount provided by FDA per month for using transit.
- Advertise the reimbursement amount to the FDA employees via e-mail, flyers etc.
- Provide and display transit information including maps of routes, schedules, fares etc. at a central location.
- Distribute flyers about the transit option via e-mails, newsletters, pamphlets, and through scheduled meetings.
- FDA maintains a fleet of government cars. These cars are to be used by employees on official business outside the FDA Campus. The ETC should make sure all employees are aware of these vehicles and that they can use these vehicles when they need to travel off campus for work purposes.

e. Shuttle Service

- As indicated in Table 11, a goal of getting 10 percent of the total number of employees to use transit has been set. Considering that approximately 9 percent of the FDA employees who have already moved to the FDA Campus are using transit, the goal of 10 percent is achievable. Efforts must be made to make sure that the transit use is kept at this high level. The shuttle service plays a key role in maintaining a high level of transit ridership. Improvements to the shuttle service are already in process and should be implemented in the coming year. These include:

  - Increase the frequency of shuttle service during the morning and evening peak hours as funds become available.

- Extend the hours of the shuttle service such that they coincide with the working hours of most of the FDA employees.
- Provide more shuttles from FDA between 4:30 p.m. and 5:30 p.m., as funds become available. If/when an express bus is started from FDA to Rockville area, this schedule can be modified.

- With the provision of a shuttle service, which is able to service the FDA employees adequately, we believe that the overall transit ridership will be higher and thus the goal of eventually reaching one parking space for every two employees will be achieved.

f. Telecommuting

- Develop a training program to provide potential telecommuters and their managers with the goals, objectives, and guidelines of the program.
- Introduce the telecommuting option to managers and ask them to identify any jobs that they think can be accomplished via telecommuting.
- Hold meetings with potential telecommuters and introduce telecommuting to them.

g. Bicycling/Walking

- Provide conveniently located showers and lockers
- Provide a bicycle route map
- Provide covered bicycle parking in close proximity to buildings so that employees can feel safe leaving their bicycles.

As each phase is completed, the ETC will need to reassign parking so that all employees have an equal chance of obtaining a parking space. The steps outlined above will need to be carried out with the completion of each phase.

6.2 FDA TMP Commitments

FDA is committed to reducing the number of vehicles that will travel to the site. The acting ETC has been working with employees who have already been relocated and/or are about to be relocated to meet this commitment. In order to meet its commitment FDA has accomplished the following:

- FDA maintains a shuttle service between the FDA Campus and several surrounding Metrorail stations.
- A new shuttle circulator has started within the FDA Campus so that employees can reach their office more conveniently.
- The acting ETC has been involved in getting increased frequency of bus service to the FDA Campus as well as increasing bicycle route connectivity to the site.

Quarterly meetings are being held with transit agencies to ensure transit service is available and enhanced as employees begin the relocation process. On site transit stops are being incorporated into the design of the facility.

6.3 FDA TMP Parking Management

The proposed 2009 Master Plan provides a total of 6,926 parking spaces on the FDA Campus, with 5,926 spaces for FDA employees and 1,000 spaces for visitors. The following summarizes how parking spaces will be assigned and managed for each group:

FDA Employees: 5,926 parking spaces will be provided for FDA employees. This number is derived from the parking ratio of two parking spaces per three employees for a total of 8,889 total employees on the site. These parking spaces are located within the perimeter fence in parking garages and on surface lots. Employees will be issued parking passes that will allow them access to employee parking areas but not to visitor parking areas.

Infrequent Visitors: 782 parking spaces will be provided in the surface visitor lot in the northwest quadrant of the campus, outside of the perimeter fence. These spaces will be available for visitors to the campus arriving without prior screeninllg or authorization. Visitors parking here will approach the campus on foot or campus shuttle bus after passing through a remote visitors' screening pavilion located adjacent to the visitors' parking lot.

Frequent Visitors: 218 parking spaces will be provided for frequent visitors to the FDA Campus distributed throughout the campus, in parking garages and surface lots within the perimeter fence. These visitor parking spaces will be clearly marked for visitors only and will not be available for FDA employees at White Oak. These frequent visitors are typically industry representatives or other outside visitors that meet on a regular basis with FDA staff at White Oak and will have been screened and received authorization prior to arriving on the site. These pre-screened and authorized visitors will receive special badges allowing them limited security clearance and special passes for parking in the visitor parking areas within the perimeter fence.

All parking assignments will be managed and monitored by FDA staff and will be enforced by the Federal Protective Service.

6.4 Visitor Parking

The *2006 White Oak Master Plan Update* calls for 500 visitor parking spaces at the build-out of the FDA Campus by 2012. Recent FDA visitor parking demand has indicated that this will prove to be an inadequate number of parking spaces. With a 600 seat conference/training room and various other meeting rooms, there will be a number of major conferences and training sessions on the campus which will attract the general public and employees from other offices as well as other attendees. The nature of the FDA visitor is such that they will either be staying the whole day or a majority of the day. Many FDA visitors will also attend day-long conferences/meetings on the FDA Campus. Therefore, only one or two visitors will use each parking space on a given day.

FDA would like to provide 500 additional visitor parking spaces, bringing the total number of visitor parking to 1,000 spaces. The sections below provide some background as well as outline several key characteristics of the FDA visitor and the FDA visitor related activities.

a. Existing Conditions

As of May 2008, 2,080 FDA employees and contractors are working at the FDA Campus, of which 190 are service contractors in the cafeteria, mailroom, security etc. The FDA Campus includes a White Oak Conference Center facility which provides meeting and training rooms and can accommodate up to 600 people.

FDA provides approximately 275 visitor parking spaces (or 13 percent of the population). On several occasions the demand for visitor parking has substantially exceeded the capacity and FDA has had to scramble to find additional parking spaces. For the purposes of accurately accounting for visitor parking demand, FDA has started collecting visitor data to determine the usage of the visitor parking facility. Visitor data was collected for six weeks beginning November 18, 2007 and ending March 8, 2008. A copy of data sheets are attached in Appendix B. Figure 14 presents the number of visitors during this week.

As can be seen from Figure 14, visitors ranged from 710 to 930 per week between November 2007 and March 2008. The number of visitors in the week of November 18 to 24 was much lower due to it being a holiday weekend. February 24 to March 1 had the highest number of recorded visitors with almost 930 people visiting in one week.

During the last week of February 2008, 247 people visited the FDA Campus on a single day. Figure 15 presents the number of visitors during this week in February which had the highest number of visitors. These days coincided with conferences/and or special events that took place at that time.

Analysis of the visitor data indicates that visitors at the FDA Campus fluctuate significantly on a weekly basis. The visitor data indicates that between 115 to 250 people visit the FDA Campus on a daily basis. Overall, this indicates that for every 100 employees, FDA generates between 6 and 12 visitors each day. Thus at the build out with 8,889 employees on site, this campus may generate between 535 and 1,065 visitors each day. In addition, analysis of the visitor data indicates that visitors at the FDA Campus fluctuate significantly on a weekly basis.

Visitors to the FDA Campus, typically, stay for the entire day for things such as training and conferences. Therefore, one parking space is used by one visitor for the entire day. FDA holds most of its public meetings off site in rented or leased facilities such as hotel conference rooms. Once the FDA Campus is fully consolidated, FDA plans on holding most of its public meetings/conferences on site. Additional facilities are being constructed that will accommodate approximately 1,600 visitors on a daily basis. Therefore, if several public meetings or a large training session is occurring and additional meetings take place on the same day, then it is likely that the 500 proposed visitor parking spaces will

be inadequate. FDA has indicated that this is expected to occur on a daily basis. Furthermore, FDA also indicates that Advisory Committee Meetings will take place on a daily basis. These meetings are open to the general public and typically last for the entire day; and on occasion can stretch to multiple days.

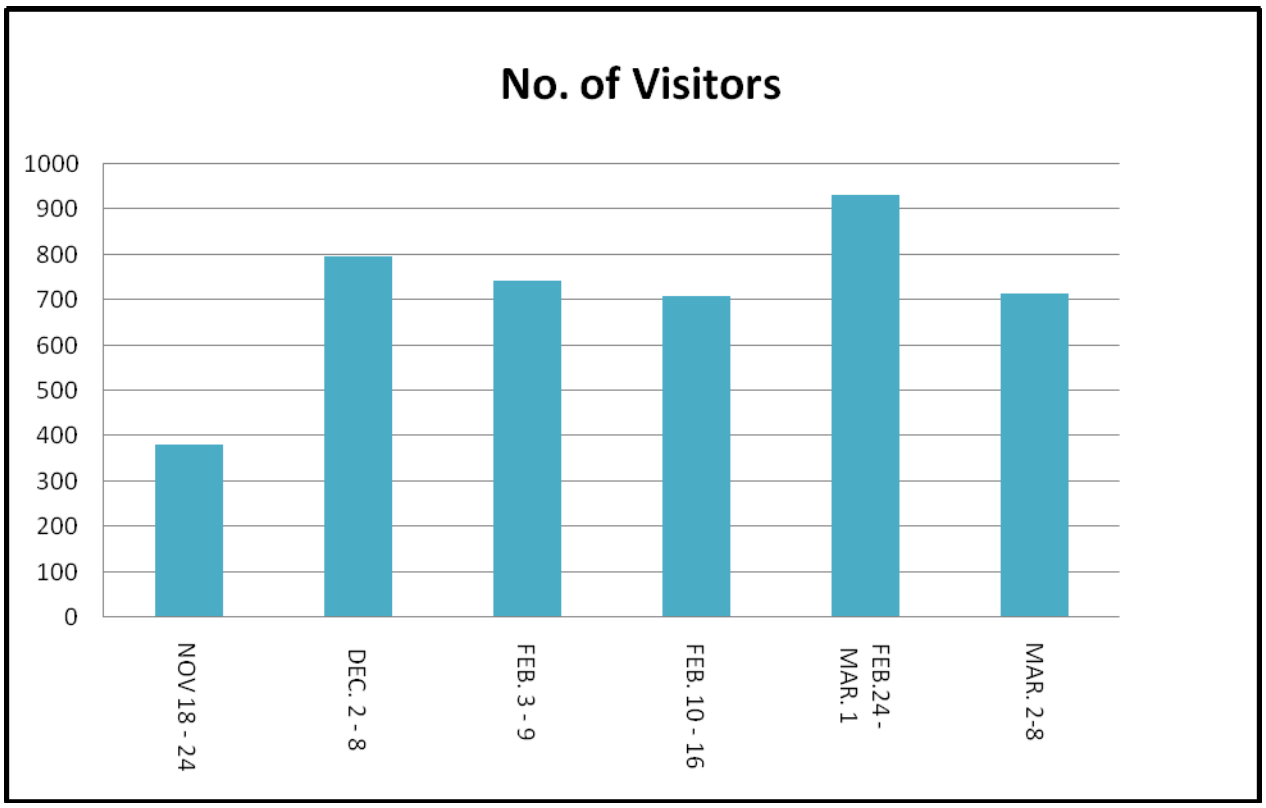

Figure 14. Number of FDA Visitors Per Week

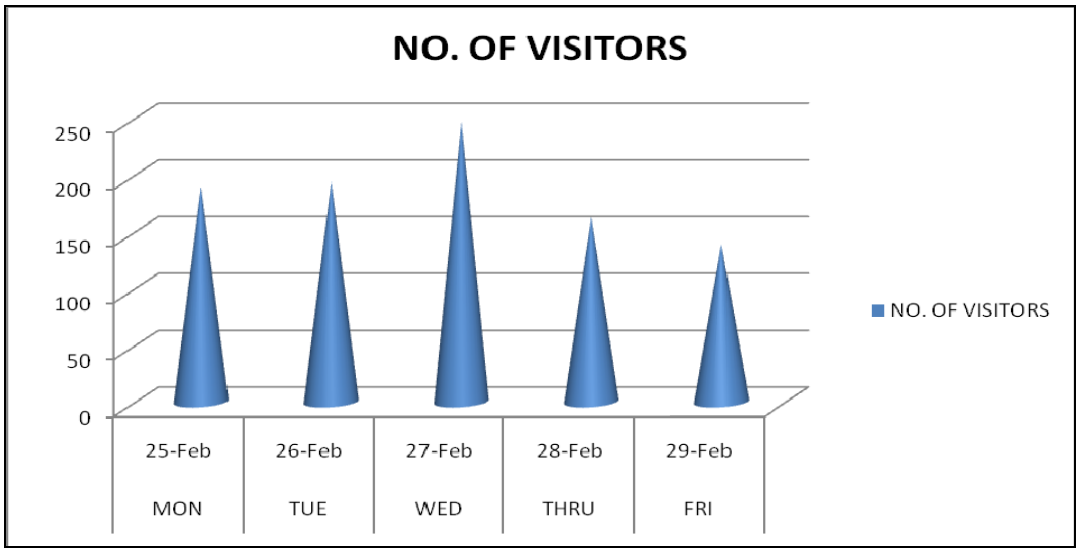

Figure 15. Number of Visitors During the Week of February 24

b. Visitor Parking Survey

For two weeks in February 2008, a visitor survey was conducted at the FDA Campus to determine the characteristics of the FDA visitor. Approximately 300 people participated in the survey. A copy of the visitor survey is included in the appendices. The results have been analyzed and presented below. During this time period, no large conferences/training sessions were held.

Overall, a majority of the visitors to the campus belong to the pharmaceutical industry. Figure 16 presents the industry affiliation of the FDA visitors to the FDA Campus. Approximately 40 percent of the visitors are in the pharmaceutical industry. Approximately 30 percent of the visitors are affiliated with the medical and health industries including government as well as private organizations.

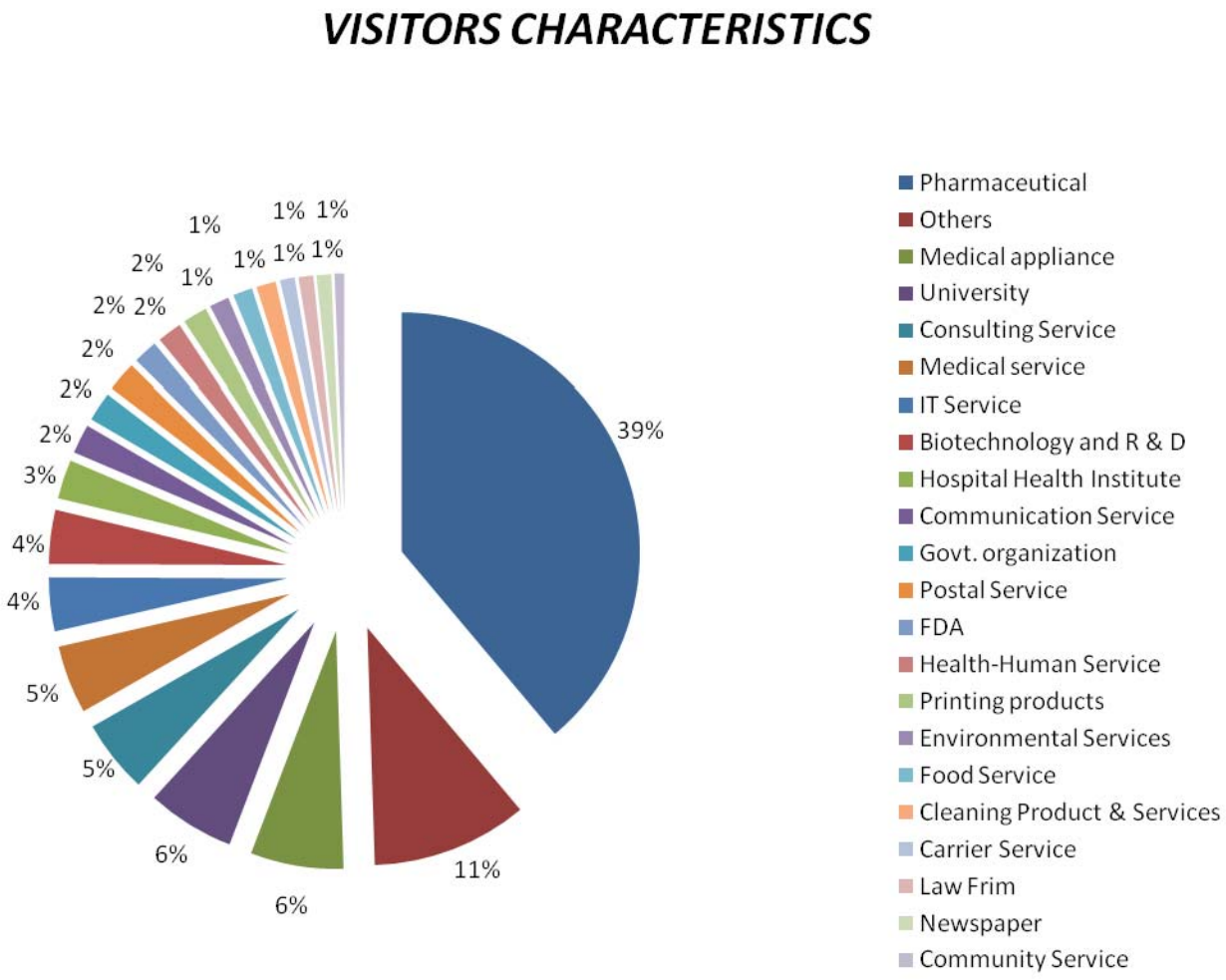

Figure 16. Visitor Affiliations

The number of visitors staying on the FDA Campus for different durations of time is graphically depicted in Figure 17. Approximately 53 percent of the visitors are visiting the FDA Campus for 2 hours

or less, 34 percent are visiting between 2 to 4 hours, and approximately 13 percent are visiting for longer than 4 hours. It should be noted that the duration of these visits is during a time period when no large meeting and/or training was conducted. FDA expects visitors to stay for much longer time periods when meetings/conferences/trainings are held on the FDA Campus. These types of events are expected to occur with some regularity once FDA is fully consolidated and the meeting/conference facilities are fully constructed.

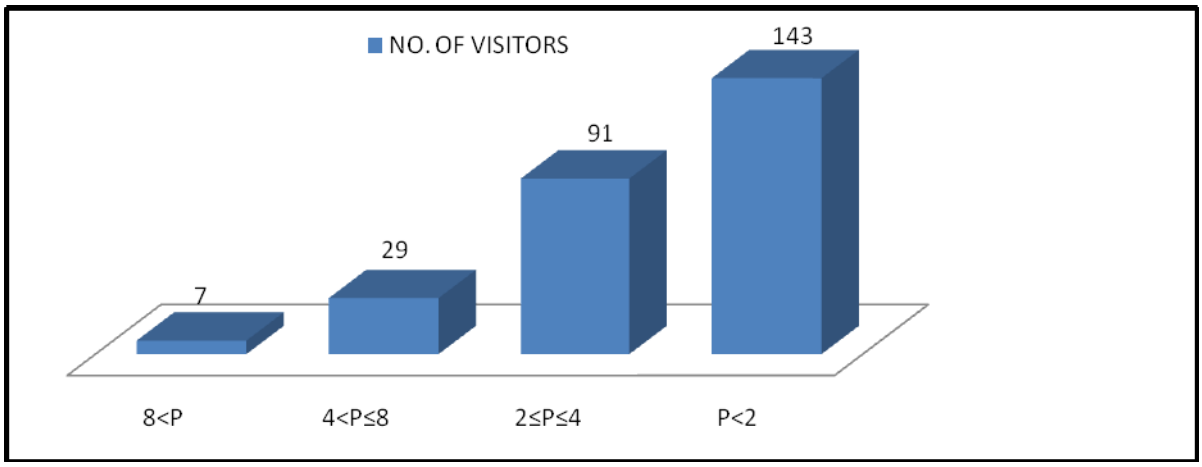

Figure 17. Average Parking Duration

As shown in Figure 18, a majority, approximately 64 percent of the visitors, arrive before 12 p.m. In fact, approximately 35 percent are visiting between 7 a.m. and 10 a.m. Based on the current ratio of 6 visitors for every 100 employees, if these visitors use a parking space for an average of 4 hours, it would indicate that almost 675 parking spaces will be occupied during morning hours and will not be able to be re-utilized during that time period. With all day conferences, this number could almost double.

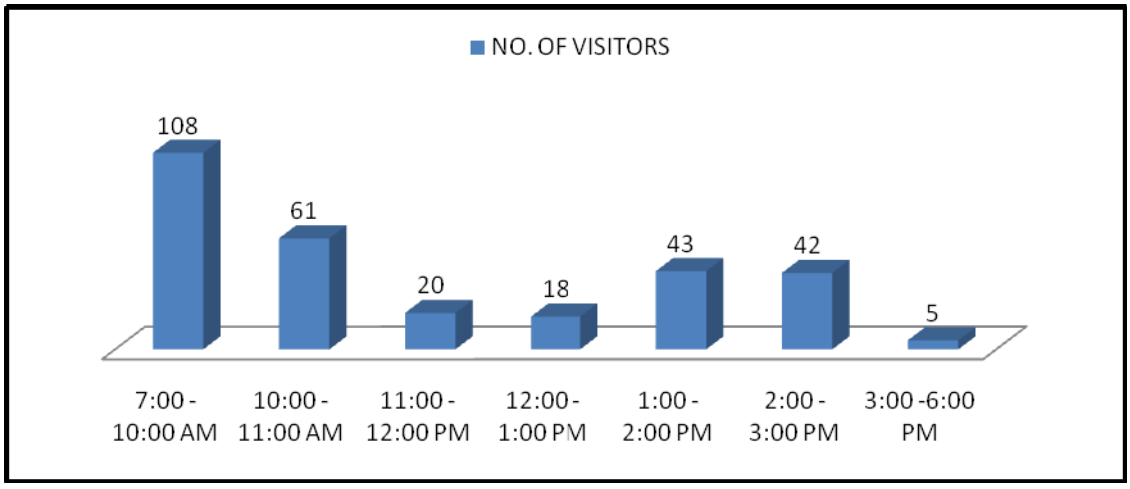

Figure 18. Average Visitor Arrival Time

c. Future Needs

FDA holds large training sessions which can last for the entire day. Furthermore, it also holds conferences which can last several days and are expected to bring a large number of visitors. These types of events will not allow for visitor parking spaces to be shared. The FDA Campus can accommodate 200 visitors and there are times when the numbers of parking spaces are not adequate. For example, if more than 60 percent of the visitors arrive in the morning and stay up to four hours then it becomes difficult for FDA to accommodate additional visitors.

FDA would like to provide a total of 1,000 visitor spaces. Some of these spaces can be dedicated for short term parking for visitors such as delivery vehicles; however, a large number will be dedicated for long term visitor parking. Overall, there are several reasons that substantiate the increase in the visitor parking from 500 spaces to 1,000 spaces:

- The FDA Campus currently provides for 275 visitor parking spaces. On numerous occasions, FDA has had more visitors than can be accommodated in the 275 visitor parking spaces. At present, FDA is experiencing approximately 6 to 12 visitors for every 100 employees. This is when no major conferences or training sessions are being conducted.
- Advisory Committee Meetings last all day, for several days in a row, where the general public is invited to attend.
- The existing White Oak Conference Center can accommodate 600 people at one time. At full build-out the FDA Campus will include a 600 seat all purpose room, and various other smaller conference and meeting rooms.
- By 2012, the FDA Campus conference and training facilities will be able to accommodate up to 1,600 visitors for purposes such as conferences, training sessions, and meetings, in addition to, visitors who may arrive to conduct routine business with FDA. It is anticipated that major training sessions will be held on a regular basis lasting several days to a full week. This could add an additional 500 to 600 visitors a day.
- Based on its experience, FDA expects that visitors coming for the training sessions and conferences will need parking for long periods/all day thus sharing a parking space will not be feasible.

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7 MONITORING & EVALUATION

This TMP is a flexible document that can be reshaped as new employees are added to the FDA Campus and as they adapt to their new location. Each of the TMP strategies must be evaluated and changed as seen fit by the ETC but especially during each phase of development. The ETC will evaluate each strategy by setting the goals and then documenting the progress of each goal. This is an update to the TMP published in 2006. During each evaluation period, the following steps need to be carried out:

- Determine the extent to which each program has achieved its objective
- Plan the degree of consistency of program implementation
- Detail the relationship of different strategies to the effectiveness of the program

Several options are available to the ETC in order to gauge the success of these programs, including:

- Perform an employee survey and update TMP. The ETC will perform periodic surveys of employees and reevaluate the program. This would include determining whether the goals are being met and, based on the employee trends, identifying programs which are successful and need to be emphasized and those that are not working. Surveys will be performed within six months of each major move which is in 2009 and 2012. The survey's goal will be to identify potential changes in trip characteristics.
- Perform traffic counts at all the access points at the FDA Campus. This can be easily achieved by setting tubes at each access point and periodically counting the vehicles. As each strategy is initiated, the impact of that strategy can be judged via the impact in the number of vehicles accessing the site. Care must be taken to handle the construction traffic.
- Provide program participation documentation (e.g. application of transit subsidies, van registration, preferential parking registration)
- Provide packages to existing and perspective employees that identify the transit services and the incentives being offered. As can be seen in the survey results, approximately 12 percent of the FDA employees who have relocated to the FDA Campus have moved their residences. It can be anticipated that this trend of existing employees moving closer to the FDA Campus will continue and new employees will most likely live closer to the FDA Campus. A transit package will help employees in relocating to identify locations that will be more transit friendly.

Once the FDA Headquarters at White Oak consolidation is complete, the ETC will evaluate the effectiveness of the TMP and will make modifications to achieve the stated goals. The ETC will update the TMP should any change occur if the FDA Master Plan would need to be updated. In addition, an employee survey will be performed annually and be used to revise the strategies, especially since the location of the employees can be expected to change over time. FDA will also participate in regional transportation surveys with local/municipal governments. Once the site is fully occupied, the overall goal will be an AVO of two vehicles for every three employees.

APPENDIX A

Employee Transportation Survey

Default Section

All questions marked with an asterisk must be answered in order to continue.

* 1. Is your current duty station at the White Oak FDA campus?

- ( ) Yes
- ( ) No

You do not work in White Oak

Personnel Not Located at White Oak FDA Campus

All questions marked with an asterisk must be answered in order to continue.

* 1. What is the five-digit Zip code for your current place of residence?

Enter Zip Code

* 2. For which FDA organization do you currently work?

	Organization
Organization	

* 3. Are you a contractor working for the FDA? If yes, what is your company's name?

- ( ) Yes
- ( ) No

Company Name:

* 4. What is the address of your workplace?

	Workplace Address
Address	

Other (please specify)

*** 5. What is your normal work schedule? (Please indicate start and end time for each day of the week)**

	Start Time	End Time
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

Other (please specify)

*** 6. Which best describes your current work schedule?**

	Work Schedule
Work Schedule	

7. If you telecommute from home or an off-site location, how many days a week do you typically telecommute? (Please provide a number between 0.5 and 5)

Days per Week

8. If you telecommute, what days of the week do you telecommute?

- [ ] Monday
- [ ] Tuesday
- [ ] Wednesday
- [ ] Thursday
- [ ] Friday

*** 9. What was your primary mode of travel to work today or on your last full work day?**

	Primary Mode of Travel
Mode of Travel	

10. If you carpooled or vanpooled today as your primary mode of travel, were you a driver or a passenger?

- ( ) Driver
- ( ) Passenger

11. If you carpooled or vanpooled today as your primary mode of travel, how many persons were in your vehicle, including yourself?

- ◯ 2
- ◯ 3
- ◯ 4
- ◯ more than 4

12. If you carpooled or vanpooled today as your primary mode of travel, how many FDA employees were in your vehicle, including yourself (include contractors)?

- ◯ 2
- ◯ 3
- ◯ 4
- ◯ more than 4

13. If you drive to work, how many days a week do you typically use your vehicle for each of the following purposes?

	Days Per Week
Travel for work related purposes outside the FDA facility	
Travel between FDA buildings	
Travel for shopping/banking/restaurant needs during the work day	
Daycare/childcare	
Drop-off/Pick-up items or other passengers on the way to or home from work	

Other (please specify)

*** 14. Approximately, how much does your commute cost you each week, including transit fares, parking, gas etc.?**

Commute Cost

*** 15. Do you currently receive a transit subsidy?**

- ◯ Yes
- ◯ No

*** 16. How likely are you to relocate your place of residence after your duty station changes to the White Oak FDA campus?**

- ◯ Very likely
- ◯ Somewhat likely
- ◯ Not likely

*** 17. What primary mode of travel do you anticipate using to commute to the White Oak facility?**

	Mode of Travel
Mode of Travel	

18. If you anticipate driving to the White Oak facility, how many days a week do you anticipate using your vehicle for each of the following purposes?

	Days Per Week
Travel for work related purposes outside the FDA	
Travel between FDA buildings	
Travel for shopping/banking/restaurant needs during the work day	
Daycare/childcare	
Drop-off/Pick-up items or other passengers on the way to or home from work	
Other	

Other (please specify)

19. If you anticipate driving alone to the White Oak FDA Campus, please rate each of the programs below as to how likely you would be to switch to another mode of travel as a result of the particular program being provided. (These programs are listed for survey purposes only. No commitment to provide these services has been made to date.)

	Likelihood
Discount bus or rail passes are sold at work	
Emergency or guaranteed ride-home services at no cost to you	
Daycare services are available on site	
Extended daycare hours	
Personalized ride-matching services are provided for carpooling and vanpooling	
Preferential parking for carpools/vanpools	
Free shuttle to Metro Rail Station	
Subsidized carpool and vanpool set-up assistance	
A direct bus from your area of residence to work	
More flexible work hours	
Transit subsidy of up to $100 per month	

20. The combination of which two services from question 19, if they were provided, would increase your vote to Very Likely?

- [ ] Discount bus or rail passes are sold at work
- [ ] Emergency or guaranteed ride-home services at no cost to you
- [ ] Daycare services are available on site
- [ ] Extended daycare hours
- [ ] Personalized ride-matching services are provided for carpooling and vanpooling
- [ ] Preferential parking for carpools/vanpools
- [ ] Free shuttle to Metro Rail Station
- [ ] Subsidized carpool and vanpool set-up assistance
- [ ] A direct bus from your area of residence to work
- [ ] More flexible work hours
- [ ] Transit subsidy of up to $100 per month

*** 21. Do you plan to use or do you use handicap parking facilities at work?**

- ◯ Yes
- ◯ No

*** 22. Presently or in the future, would you use a day care center located on the White Oak FDA campus?**

- ◯ Yes
- ◯ No

23. If you answered yes to question 21, then when would you first have need for the day care?

	When Needed
When Needed	

24. If you could use Metro Rail transit, which station would you use as your destination station to get to the White Oak FDA campus?

	Metro Rail
Which Metro Rail	

*** 25. If an express bus was provided for a fee from a Park-n-Ride near your home to the White Oak FDA Campus, would you use it to commute? (This service would operate between a park-n-ride lot or another such location to the FDA White Oak Campus. These buses would take quicker routes such as HOV lanes etc.)**

- ◯ Yes
- ◯ No

26. If you answered no to question 24, please give a reason.

*** 27. If Zip-Car was provided at the White Oak FDA campus, would you use it? (This is a service where you join zipcar and upon approval get a "zipcard". You reserve a car online for either a couple of hours or for the whole day. You go to a zipcar location and unlock the car using the zipcard. You return the car to same location as where you picked it up from. Gas and insurance are included in the cost of the car.)**

- ◯ Yes
- ◯ No

*** 28. If you are planning on driving to the White Oak FDA Campus, would you be willing to carpool or vanpool if you were provided Guaranteed Ride Home service? (This service is offered to commuter who use carpool, vanpool, bike, or take transit at least twice a week. It will provide such a commuter with a guaranteed ride home four times a year in an emergency. This service will be free of charge.)**

- ◯ Yes
- ◯ No

Employee Transportation Survey - ONSITE

Personnel Located At The White Oak FDA Campus

All questions marked with an asterisk must be answered in order to continue.

*** 1. Are you a contractor working for the FDA at the White Oak Campus? If yes, what is your company's name?**

- ◯ Yes
- ◯ No

Company Name:

*** 2. Did you change the location of your place of residence due to your job moving to the White Oak FDA Campus?**

- ◯ Yes
- ◯ No

3. If you changed the location of your place of residence, please provide your previous five-digit zip code.

Enter Zip Code

*** 4. Are you planning on changing the location of your place of residence to be closer to the White Oak FDA campus?**

- ○ Yes
- ○ No

*** 5. What is the five-digit zip code for your current place of residence?**

Enter Zip Code

*** 6. For which FDA organization do you currently work?**

	FDA Orgamization
Organization	

*** 7. What was the address of your previous FDA office (before moving to the White Oak FDA Campus)?**

	FDA Address
Address	

Other (please specify)

*** 8. Before your work moved to the White Oak FDA facility, what mode of travel did you typically use?**

	Mode of Travel
Mode of Travel	

*** 9. What is your normal work schedule? (Please indicate start and end time for each day of the week)**

	Start	End
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

*** 10. Which best describes your current work schedule?**

	Work Schedule
Work Schedule	

11. If you telecommute from home or an off-site location, how many days a week do you typically telecommute? (Please provide a number between 0.5 and 5)

Day(s) Per Week

12. If you telecommute, identify the day(s) of the week when you most frequently telecommute?

- [ ] Monday
- [ ] Tuesday
- [ ] Wednesday
- [ ] Thursday
- [ ] Friday

*** 13. What was your primary mode of travel to work today or on your last full work day?**

	Mode of Travel
Mode of Travel	

14. If you carpooled or vanpooled today as your primary mode of travel, were you a:

- ( ) Driver
- ( ) Passenger

15. If you carpooled or vanpooled today as your primary mode of travel, how many persons were in your vehicle, including yourself?

- ( ) 2
- ( ) 3
- ( ) 4
- ( ) more than 4

16. If you carpooled or vanpooled today as your primary mode of travel, how many FDA employees were in your vehicle, including yourself (include contractors)?

- ( ) 2
- ( ) 3
- ( ) 4
- ( ) more than 4

17. If you drive to work, how many days a week do you typically use your vehicle for each of the following purposes?

	Day(s) a week
Travel for work related purposes outside the FDA facility	
Travel between FDA buildings	
Travel for shopping/banking/restaurant needs during the work day	
Daycare/childcare	
Drop-off/Pick-up items or other passengers on the way to or home from work	

Other (please specify)

*** 18. How long does your commute from home to the office typically take?**

	Commuting Time
How Long is Commute	

*** 19. Approximately how much does your commute cost you each week, including transit fares, parking, gas, etc.?**

Cost Per Week

*** 20. Do you currently receive a transit subsidy?**

- Yes
- No

21. If you receive a transit subsidy, please specify how much you receive per month.

Transit Subsidy Amount

*** 22. Do you use the FDA Shuttle?**

- Yes
- No

23. If you use the FDA Shuttle, which route do you use?

- White Oak to Rockville
- White Oak to College Park
- White Oak to Silver Spring Metro

24. If you use the FDA Shuttle, how many days a week do you use it?

Days Per Week

25. If you use the FDA Shuttle, are there any improvements to the Shuttle service that are needed? (For example, increasing frequency of service, extending shuttle hours, a new shuttle route, etc.)

*** 26. Do you plan to use or do you use handicap parking facilities at work?**

- Yes
- No

*** 27. Presently or in the future, would you use a day care center located on the White Oak FDA campus?**

- Yes
- No

28. If you answered yes to question 26, then when would you first have need for the day care?

	Date Needed
Date Needed	

*** 29. If an express bus (commuter bus) was provided for a fee from a Park-n-Ride near your home to the White Oak FDA campus, would you take it? (This service would operate between a park-n-ride lot or another such location to the FDA White Oak Campus. These buses would take quicker routes such as HOV lanes etc.)**

- Yes
- No

30. If you answered no to question 28, please give a reason.

*** 31. If Zip-Car was provided at the White Oak FDA campus, would you use it? (This is a service where you join zipcar and upon approval get a "zipcard". You reserve a car online for either a couple of hours or for the whole day. You go to a zipcar location and unlock the car using the zipcard. You return the car to same location as where you picked it up from. Gas and insurance are included in the cost of the car.)**

- Yes
- No

32. If you currently drive to work, are there any improvements to services so that you would take transit? (For example, a coummter bus from (blank) park-n-ride to White Oak FDA Campus, increase in the frequency of Bus #(blank), bus service from (blank) metro station to White Oak FDA Campus etc.)

*** 33. If you currently drive to work, would you be willing to carpool or vanpool if you were provided Guaranteed Ride Home service? (This service is offered to commuters who use carpool, vanpool, bike, or take transit at least twice a week. It will provide such a commuter with a guaranteed ride home four times a year in an emergency. This service will be free of charge.)**

- Yes
- No

Final Page

Appendix E: Traffic and Transportation Technical Report

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U.S. Food and Drug Administration Headquarters Consolidation Master Plan Update

Traffic Technical Report

Prepared for:

The U.S. General Services Administration
National Capital Region

In cooperation with:

The U.S. Food and Drug Administration

Prepared by:

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6110 Frost Place
Laurel, MD 20707

March 2009

accommodating growth

protecting resources

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Executive Summary

This Technical Report has been prepared by the U.S. General Services Administration (GSA) to assess and report potential transportation impacts resulting from revisions to the U.S. Food and Drug Administration (FDA) Master Plan for the consolidation of FDA's headquarters facilities at the Federal Research Center (FRC) at White Oak. This report identifies the existing and future traffic conditions at 18 roadway intersections in the vicinity of the site. Measures to mitigate the impacts on the roadway system are also evaluated and presented in the report.

GSA is proposing to update the FDA Headquarters Master Plan to accommodate an increase of 1,170 FDA employees due to Congressional mandates. The project will involve the development of 1,254,922 additional gross square feet of office and laboratory space, construction of a fitness center, and expansion of the Central Utility Plant to serve the FDA White Oak Campus. In addition, GSA plans to relocate the Child Care Center and the Broadcast Studio from their locations proposed in the 2006 FDA Master Plan. GSA is updating the FDA Headquarters Master Plan to determine how best to accommodate the additional growth on the FDA White Oak Campus.

Existing Conditions

The FDA has already been approved to relocate 7,719 employees to the FDA White Oak Campus. The planned consolidation of its operations is expected to be completed by 2011. As of May 2008, approximately 2,080 employees (1,890 FDA employees and 190 contractors) have relocated to the FDA White Oak Campus. Thus, the existing conditions analysis in this report includes these 2,080 FDA employees. Overall, under existing conditions all of the study intersections operate at acceptable Level of Service (LOS) with the exception of US 29/Fairland Road and US 29/Musgrove Road, and US 29/Stewart Lane intersections which operate at or above capacity conditions.

No-Action Impacts

This analysis assumes that all the 7,719 employees will be relocated to the FDA White Oak Campus by 2011. It also includes all the developments that have been approved for construction by Montgomery and Prince George's Counties in the vicinity of the site. Furthermore, this analysis includes future planned improvements at the study intersections. This analysis was carried out under two scenarios: 1) with the ICC and 2) without the ICC. The ICC is funded and expected to be completed by 2012. However, the build out date for the FDA consolidation of the 7,719 employees is 2011 and thus scenarios with and without the ICC were studied.

Without the ICC, most of the intersections analyzed are expected to operate at unacceptable LOSs during both or at least one peak hour. The intersections of New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Mahan Road, New Hampshire Avenue/Lockwood Drive, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Blvd, US 29 N.B. Ramp/Cherry Hill Road and Proposed Cherry Hill Road/Eastern Site Access are expected to operate at an acceptable LOS during both the morning and evening peak hours. Similarly, with the ICC, most of the intersections analyzed are expected to operate at unacceptable LOS during both or at least one peak hour. The intersections of Cherry Hill Road/Powder Mill Road, New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Mahan Road, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Blvd, US 29 N.B. Ramp/Cherry Hill Road and Proposed Cherry Hill Road/Eastern Site Access are expected to operate at an acceptable LOS during both the morning and evening peak

hours. Overall, most of the study intersections are expected to operate at above capacity conditions under the No-Action conditions with or without the ICC.

Action Impacts

This analysis looks at the impacts of the 1,170 employees on the study area network. Without the ICC and with the 1,170 new FDA employees, most intersections are expected to continue operating at unacceptable LOSs in the peak hours. The following intersections are expected to operate at acceptable LOS during both the morning and evening peak hours:

- Cherry Hill Road/Eastern Access
- New Hampshire Avenue/Powder Mill Road,
- New Hampshire Avenue/Schindler/Mahan Road
- Beltsville Drive/Powder Mill Road
- Beltsville Drive/Calverton Boulevard
- US 29 N.B. Ramp/Cherry Hill Road

With the ICC and with the 1,170 FDA employees, most intersections are expected to continue operating at unacceptable LOS during the peak hours. However several intersections are expected to operate at acceptable LOS during both the morning and evening peak hours including:

- Cherry Hill Road/Eastern Access
- Cherry Hill Road/Powder Mill Road
- New Hampshire Avenue/Powder Mill Road
- New Hampshire Avenue/Schindler/Mahan Road
- Beltsville Drive/Powder Mill Road
- Beltsville Drive/Calverton Boulevard
- US 29 N.B. Ramp/Cherry Hill Road

Conclusions

Results of the analysis indicate that with the addition of 1,170 new FDA employees at the FDA Campus, most intersections are expected to continue operating above unacceptable LOSs during peak hours. Overall, with the ICC, the volumes at most of the intersections and thus the Critical Lane Volume (CLV) are expected to decrease. However, even with this decrease in traffic, most intersections will continue to operate at unacceptable conditions. Improvements will be required at several intersections to bring them to under the No-Action condition CLVs. Major improvements will be required at most of the intersections to bring them to an acceptable LOS.

Improvements to intersections are recommended in order to bring them to acceptable LOS, even though roadway improvements are not under the jurisdiction of GSA and GSA cannot fund the transportation improvements. These improvements are presented in detail in the report, under Mitigation Measures.

1. Introduction and Scope of Investigation

Due to a mandate by Congress, the Food and Drug Administration (FDA) is planning to add 1,170 employees to their headquarters facilities located within the Federal Research Center (FRC) at White Oak Campus. This will bring the total number of FDA employees at the FRC White Oak Campus to 8,889. A study was conducted for the initial 7,719 planned FDA employees and their impacts on the surrounding roadway network in 2005 (GSA, 2005). This study investigates the impact of the additional 1,170 employees.

1.1 Site Description

The FDA Headquarters at the FRC White Oak is located at 10903 New Hampshire Avenue in Silver Spring, Montgomery County, Maryland. The FDA Headquarters at White Oak encompasses approximately 130 acres located east of New Hampshire Avenue (MD 650) and south of US 29. Access to the FDA Headquarters is provided by three roadways:

- Mahan Road
- Michelson Road
- Eastern Access Entrance from Cherry Hill Road (see Figure 1).

Main access to the site is provided via New Hampshire Avenue at Mahan Road which is located approximately one mile north of I-495. A second access is provided via Michelson Road onto New Hampshire Avenue, and a third access is under construction and will connect to Cherry Hill Road north of Powder Mill Road. Figure 1 presents a site location map.

1.2 Surrounding Land Use

The FDA Headquarters is surrounded by both commercial and residential developments. Land along the western side of New Hampshire Avenue is developed with mostly residential uses and land along the east side is developed with residential and commercial uses. The White Oak Shopping Center is located just north of the site. The site is bounded to the north by commercial and residential properties, the Paint Branch Stream Valley Park, and the Percontee quarry. To the south of the FRC lie the U.S. Army's Adelphi Laboratory, residential properties, Powder Mill Community Park, and the Hillandale Shopping Center.

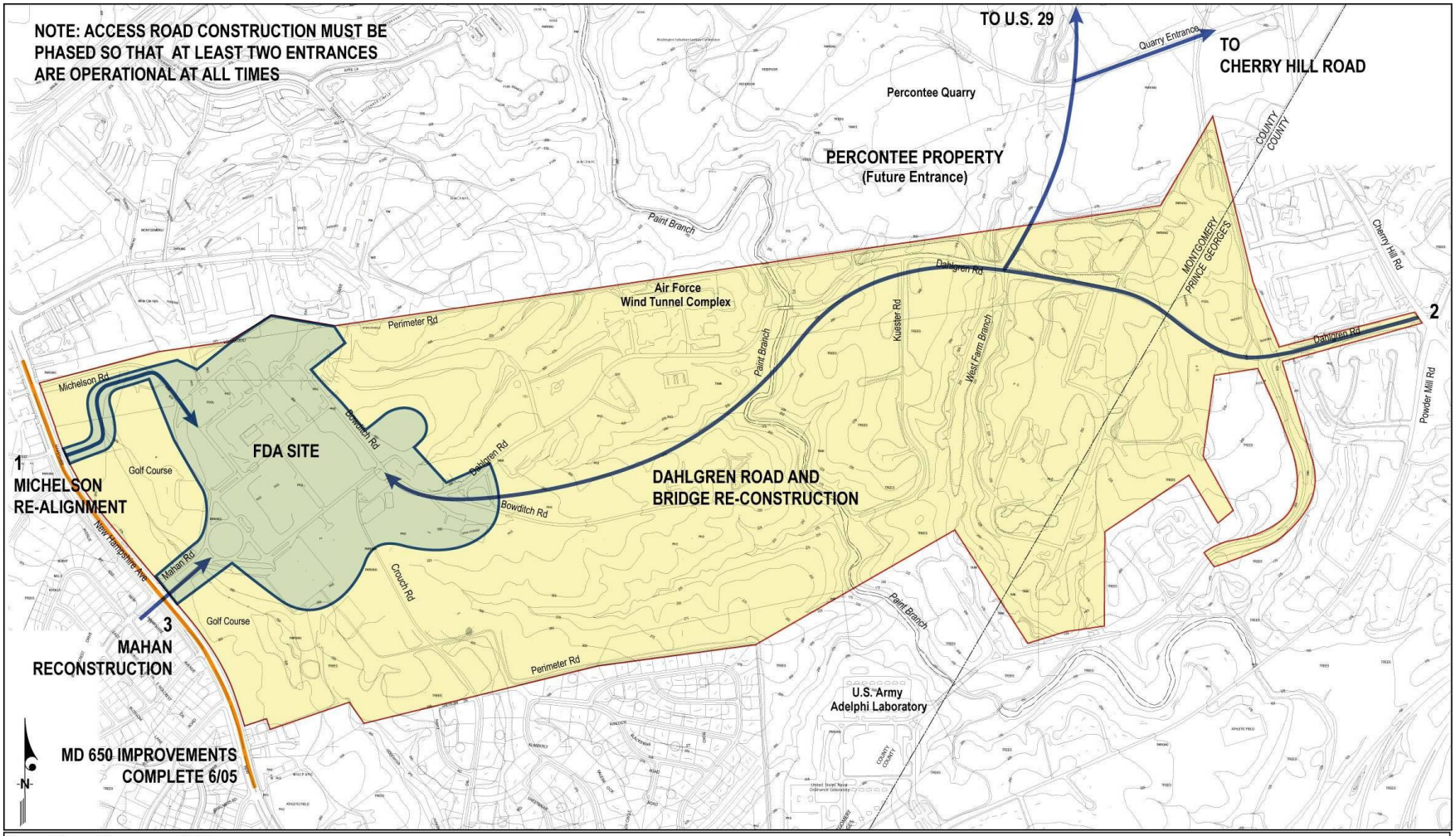


Figure 1
Site Location Map

2. Existing Traffic Condition

This section describes the existing transportation facilities in the vicinity of the FDA White Oak Campus, including the roadway network, traffic conditions, and the availability of public transportation facilities.

2.1 Principal Roadways

The FDA White Oak Campus is located 1.15 miles north of I-495. The campus is surrounded by New Hampshire Avenue to the west, Cherry Hill Road to the east and Powder Mill Road (MD 212) to the south. Figure 1 presents a site location map.

The main roadways in the vicinity of the FDA White Oak Campus site are described as follows:

- Interstate 495 (I-495). In the vicinity of the site, I-495 also known as the Capital Beltway is an eight-lane, divided, interstate highway. It carries approximately 212,170 vehicles per day (VPD) near New Hampshire Avenue. The posted speed limit in the vicinity of the study area is 55 miles per hour (MPH).
- New Hampshire Avenue (MD 650). This is a six-lane divided roadway with a posted speed limit of 35 mph. It runs in a north south direction and has a grade separated interchange with both I-495 and US 29 (Columbia Pike). It carries approximately 51,400 VPD north of I-495. Its intersections with Elton Road, Powder Mill Road, Schindler Drive/Mahan Road, Michelson Road, and Lockwood Drive are signalized.
- Powder Mill Road (MD 212). This is a two-lane roadway between New Hampshire Avenue and Cherry Hill Road with a posted speed limit of 35 mph. It runs in an east-west direction with signalized intersections at New Hampshire Avenue and Cherry Hill Road. East of Cherry Hill Road, it becomes a four-lane roadway and has an interchange with I-95. It carries approximately 22,500 VPD.
- Columbia Pike (US 29). This is a six-lane highway with a posted speed limit of 50 mph. It runs in a north-south direction, parallel to I-95 and ends at I-70 to the north. It is grade separated at its intersections with New Hampshire Avenue and Cherry Hill Road/Randolph Road. It carries approximately 64,000 VPD.
- Cherry Hill Road. This roadway runs in a north-south direction and has a posted speed limit of 40 mph. In the vicinity of the study area it has a four-lane cross-section. Its intersections with Powder Mill Road, US 29/Randolph Road, Plum Orchard Drive, Calverton Drive, and Prosperity Drive are signalized. As mentioned above, its intersection with US 29 (Columbia Pike) is a grade separated interchange.
- Randolph Road. North of Columbia Pike (US 29) Cherry Hill Road becomes Randolph Road. It is a four-lane, undivided highway that runs in a north-south direction. The posted speed limit for this roadway is 35 miles per hour.
- Plum Orchard Drive. This is a two-lane roadway which runs in a east-west direction. Its intersection with Cherry Hill Road is signalized. It is developed with multi-family homes east of Cherry Hill Road and a large shopping center exists on the northwest quadrant.

- Calverton Boulevard/Broadbirch Drive. This is a two-lane roadway which connects Cherry Hill Road to Powder Mill Road (MD 212) Road via Beltsville Drive. Similarly Broadbirch Drive connects Cherry Hill Road to Columbia Pike via Tech Road. It is two lanes to the east of Cherry Hill Road and becomes a four-lane facility to the west. To the west of the Cherry Hill Road, this roadway serves a shopping center and also other office/commercial developments. To the east of Cherry Hill Road, this roadway serves as the primary access point to a neighborhood. Its intersection with Cherry Hill Road is signalized.
- Prosperity Drive. This two-lane roadway runs in an east-west direction, teeing into Cherry Hill Road and extending past Tech Road. Its intersection with Cherry Hill Road is signalized. Land along Prosperity Drive is developed with either retail or office developments.
- Lockwood Drive. This two-lane roadway runs in an east-west direction from US 29 (Columbia Pike) to east of New Hampshire Avenue. It provides access to several commercial and residential developments located along it. There is a large shopping center at the northeast corner of its intersection with New Hampshire Avenue.
- Schindler Drive/Mahan Road. This two-lane roadway runs in an east-west direction. To the west of New Hampshire Avenue, it provides access to a neighborhood and to the east it provides the main access point for the FDA development. Its intersection with New Hampshire Avenue is signalized.
- Fairland Road: The two-lane roadway runs in an east-west direction and makes a four leg signalized intersection with US 29. Fairland road intersects with Old Columbia Pike at signalized intersection to the west of US 29 and provides access to the commercial and residential developments. To the east of US 29, Fairland road provides access to the residential developments and connected to Briggs Chaney Road.

2.2 Traffic Operations Analysis

Traffic count data was collected at the following intersections in October 2007 and March and April 2008:

1. New Hampshire Avenue (MD 650)/Powder Mill Road
2. New Hampshire Avenue (MD 650)/Mahan Road
3. New Hampshire Avenue(MD 650)/Michelson Road/Northwest Drive
4. New Hampshire Avenue (MD 650)/Lockwood Drive
5. Cherry Hill Road/Powder Mill Road
6. Cherry Hill Road/Plum Orchard Drive
7. Cherry Hill Road/Broadbirch Drive/Calverton Boulevard
8. Cherry Hill Road/Prosperity Drive
9. Beltsville Drive/Powder Mill Road
10. Beltsville Drive/Calverton Boulevard
11. US 29/ Lockwood Drive
12. US 29/ Stewart Lane
13. US 29/Industrial Parkway
14. US 29/Tech Road
15. US 29 SB Ramp/ Randolph Road
16. US 29 NB Ramp/Randolph Road

17. US 29/Musgrove Road
18. US 29/Fairland Road
19. Cherry Hill Road/Eastern Access

The existing morning and evening peak hour traffic volumes at these intersections are presented in Figure 2. The raw traffic count data is located in Appendix A of this report.

It should be noted that the consolidation of the FDA employees at the FDA White Oak Campus has begun and as of January 2008, approximately 2,080 employees (1,890 FDA employees and 190 contractors) are currently located at the site. Thus, the existing traffic count data includes these FDA employees.

Using these volumes and existing lane geometries, intersection capacity analysis was performed for both the a.m. and evening peak hours. Analysis was performed using the Critical Lane Analysis Technique as directed by both the Montgomery County and Prince George's County guidelines. The Critical Lane Analysis outputs a Level of Service (LOS). LOS is described in the Highway Capacity Manual (HCM) as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorist and/or passengers". The HCM defines six levels of service ranging from A to F, with A presenting the optimal operating conditions with minimal delays and F representing congestion.

The Critical Lane Analysis technique determines the overall operational LOS for an entire signalized intersection. Unsignalized intersections are assumed to be simple two-phase signalized intersections for the procedure. The procedure examines the combination of vehicular streams with conflicting movement during a peak period. This maximum number of conflicts is termed the critical lane volume (CLV). This CLV value is then compared to a range of values, to determine the approximate LOS at an intersection.

Intersections in Montgomery County with a CLV of 1,475 or lower are considered to be operating at acceptable level of service. Intersections in Prince George's county with a CLV of 1,600 (LOS E) or lower are considered to be operating at acceptable level of service.

Capacity analyses were carried out for both the morning and evening peak at the study area intersections. These LOSs are presented with the existing traffic volumes on Figure 2. Table 1 provides the CLV for each of the intersections. The CLV calculation worksheets are attached in Appendix B.

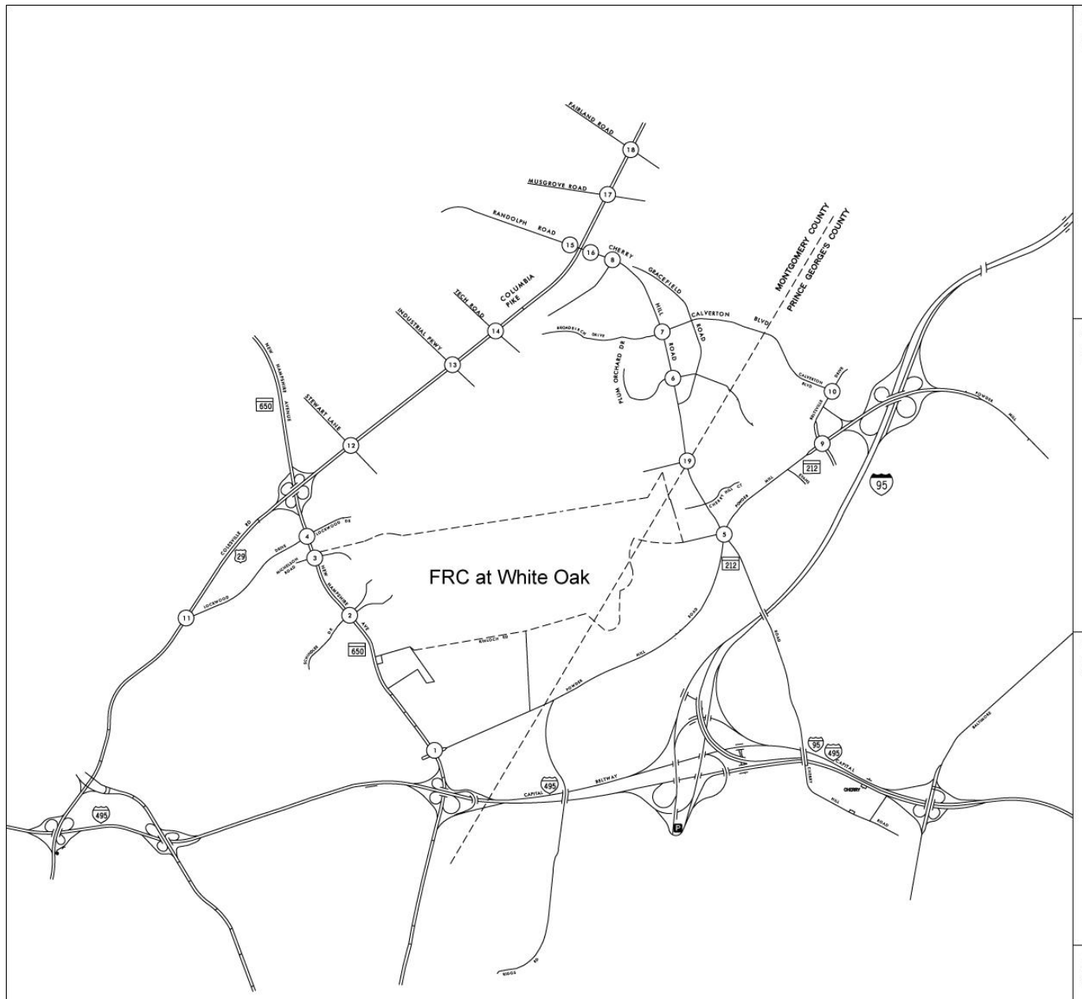
Table 1. Existing Levels of Service, January 2008

Intersection	Morning (CLV)	Evening (CLV)
Cherry Hill Road/Powder Mill Road*	B (1,128)	C (1,251)
Cherry Hill Road/Plum Orchard Drive	Acceptable (951)	Acceptable (1,055)
Cherry Hill Road/Calverton Boulevard/Broadbirch Drive	Acceptable (1,101)	Acceptable (1,419)
Cherry Hill Road/Prosperity Drive	Acceptable (1,195)	Acceptable (1,050)

Intersection	Morning (CLV)	Evening (CLV)
New Hampshire Avenue/Michelson Road	Acceptable (1,073)	Acceptable (1,008)
New Hampshire Avenue/Powder Mill Road	Acceptable (1,272)	Acceptable (1,400)
New Hampshire Avenue/Schindler Drive/Mahan Road	Acceptable (1,048)	Acceptable (870)
New Hampshire Avenue/Lockwood Drive1	Acceptable (1,223)	Acceptable (1,207)
Beltsville Drive/Powder Mill Road*	B (1,044)	C (1,299)
Beltsville Drive/Calverton Boulevard*	A (797)	A (846)
US 29 /Fairland Road	Unacceptable (1,591)	Unacceptable (1,769)
US 29 /Musgrove Road	Acceptable (1,448)	Unacceptable (1,593)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (875)	Acceptable (819)
US 29 S.B. Ramp/Cherry Hill Road	Acceptable (1,096)	Acceptable (951)
US 29/ Tech Road	Acceptable (1,448)	Acceptable (1,460)
US 29/ Industrial Parkway	Acceptable (1,343)	Acceptable (1,396)
US 29/Stewart Lane	Acceptable (1,423)	Unacceptable (1,681)
US 29/ Lockwood Drive	Acceptable (1,475)	Acceptable (1,448)

* These intersections are located in Prince George's County

As can be seen in Table 1, all of the study intersections operate at acceptable level of service with the exception of US 29/Fairland Road and US 29/Musgrove Road, and US 29/Stewart Lane intersections which operate at or above capacity conditions.



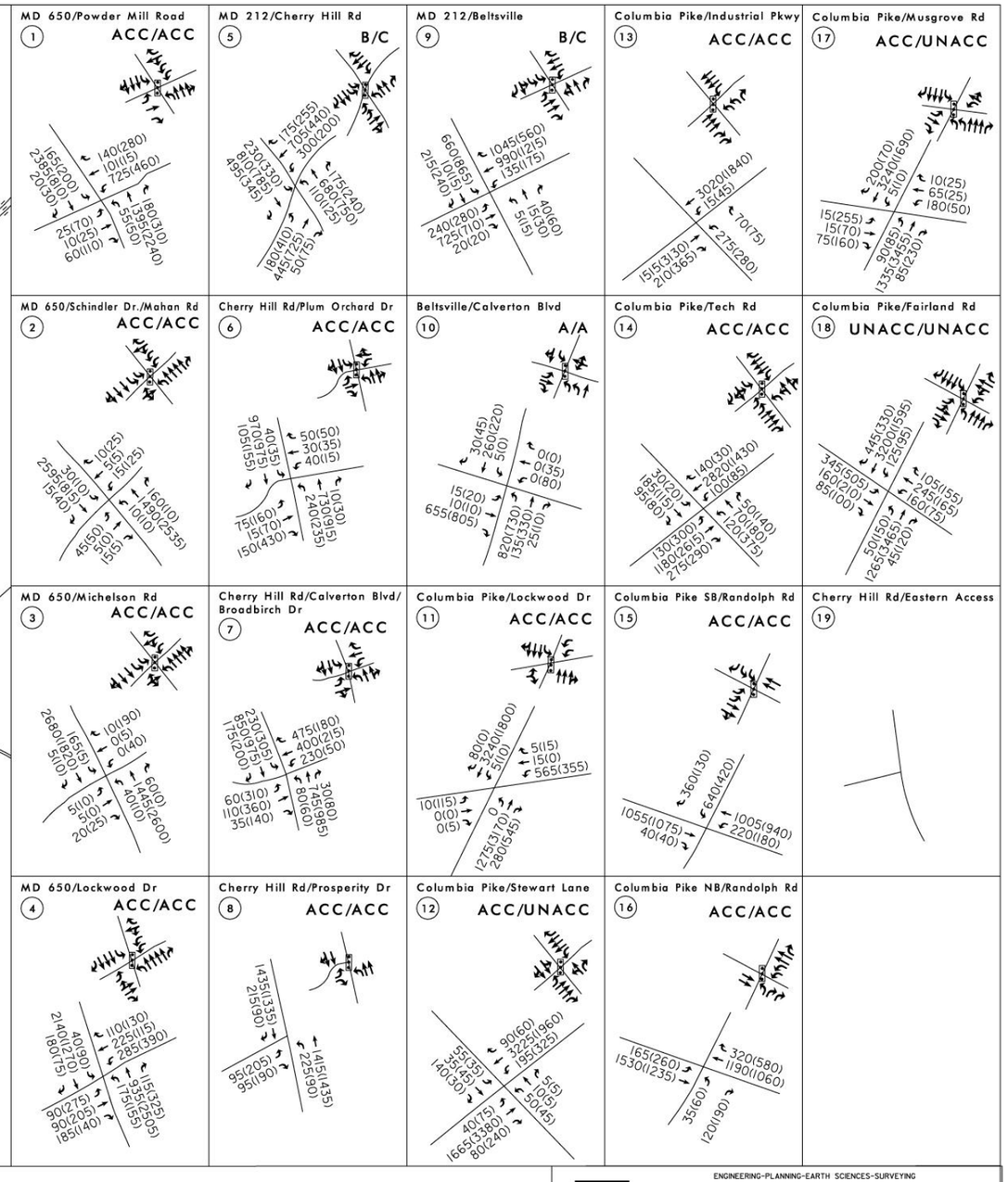


Figure 2
Existing Traffic Volumes, Lane Geometries, and LOS Results

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ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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3. Roadway Impacts

The evaluation of the transportation impacts of the FDA White Oak Campus was based on the guidelines set forth by Montgomery County and Prince George's County. In particular these impacts were evaluated per Prince George's Guidelines for the Analysis of the Traffic Impact of Development Proposals (M-NCPPC, 2002) and the Local Area Transportation Review Guidelines (M-NCPPC, 2008) set forth by Maryland-National Capital Park and Planning Commission (Montgomery County).

3.1 No-Action Analysis

The No-Action analysis examines the impacts of FDA relocating to the FDA White Oak Campus with 7,719 employees. Access would be provided along New Hampshire Avenue via Schindler Drive/Mahan Road, Michelson Road, and along Cherry Hill Road via the new Eastern Access Road. Access to buses would also be provided through an onsite bus stop. In accordance with the *2006 Master Plan Update,* two parking spaces would be provided for every three employees, for a parking ratio of 1:1.5 (or 5,146 employee parking spaces). Five hundred additional parking spaces would be provided for visitors. To achieve this parking ratio a Transportation Management Plan (TMP) has been developed (see Section 4.2 for more information on the TMP). This analysis assumes the number of vehicles traveling to the site equals the number of parking spaces.

The No-Action Alternative is an analysis of the future anticipated volumes at the study intersections without the project traffic. It includes, existing traffic volumes, regional background growth, and approved un-built developments in the study area including the previously approved FDA development (with 7,719 employees). Discussions with the Montgomery and Prince George's County staff have indicated that they will not require the regional growth factors.

The No-Action analysis also takes into account any funded infrastructure improvements in the study area. The Intercounty Connector (ICC) is expected to be fully constructed and open by 2012. However, a majority of the FDA employees will be at the FDA White Oak Campus before it opens. Thus, in order to understand the impacts of the ICC two No-Action scenarios were studied and they were as follows:

- No-Action Analysis without Inter County Connector (ICC)
- No-Action Analysis with Inter County Connector (ICC)

3.1.1 Regional Growth

Discussions with the Montgomery and Prince George's County staff have indicated that they will not require additional regional growth because they wanted all background development included.

3.1.2 Approved Developments

Approved developments which are not yet built or occupied are included in the background traffic. A list of approved background developments was obtained from both Prince George's County and Montgomery County. The developments are graphically presented in Figure 3. It is assumed that these developments will be built out by 2012. Table 2 presents the background developments and the associated trip generation. The number of vehicle trips generated by these developments was

estimated using rates presented in Figure 3 of the Guidelines for the Analysis of the Traffic Impact of Development Proposals (M-NCPPC, 2002) for the Prince Georges County developments and the rates documented in Appendix A of the Local Area Transportation Review Guidelines (LATR) (M-NCPPC, 2008) for the Montgomery County developments. Trip rates for any developments not covered by these two documents were estimated using rates documented in Trip Generation, 7th Edition, Institute of Transportation Engineers (ITE, 2003).

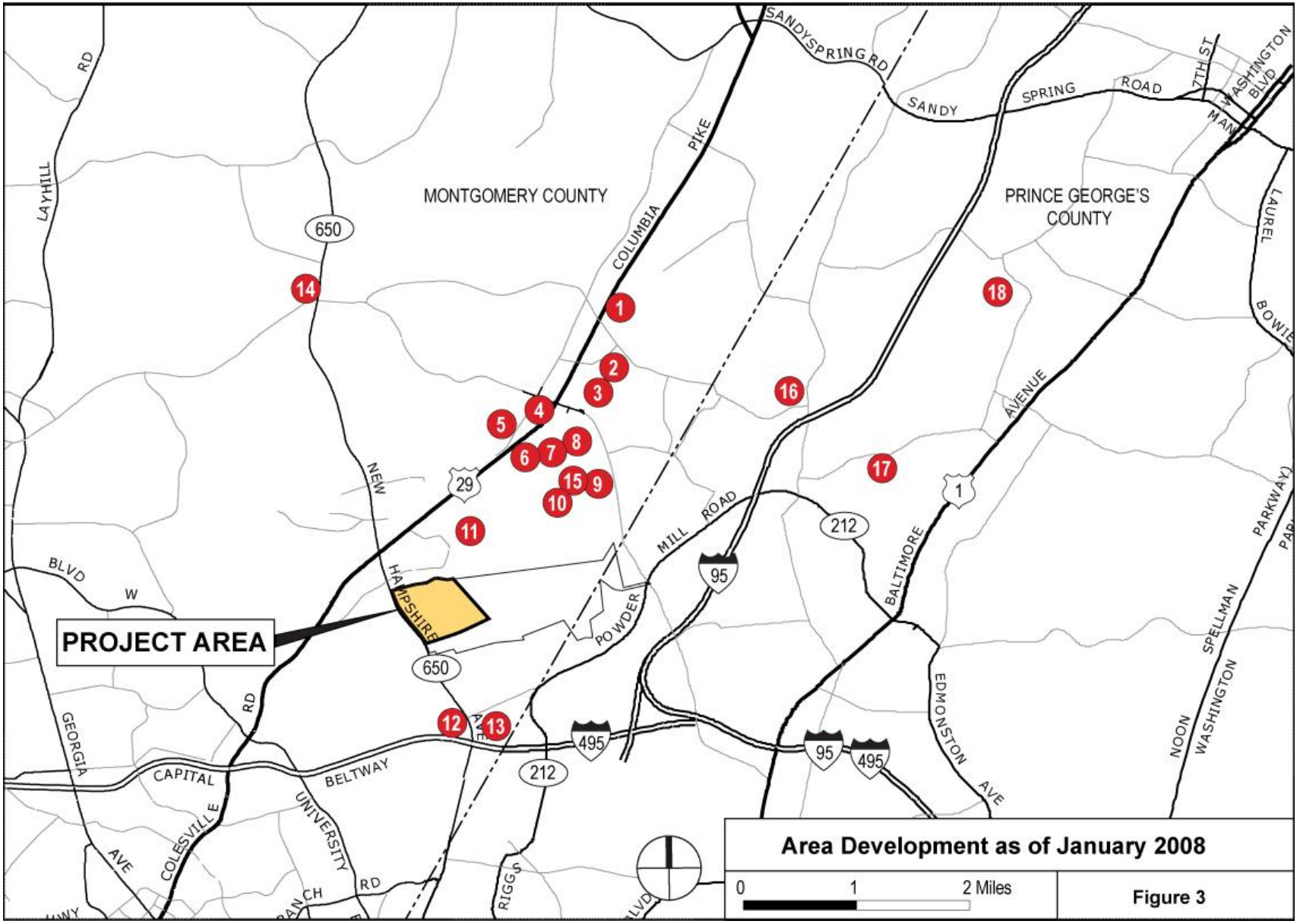
In order to determine the impact of these developments on the surrounding roadway network, these trips were distributed to the study area according to the trip distribution percentages presented in Table E-6 of the LATR for Super District 6. The FDA trips were distributed along the roadway network based on the trip distribution/assignment presented in the previous FDA Final Supplemental Environmental Impact Statement (GSA, 2005).

Table 2: Approved Background Developments

SR #	Land Use	Code	Size	Unit	Morning Peak			Evening Peak		
					In	Out	Total	In	Out	Total
	MONTGOMERY COUNTY									
1	Fairland View									
	Townhouses	MG	39	Each	5	15	20	20	10	30
2	Deer Park Subdivision									
	Single-Family Detached	MG	12	Each	5	5	10	10	5	15
3	Summer Hill									
	Single-Family Detached	MG	3	Each	0	5	5	5	0	5
4	Seventh Day Adventist									
	General Office	MG	350,000	SF	505	75	580	85	420	505
5	Rolling Acres									
	Single-Family Detached	MG	10	Each	5	5	10	5	5	10
6	WestTech Village Corner High-Turnover Restaurant									
	TGI	932	7,000	SF	40	40	80	40	35	75
	Pass-By Reduction (43%)							15	15	30
	Panera Bread	932	5,000	SF	30	30	60	30	25	55
	Pass-By Reduction (43%)							15	10	25
	Steakhouse	932	7,000	SF	40	40	80	40	35	75
	Pass-By Reduction (43%)							15	15	30
	Total Pass-By Reduction							45	40	85
	Net Trips				110	110	220	65	55	120
7	Baywood Hotels									
	Room Hotel	320	104	Rooms	15	30	45	30	30	60
8	WestFarm I-1									
	GBLLC	MG	73,078	SF	100	15	115	20	105	125
	Home Depot	MG	129,134	SF	185	25	210	35	170	205
	State Farm Insurance Co.	MG	63,552	SF	85	15	100	20	90	110
	Mont. County Public School	MG	239,575	SF	350	50	400	60	305	365
	Total Trips				720	105	825	135	670	805

SR #	Land Use	Code	Size	Unit	Morning Peak			Evening Peak		
					In	Out	Total	In	Out	Total
9	Orchard center									
	Office	MG	79,772	SF	115	15	130	25	110	135
10	WestFarm I-3									
	Marriott International	MG	18,824	SF	20	5	25	5	35	40
	SHA	MG	160,639	SF	230	35	265	45	205	250
	Clark Security	MG	10,000	SF	15	0	15	5	15	20
	USPS	MG	64,774	SF	85	15	100	20	95	115
	Kaiser Permanente	MG	294,847	SF	430	65	495	75	370	445
	GBLLC	MG	428,000	SF	625	95	720	110	525	635
	Total Trips				####	215	1,620	260	1,245	####
11	White Oak Property									
	Townhouses	MG	106	Each	10	40	50	55	30	85
12	FDA Relocation*									
	FDA White Oak	Report	7,719	Emp	2430	300	2,730	340	2,205	2,545
13	Chevy Chase Bank, Hillandale									
	Drive-in Bank	912	3,650	SF	25	20	45	85	80	165
	Diverted Trips (25%)							20	20	40
	Pass-By Trips (54%)							45	45	90
	Total Trips							20	15	35
14	New Hampshire Ave									
	General Office	MG	55,862	SF	75	10	85	15	85	100
15	Randolph Plaza									
	General Office	MG	16,806	SF	20	5	25	5	35	40
	General Retail	MG	4,005	SF	5	5	10	15	15	30
	Pass-By Reduction (40%)				5		5	5	5	10
	Net New Trips				0	5	5	10	10	20
	Total Trips				20	10	30	15	45	60
	PRINCE GEORGE'S COUNTY									
16	Cross Creek									
	Hotel	PG	50	Rooms	20	15	35	20	20	40
	Single Family Detached	PG	97	Each	15	60	75	55	30	85
	Total Trips				35	75	110	75	50	125
17	Ammendale South									
	Flex Office	PG	90,000	SF	70	20	90	20	70	90

* For trip generation analysis refer to Food and Drug Administration Headquarters Consolidated Final Environmental Impact Statement (GSA, 2005)


MONTGOMERY COUNTY
PRINCE GEORGE'S COUNTY
PROJECT AREA
SANDY SPRING RD
SANDY SPRING ROAD
COLUMBIA PIKE
LAYHILL RD
NEW HAMPSHIRE AVE
MILL ROAD
POWDER MILL
BALTIMORE AVENUE
LAUREL BOWIE
BLVD W
GEORGIA AVE
COLESVILLE RD
UNIVERSITY BLVD
CAPITAL BELTWAY
RIGGS RD
EDMONSTON AVE
SPELLMAN NOON
WASHINGTON PARKWAY
650
29
212
95
495
1
Area Development as of January 2008
0 1 2 Miles
Figure 3

3.1.3 Roadway Improvements

The following roadway improvements are programmed and or are under construction in the study area as of January 2008:

- New Hampshire Avenue/Schindler Drive/Mahan Road
  - Along westbound Mahan Road provide dual left turn lanes, a shared left turn-through lane, and an exclusive right turn lane

- Inter County Connector (ICC)
  - Contract A – Section between I-270/I-370 to MD 97 is under construction and will be opened in Fall of 2010
  - Contract B – Section between MD 97 to US 29 is scheduled to open in 2011
  - Contract C – Section between US 29 to I-95 is expected to open in 2011
  - Contract D – Collector-Distributor road along I-95 is scheduled to open by 2012
  - Contract E- Section between I-95 and US 1 is expected to open by 2011

3.1.4 No-Action without Inter County Connector (ICC) – Traffic Operations Analysis

Under the No-Action Analysis without ICC scenario, FDA would relocate to the FDA White Oak Campus site with 7,719 employees. Access would be provided along New Hampshire Avenue via Schindler Drive/Mahan Road and Michelson Road and along Cherry Hill Road via the new Eastern Access Road. The ICC would not be constructed.

The No-Action without the ICC volumes were obtained by combining the existing traffic volumes with the background development volumes. These volumes are presented in Figure 4 and the LOS results are presented in Table 3 below. The CLV calculations sheets are attached in Appendix D

Table 3. No Action Alternative without ICC LOS Results

Intersection	Existing		No-Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Cherry Hill Road/Powder Mill Road*	B (1,128)	C (1,251)	C (1,238)	F (1,660)
Cherry Hill Road/Plum Orchard Drive	Acceptable (951)	Acceptable (1,055)	Unacceptable (1,817)	Unacceptable (1,723)
Cherry Hill Rd/Calverton Blvd./Broadbirch Dr	Acceptable (1,101)	Acceptable (1,419)	Unacceptable (1,826)	Unacceptable (2,074)
Cherry Hill Road/Prosperity Drive	Acceptable (1,195)	Acceptable (1,050)	Unacceptable (1,648)	Acceptable (1,411)
New Hampshire Avenue/Michelson Road	Acceptable (1,073)	Acceptable (1,008)	Acceptable (1,192)	Unacceptable (1,530)
New Hampshire Avenue/Powder Mill Road	Acceptable (1,272)	Acceptable (1,400)	Acceptable (1,373)	Acceptable (1,444)
New Hampshire Avenue/Schindler	Acceptable (1,048)	Acceptable (870)	Acceptable (1,083)	Acceptable (1,039)

Intersection	Existing		No-Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Drive/Mahan Road				
New Hampshire Avenue/Lockwood Drive	Acceptable (1,223)	Acceptable (1,207)	Acceptable (1,415)	Acceptable (1,361)
Beltsville Drive/Powder Mill Road*	B (1,044)	C (1,299)	E (1,460)	D (1,421)
Beltsville Drive/Calverton Boulevard*	A (797)	A (846)	A (836)	A (849)
US 29 Fairland Road	Unacceptable (1,591)	Unacceptable (1,769)	Unacceptable (1,837)	Unacceptable (1,993)
US 29 /Musgrove Road	Acceptable (1,448)	Unacceptable (1,593)	Unacceptable (1,698)	Unacceptable (1,814)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (875)	Acceptable (819)	Acceptable (1,328)	Acceptable (1,304)
US 29 S.B. Ramp/Cherry Hill Road	Acceptable (1,096)	Acceptable (951)	Unacceptable (1,573)	Acceptable (1,286)
US 29/ Tech Road	Acceptable (1,448)	Acceptable (1,460)	Unacceptable (1,906)	Unacceptable (2,478)
US 29/ Industrial Parkway	Acceptable (1,343)	Acceptable (1,396)	Acceptable (1,397)	Unacceptable (1,499)
US 29/Stewart Lane	Acceptable (1,423)	Unacceptable (1,681)	Unacceptable (1,560)	Unacceptable (1,792)
US 29/ Lockwood Drive	Acceptable (1,475)	Acceptable (1,448)	Unacceptable (1,574)	Unacceptable (1,595)
Cherry Hill Road/Eastern Site Access	---	---	Acceptable (902)	Acceptable (1,261)

* These intersections are located in Prince George's County

Results of the analysis indicate that under the No-Action without the ICC Alternative most of the intersections analyzed are expected to operate at unacceptable LOSs during both or at least one peak hour. The intersections of New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Mahan Road, New Hampshire Avenue/Lockwood Drive, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Blvd, US 29 N.B. Ramp/Cherry Hill Road and Proposed Cherry Hill Road/Eastern Site Access are expected to operate at acceptable LOS during both the morning and evening peak hours.

Overall, most of the study intersections are expected to above capacity conditions under the No-Action conditions.

3.1.5 No-Action with Inter County Connector (ICC) – Traffic Operations Analysis

The volumes for the No-Action Alternative with ICC were projected based on the forecasts contained in the ICC Travel Analysis Technical Report (SHA, 2004). The No-Action Volumes without the ICC were adjusted based on the percent change rates calculated from the ICC Travel Analysis Technical Report to determine the No-Action with the ICC Volumes. These volumes were

further adjusted based on access points of developments and the level developments anticipated in the study area. Furthermore, the employees from the approved FDA development (7,719 employees) were redistributed to the roadway network based on the change in travel patterns that the ICC is expected to create. The distribution percentages used are presented under the Action Analysis.

The No-Action Volumes with the ICC are presented in Figure 5 and the LOS results are presented in Table 4 below. The CLV calculations sheets are attached in Appendix D.

Table 4. No Action Alternative with ICC LOS Results

Intersection	Existing		No-Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Cherry Hill Road/Powder Mill Road*	B (1,128)	C (1,251)	B (1,076)	E (1466)
Cherry Hill Road/Plum Orchard Drive	Acceptable (951)	Acceptable (1,055)	Unacceptable (1,586)	Acceptable (1,357)
Cherry Hill Road/Calverton Blvd./Broadbirch Dr	Acceptable (1,101)	Acceptable (1,419)	Unacceptable (1,631)	Unacceptable (1,626)
Cherry Hill Road/Prosperity Drive	Acceptable (1,195)	Acceptable (1,050)	Unacceptable (1,645)	Acceptable (1,138)
New Hampshire Avenue/Michelson Road	Acceptable (1,073)	Acceptable (1,008)	Acceptable (1,318)	Unacceptable (1,549)
New Hampshire Avenue/Powder Mill Road	Acceptable (1,272)	Acceptable (1,400)	Acceptable (1,433)	Acceptable (1,372)
New Hampshire Avenue/Schindler Drive/Mahan Road	Acceptable (1,048)	Acceptable (870)	Acceptable (1,178)	Acceptable (1,242)
New Hampshire Avenue/Lockwood Drive	Acceptable (1,223)	Acceptable (1,207)	Unacceptable (1,610)	Acceptable (1,275)
Beltsville Drive/Powder Mill Road*	B (1,044)	C (1,299)	D (1,362)	C (1287)
Beltsville Drive/Calverton Boulevard*	A (797)	A (846)	A (797)	A (834)
US 29 Fairland Road	Unacceptable (1,591)	Unacceptable (1,769)	Unacceptable (1,979)	Unacceptable (2,234)
US 29 /Musgrove Road	Acceptable (1,448)	Unacceptable (1,593)	Unacceptable (1,743)	Unacceptable (1,931)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (875)	Acceptable (819)	Acceptable (1,325)	Acceptable (1,157)
US 29 S.B. Ramp/Cherry Hill Road	Acceptable (1,096)	Acceptable (951)	Unacceptable (1,637)	Acceptable (1,150)
US 29/ Tech Road	Acceptable (1,448)	Acceptable (1,460)	Unacceptable (1,923)	Unacceptable (3,044)
US 29/ Industrial Parkway	Acceptable (1,343)	Acceptable (1,396)	Unacceptable (1,557)	Unacceptable (1,845)
US 29/Stewart Lane	Acceptable (1,423)	Unacceptable (1,681)	Unacceptable (1,800)	Unacceptable (2,164)

Intersection	Existing		No-Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
US 29/ Lockwood Drive	Acceptable (1,475)	Acceptable (1,448)	Acceptable (1,231)	Unacceptable (1,814)
Cherry Hill Road/Eastern Site Access	---	---	Acceptable (849)	Acceptable (1,056)

* These intersections are located in Prince George's County

Most of the intersections analyzed are expected to operate at unacceptable LOS during both or at least one peak hour. The intersections of Cherry Hill Road/Powder Mill Road, New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Mahan Road, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Blvd, US 29 N.B. Ramp/Cherry Hill Road and Proposed Cherry Hill Road/Eastern Site Access are expected to operate at acceptable LOS during both the morning and evening peak hours.

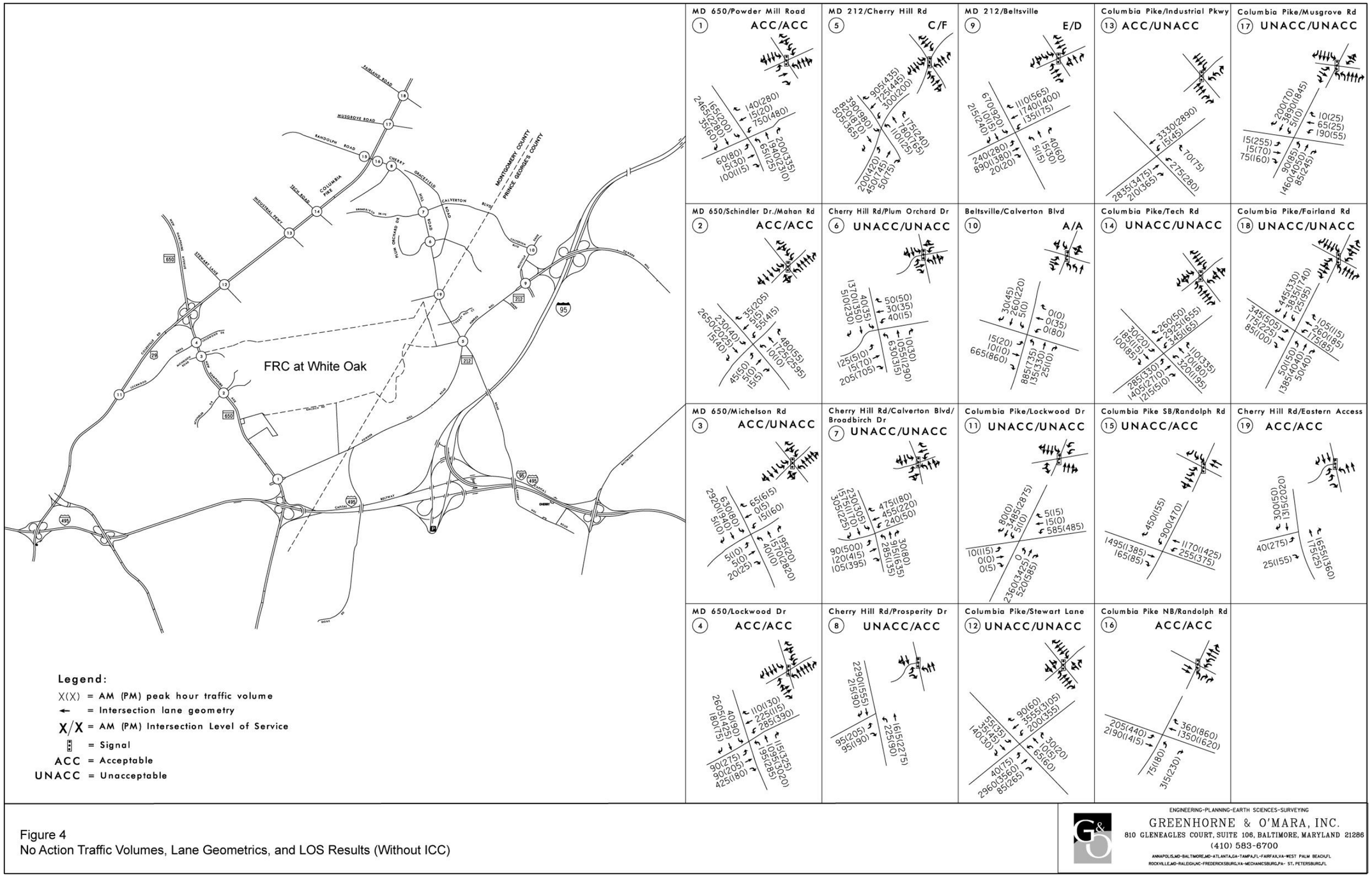


Figure 4
No Action Traffic Volumes, Lane Geometrics, and LOS Results (Without ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
ANNAPOLIS,MD-BALTIMORE,MD-ATLANTA,GA-TAMPA,FL-FAIRFAX,VA-WEST PALM BEACH,FL
ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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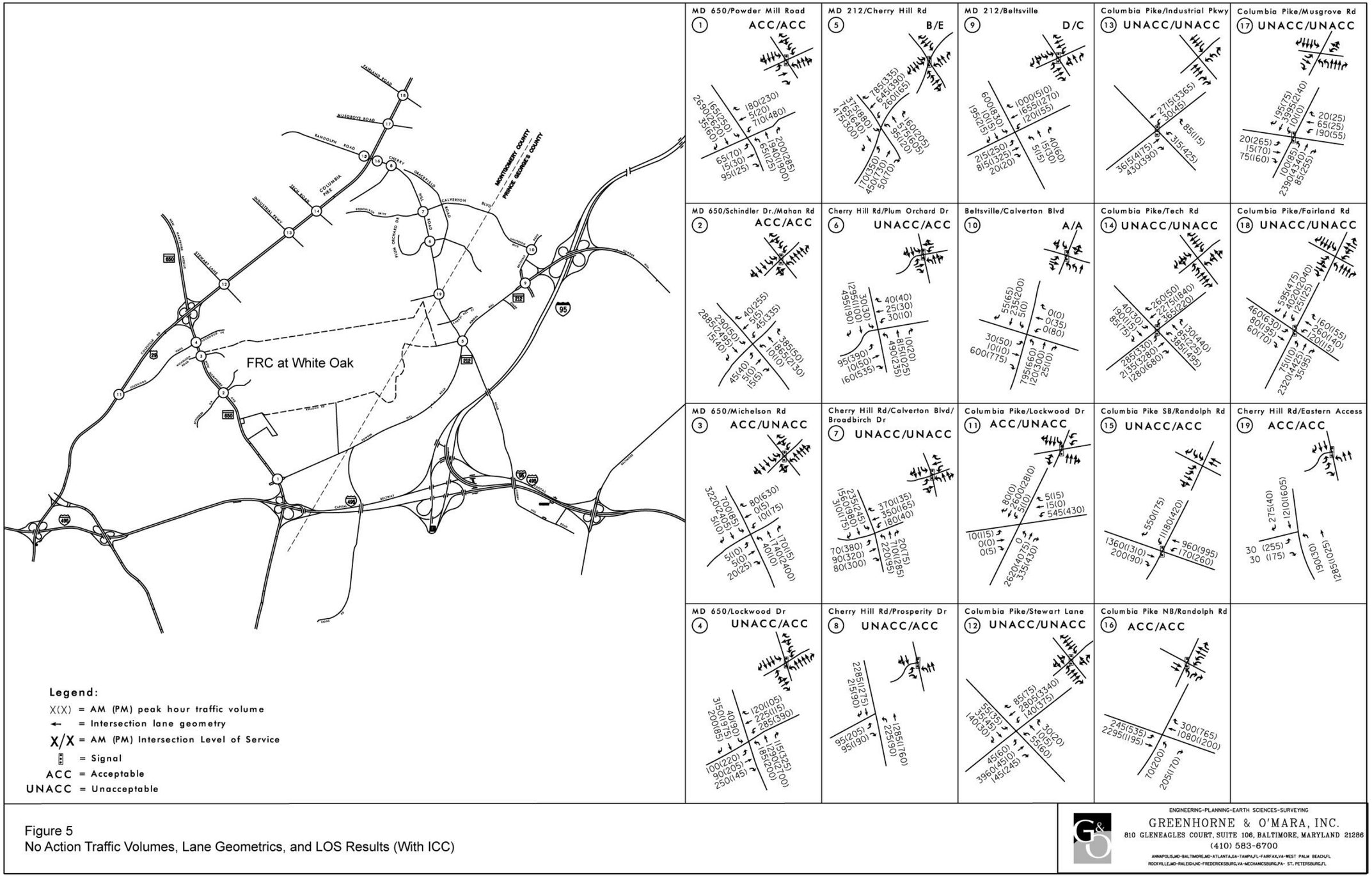

Figure 5
No Action Traffic Volumes, Lane Geometrics, and LOS Results (With ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
ANNAPOLIS,MD-BALTIMORE,MD-ATLANTA,GA-TAMPA,FL-FAIRFAX,VA-WEST PALM BEACH,FL
ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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3.2 Proposed Action Analysis

Under the Proposed Action, the number of employees at the FDA White Oak Campus would increase from the previously approved 7,719 to 8,889. This constitutes an increase of 1,170 employees. These employees are expected to be new hires and not relocations from existing FDA locations.

The National Capital Planning Commission (NCPC) Comprehensive Plan for the National's Capital: Federal Elements (2004) has established a goal of providing one parking spaces for every two employees. The 2006 Master Plan for the FDA White Oak Campus had a parking ratio of one parking space for every 1.5 employees. For the purposes of this study, it has been assumed that the parking ratio would maintain the 2006 Master Plan parking ratio of one parking space for every 1.5 employees.

The 2006 FDA Master Plan development also allows for 500 visitor parking spaces. However, the FDA is experiencing large numbers of visitors on a daily basis at the FDA White Oak Campus, and this is expected to continue as the consolidation continues. Thus FDA would like to provide an additional 500 visitor parking spaces, for a total of 1,000 visitor spaces. The Transportation Management Plan (TMP) provides more information on visitor parking.

Access to the FDA White Oak Campus would be provided by three access points; two along New Hampshire Avenue and one along Cherry Hill Road at the following locations:

- Via Schindler Drive/Mahan Road
- Via Michelson Road
- Via new eastern access onto Cherry Hill Road

The number of vehicle-trips generated by the proposed development was estimated based on the travel patterns of the existing FDA employees, which were determined based on a survey of approximately 7,235 employees, and on discussions with the Montgomery County and Prince George's County staff. Table 5 presents the trip generation for the 1,170 new employees at this site. As can be seen in Table 5, the FDA White Oak Campus is expected to generate approximately 777 vehicle trips in the morning peak hour and approximately 776 vehicles trips in the evening peak hour.

Table 5. FDA White oak Campus Trip Generation

	morning	evening
Employees	1,170	1,170
Percent Absentees	10	10
Trips	1,053	1,053
Proposed Additional Parking Spaces	780[1]	780[1]
Percent in Peak Hour (peak direction)	42%[2]	40%[2]
Peak Hour Vehicle Trips (peak direction)	328	312
Peak Hour Vehicle Trips (non-peak direction)	49[3]	64[4]
Peak Hour Visitor (peak direction)	400[5]	400[5]
Total Vehicle Trips	**777**	**776**

[1] The total number of parking spaces provided on site at the new FDA facility
[2] Peak hour percentages have been based on the employee survey. For a conservative analysis the peak hour percentages have been increased by 5 percent
[3] Peak direction percentage for "outbound) based on in/out ratio provided by M-NCPPC guidelines for office 87 percent/13 percent
[4] Peak direction percentage for "inbound" based on in/out ratio provided by M-NCPPC guidelines for office land use of 83 percent/17 percent
[5] The FDA site is proposing an additional 500 visitor parking spaces. In order to perform a conservative analysis, it has been assumed that approximately 80 percent of the total visitors will arrive and depart during the peak hour

3.2.1 Site Trip Distribution

The trip distribution was based on the trip distribution percentages presented in Table E-6 of the LATR for Super District 6 as well as the existing/proposed roadway network and the existing/proposed access points. The trip distribution percentages are presented in Figure 6 and Figure 7 for the 'without ICC scenario' and 'with ICC scenario', respectively.

- Site Trip Distribution without ICC
    - 16 percent to/from the west along I-495
    - 10 percent to/from the west along University Boulevard (MD 193)
    - 4 percent to/from the south along Colesville Road (US 29)
    - 3 percent to/from the south along New Hampshire Avenue
    - 20 percent to/from the east along I-495
    - 6 percent to/from the north along I-95
    - 10 percent to/from the north along US 29
    - 15 percent to/from the noth/west along Randolph Road
    - 15 percent to/from the north along New Hampshire Avenue
    - 1 percent to/from the south along Cherry Hill Road
- Site Trip Distribution with ICC
    - 10 percent to/from the west along I-495
    - 1 percent to/from the west along University Boulevard (MD 193)
    - 4 percent to/from the south along Colesville Road (US 29)
    - 3 percent to/from the south along New Hampshire Avenue
    - 20 percent to/from the east along I-495
    - 6 percent to/from the north along I-95
    - 20 percent to/from the north along US 29
    - 10 percent to/from the west along Randolph Road
    - 25 percent to/from the north along New Hampshire Avenue
    - 1 percent to/from the south along Cherry Hill Road

3.2.2 Site Trip Assignment

The trip generation estimated for the FDA White Oak Campus was distributed along the study area roadways/intersections based on the trip distribution estimates presented above for two different scenarios. The site trip assignments for Without ICC and With ICC are presented in Figure 8 and Figure 9, respectively.

3.2.3 Action without Inter County Connector (ICC) – Operations Analysis

Impacts from the Action Alternatives without ICC Traffic Volumes were determined by adding the Site Traffic Volumes without ICC (Figure 10) to the No-Action Traffic Volumes without ICC (Figure 4). Intersection capacity analyses were performed at the study intersections and the results are presented in Figure 10 and Table 6.

Table 6. Action Alternative without ICC LOS Results

Intersection	No-Action		Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Cherry Hill Road/Powder Mill Road*	C (1,238)	F (1,660)	C (1,244)	F (1,684)
Cherry Hill Road/Plum Orchard Drive	Unacceptable (1,817)	Unacceptable (1,723)	Unacceptable (1,964)	Unacceptable (1,880)
Cherry Hill Road/Calverton Boulevard/Broadbirch Drive	Unacceptable (1,826)	Unacceptable (2,074)	Unacceptable (1,919)	Unacceptable (2,164)
Cherry Hill Road/Prosperity Drive	Unacceptable (1,648)	Acceptable (1,411)	Unacceptable (1,740)	Unacceptable (1,501)
New Hampshire Avenue/Michelson Road	Acceptable (1,192)	Unacceptable (1,530)	Acceptable (1,239)	Unacceptable (1,759)
New Hampshire Avenue/Powder Mill Road	Acceptable (1,373)	Acceptable (1,444)	Acceptable (1,423)	Acceptable (1,451)
New Hampshire Avenue/Schindler Drive/Mahan Road	Acceptable (1,083)	Acceptable (1,039)	Acceptable (1,089)	Acceptable (1,125)
New Hampshire Avenue/Lockwood Drive	Acceptable (1,415)	Acceptable (1,361)	Unacceptable (1,494)	Acceptable (1,430)
Beltsville Drive/Powder Mill Road*	E (1,460)	D (1,421)	E (1,485)	D (1,424)
Beltsville Drive/Calverton Boulevard*	A (836)	A (849)	A (836)	A (849)
US 29 Fairland Road	Unacceptable (1,837)	Unacceptable (1,993)	Unacceptable (1,865)	Unacceptable (2,021)
US 29 /Musgrove Road	Unacceptable (1,698)	Unacceptable (1,814)	Unacceptable (1,726)	Unacceptable (1,841)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (1,328)	Acceptable (1,304)	Acceptable (1,420)	Acceptable (1,369)
US 29 S.B. Ramp/Cherry Hill Road	Unacceptable (1,573)	Acceptable (1,286)	Unacceptable (1,670)	Acceptable (1,294)
US 29/ Tech Road	Unacceptable (1,906)	Unacceptable (2,478)	Unacceptable (1,782)	Unacceptable (2,020)
US 29/ Industrial Parkway	Acceptable (1,397)	Unacceptable (1,499)	Acceptable (1,401)	Unacceptable (1,502)
US 29/Stewart Lane	Unacceptable (1,560)	Unacceptable (1,792)	Unacceptable (1,564)	Unacceptable (1,796)

Intersection	No-Action		Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
US 29/ Lockwood Drive	Unacceptable (1,574)	Unacceptable (1,595)	Unacceptable (1,581)	Unacceptable (1,615)
Cherry Hill Road/Eastern Site Access	Acceptable (902)	Acceptable (1,261)	Acceptable (952)	Acceptable (1,368)

* These intersections are located in Prince George's County

With the 1,170 new FDA employees, most intersections are expected to continue operating at above unacceptable LOSs in the peak hours. The intersections of Cherry Hill Road/Eastern Access, New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Schindler/Mahan Road, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Boulevard and US 29 N.B. Ramp/Cherry Hill Road are expected to operate at acceptable LOS during both the morning and evening peak hours.

3.2.4 Action with Inter County Connector (ICC) – Operations Analysis

Impacts from Action Alternatives with ICC Traffic Volumes were determined by adding the Site Traffic Volumes with ICC (Figure 11) to the No-Action Traffic Volumes with ICC (Figure 5). Intersection capacity analyses were performed at the study intersections and the results are presented in Figure 11 and Table 7.

Table 7. Action Alternative with ICC LOS Results

Intersection	No-Action		Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Cherry Hill Road/Powder Mill Road*	B (1,076)	E (1,466)	B (1,085)	E (1,514)
Cherry Hill Road/Plum Orchard Drive	Unacceptable (1,586)	Acceptable (1,357)	Unacceptable (1,660)	Acceptable (1,365)
Cherry Hill Rd/Calverton Blvd./Broadbirch Dr	Unacceptable (1,631)	Unacceptable (1,626)	Unacceptable (1,705)	Unacceptable (1,695)
Cherry Hill Road/Prosperity Drive	Unacceptable (1,645)	Acceptable (1,138)	Unacceptable (1,719)	Acceptable (1,207)
New Hampshire Avenue/Michelson Road	Acceptable (1,318)	Unacceptable (1,549)	Acceptable (1,365)	Unacceptable (1,785)
New Hampshire Avenue/Powder Mill Road	Acceptable (1,433)	Acceptable (1,372)	Acceptable (1,442)	Acceptable (1,429)
New Hampshire Avenue/Schindler Drive/Mahan Road	Acceptable (1,167)	Acceptable (1,218)	Acceptable (1,172)	Acceptable (1,332)
New Hampshire Avenue/Lockwood Drive	Unacceptable (1,610)	Acceptable (1,275)	Unacceptable (1,719)	Acceptable (1,339)
Beltsville Drive/Powder Mill Road*	D (1362)	C (1287)	D (1406)	C (1292)

Intersection	No-Action		Action	
	morning (CLV)	evening (CLV)	morning (CLV)	evening (CLV)
Beltsville Drive/Calverton Boulevard*	A (797)	A (834)	A (797)	A (834)
US 29 Fairland Road	Unacceptable (1,979)	Unacceptable (2,234)	Unacceptable (2,033)	Unacceptable (2,286)
US 29 /Musgrove Road	Unacceptable (1,743)	Unacceptable (1,931)	Unacceptable (1,797)	Unacceptable (1,983)
US 29 N.B. Ramp/Cherry Hill Road	Acceptable (1,325)	Acceptable (1,157)	Acceptable (1,400)	Acceptable (1,366)
US 29 S.B. Ramp/Cherry Hill Road	Unacceptable (1,637)	Acceptable (1,150)	Unacceptable (1,722)	Acceptable (1,159)
US 29/ Tech Road	Unacceptable (1,884)	Unacceptable (2,463)	Unacceptable (1,884)	Unacceptable (2,492)
US 29/ Industrial Parkway	Unacceptable (1,557)	Unacceptable (1,845)	Unacceptable (1,557)	Unacceptable (1,874)
US 29/Stewart Lane	Unacceptable (1,800)	Unacceptable (2,164)	Unacceptable (1,800)	Unacceptable (2,193)
US 29/ Lockwood Drive	Acceptable (1,231)	Unacceptable (1,814)	Acceptable (1,231)	Unacceptable (1,822)
Cherry Hill Road/Eastern Site Access	Acceptable (849)	Acceptable (1,056)	Acceptable (948)	Acceptable (1,156)

* These intersections are located in Prince George's County

As can be seen in Table 7, with the 1,170 FDA employees, most intersections are expected to continue operating at unacceptable LOS during the peak hours. Several intersection, however, are expected to operate at acceptable LOS during both the morning and evening peak hours and they are the intersections of Cherry Hill Road/Eastern Access, Cherry Hill Road/Powder Mill Road, New Hampshire Avenue/Powder Mill Road, New Hampshire Avenue/Schindler/Mahan Road, Beltsville Drive/Powder Mill Road, Beltsville Drive/Calverton Boulevard, and US 29 N.B. Ramp/Cherry Hill Road.

It should be noted that most intersections analyzed are expected to operate at unacceptable LOS either with or without the 1,170 FDA employees. Major improvements will be required at most of the intersections to bring them to acceptable LOS. Improvement will be required at several intersections to bring them to No-Action CLVs. These improvements are discussed in the Section 4 below.

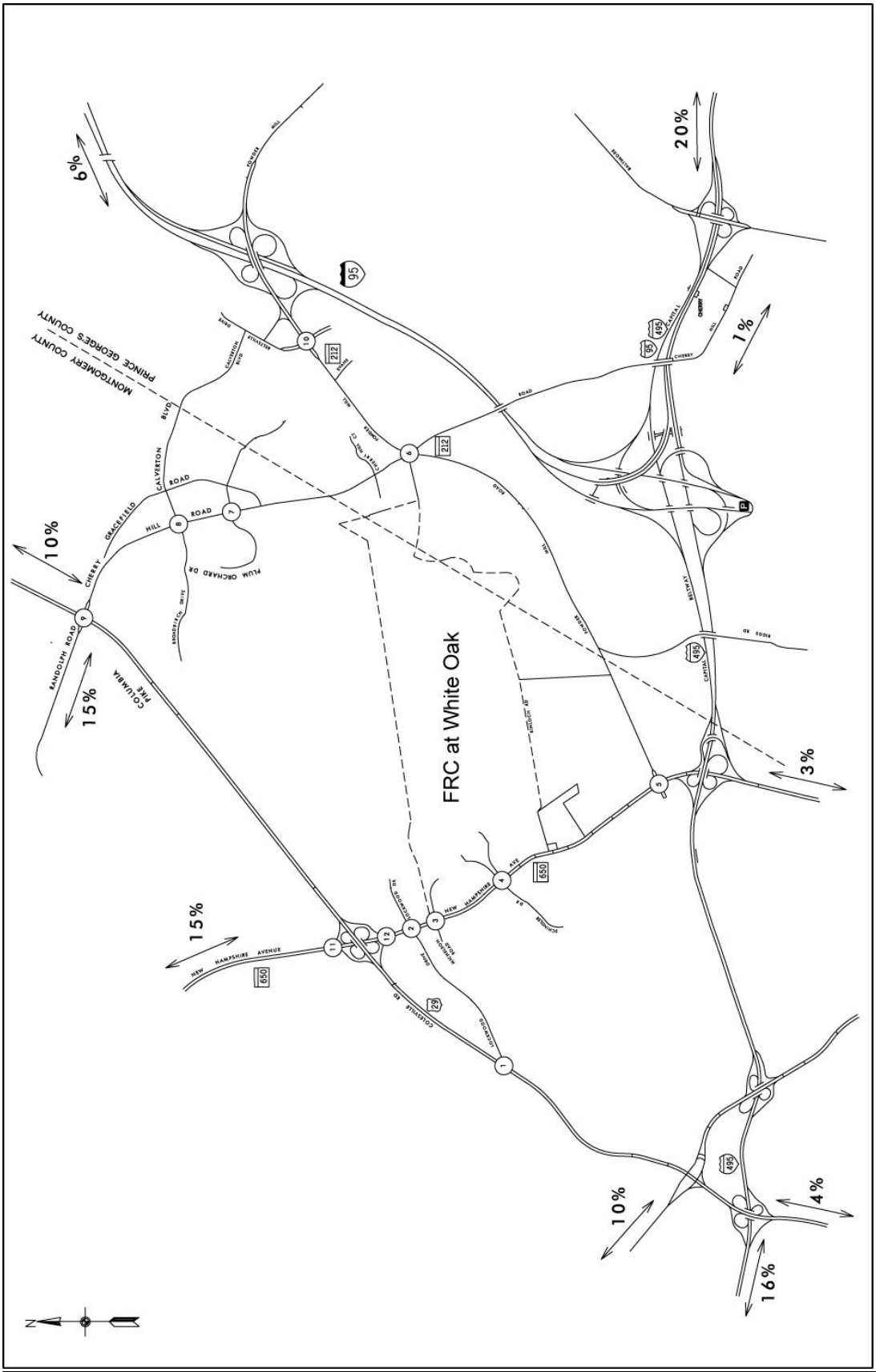

Figure 6
Trip Distribution Percentages
(Per FDA employee zip code)
Without ICC

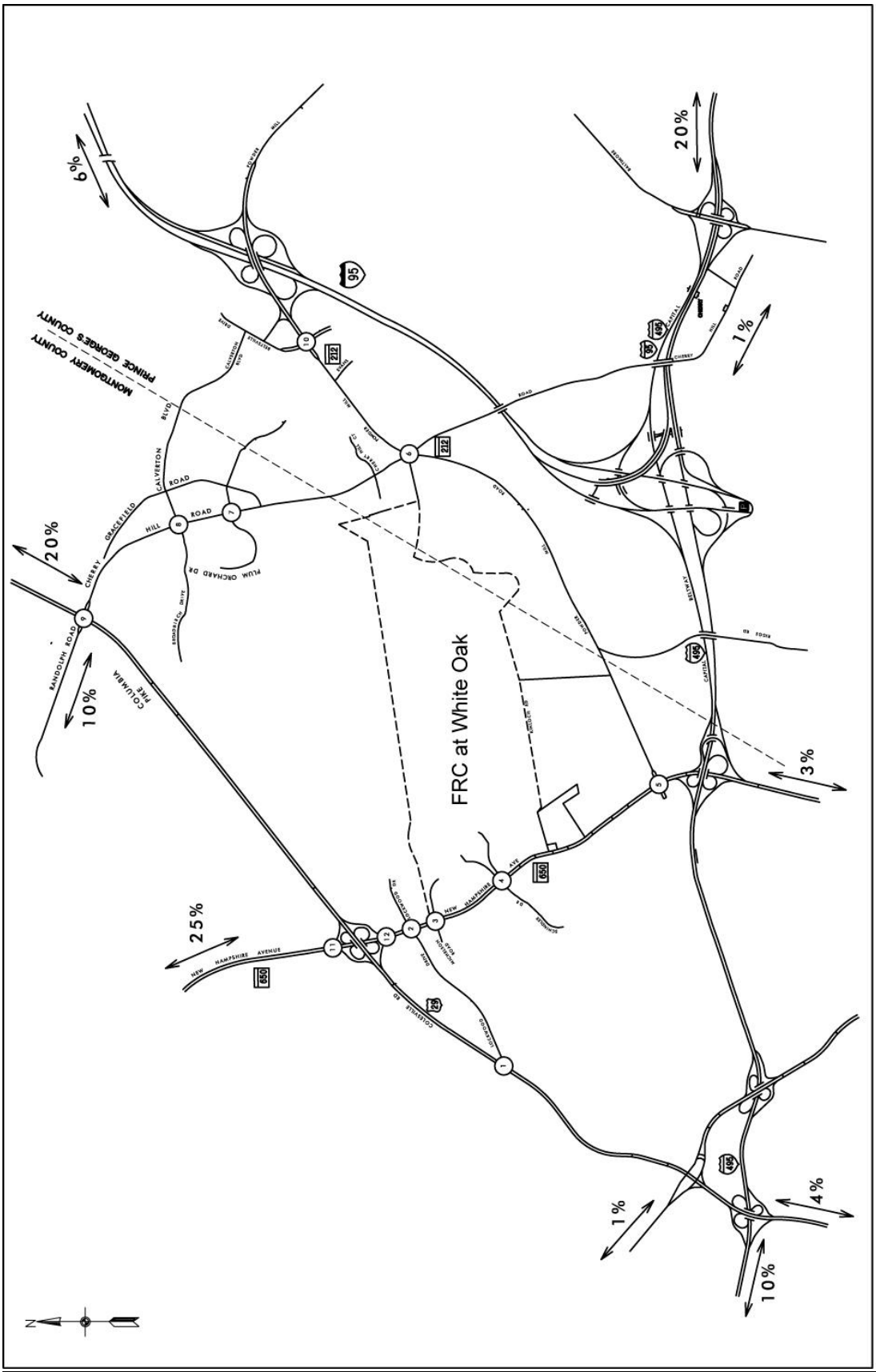

Figure 7
Trip Distribution Percentages
(Per FDA employee zip code)
With ICC

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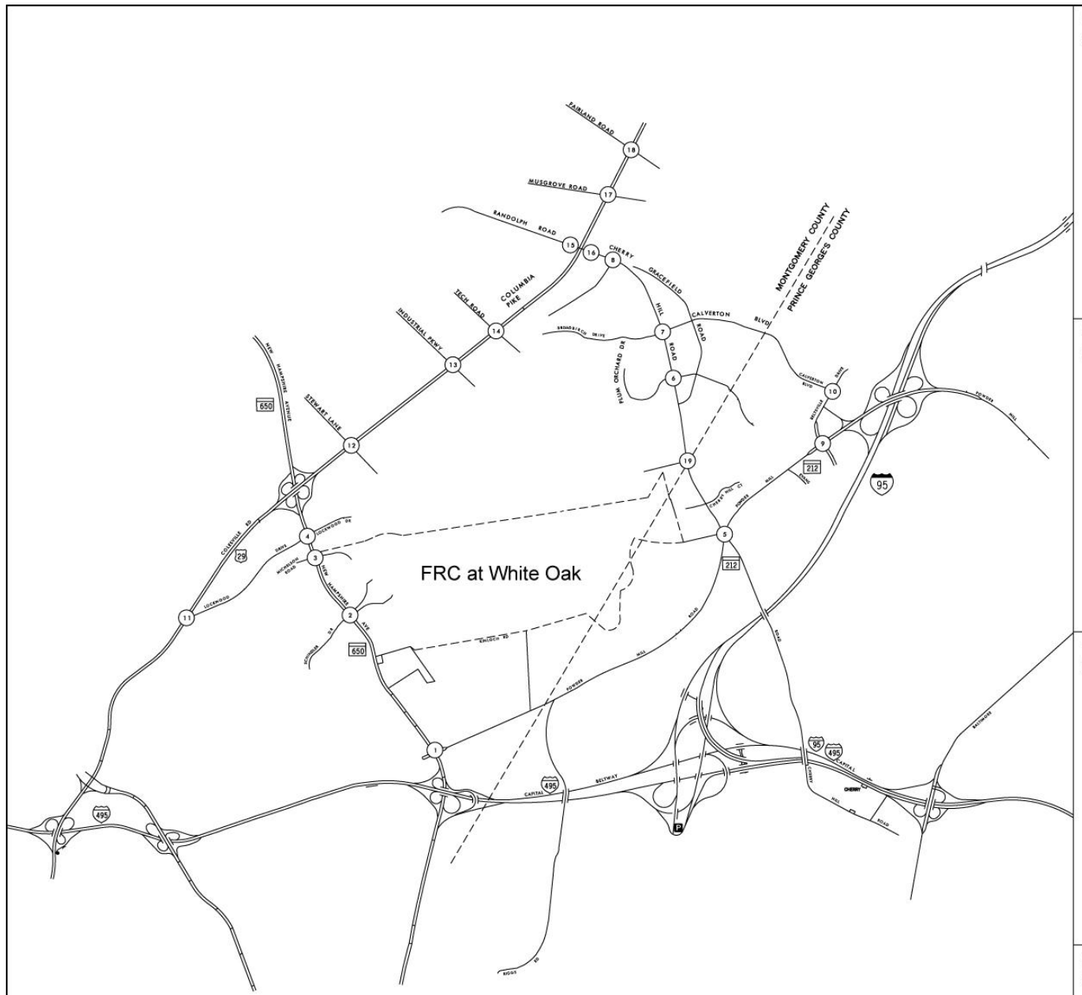

Legend:

X(X) = AM (PM) peak hour traffic volume
← = Intersection lane geometry
X/X = AM (PM) Intersection Level of Service
= Signal
ACC = Acceptable
UNACC = Unacceptable

MD 650/Powder Mill Road (1)
15(220)
225(20)

MD 212/Cherry Hill Rd (5)
45(5)
5(40)
0(5)
5(0)

MD 212/Beltsville (9)
45(5)
5(40)

Columbia Pike/Industrial Pkwy (13)
10(0)
0(10)

Columbia Pike/Musgrove Rd (17)
75(5)
5(75)

MD 650/Schindler Dr./Mahan Rd (2)
5(85)
85(5)
5(65)
10(155)
160(15)
65(5)

Cherry Hill Rd/Plum Orchard Dr (6)
175(15)
10(170)

Beltsville/Calverton Blvd (10)

Columbia Pike/Tech Rd (14)
10(0)
0(10)

Columbia Pike/Fairland Rd (18)
75(5)
5(75)

MD 650/Michelson Rd (3)
195(20)
85(5)
15(190)
5(65)
65(5)
5(85)

Cherry Hill Rd/Calverton Blvd/ Broadbirch Dr (7)
175(15)
10(170)

Columbia Pike/Lockwood Dr (11)
10(110)
5(45)
80(5)
80(10)

Columbia Pike SB/Randolph Rd (15)
65(5)
110(10)
5(105)

Cherry Hill Rd/Eastern Access (19)
175(15)
10(170)
50(5)
5(45)

MD 650/Lockwood Dr (4)
200(15)
80(10)
15(230)
5(45)

Cherry Hill Rd/Prosperity Dr (8)
175(15)
10(170)

Columbia Pike/Stewart Lane (12)
10(0)
0(10)

Columbia Pike NB/Randolph Rd (16)
175(15)
5(65)
5(105)

Figure 8
Site Trip Assignment
(Without ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
ANNAPOLIS,MD-BALTIMORE,MD-ATLANTA,GA-TAMPA,FL-FAIRFAX,VA-WEST PALM BEACH,FL
ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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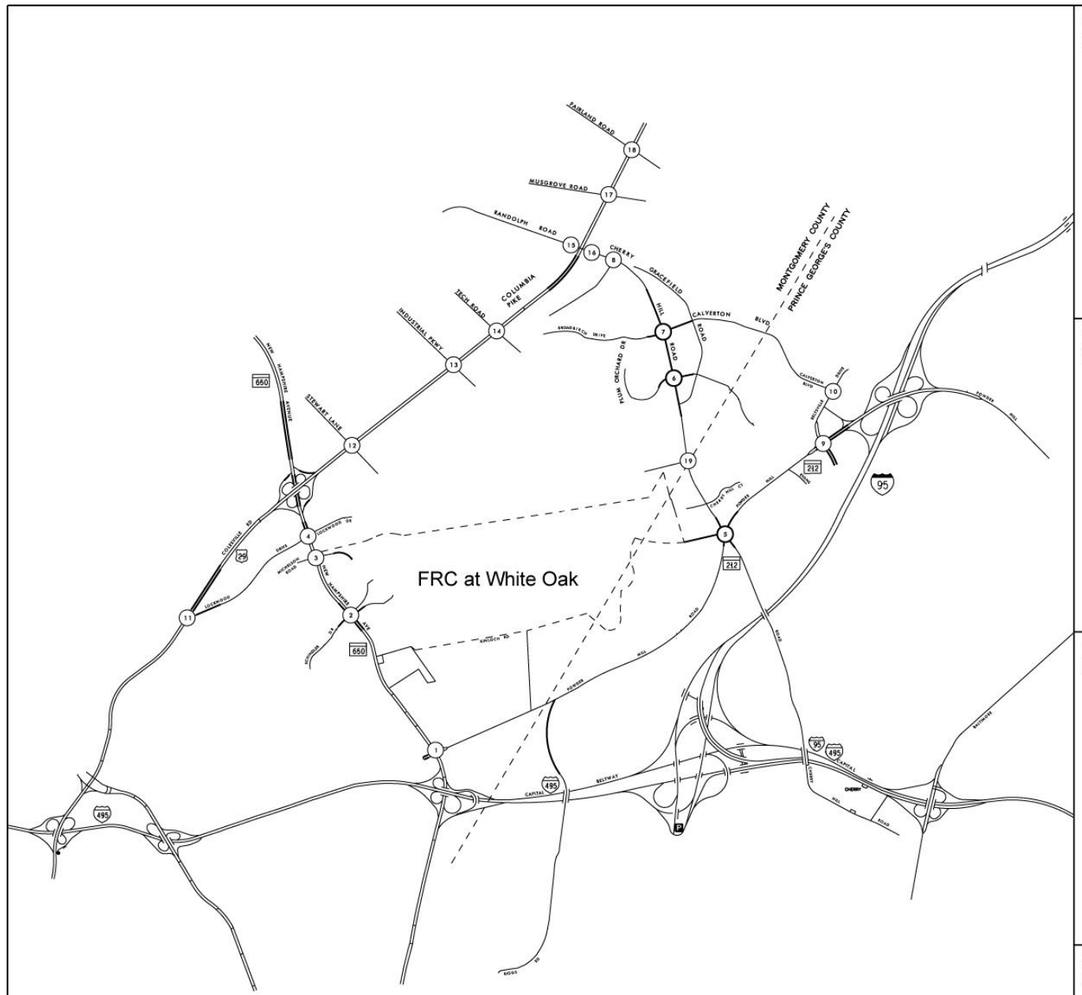

Legend:

X(X) = AM (PM) peak hour traffic volume
← = Intersection lane geometry
X/X = AM (PM) Intersection Level of Service
= Signal
ACC = Acceptable
UNACC = Unacceptable

MD 650/Powder Mill Road (1) E/C
151(155) → ← 170(15)

MD 212/Cherry Hill Rd (5) A/C
5(80) → 0(0) ← 80(110) ← 10(0)

MD 212/Beltsville (9) E/C
5(80) → ← 80(10)

Columbia Pike/Industrial Pkwy (13)
80(5) → ← 0(80)

Columbia Pike/Musgrove Rd (17)
10(140) ← 145(15)

MD 650/Schindler Dr./Mahan Rd (2) D/B
100(5) 5(45) → 5(100) ← 10(110) ← 20(10) 50(5)

Cherry Hill Rd/Plum Orchard Dr (6) A/C
140(15) → ← 15(130)

Beltsville/Calverton Blvd (10) D/B

Columbia Pike/Tech Rd (14)
80(5) → ← 0(80)

Columbia Pike/Fairland Rd (18)
10(140) ← 145(15)

MD 650/Michelson Rd (3)
230(20) 100(5) → ← 10(235) 5(45) ← 50(5) 5(100)

Cherry Hill Rd/Calverton Blvd/ Broadbirch Dr (7) F/E
140(15) → ← 15(130)

Columbia Pike/Lockwood Dr (11)
35(5) 35(5) → ← 0(55) 0(20)

Columbia Pike SB/Randolph Rd (15)
65(5) 10 → ← 75(10)

Cherry Hill Rd/Eastern Access (19)
15(130) 5(90) → ← 140(15) ← 90(10)

MD 650/Lockwood Dr (4) D/F
295(20) → 35(5) → ← 15(35) 0(20)

Cherry Hill Rd/Prosperity Dr (8) B/B
140(15) → ← 15(130)

Columbia Pike/Stewart Lane (12)
80(5) → ← 0(80)

Columbia Pike NB/Randolph Rd (16)
140(15) → ← 10(70) 5(60) 0(10)

Figure 9
Site Trip Assignment (With ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
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ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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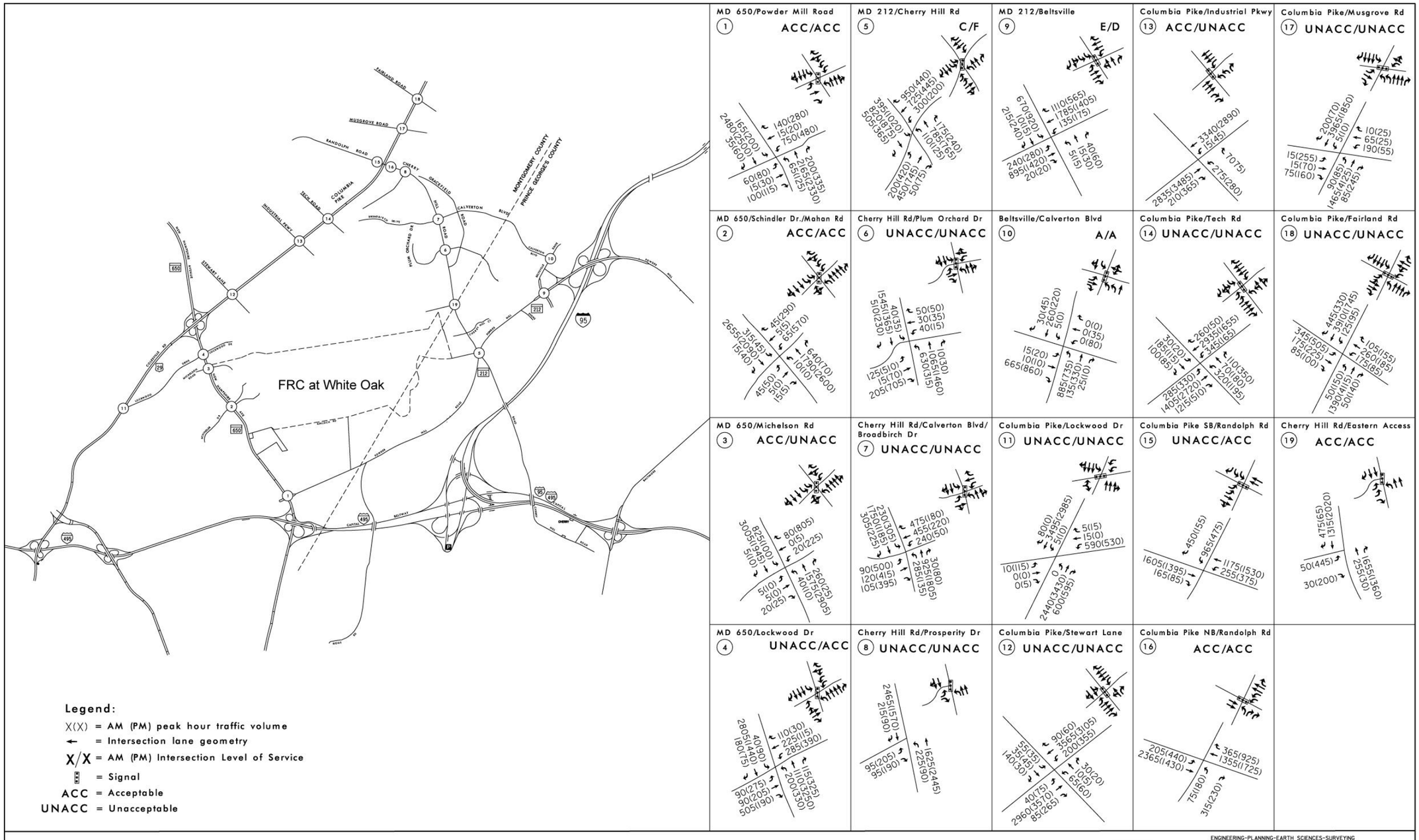

Figure 10
Action Traffic Volumes, Lane Geometries, and LOS Results
(Without ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
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ROCKVILLE,MD-RALEIGH,NC-FREDERICKSBURG,VA-MECHANICSBURG,PA- ST. PETERSBURG,FL

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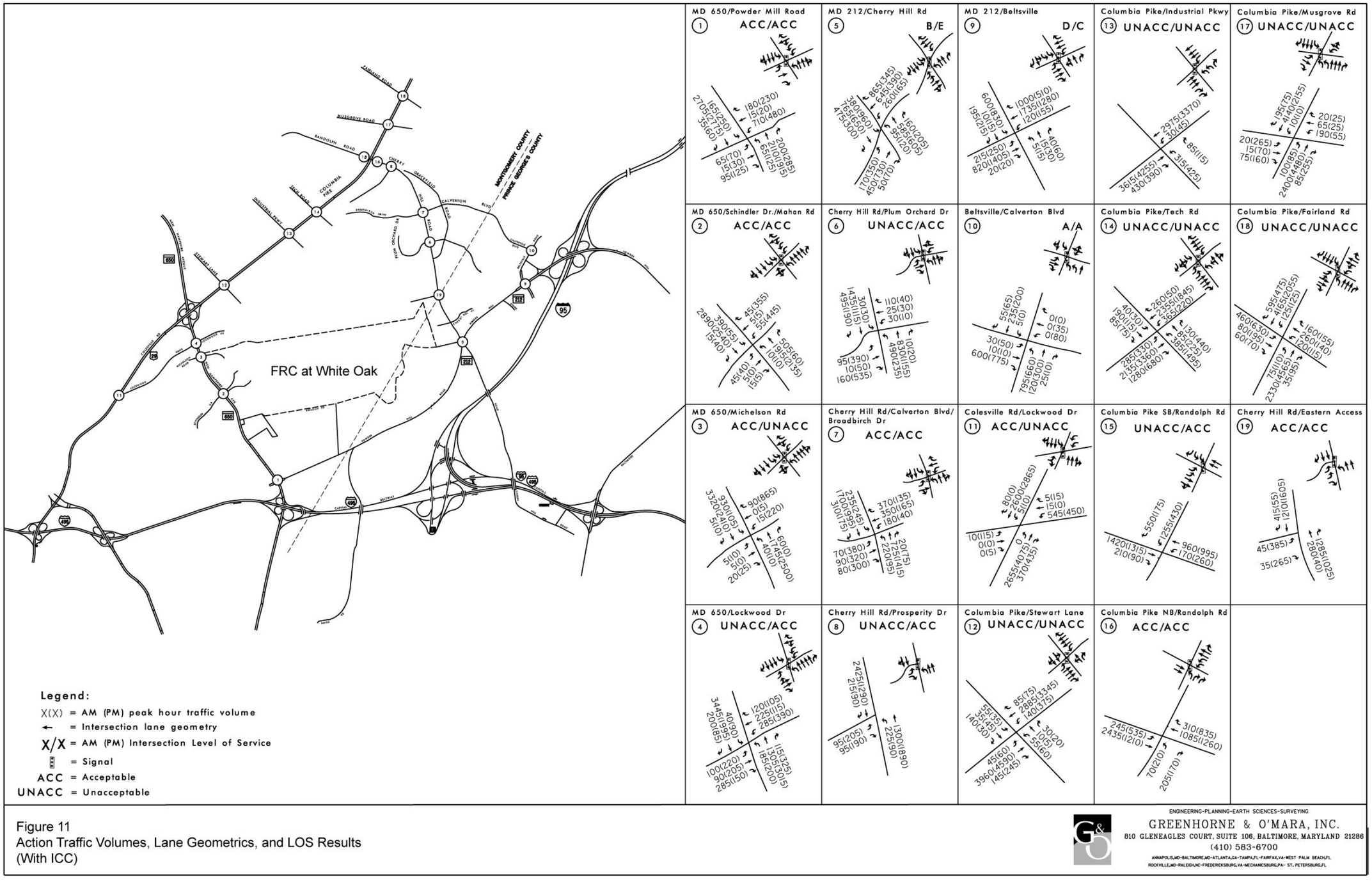

Figure 11
Action Traffic Volumes, Lane Geometries, and LOS Results
(With ICC)

ENGINEERING-PLANNING-EARTH SCIENCES-SURVEYING
GREENHORNE & O'MARA, INC.
810 GLENEAGLES COURT, SUITE 106, BALTIMORE, MARYLAND 21286
(410) 583-6700
ANNAPOLIS,MD-BALTIMORE,MD-ATLANTA,GA-TAMPA,FL-FAIRFAX,VA-WEST PALM BEACH,FL
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4. Mitigation Measures

Major improvements would be required at most of the intersections to bring them to acceptable levels of service whether under the 2006 Master Plan or the Master Plan Update alternatives. The following mitigation measures are recommended, even though roadway improvements are not under the jurisdiction of GSA and GSA cannot fund the transportation improvements.

4.1 Improve Operational Conditions at Intersections

A majority of the intersections in the study area are expected to operate at an unacceptable LOS. With the ICC, many intersections along US 29 are expected to operate with a higher CLV as compared to without the ICC. Many of the intersections along Cherry Hill Road, however, are expected to operate with a lower CLV.

Even though roadway improvements are not under the jurisdiction of GSA and GSA cannot fund the transportation improvements, Table 18 shows the roadway improvements that are recommended to improve traffic conditions based on an analysis of the traffic conditions:

Table 8. Recommended Roadway Improvements

Intersection	No-Action Alternative (2006 Master Plan)	Alternatives 2 & 3 (Master Plan Update)	
		Without the ICC	With the ICC
Cherry Hill Road/Powder Mill Road			
Provide an exclusive right turn lane along Powder Mill Road		X	X
Cherry Hill Road/Plum Orchard Drive			
Provide an exclusive southbound right turn lane along Cherry Hill Road	X	X	X
Cherry Hill Rd/Calverton Blvd./Broadbirch Dr			
Provide an exclusive southbound right turn lane along Cherry Hill Road	X	X	X
Provide an exclusive right turn lane along Broadbirch Drive	X	X	X
Cherry Hill Road/Prosperity Drive			
Provide an additional eastbound left turn lane from Prosperity Drive to northbound Cherry Hill Road		X	X
Provide an exclusive southbound right turn lane along Cherry Hill Road		X	
New Hampshire Avenue/Michelson Road			
Convert the right turn lane along westbound Michelson Road to a free-flow right turn lane		X	X
US 29 Fairland Road/Musgrove Road			

Intersection	No-Action Alternative (2006 Master Plan)	Alternatives 2 & 3 (Master Plan Update)	
		Without the ICC	With the ICC
The interchange as proposed by SHA (CTP 2008-2013) should be constructed*		X	X
US 29/ Tech Road; US 29/Stewart Lane			
The interchange as proposed by SHA (CTP 2008-2013) should be constructed		X	X
US 29/ Lockwood Drive			
Provide an additional eastbound left turn lane from driveway onto northbound US 29		X	X

*The Consolidated Transportation Program (CTP) is Maryland's six-year capital budget for transportation projects. The Capital Program includes major and minor projects for the Maryland Department of Transportation and the modal agencies and related authorities.

4.2 Transportation Management Plan (TMP)

The Master Plan Update action analysis presented above includes the implementation of a Transportation Management Plan (TMP). The site trip generation for the 1,170 FDA employees is based on the parking provided on site, which includes 1 parking space for every 1.5 employees, thus inherent in the analysis is the need to provide the employees who will not have parking spaces with viable alternative modes of transportation. Therefore, the FRC White Oak Campus has implemented a TMP which seeks to reduce the number of single occupancy vehicles and encourage alternate modes of traveling to work.

An update to the FDA TMP has been prepared. In order to update the TMP, an employee survey was completed in December 2007. Separate surveys were completed by the employees currently at the White Oak Campus and the employees slated to move to the Campus. Travel characteristics as well as the TMP strategies which are in place as of December 2007 were analyzed. Overall, the FDA is meeting or exceeding the goals outlined in the 2005 TMP. As of December 2007, the FDA employees at the FRC White Oak Campus have an average vehicle occupancy (AVO) of 1.27. FDA is dedicated to continue on this path and obtain an AVO of 1.5 by 2012. Strategies to attain this AVO have been outlined in the TMP. The following strategies are either in place or are in the process of being implemented:

- FDA employees eligible to receive Transit Subsidies
- FDA provides shuttle service from Silver Spring, Twinbrook, and College Park Metrorail stations and other FDA locations
- FDA also runs a circulator shuttle which provides service within the FDA Campus
- FDA will provide Carpool/Vanpool incentives such as preferred parking, and guaranteed Ride Home service
- An On-Site Transit Stop will be provided
- Telecommuting programs are and will continue to be provided
- FDA provides Bicycling/Walking-to-work incentives
- FDA employ a full time Employee Transportation Coordinator

5. Conclusions

FDA is proposing to increase its employee population from 7,719 employees to 8,889 employees by 2012 as part of its headquarters consolidation project at the FDA White Oak Campus which is located in White Oak, Maryland. This is an increase of 1,170 employees. The FDA is also proposing to increase its visitor parking by an additional 500 spaces, for a total of 1,000 visitor spaces. This development is expected to add approximately 777 trips during the morning peak hour and 776 trips during the evening peak hour.

The ICC is expected to be completed by 2012; however, a majority of the FDA employees are expected to be on site before the completion of the ICC. Thus, two scenarios were investigated; one scenario with the ICC and another without the ICC.

Overall, under both scenarios, a majority of the study intersections are expected to operate at or above capacity conditions. Results of the analysis indicate that with the addition of 1,170 new FDA employees at the FDA Campus, most intersections are expected to continue operating above unacceptable LOSs during peak hours. With some improvements, however, the trips from the additional FDA employees can be mitigated. These improvements are outlined in the Mitigation Measure section of the report.

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6. References

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7. List of Preparers

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Appendix A: Traffic Counts

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Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6558

Weather: SUNNY
Counted By: ALAN
Town: BELTSVILLE
County: PRINCE GEORGE"S

Site Name : Beltsville Rd @ Calverton Blvd
Site Code : 00000000
Start Date : 10/18/2007

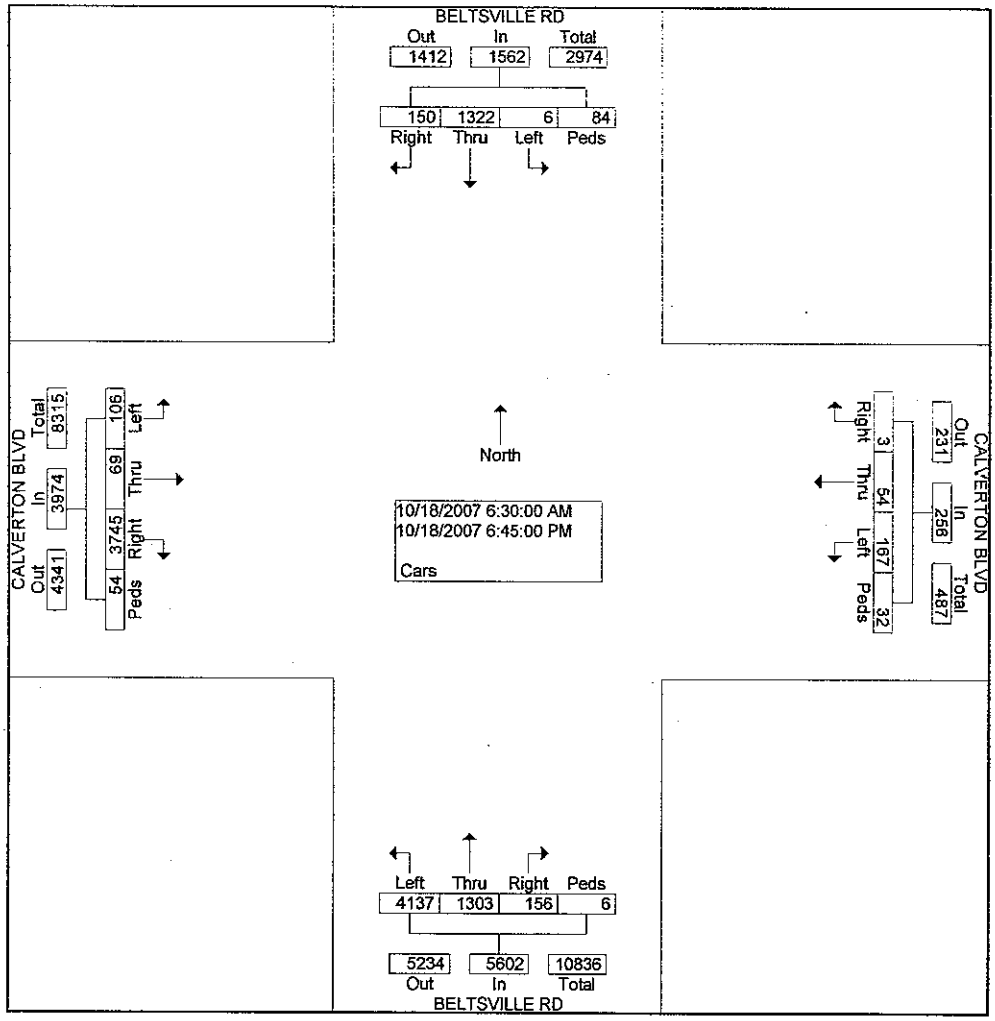
Groups Printed- Cars

	BELTSVILLE RD From North					CALVERTON BLVD From East					BELTSVILLE RD From South					CALVERTON BLVD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	0	61	2	0	63	0	0	0	2	2	148	20	1	1	170	1	1	65	2	69	304
06:45 AM	0	57	9	1	67	0	0	0	0	0	173	19	1	0	193	3	0	107	0	110	370
Total	0	118	11	1	130	0	0	0	2	2	321	39	2	1	363	4	1	172	2	179	674
07:00 AM	0	66	8	3	77	0	0	0	0	0	199	25	3	0	227	2	0	116	1	119	423
07:15 AM	0	69	11	1	81	0	0	0	0	0	200	25	4	0	229	3	4	180	1	188	498
07:30 AM	1	63	5	3	72	0	0	0	0	0	201	36	4	0	241	3	1	161	1	166	479
07:45 AM	3	65	10	1	79	0	0	0	0	0	211	31	9	0	251	3	2	151	3	159	489
Total	4	263	34	8	309	0	0	0	0	0	811	117	20	0	948	11	7	608	6	632	1889
08:00 AM	1	64	4	1	70	0	0	0	0	0	208	44	8	0	260	4	3	161	0	168	498
08:15 AM	0	47	2	3	52	0	0	1	0	1	175	35	19	0	229	3	10	125	2	140	422
08:30 AM	0	56	5	3	64	2	0	0	0	2	221	51	30	1	303	4	8	127	2	141	510
08:45 AM	0	51	3	0	54	2	0	0	0	2	156	52	18	0	226	14	7	126	1	148	430
Total	1	218	14	7	240	4	0	1	0	5	760	182	75	1	1018	25	28	539	5	597	1860
09:00 AM	0	48	2	6	56	2	3	0	0	5	162	40	22	1	225	7	7	120	4	138	424
09:15 AM	0	39	3	6	48	5	0	0	0	5	141	32	16	0	189	5	8	114	0	127	369
*** BREAK ***																					
Total	0	87	5	12	104	7	3	0	0	10	303	72	38	1	414	12	15	234	4	265	793
*** BREAK ***																					
04:00 PM	0	41	2	5	48	10	3	0	3	16	140	61	1	0	202	5	1	180	3	189	455
04:15 PM	0	28	4	1	33	6	1	0	0	7	127	62	1	0	190	4	1	161	3	169	399
04:30 PM	0	57	5	2	64	12	4	1	1	18	157	62	3	0	222	8	0	147	1	156	460
04:45 PM	0	41	9	5	55	13	4	0	0	17	186	71	2	0	259	3	1	160	3	167	498
Total	0	167	20	13	200	41	12	1	4	58	610	256	7	0	873	20	3	648	10	681	1812
05:00 PM	0	58	10	6	74	33	16	0	0	49	188	65	2	0	255	6	0	215	2	223	601
05:15 PM	0	61	11	4	76	19	9	0	0	28	176	85	0	1	262	1	3	212	5	221	587
05:30 PM	0	55	13	8	76	14	5	0	0	19	189	86	1	1	277	5	4	188	5	202	574
05:45 PM	0	47	12	8	67	11	2	0	0	13	174	91	5	0	270	5	4	189	8	206	556
Total	0	221	46	26	293	77	32	0	0	109	727	327	8	2	1064	17	11	804	20	852	2318
06:00 PM	0	58	5	4	67	13	2	0	5	20	134	79	4	1	218	4	0	217	5	226	531
06:15 PM	1	64	8	4	77	4	3	1	9	17	161	80	0	0	241	4	4	174	0	182	517
06:30 PM	0	60	3	8	71	17	1	0	9	27	172	79	1	0	252	3	0	204	2	209	559
06:45 PM	0	66	4	1	71	4	1	0	3	8	138	72	1	0	211	6	0	145	0	151	441
Total	1	248	20	17	286	38	7	1	26	72	605	310	6	1	922	17	4	740	7	768	2048
Grand Total	6	1322	150	84	1562	167	54	3	32	256	4137	1303	156	6	5602	106	69	3745	54	3974	11394
Apprch %	0.4	84.6	9.6	5.4		65.2	21.1	1.2	12.5		73.8	23.3	2.8	0.1		2.7	1.7	94.2	1.4		
Total %	0.1	11.6	1.3	0.7	13.7	1.5	0.5	0.0	0.3	2.2	36.3	11.4	1.4	0.1	49.2	0.9	0.6	32.9	0.5	34.9	

Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6558

Weather: SUNNY
Counted By: ALAN
Town: BELTSVILLE
County: PRINCE GEORGE"S

File Name : Beltsville Rd @ Calverton Blvd
Site Code : 00000000
Start Date : 10/18/2007
Page No : 2

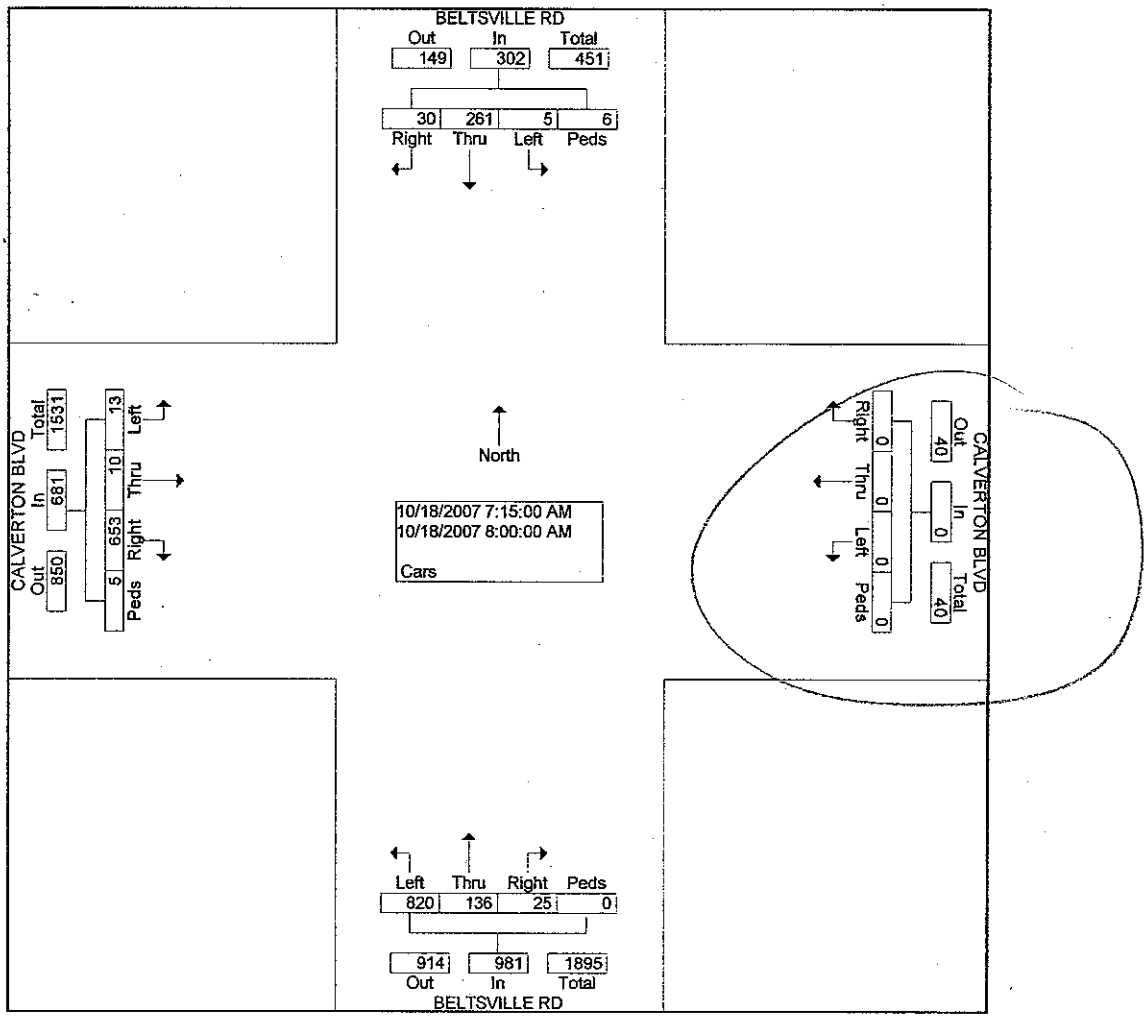


Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6566

Weather: SUNNY
Counted By: ALAN
Town: BELTSVILLE
County: PRINCE GEORGE"S

File Name : Beltsville Rd @ Calverton Blvd
Site Code : 00000000
Start Date : 10/18/2007
Page No : 3

	BELTSVILLE RD From North					CALVERTON BLVD From East					BELTSVILLE RD From South					CALVERTON BLVD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	5	261	30	6	302	0	0	0	0	0	820	136	25	0	981	13	10	653	5	681	1964
Percent	1.7	86.4	9.9	2.0		0.0	0.0	0.0	0.0		83.6	13.9	2.5	0.0		1.9	1.5	95.9	0.7		
08:00 Volume	1	64	4	1	70	0	0	0	0	0	208	44	8	0	260	4	3	161	0	168	498
Peak Factor																					0.986
High Int.	07:15 AM					6:15:00 AM					08:00 AM					07:15 AM					
Volume	0	69	11	1	81	0	0	0	0	0	208	44	8	0	260	3	4	180	1	188	
Peak Factor					0.932										0.943					0.906	

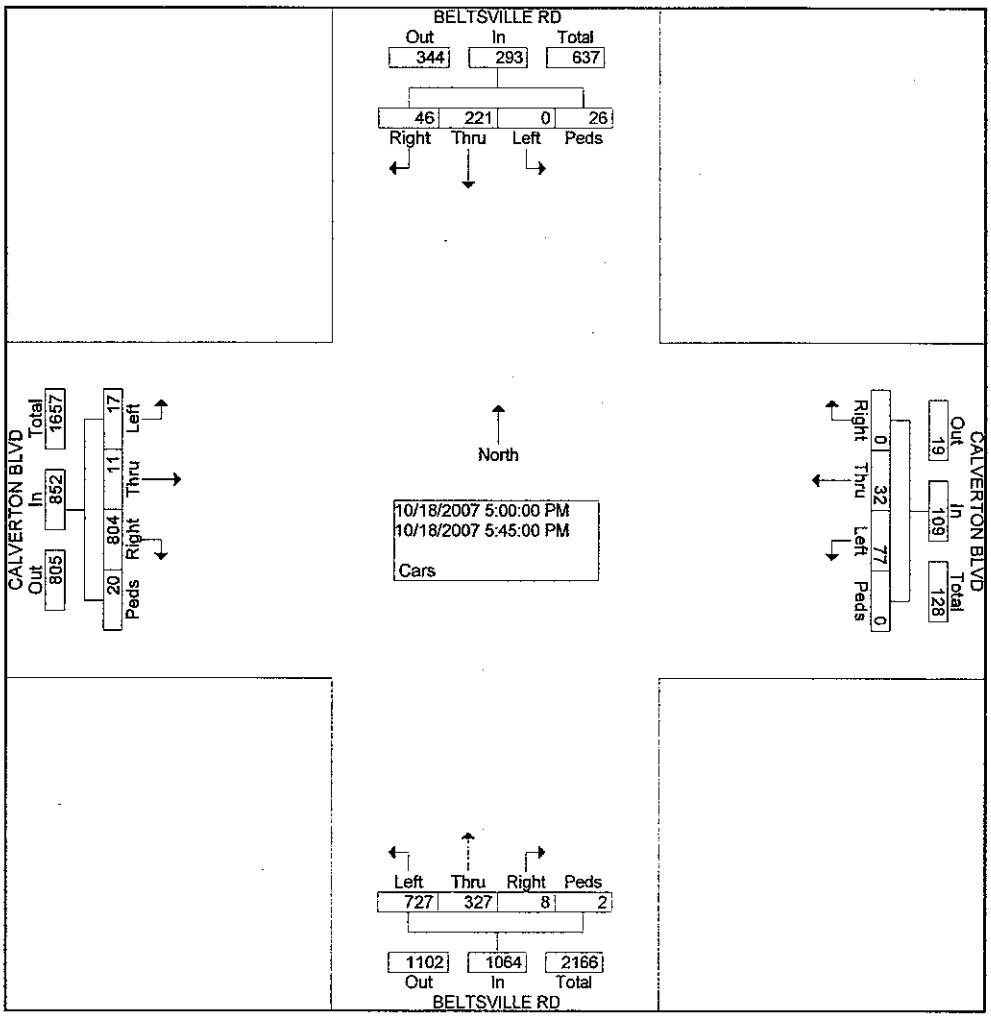


Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6556

Weather: SUNNY
Counted By: ALAN
Town: BELTSVILLE
County: PRINCE GEORGE"S

File Name : Beltsville Rd @ Calverton Blvd
Site Code : 00000000
Start Date : 10/18/2007
Page No : 4

	BELTSVILLE RD From North					CALVERTON BLVD From East					BELTSVILLE RD From South					CALVERTON BLVD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	0	221	46	26	293	77	32	0	0	109	727	327	8	2	1064	17	11	804	20	852	2318
Percent	0.0	75.4	15.7	8.9		70.6	29.4	0.0	0.0		68.3	30.7	0.8	0.2		2.0	1.3	94.4	2.3		
05:00 Volume	0	58	10	6	74	33	16	0	0	49	188	65	2	0	255	6	0	215	2	223	601
Peak Factor																					0.964
High Int.	05:15 PM					05:00 PM					05:30 PM					05:00 PM					
Volume	0	61	11	4	76	33	16	0	0	49	189	86	1	1	277	6	0	215	2	223	
Peak Factor					0.964					0.556					0.960					0.955	



Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 2122
(410) 737-6564

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : US 29 @ CHERRY HILL RD
Site Code : 00000000
Start Date : 10/24/2007
Page No : 1

Groups Printed- 1 - Unshifted

	US 29 SB RAMP From North					CHERRY HILL ROAD From East					US 29 NB RAMP From South					CHERRY HILL ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	76	0	71	0	147	90	236	63	3	392	9	0	6	0	15	15	149	22	0	186	740
06:45 AM	67	0	75	0	142	55	315	56	0	426	12	0	7	0	19	5	156	35	0	196	783
Total	143	0	146	0	289	145	551	119	3	818	21	0	13	0	34	20	305	57	0	382	1523
07:00 AM	94	0	103	0	197	58	292	58	2	410	18	0	9	0	27	12	166	49	0	227	861
07:15 AM	93	0	135	0	228	62	267	43	0	372	29	0	9	0	38	8	231	40	0	279	917
07:30 AM	82	1	156	1	240	60	281	29	0	370	29	0	14	0	43	11	230	36	0	277	930
07:45 AM	96	0	151	0	247	58	223	38	1	320	37	0	10	0	47	7	245	49	2	303	917
Total	365	1	545	1	912	238	1063	168	3	1472	113	0	42	0	155	38	872	174	2	1086	3625
08:00 AM	86	0	153	0	239	83	248	62	0	393	31	0	7	0	38	15	224	41	0	280	950
08:15 AM	84	0	162	0	246	96	247	61	2	406	21	0	5	0	26	10	223	37	0	270	948
08:30 AM	95	0	176	0	271	84	251	59	0	394	32	0	12	0	44	7	198	37	1	243	952
08:45 AM	93	0	210	0	303	99	175	39	0	313	37	0	5	0	42	12	209	31	0	252	910
Total	358	0	701	0	1059	362	921	221	2	1506	121	0	29	0	150	44	854	146	1	1045	3760
09:00 AM	62	0	187	0	249	63	206	57	0	326	34	0	15	0	49	12	248	26	1	287	911
09:15 AM	72	0	210	0	282	50	199	42	0	291	41	0	13	0	54	6	239	22	1	268	895
*** BREAK ***																					
Total	134	0	397	0	531	113	405	99	0	617	75	0	28	0	103	18	487	48	2	555	1806
*** BREAK ***																					
04:00 PM	31	0	90	0	121	132	178	42	0	352	51	0	10	0	61	11	180	63	0	254	788
04:15 PM	34	0	92	0	126	125	190	40	0	355	51	0	7	0	58	10	164	47	0	221	760
04:30 PM	25	0	113	0	138	143	180	32	1	356	61	0	11	0	72	9	190	66	0	265	831
04:45 PM	30	0	102	0	132	132	173	56	0	361	41	0	11	0	52	7	172	40	0	219	764
Total	120	0	397	0	517	532	721	170	1	1424	204	0	39	0	243	37	706	216	0	959	3143
05:00 PM	45	0	113	0	158	127	206	49	3	385	56	0	16	0	72	10	188	57	1	256	871
05:15 PM	18	0	115	0	133	159	232	39	1	431	43	0	14	0	57	6	218	50	1	275	896
05:30 PM	40	0	110	0	150	167	219	49	0	435	41	0	12	0	53	14	217	74	0	305	943
05:45 PM	29	0	80	0	109	127	222	42	0	391	51	0	18	0	69	12	193	77	0	282	851
Total	132	0	418	0	550	580	879	179	4	1642	191	0	60	0	251	42	816	258	2	1118	3561
06:00 PM	28	0	92	0	120	117	193	38	0	348	47	0	15	0	62	12	248	73	2	335	865
06:15 PM	30	0	72	0	102	115	179	51	0	345	38	0	11	0	49	6	192	61	1	260	756
06:30 PM	33	0	87	0	120	96	188	51	0	335	41	0	10	0	51	12	165	47	0	224	730
06:45 PM	27	0	77	0	104	113	168	49	1	331	49	0	12	0	61	10	172	48	2	232	728
Total	118	0	328	0	446	441	728	189	1	1359	175	0	48	0	223	40	777	229	5	1051	3079
Grand Total	1370	1	2932	1	4304	2411	5268	1145	14	8838	900	0	259	0	1159	239	4817	1128	12	6196	20497
Apprch %	31.8	0.0	68.1	0.0		27.3	59.6	13.0	0.2		77.7	0.0	22.3	0.0		3.9	77.7	18.2	0.2		
Total %	6.7	0.0	14.3	0.0	21.0	11.8	25.7	5.6	0.1	43.1	4.4	0.0	1.3	0.0	5.7	1.2	23.5	5.5	0.1	30.2	

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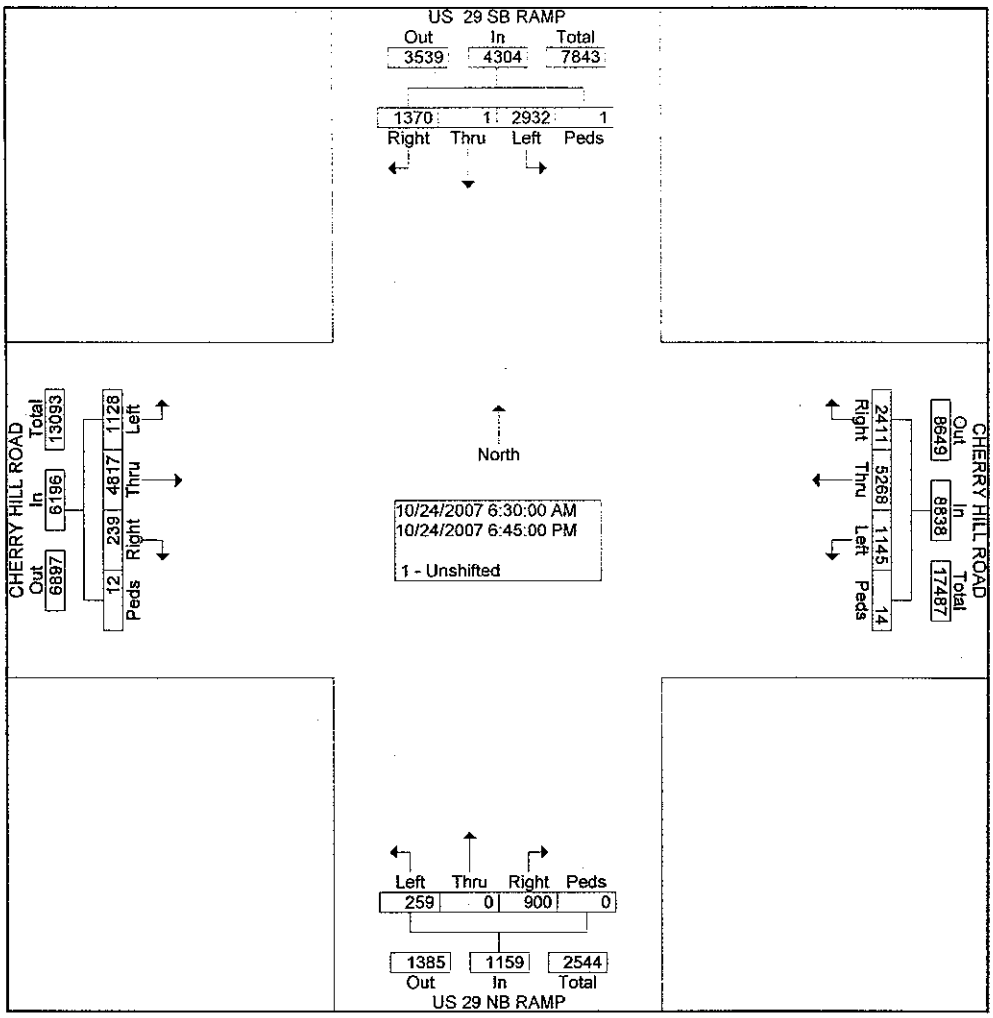
(410) 737-6564

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : US 29 @ CHERRY HILL RD
Site Code : 00000000
Start Date : 10/24/2007
Page No : 2



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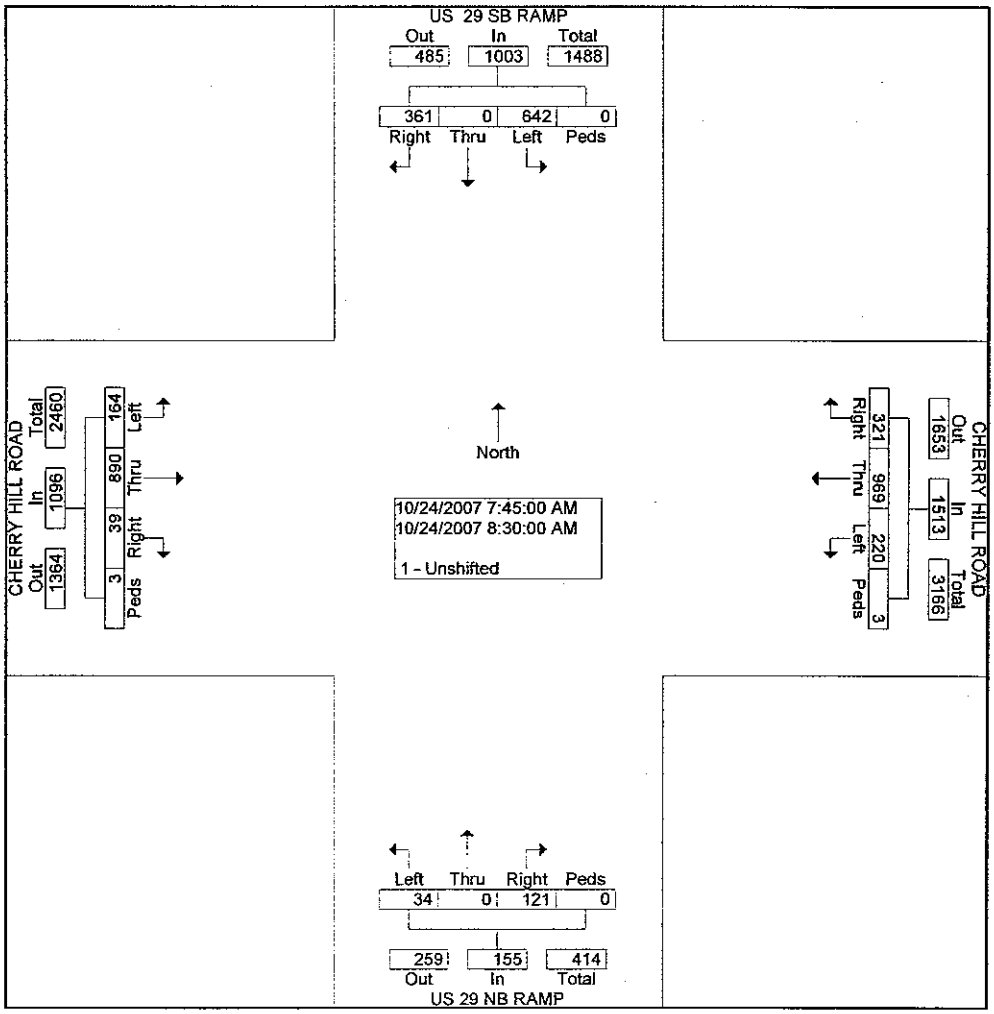
(410) 737-6564

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : US 29 @ CHERRY HILL RD
Site Code : 00000000
Start Date : 10/24/2007
Page No : 3

	US 29 SB RAMP From North					CHERRY HILL ROAD From East					US 29 NB RAMP From South					CHERRY HILL ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:45 AM																				
Volume	361	0	642	0	1003	321	969	220	3	1513	121	0	34	0	155	39	890	164	3	1096	3767
Percent	36.0	0.0	64.0	0.0		21.2	64.0	14.5	0.2		78.1	0.0	21.9	0.0		3.6	81.2	15.0	0.3		
08:30 Volume	95	0	176	0	271	84	251	59	0	394	32	0	12	0	44	7	198	37	1	243	952
Peak Factor																					0.989
High Int.	08:30 AM					08:15 AM					07:45 AM					07:45 AM					
Volume	95	0	176	0	271	96	247	61	2	406	37	0	10	0	47	7	245	49	2	303	
Peak Factor					0.925					0.932					0.824					0.904	



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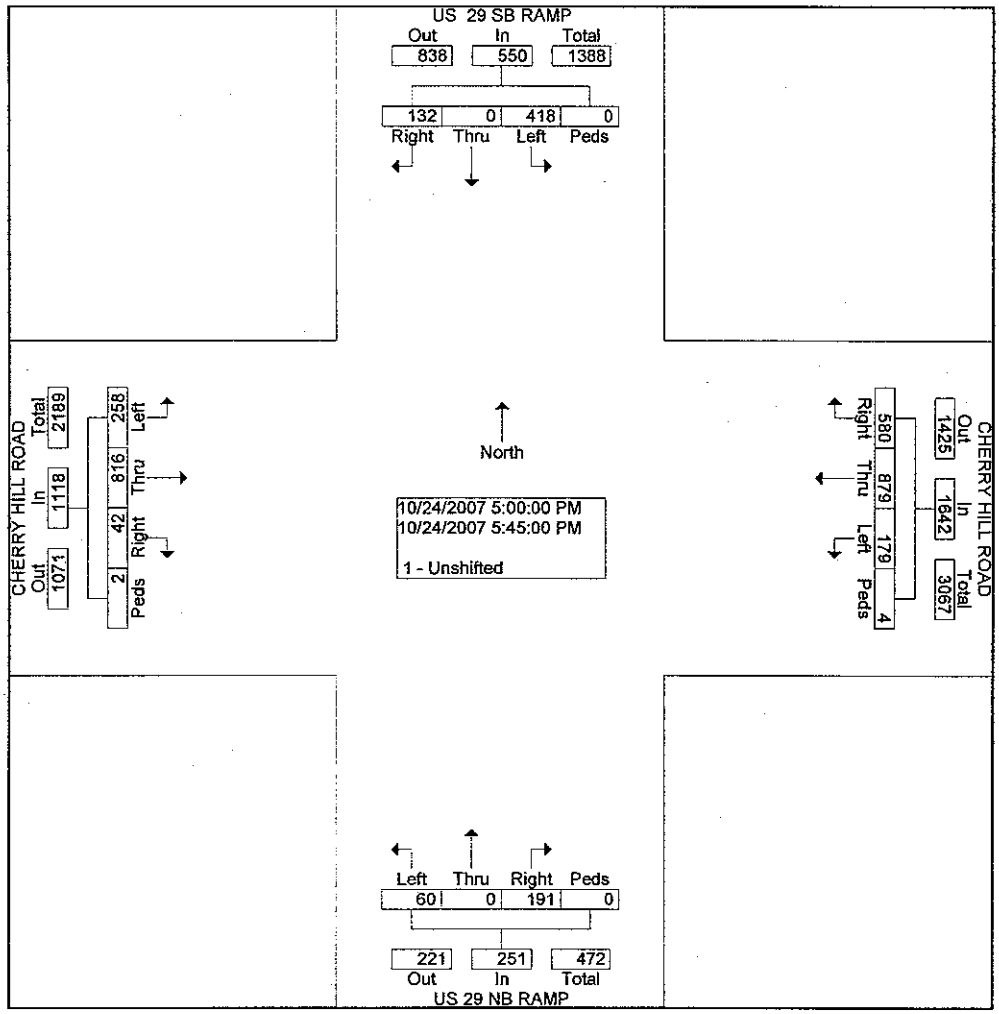
Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : US 29 @ CHERRY HILL RD
Site Code : 00000000
Start Date : 10/24/2007

	US 29 SB RAMP From North					CHERRY HILL ROAD From East					US 29 NB RAMP From South					CHERRY HILL ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	132	0	418	0	550	580	879	179	4	1642	191	0	60	0	251	42	816	258	2	1118	3561
Percent	24.0	0.0	76.0	0.0		35.3	53.5	10.9	0.2		76.1	0.0	23.9	0.0		3.8	73.0	23.1	0.2		
05:30 Volume	40	0	110	0	150	167	219	49	0	435	41	0	12	0	53	14	217	74	0	305	943
Peak Factor																					0.944
High Int.	05:00 PM					05:30 PM					05:00 PM					05:30 PM					
Volume	45	0	113	0	158	167	219	49	0	435	56	0	16	0	72	14	217	74	0	305	
Peak Factor					0.870					0.944					0.872					0.916	



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Tel: (410)-737-8562

Weather: SUNNY
Counted By: DEB, RK
Town: FAIRLAND
County: MONTGOMERY

Intersection : Cherry Hill Rd @ Plum Orchard Dr
Site Code : 00000000
Start Date : 10/18/2007
Page No : 1

Groups Printed- Unshifted

	CHERRY HILL RD From North					PLUM ORCHARD DR From East					CHERRY HILL RD From South					PLUM ORCHARD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	2	156	19	4	181	6	4	8	1	19	43	182	0	0	225	11	2	23	0	36	461
06:45 AM	1	161	29	2	193	9	1	7	1	18	55	149	0	1	205	3	1	21	2	27	443
Total	3	317	48	6	374	15	5	15	2	37	98	331	0	1	430	14	3	44	2	63	904
07:00 AM	1	165	14	2	182	14	10	7	2	33	57	176	1	0	234	6	1	29	1	37	486
07:15 AM	1	138	5	1	145	18	4	13	4	39	52	193	3	1	249	2	0	17	0	19	452
07:30 AM	2	157	16	3	178	7	5	9	4	25	60	200	1	0	261	2	2	28	1	33	497
07:45 AM	4	214	20	1	239	11	7	9	1	28	49	195	4	0	248	5	0	17	3	25	540
Total	8	674	55	7	744	50	26	38	11	125	218	764	9	1	992	15	3	91	5	114	1975
08:00 AM	10	263	26	0	299	21	6	2	3	32	69	177	6	1	253	20	2	44	0	66	650
08:15 AM	12	217	31	5	265	8	5	15	4	32	63	199	1	0	263	18	3	37	3	61	621
08:30 AM	4	198	15	3	220	7	6	10	3	26	56	165	1	1	223	11	3	41	0	55	524
08:45 AM	12	261	29	2	304	4	10	21	0	35	52	154	3	0	209	20	5	29	1	55	603
Total	38	939	101	10	1088	40	27	48	10	125	240	695	11	2	948	69	13	151	4	237	2398
09:00 AM	8	253	23	0	284	11	7	12	0	30	45	161	1	1	208	14	6	44	1	65	587
09:15 AM	4	200	23	1	228	15	8	24	2	49	45	119	2	0	166	16	4	56	0	76	519
*** BREAK ***																					
Total	12	453	46	1	512	26	15	36	2	79	90	280	3	1	374	30	10	100	1	141	1106
*** BREAK ***																					
04:00 PM	11	166	51	1	229	3	12	22	3	40	51	177	3	1	232	48	18	120	0	186	687
04:15 PM	9	223	43	2	277	8	10	26	0	44	56	183	4	5	248	31	16	108	6	161	730
04:30 PM	9	187	34	8	238	6	9	21	6	42	57	196	4	2	259	30	22	138	0	190	729
04:45 PM	7	207	33	11	258	2	14	6	4	26	54	210	5	2	271	33	21	112	3	169	724
Total	36	783	161	22	1002	19	45	75	13	152	218	766	16	10	1010	142	77	478	9	706	2870
05:00 PM	11	216	40	0	267	3	10	18	0	31	75	230	3	4	312	53	28	142	0	223	833
05:15 PM	8	245	39	6	298	4	7	9	6	26	48	225	10	0	283	40	21	94	0	155	762
05:30 PM	6	216	27	3	252	2	9	15	2	28	59	239	9	0	307	35	9	82	4	130	717
05:45 PM	6	243	40	11	300	4	7	9	3	23	54	222	5	1	282	29	10	114	1	154	759
Total	31	920	146	20	1117	13	33	51	11	108	236	916	27	5	1184	157	68	432	5	662	3071
06:00 PM	6	253	49	1	309	4	4	6	3	17	46	210	9	0	265	36	19	93	0	148	739
06:15 PM	4	218	34	2	258	7	5	5	6	23	61	217	7	0	285	41	17	109	2	169	735
06:30 PM	9	200	43	0	252	9	9	8	6	32	51	191	4	0	246	37	12	103	1	153	683
06:45 PM	14	207	49	0	270	3	7	10	0	20	55	200	5	0	260	40	17	86	0	143	693
Total	33	878	175	3	1089	23	25	29	15	92	213	818	25	0	1056	154	65	391	3	613	2850
Grand Total	161	4964	732	69	5926	186	176	292	64	718	1313	4570	91	20	5994	581	239	1687	29	2536	15174
Apprch %	2.7	83.8	12.4	1.2		25.9	24.5	40.7	8.9		21.9	76.2	1.5	0.3		22.9	9.4	66.5	1.1		
Total %	1.1	32.7	4.8	0.5	39.1	1.2	1.2	1.9	0.4	4.7	8.7	30.1	0.6	0.1	39.5	3.8	1.6	11.1	0.2	16.7	

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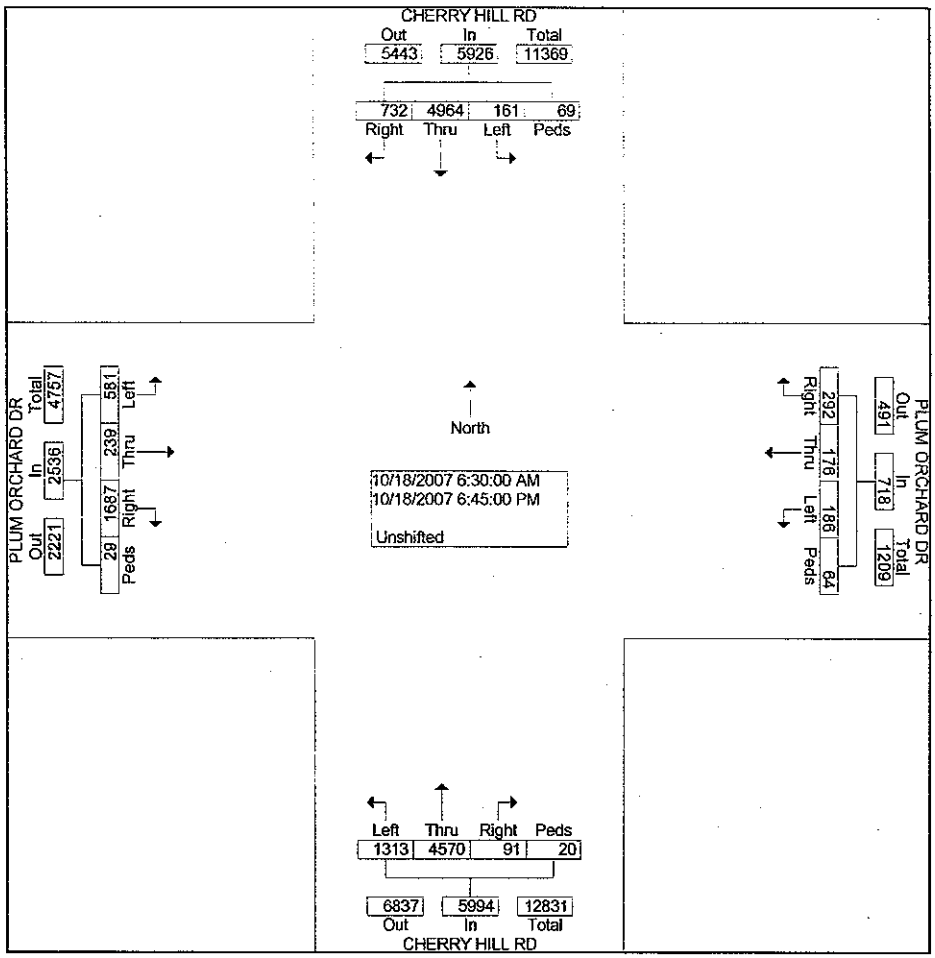
Weather: SUNNY
Counted By: DEB, RK
Town: FAIRLAND
County: MONTGOMERY

File Name : Cherry Hill Rd @ Plum Orchard Dr
Site Code : 00000000
Start Date : 10/18/2007
Page No : 2



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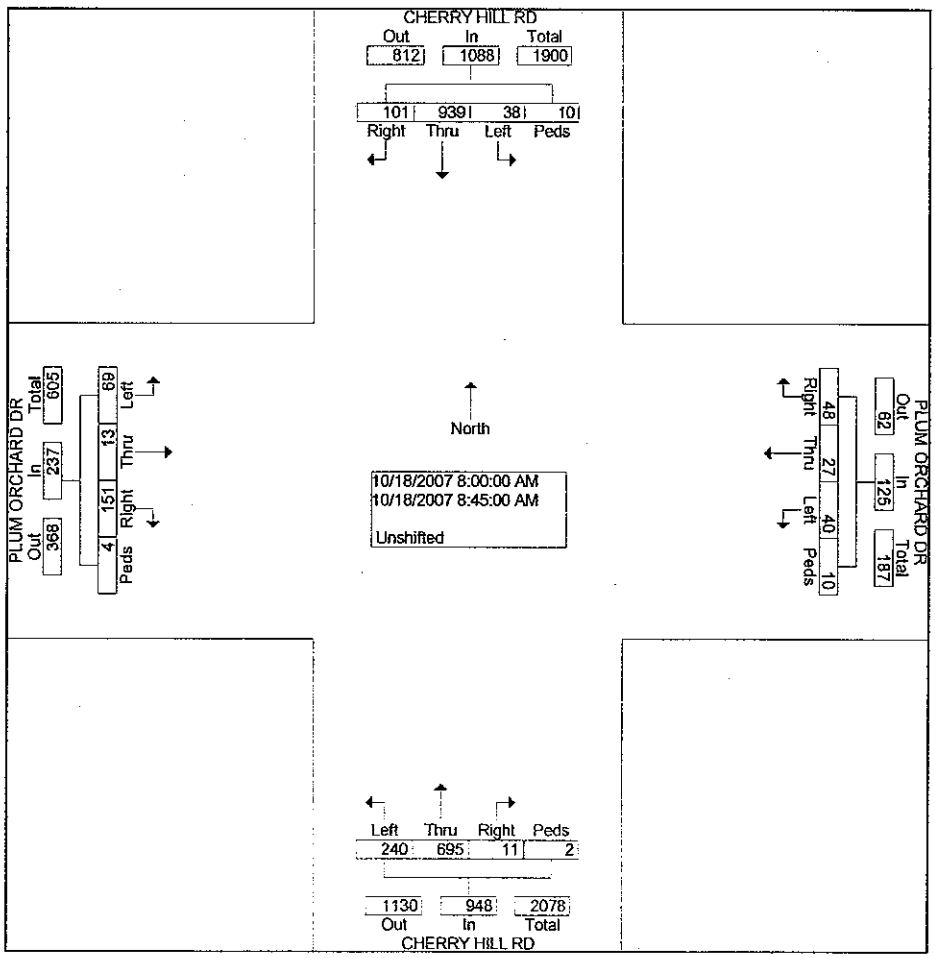
Weather: SUNNY
Counted By: DEB, RK
Town: FAIRLAND
County: MONTGOMERY

File Name : Cherry Hill Rd @ Plum Orchard Dr
Site Code : 00000000
Start Date : 10/18/2007
Page No : 3

	CHERRY HILL RD From North					PLUM ORCHARD DR From East					CHERRY HILL RD From South					PLUM ORCHARD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	08:00 AM																				
Volume	38	939	101	10	1088	40	27	48	10	125	240	695	11	2	948	69	13	151	4	237	2398
Percent	3.5	86.3	9.3	0.9		32.0	21.6	38.4	8.0		25.3	73.3	1.2	0.2		29.1	5.5	63.7	1.7		
08:00 Volume	10	263	26	0	299	21	6	2	3	32	69	177	6	1	253	20	2	44	0	66	650
Peak Factor																					0.922
High Int.	08:45 AM					08:45 AM					08:15 AM					08:00 AM					
Volume	12	261	29	2	304	4	10	21	0	35	63	199	1	0	263	20	2	44	0	66	
Peak Factor					0.895					0.893					0.901					0.898	



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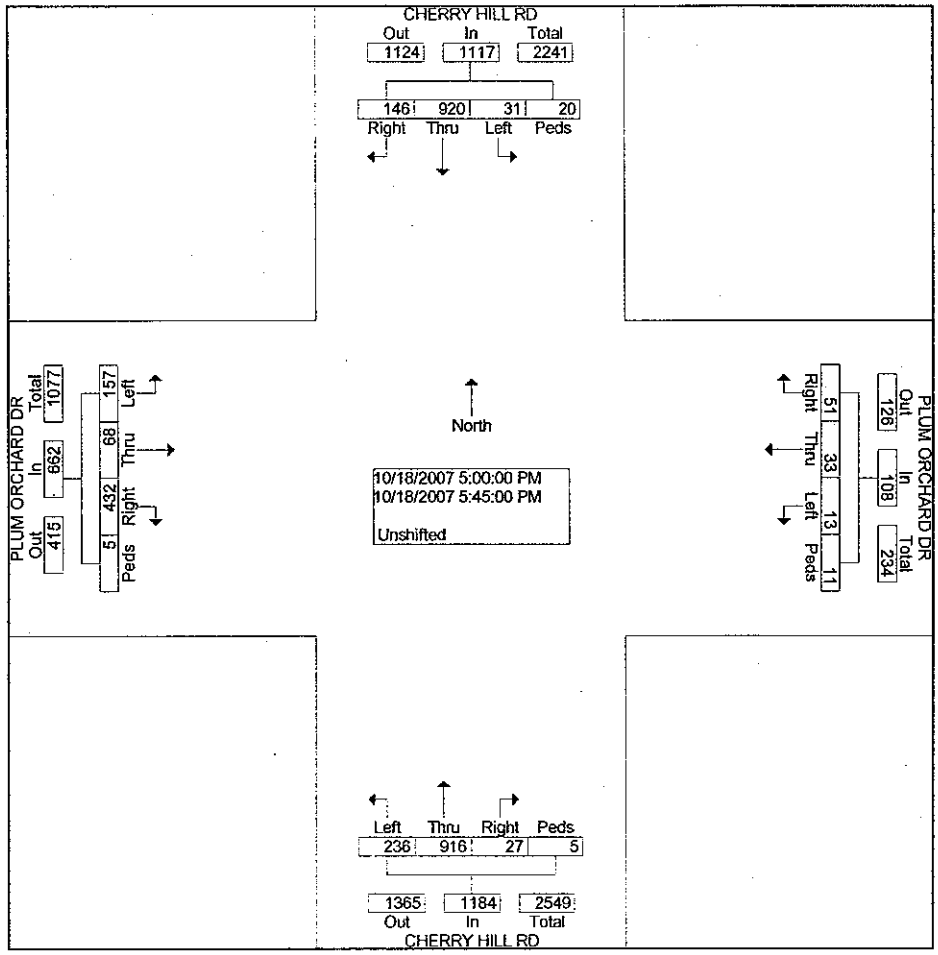
Weather: SUNNY
Counted By: DEB, RK
Town: FAIRLAND
County: MONTGOMERY

File Name : Cherry Hill Rd @ Plum Orchard Dr
Site Code : 00000000
Start Date : 10/18/2007
Page No : 4

	CHERRY HILL RD From North					PLUM ORCHARD DR From East					CHERRY HILL RD From South					PLUM ORCHARD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	31	920	146	20	1117	13	33	51	11	108	236	916	27	5	1184	157	68	432	5	662	3071
Percent	2.8	82.4	13.1	1.8		12.0	30.6	47.2	10.2		19.9	77.4	2.3	0.4		23.7	10.3	65.3	0.8		
05:00 Volume	11	216	40	0	267	3	10	18	0	31	75	230	3	4	312	53	28	142	0	223	833
Peak Factor																					0.922
High Int.	05:45 PM					05:00 PM					05:00 PM					05:00 PM					
Volume	6	243	40	11	300	3	10	18	0	31	75	230	3	4	312	53	28	142	0	223	
Peak Factor					0.93					0.87					0.94					0.74	
					1					1					9					2	



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(410) 737-6564

Weather: Sunny
Counted By: Alan, Deb
Town: Calverton
County: Prince George's

File Name : Powder Mill @ Cherry Hill
Site Code : 00000000
Start Date : 10/23/2007
Page No : 1

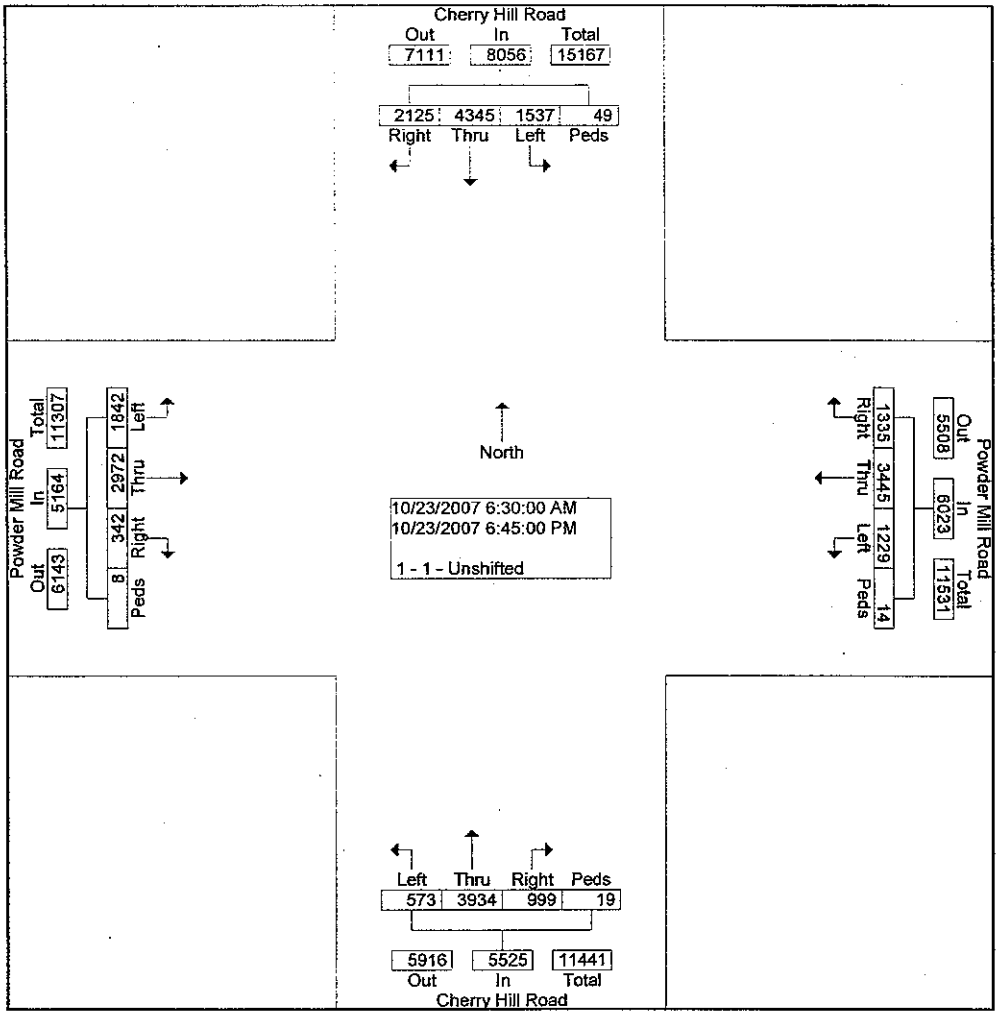
Groups Printed- 1 - 1 - Unshifted

	Cherry Hill Road From North					Powder Mill Road From East					Cherry Hill Road From South					Powder Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	80	106	42	0	228	73	272	28	0	373	0	128	20	0	148	4	81	32	0	117	866
06:45 AM	60	148	38	0	246	61	248	40	1	350	0	157	18	0	175	11	75	37	0	123	894
Total	140	254	80	0	474	134	520	68	1	723	0	285	38	0	323	15	156	69	0	240	1760
07:00 AM	88	180	56	0	324	42	185	74	3	304	32	149	29	3	213	11	83	41	0	135	976
07:15 AM	129	206	59	0	394	32	182	72	1	287	54	166	16	1	237	17	102	41	0	160	1078
07:30 AM	152	204	53	3	412	51	182	69	0	302	49	193	52	0	294	17	158	55	0	230	1238
07:45 AM	126	222	63	1	412	49	156	85	2	292	39	170	15	1	225	6	101	44	2	153	1082
Total	495	812	231	4	1542	174	705	300	6	1185	174	678	112	5	969	51	444	181	2	678	4374
08:00 AM	122	184	36	0	342	44	149	66	0	259	18	153	26	0	197	13	87	46	0	146	944
08:15 AM	93	195	46	2	336	50	208	49	1	308	33	181	17	0	231	12	74	61	0	147	1022
08:30 AM	101	214	57	1	373	71	192	70	0	333	27	150	24	0	201	12	90	60	0	162	1069
08:45 AM	82	199	73	1	355	74	163	53	1	291	41	162	16	0	219	25	67	62	2	156	1021
Total	398	792	212	4	1406	239	712	238	2	1191	119	646	83	0	848	62	318	229	2	611	4056
09:00 AM	87	182	45	3	317	50	170	65	0	285	32	130	18	0	180	9	51	55	0	115	897
09:15 AM	89	143	49	0	281	43	112	34	0	189	35	99	18	0	152	4	52	37	0	93	715
*** BREAK ***																					
Total	176	325	94	3	598	93	282	99	0	474	67	229	36	0	332	13	103	92	0	208	1612
*** BREAK ***																					
04:00 PM	66	169	69	3	307	53	111	26	0	190	32	152	22	0	206	11	146	91	0	248	951
04:15 PM	79	169	84	1	333	53	89	24	0	166	54	154	25	0	233	16	154	117	0	287	1019
04:30 PM	84	195	92	0	371	61	102	39	1	203	36	164	18	1	219	10	171	117	0	298	1091
04:45 PM	95	197	79	1	372	52	100	46	1	199	53	182	22	0	257	17	169	113	2	301	1129
Total	324	730	324	5	1383	219	402	135	2	758	175	652	87	1	915	54	640	438	2	1134	4190
05:00 PM	78	169	79	6	332	60	124	44	0	228	56	176	36	2	270	15	182	93	2	292	1122
05:15 PM	105	206	77	4	392	78	106	51	0	235	46	207	31	0	284	17	186	105	0	308	1219
05:30 PM	85	231	83	6	405	54	112	48	1	215	74	190	29	10	303	21	184	106	0	311	1234
05:45 PM	78	179	92	9	358	64	97	54	1	216	63	176	29	1	269	21	174	104	0	299	1142
Total	346	785	331	25	1487	256	439	197	2	894	239	749	125	13	1126	74	726	408	2	1210	4717
06:00 PM	61	173	56	4	294	48	109	55	1	213	71	183	27	0	281	23	153	126	0	302	1090
06:15 PM	52	178	61	4	295	65	92	43	0	200	39	184	22	0	245	22	161	116	0	299	1039
06:30 PM	63	171	69	0	303	60	90	58	0	208	67	165	21	0	253	19	151	89	0	259	1023
06:45 PM	70	125	79	0	274	47	94	36	0	177	48	163	22	0	233	9	120	94	0	223	907
Total	246	647	265	8	1166	220	385	192	1	798	225	695	92	0	1012	73	585	425	0	1083	4059
Grand Total	2125	4345	1537	49	8056	1335	3445	1229	14	6023	999	3934	573	19	5525	342	2972	1842	8	5164	24768
Apprch %	26.4	53.9	19.1	0.6		22.2	57.2	20.4	0.2		18.1	71.2	10.4	0.3		6.6	57.6	35.7	0.2		
Total %	8.6	17.5	6.2	0.2	32.5	5.4	13.9	5.0	0.1	24.3	4.0	15.9	2.3	0.1	22.3	1.4	12.0	7.4	0.0	20.8	

Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Sunny
Counted By: Alan, Deb
Town: Calverton
County: Prince George's

File Name : Powder Mill @ Cherry Hill
Site Code : 00000000
Start Date : 10/23/2007



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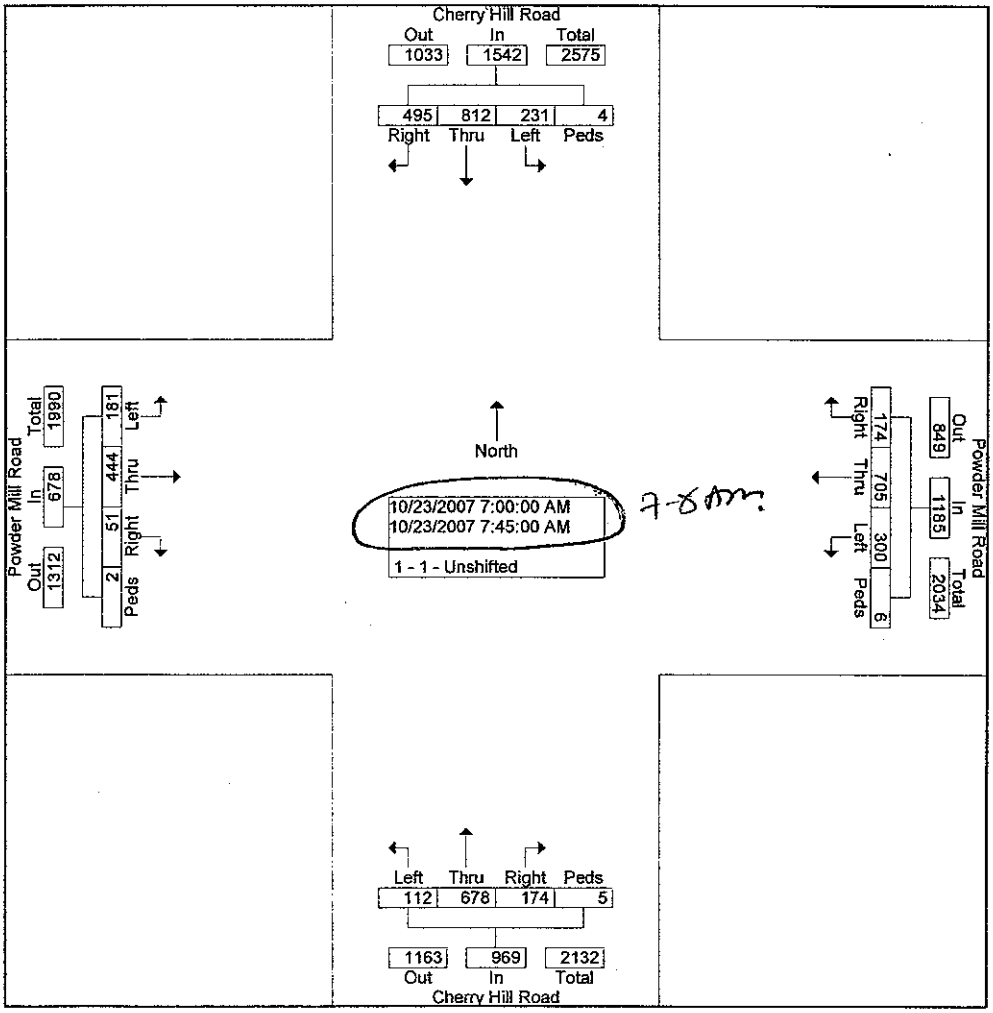
(410) 737-6564

Weather: Sunny
Counted By: Alan, Deb
Town: Calverton
County: Prince George's

File Name : Powder Mill @ Cherry Hill
Site Code : 00000000
Start Date : 10/23/2007
Page No : 3

	Cherry Hill Road From North					Powder Mill Road From East					Cherry Hill Road From South					Powder Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	495	812	231	4	1542	174	705	300	6	1185	174	678	112	5	969	51	444	181	2	678	4374
Percent	32.1	52.7	15.0	0.3		14.7	59.5	25.3	0.5		18.0	70.0	11.6	0.5		7.5	65.5	26.7	0.3		
07:30 Volume	152	204	53	3	412	51	182	69	0	302	49	193	52	0	294	17	158	55	0	230	1238
Peak Factor																					0.883
High Int.	07:30 AM					07:00 AM					07:30 AM					07:30 AM					
Volume	152	204	53	3	412	42	185	74	3	304	49	193	52	0	294	17	158	55	0	230	
Peak Factor					0.936					0.975					0.824					0.737	



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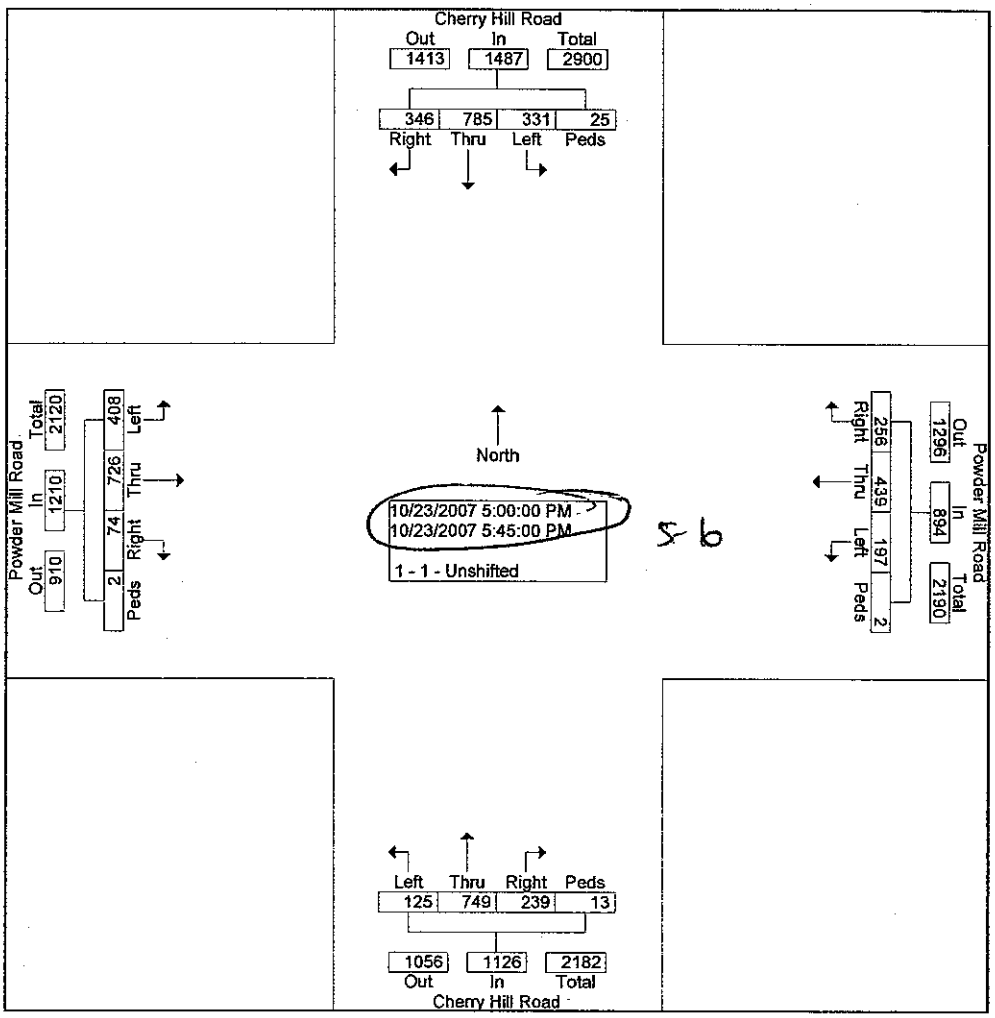
(410) 737-6564

Weather: Sunny
Counted By: Alan, Deb
Town: Calverton
County: Prince George's

File Name : Powder Mill @ Cherry Hill
Site Code : 00000000
Start Date : 10/23/2007
Page No : 4

	Cherry Hill Road From North					Powder Mill Road From East					Cherry Hill Road From South					Powder Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	346	785	331	25	1487	256	439	197	2	894	239	749	125	13	1126	74	726	408	2	1210	4717
Percent	23.3	52.8	22.3	1.7		28.6	49.1	22.0	0.2		21.2	66.5	11.1	1.2		6.1	60.0	33.7	0.2		
05:30 Volume	85	231	83	6	405	54	112	48	1	215	74	190	29	10	303	21	184	106	0	311	1234
Peak Factor																					0.956
High Int.	05:30 PM					05:15 PM					05:30 PM					05:30 PM					
Volume	85	231	83	6	405	78	106	51	0	235	74	190	29	10	303	21	184	106	0	311	
Peak Factor					0.918					0.951					0.929					0.973	



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1504 Joh Avenue Suite 160
Baltimore, MD 21227

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : CHERRY HILL RD @ Calverton & Broadbirch
Site Code : 00000000
Start Date : 10/25/2007
Page No : 1

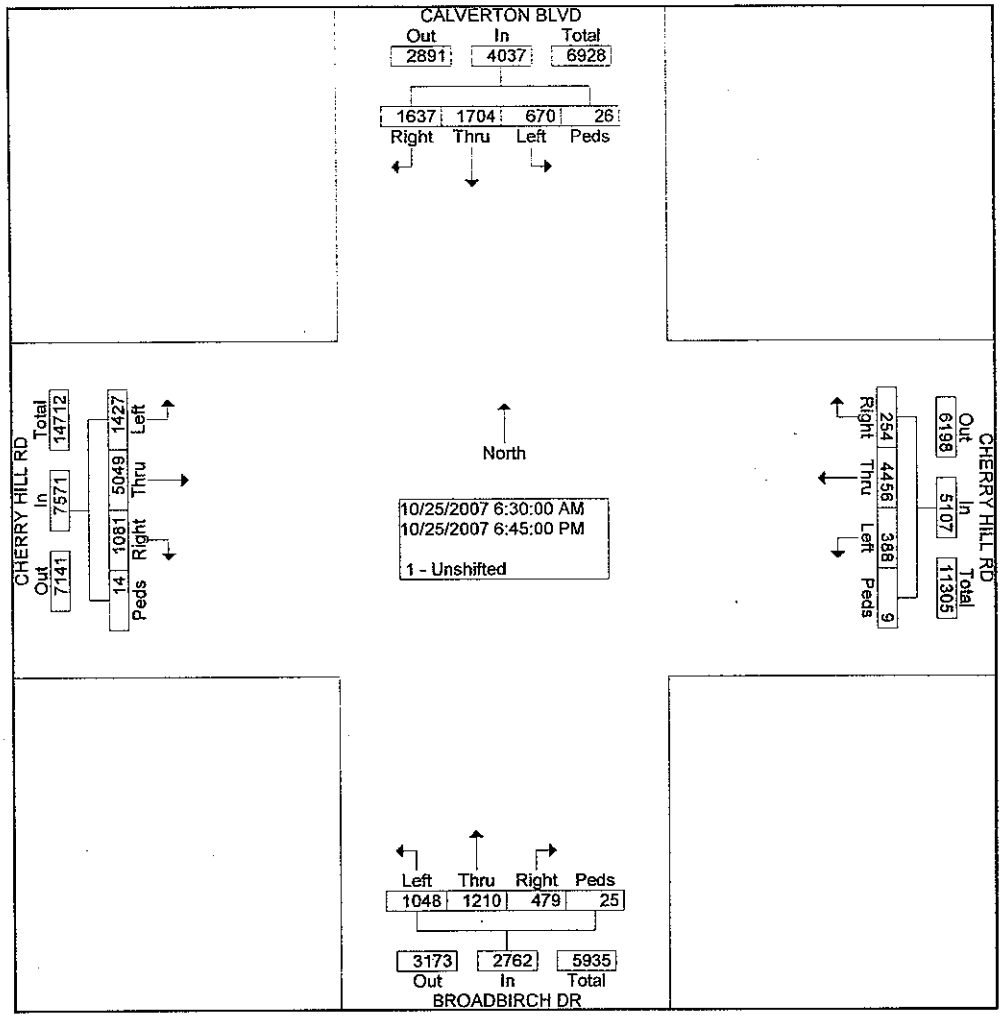
Groups Printed- 1 - Unshifted

	CALVERTON BLVD From North					CHERRY HILL RD From East					BROADBIRCH DR From South					CHERRY HILL RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	94	70	31	1	196	1	109	12	0	122	13	25	18	0	56	18	91	15	0	124	498
06:45 AM	105	68	34	0	207	4	184	10	0	198	10	19	14	1	44	13	135	25	1	174	623
Total	199	138	65	1	403	5	293	22	0	320	23	44	32	1	100	31	226	40	1	298	1121
07:00 AM	103	74	39	0	216	1	169	13	2	185	5	14	6	1	26	16	184	30	1	231	658
07:15 AM	115	112	48	1	276	9	213	18	1	241	6	22	17	0	45	32	236	37	1	306	868
07:30 AM	116	85	75	5	281	7	147	22	0	176	9	28	13	3	53	38	220	56	0	314	824
07:45 AM	143	98	56	1	298	6	197	22	0	225	11	31	16	0	58	53	205	70	0	328	909
Total	477	369	218	7	1071	23	726	75	3	827	31	95	52	4	182	139	845	193	2	1179	3259
08:00 AM	101	106	52	0	259	7	188	20	1	216	8	27	14	0	49	52	185	64	1	302	826
08:15 AM	86	104	34	1	225	12	170	27	0	209	14	33	22	0	69	64	224	66	0	354	857
08:30 AM	74	92	31	0	197	6	147	13	0	166	24	37	27	0	88	78	196	61	2	337	788
08:45 AM	65	89	27	0	181	10	190	27	1	228	15	29	25	1	70	77	243	66	0	386	865
Total	326	391	144	1	862	35	695	87	2	819	61	126	88	1	276	271	848	257	3	1379	3336
09:00 AM	84	95	33	0	212	5	137	25	0	167	14	26	30	0	70	66	238	52	2	358	807
09:15 AM	72	80	28	0	180	6	153	23	0	182	12	35	28	0	75	92	205	56	0	353	790
*** BREAK ***																					
Total	156	175	61	0	392	11	290	48	0	349	26	61	58	0	145	158	443	108	2	711	1597
*** BREAK ***																					
04:00 PM	44	48	12	0	104	8	217	11	1	237	22	64	42	0	128	46	204	64	0	314	783
04:15 PM	47	65	13	2	127	6	178	8	0	192	39	59	54	1	153	50	207	81	2	340	812
04:30 PM	53	47	7	0	107	9	224	14	1	248	32	79	73	1	185	59	201	53	1	314	854
04:45 PM	48	61	13	3	125	17	219	13	0	249	30	94	63	1	188	56	248	74	0	378	940
Total	192	221	45	5	463	40	838	46	2	926	123	296	232	3	654	211	860	272	3	1346	3389
05:00 PM	41	54	10	1	106	18	242	15	0	275	40	90	70	1	201	53	243	81	0	377	959
05:15 PM	57	53	11	1	122	23	182	5	0	210	47	84	95	0	226	42	240	78	0	360	918
05:30 PM	32	45	15	0	92	20	248	27	0	295	24	89	83	0	196	48	245	70	0	363	946
05:45 PM	35	71	11	5	122	17	200	7	1	225	23	75	68	1	167	45	250	72	0	367	881
Total	165	223	47	7	442	78	872	54	1	1005	134	338	316	2	790	188	978	301	0	1467	3704
06:00 PM	31	54	21	3	109	10	203	9	1	223	20	74	65	5	164	22	227	73	1	323	819
06:15 PM	33	48	23	0	104	13	194	11	0	218	17	60	85	3	165	25	226	76	0	327	814
06:30 PM	30	43	16	1	90	25	186	19	0	230	21	52	71	3	147	18	197	53	0	268	735
06:45 PM	28	42	30	1	101	14	159	17	0	190	23	64	49	3	139	18	199	54	2	273	703
Total	122	187	90	5	404	62	742	56	1	861	81	250	270	14	615	83	849	256	3	1191	3071
Grand Total	1637	1704	670	26	4037	254	4456	388	9	5107	479	1210	1048	25	2762	1081	5049	1427	14	7571	19477
Apprch %	40.5	42.2	16.6	0.6		5.0	87.3	7.6	0.2		17.3	43.8	37.9	0.9		14.3	66.7	18.8	0.2		
Total %	8.4	8.7	3.4	0.1	20.7	1.3	22.9	2.0	0.0	26.2	2.5	6.2	5.4	0.1	14.2	5.6	25.9	7.3	0.1	38.9	

Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : CHERRY HILL RD @ Calverton & Broadbirch
Site Code : 00000000
Start Date : 10/25/2007
Page No : 2



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Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
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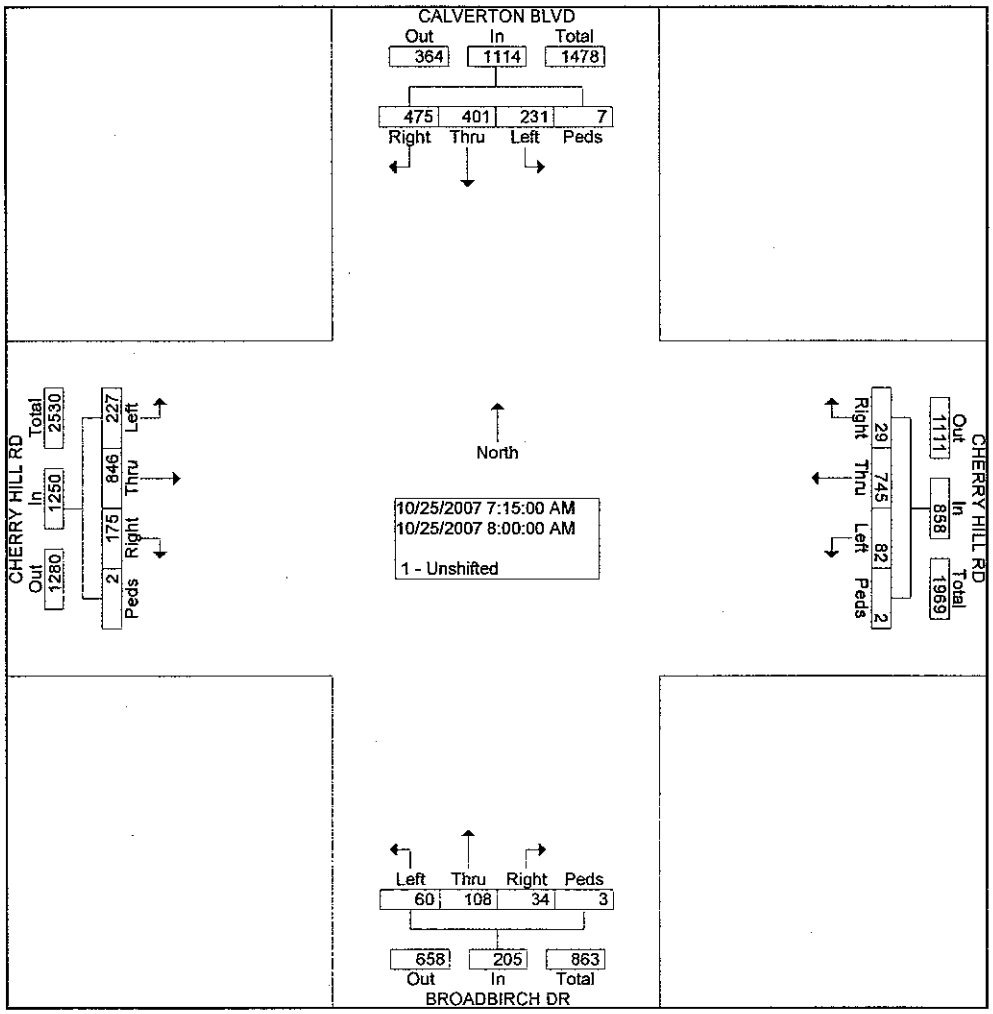
File Name : CHERRY HILL RD @ Calverton & Broadbirch
Site Code : 00000000
Start Date : 10/25/2007
Page No : 3

	CALVERTON BLVD From North					CHERRY HILL RD From East					BROADBIRCH DR From South					CHERRY HILL RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	475	401	231	7	1114	29	745	82	2	858	34	108	60	3	205	175	846	227	2	1250	3427
Percent	42.6	36.0	20.7	0.6		3.4	86.8	9.6	0.2		16.6	52.7	29.3	1.5		14.0	67.7	18.2	0.2		
07:45 Volume	143	98	56	1	298	6	197	22	0	225	11	31	16	0	58	53	205	70	0	328	909
Peak Factor																					0.943
High Int.	07:45 AM					07:15 AM					07:45 AM					07:45 AM					
Volume	143	98	56	1	298	9	213	18	1	241	11	31	16	0	58	53	205	70	0	328	
Peak Factor					0.935					0.890					0.884					0.953	



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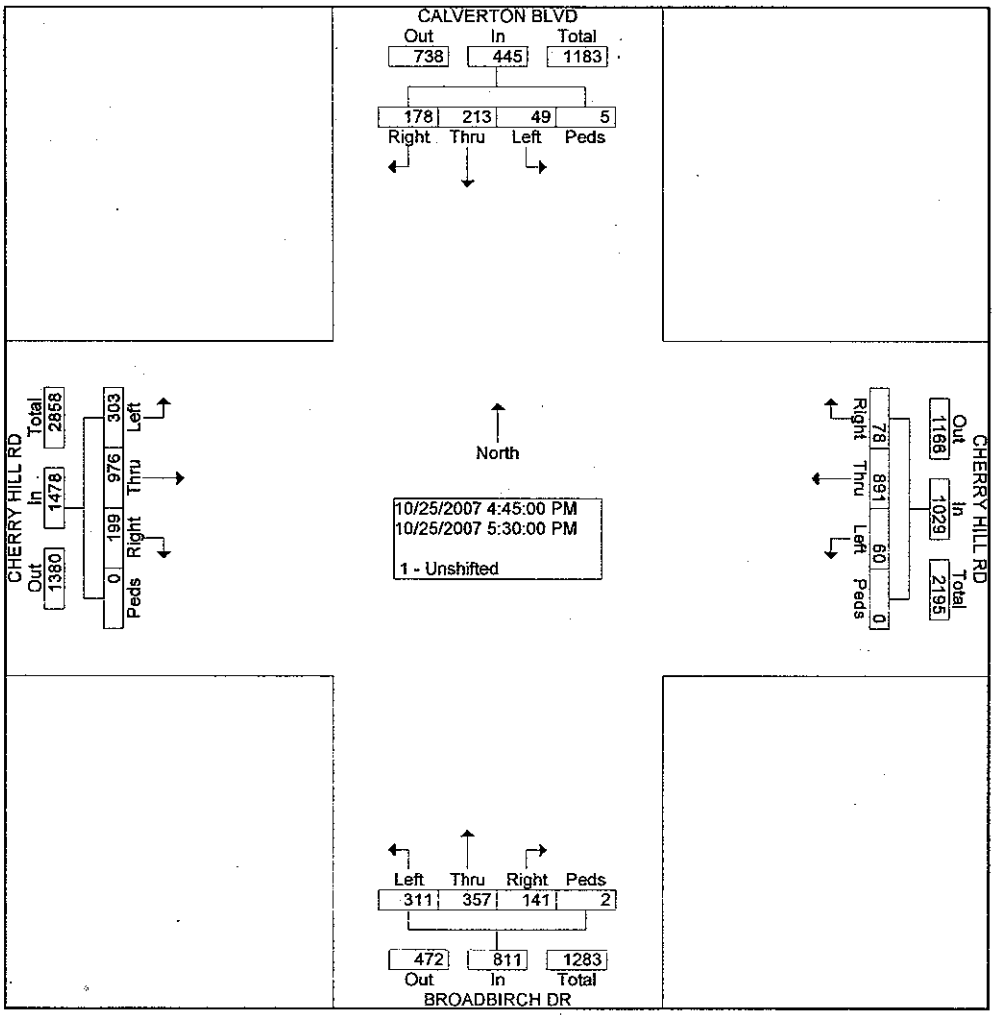
Baltimore, MD 21227

Weather: Rain
Counted By: Anita, Joyce
Town: Calverton
County: Montgomery

File Name : CHERRY HILL RD @ Calverton & Broadbirch
Site Code : 00000000
Start Date : 10/25/2007
Page No : 4

	CALVERTON BLVD From North					CHERRY HILL RD From East					BROADBIRCH DR From South					CHERRY HILL RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	178	213	49	5	445	78	891	60	0	1029	141	357	311	2	811	199	976	303	0	1478	3763
Percent	40.0	47.9	11.0	1.1		7.6	86.6	5.8	0.0		17.4	44.0	38.3	0.2		13.5	66.0	20.5	0.0		
05:00 Volume	41	54	10	1	106	18	242	15	0	275	40	90	70	1	201	53	243	81	0	377	959
Peak Factor																					0.981
High Int.	04:45 PM					05:30 PM					05:15 PM					04:45 PM					
Volume	48	61	13	3	125	20	248	27	0	295	47	84	95	0	226	56	248	74	0	378	
Peak Factor					0.890					0.872					0.897					0.978	



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1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Michelson Road
Site Code : 00000000
Start Date : 10/17/2007
Page No : 1

Groups Printed- Cars

	MD 650 From North					MICHELSON ROAD From East					MD 650 From South					MICHELSON ROAD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	19	455	0	4	478	2	0	1	0	3	0	303	34	0	337	0	0	2	0	2	820
06:45 AM	19	492	1	0	512	1	0	0	0	1	4	305	35	0	344	1	2	1	0	4	861
Total	38	947	1	4	990	3	0	1	0	4	4	608	69	0	681	1	2	3	0	6	1681
07:00 AM	21	496	1	0	518	1	0	2	0	3	1	316	17	0	334	1	1	2	0	4	859
07:15 AM	25	607	1	1	634	2	0	0	0	2	1	334	11	0	346	0	1	4	0	5	987
07:30 AM	29	601	0	0	630	3	0	3	0	6	7	292	10	0	309	0	0	1	0	1	946
07:45 AM	35	716	2	1	754	0	0	2	0	2	5	332	13	0	350	2	1	7	0	10	1116
Total	110	2420	4	2	2536	6	0	7	0	13	14	1274	51	0	1339	3	3	14	0	20	3908
08:00 AM	51	707	0	1	759	0	0	1	0	1	14	345	12	0	371	0	2	1	0	3	1134
08:15 AM	32	635	3	1	671	0	0	2	0	2	10	379	18	0	407	0	1	6	0	7	1087
08:30 AM	45	620	1	2	668	1	1	3	0	5	10	390	15	0	415	0	1	6	0	7	1095
08:45 AM	76	616	1	4	697	3	0	6	0	9	3	372	11	0	386	2	2	0	0	4	1096
Total	204	2578	5	8	2795	4	1	12	0	17	37	1486	56	0	1579	2	6	13	0	21	4412
09:00 AM	42	532	0	2	576	1	1	1	0	3	2	285	16	0	303	1	0	3	0	4	886
09:15 AM	52	554	1	2	609	2	0	2	0	4	5	267	5	0	277	0	0	6	0	6	896
*** BREAK ***																					
Total	94	1086	1	4	1185	3	1	3	0	7	7	552	21	0	580	1	0	9	0	10	1782
*** BREAK ***																					
04:00 PM	2	352	0	12	366	8	1	43	0	52	1	535	0	0	536	4	0	9	0	13	967
04:15 PM	1	383	2	14	400	10	0	30	0	40	0	539	1	0	540	0	0	8	0	8	988
04:30 PM	2	434	2	10	448	3	0	34	0	37	0	557	0	1	558	1	0	7	0	8	1051
04:45 PM	2	439	0	9	450	5	1	36	0	42	3	601	0	0	604	1	0	5	0	6	1102
Total	7	1608	4	45	1664	26	2	143	0	171	4	2232	1	1	2238	6	0	29	0	35	4108
05:00 PM	0	491	2	8	501	20	0	51	0	71	1	588	0	0	589	2	0	3	0	5	1166
05:15 PM	2	435	1	9	447	4	0	51	0	55	0	626	0	0	626	1	0	10	0	11	1139
05:30 PM	0	448	4	5	457	9	1	39	0	49	1	674	0	0	675	2	1	6	0	9	1190
05:45 PM	0	444	2	7	453	6	1	49	0	56	6	614	0	0	620	2	0	7	0	9	1138
Total	2	1818	9	29	1858	39	2	190	0	231	8	2502	0	0	2510	7	1	26	0	34	4633
06:00 PM	1	384	1	9	395	2	0	32	0	34	3	644	1	0	648	6	0	12	0	18	1095
06:15 PM	0	434	1	14	449	6	1	27	0	34	6	586	0	0	592	3	0	1	0	4	1079
06:30 PM	0	414	1	1	416	4	0	15	0	19	5	672	2	0	679	0	0	3	0	3	1117
06:45 PM	1	431	0	3	435	1	0	14	0	15	0	655	0	0	655	3	0	7	0	10	1115
Total	2	1663	3	27	1695	13	1	88	0	102	14	2557	3	0	2574	12	0	23	0	35	4406
Grand Total	457	12120	27	119	12723	94	7	444	0	545	88	11211	201	1	11501	32	12	117	0	161	24930
Apprch %	3.6	95.3	0.2	0.9		17.2	1.3	81.5	0.0		0.8	97.5	1.7	0.0		19.9	7.5	72.7	0.0		
Total %	1.8	48.6	0.1	0.5	51.0	0.4	0.0	1.8	0.0	2.2	0.4	45.0	0.8	0.0	46.1	0.1	0.0	0.5	0.0	0.6	

Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
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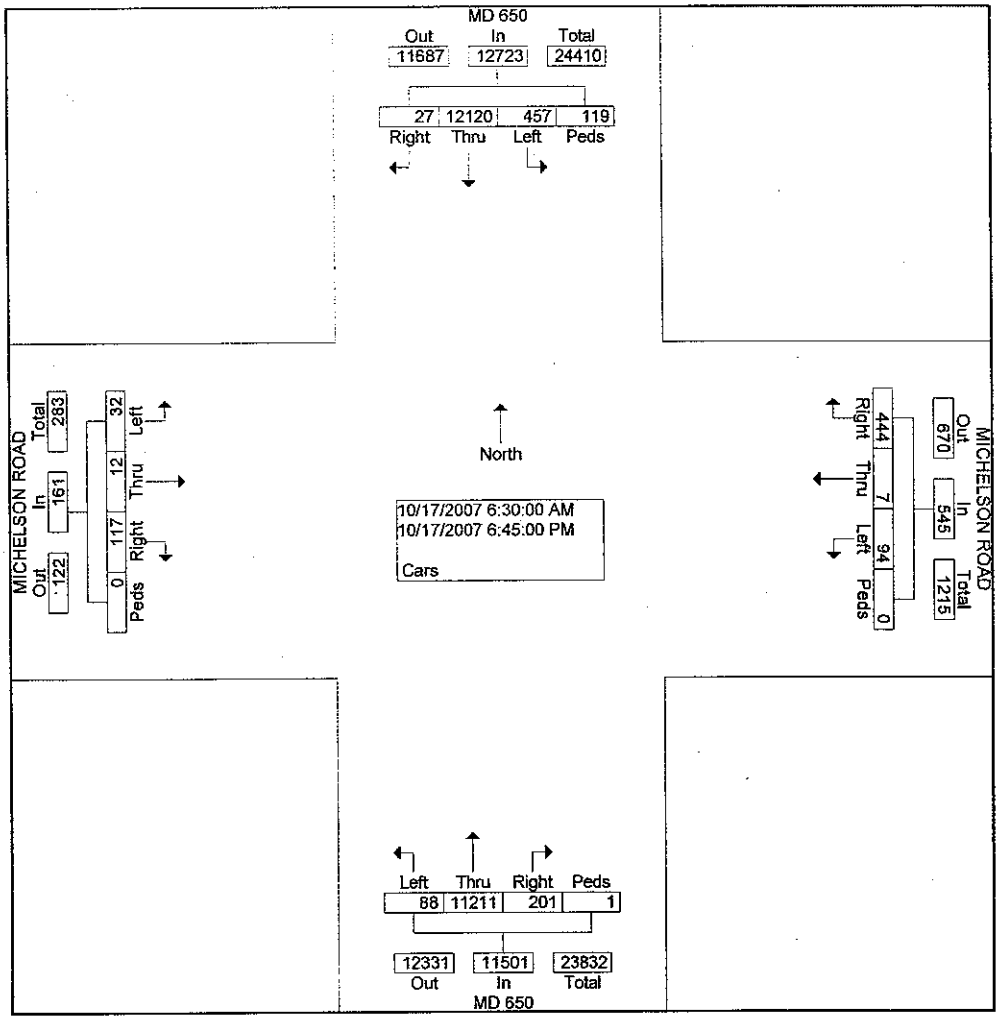
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Michelson Road
Site Code : 00000000
Start Date : 10/17/2007



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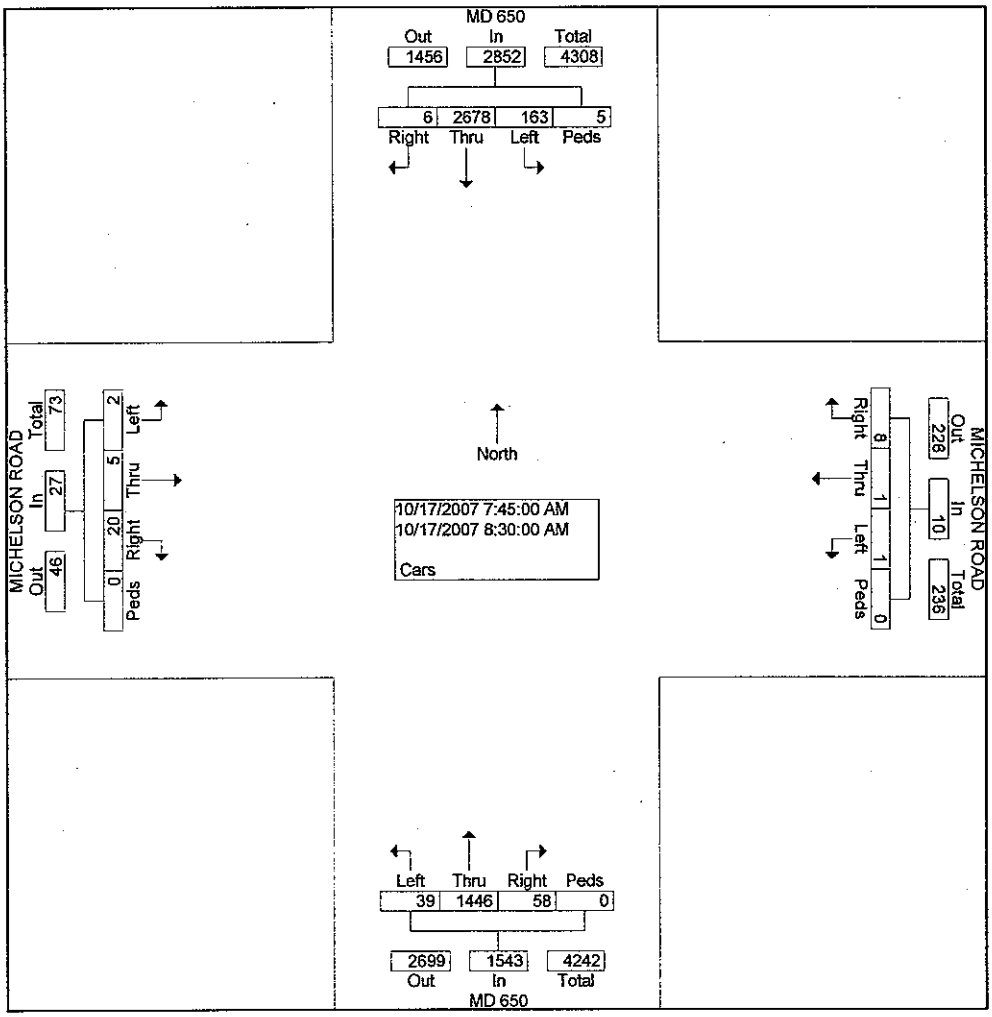
Baltimore, MD, 21227
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Michelson Road
Site Code : 00000000
Start Date : 10/17/2007

	MD 650 From North					MICHELSON ROAD From East					MD 650 From South					MICHELSON ROAD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	07:45 AM																				
Volume	163	2678	6	5	2852	1	1	8	0	10	39	1446	58	0	1543	2	5	20	0	27	4432
Percent	5.7	93.9	0.2	0.2		10.0	10.0	80.0	0.0		2.5	93.7	3.8	0.0		7.4	18.5	74.1	0.0		
08:00 Volume	51	707	0	1	759	0	0	1	0	1	14	345	12	0	371	0	2	1	0	3	1134
Peak Factor																					0.977
High Int.	08:00 AM					08:30 AM					08:30 AM					07:45 AM					
Volume	51	707	0	1	759	1	1	3	0	5	10	390	15	0	415	2	1	7	0	10	
Peak Factor					0.939					0.500					0.930					0.675	



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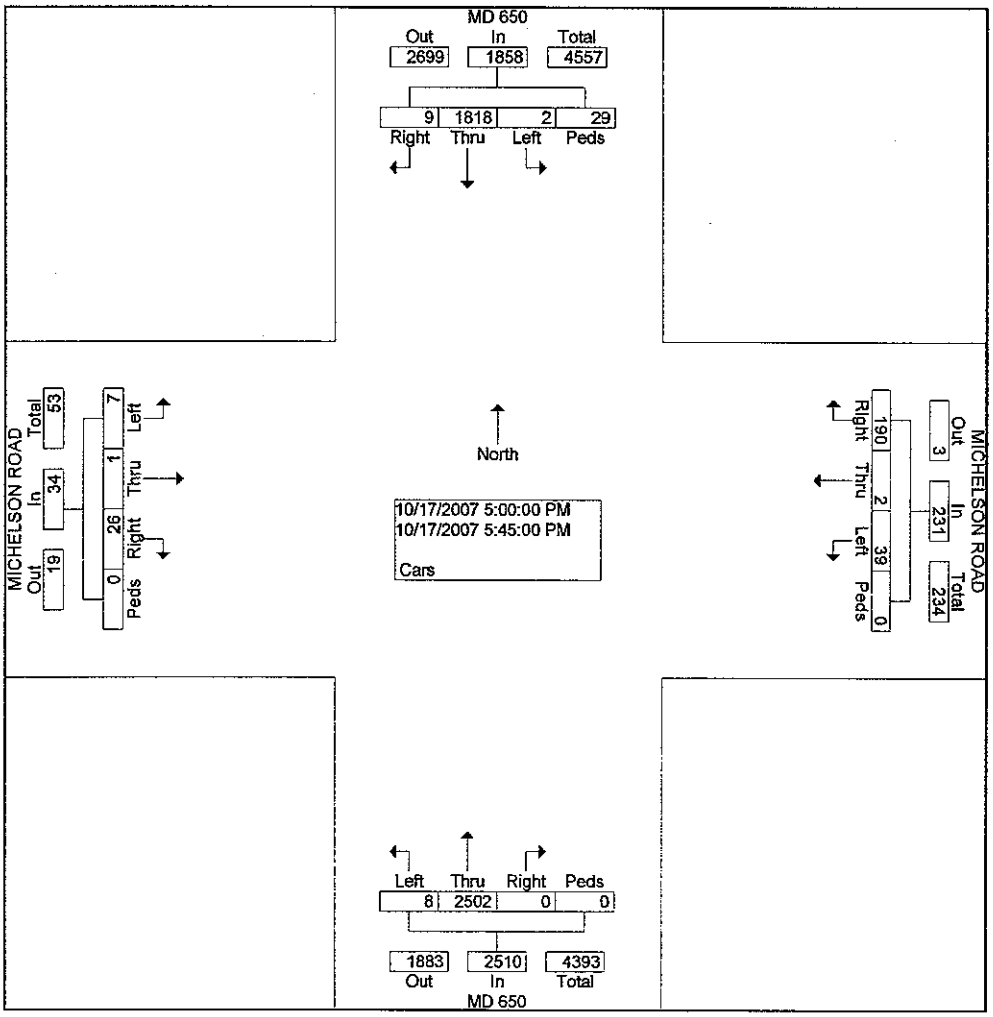
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Michelson Road
Site Code : 00000000
Start Date : 10/17/2007
Page No : 4

	MD 650 From North					MICHELSON ROAD From East					MD 650 From South					MICHELSON ROAD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	2	1818	9	29	1858	39	2	190	0	231	8	2502	0	0	2510	7	1	26	0	34	4633
Percent	0.1	97.8	0.5	1.6		16.9	0.9	82.3	0.0		0.3	99.7	0.0	0.0		20.6	2.9	76.5	0.0		
05:30 Volume	0	448	4	5	457	9	1	39	0	49	1	674	0	0	675	2	1	6	0	9	1190
Peak Factor																					0.973
High Int.	05:00 PM					05:00 PM					05:30 PM					05:15 PM					
Volume	0	491	2	8	501	20	0	51	0	71	1	674	0	0	675	1	0	10	0	11	
Peak Factor					0.927					0.813					0.930					0.773	



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Weather: SUNNY
Counted By: DEB, RK
Town: HILLANDALE
County: MONTGOMERY

File Name : MD 650 @ Powder Mill Road
Site Code : 00000000
Start Date : 10/16/2007
Page No : 1

Groups Printed- Cars

	MD 650 From North					POWDER MILL RD From East					MD 650 From South					POWDER MILL RD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	32	451	5	0	488	189	3	24	1	217	14	340	33	1	388	5	3	11	0	19	1112
06:45 AM	28	508	1	0	537	167	1	23	11	202	8	338	37	16	399	2	4	14	0	20	1158
Total	60	959	6	0	1025	356	4	47	12	419	22	678	70	17	787	7	7	25	0	39	2270
07:00 AM	25	396	3	0	424	205	1	25	3	234	14	291	48	0	353	9	3	12	0	24	1035
07:15 AM	53	455	7	0	515	209	8	29	2	248	14	302	45	3	364	6	3	14	3	26	1153
07:30 AM	34	512	9	0	555	230	5	31	2	268	16	366	36	4	422	5	2	14	0	21	1266
07:45 AM	40	432	72	7	551	208	4	29	3	244	21	353	44	11	429	4	2	13	2	21	1245
Total	152	1795	91	7	2045	852	18	114	10	994	65	1312	173	18	1568	24	10	53	5	92	4699
08:00 AM	40	530	7	0	577	180	1	35	6	222	16	362	47	4	429	7	2	20	0	29	1257
08:15 AM	25	594	2	0	621	193	2	33	0	228	17	364	48	2	431	5	3	7	0	15	1295
08:30 AM	47	573	5	0	625	198	3	35	3	239	10	349	40	3	402	5	2	16	0	23	1289
08:45 AM	51	686	4	0	741	152	1	37	0	190	13	320	43	3	379	9	0	17	0	26	1336
Total	163	2383	18	0	2564	723	7	140	9	879	56	1395	178	12	1641	26	7	60	0	93	5177
09:00 AM	48	580	3	1	632	136	4	37	4	181	18	276	33	1	328	11	3	14	0	28	1169
09:15 AM	31	500	3	0	534	112	8	24	1	145	14	308	30	2	354	2	4	15	0	21	1054
*** BREAK ***																					
Total	79	1080	6	1	1166	248	12	61	5	326	32	584	63	3	682	13	7	29	0	49	2223
*** BREAK ***																					
04:00 PM	58	441	4	0	503	121	2	58	3	184	16	507	70	19	612	11	6	24	0	41	1340
04:15 PM	52	440	4	0	496	109	2	48	5	164	6	538	77	5	626	8	6	18	4	36	1322
04:30 PM	46	461	5	1	513	98	1	59	11	169	16	516	76	12	620	13	9	28	2	52	1354
04:45 PM	40	437	9	2	488	98	5	65	1	169	10	544	81	11	646	18	4	45	3	70	1373
Total	196	1779	22	3	2000	426	10	230	20	686	48	2105	304	47	2504	50	25	115	9	199	5389
05:00 PM	53	452	5	2	512	122	6	56	3	187	15	558	82	5	660	17	13	24	4	58	1417
05:15 PM	47	447	8	2	504	119	3	79	5	206	8	570	68	20	666	22	8	20	6	56	1432
05:30 PM	57	471	5	0	533	120	0	78	0	198	18	568	79	14	679	15	0	19	2	36	1446
05:45 PM	54	373	5	0	432	90	13	80	9	192	10	551	65	3	629	10	6	16	4	36	1289
Total	211	1743	23	4	1981	451	22	293	17	783	51	2247	294	42	2634	64	27	79	16	186	5584
06:00 PM	40	446	2	0	488	99	2	78	5	184	13	556	81	4	654	10	7	24	0	41	1367
06:15 PM	53	436	1	0	490	83	5	51	8	147	5	537	73	8	623	11	2	12	2	27	1287
06:30 PM	47	449	3	0	499	102	4	62	7	175	13	491	71	7	582	10	6	22	4	42	1298
06:45 PM	40	371	5	0	416	103	1	51	1	156	9	503	73	4	589	8	6	14	2	30	1191
Total	180	1702	11	0	1893	387	12	242	21	662	40	2087	298	23	2448	39	21	72	8	140	5143
Grand Total	1041	11441	177	15	12674	3443	85	1127	94	4749	314	10808	1380	162	12264	223	104	433	38	798	30485
Apprch %	8.2	90.3	1.4	0.1		72.5	1.8	23.7	2.0		2.6	84.9	11.3	1.3		27.9	13.0	54.3	4.8		
Total %	3.4	37.5	0.6	0.0	41.6	11.3	0.3	3.7	0.3	15.6	1.0	34.1	4.5	0.5	40.2	0.7	0.3	1.4	0.1	2.6	

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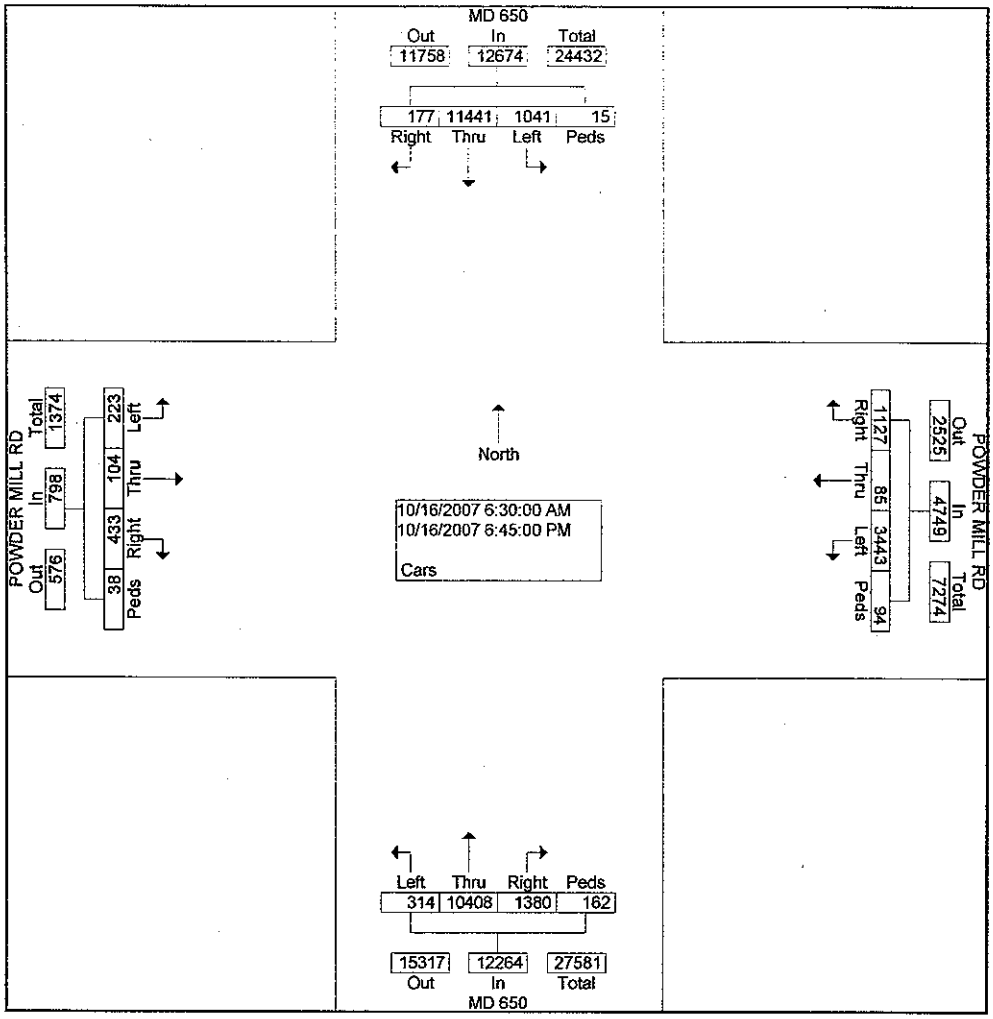
Weather: SUNNY
Counted By: DEB, RK
Town: HILLANDALE
County: MONTGOMERY

File Name : MD 650 @ Powder Mill Road
Site Code : 00000000
Start Date : 10/16/2007
Page No : 2



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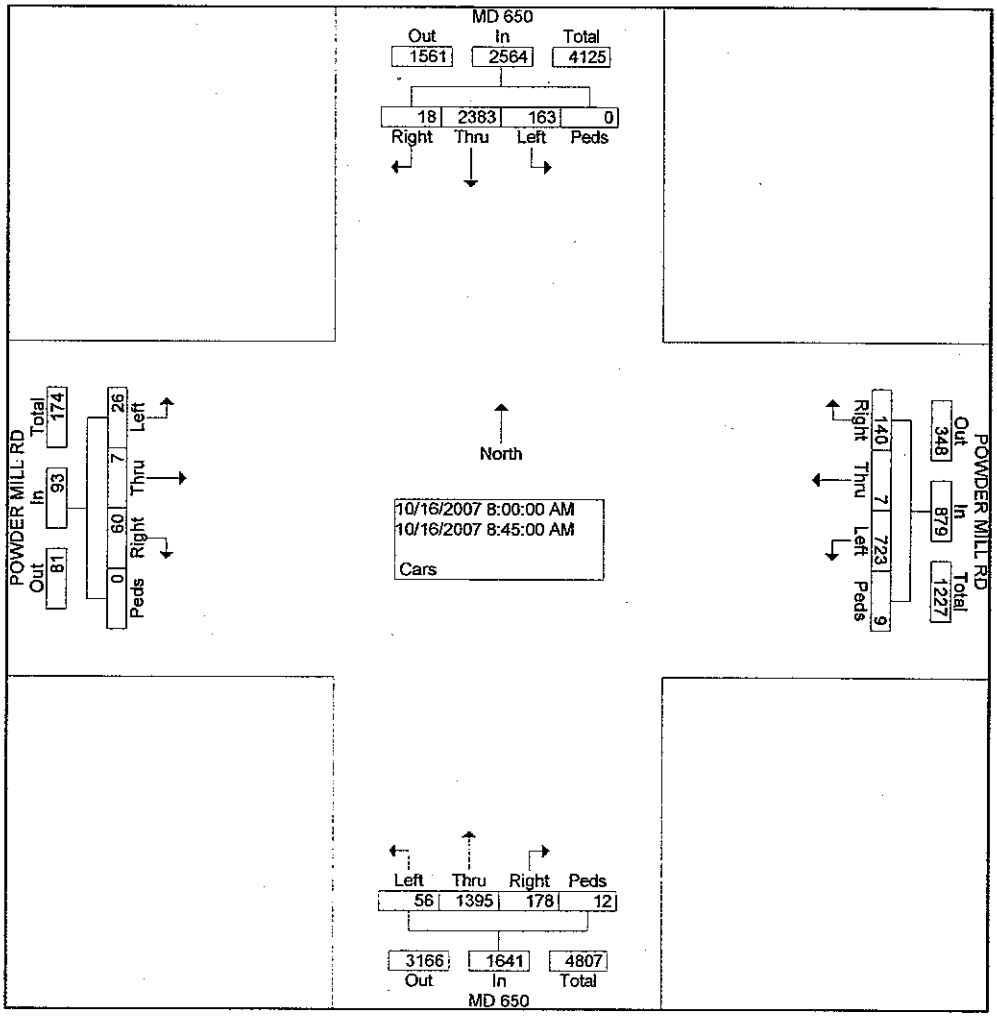
Weather: SUNNY
Counted By: DEB, RK
Town: HILLANDALE
County: MONTGOMERY

File Name : MD 650 @ Powder Mill Road
Site Code : 00000000
Start Date : 10/16/2007

	MD 650 From North					POWDER MILL RD From East					MD 650 From South					POWDER MILL RD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	08:00 AM																				
Volume	163	2383	18	0	2564	723	7	140	9	879	56	1395	178	12	1641	26	7	60	0	93	5177
Percent	6.4	92.9	0.7	0.0		82.3	0.8	15.9	1.0		3.4	85.0	10.8	0.7		28.0	7.5	64.5	0.0		
08:45 Volume	51	686	4	0	741	152	1	37	0	190	13	320	43	3	379	9	0	17	0	26	1336
Peak Factor																					0.969
High Int.	08:45 AM					08:30 AM					08:15 AM					08:00 AM					
Volume	51	686	4	0	741	198	3	35	3	239	17	364	48	2	431	7	2	20	0	29	
Peak Factor					0.865					0.919					0.952					0.802	



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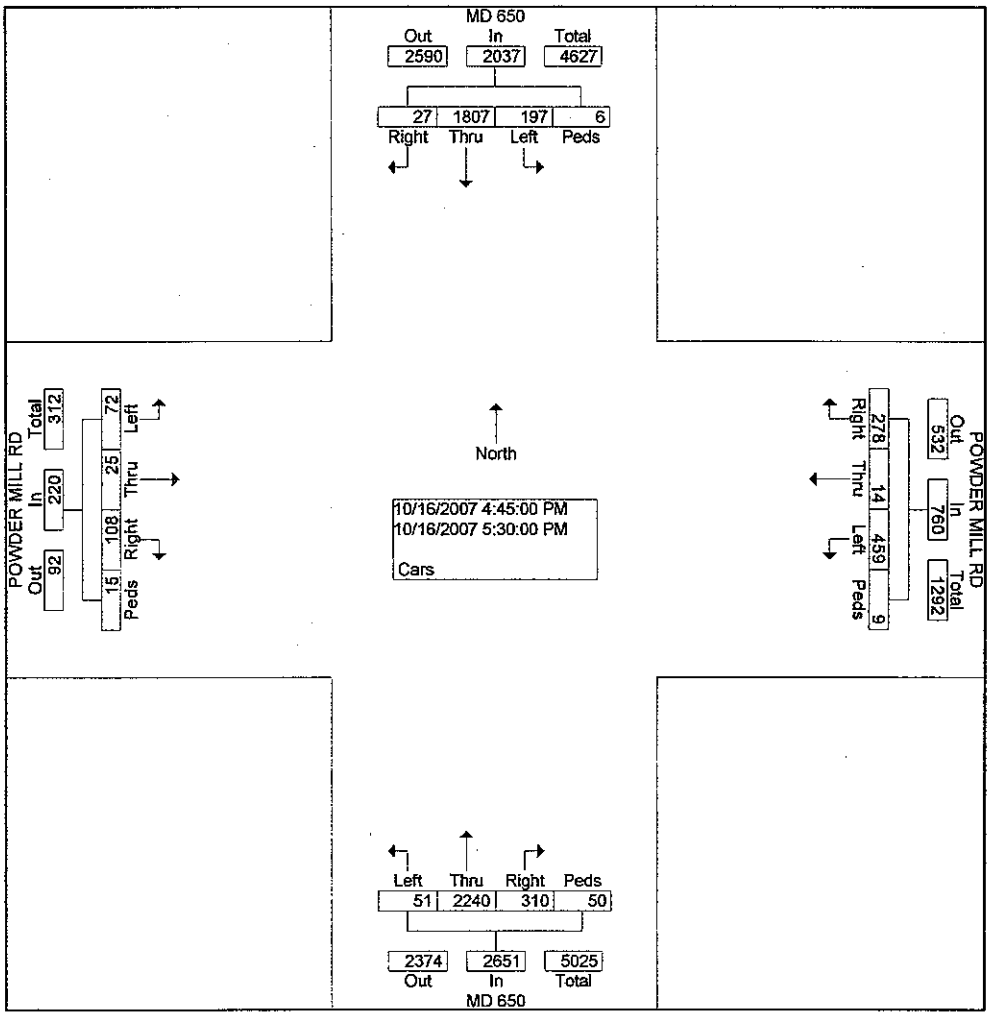
Weather: SUNNY
Counted By: DEB, RK
Town: HILLANDALE
County: MONTGOMERY

File Name : MD 650 @ Powder Mill Road
Site Code : 00000000
Start Date : 10/16/2007
Page No : 4

	MD 650 From North					POWDER MILL RD From East					MD 650 From South					POWDER MILL RD From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	197	1807	27	6	2037	459	14	278	9	760	51	2240	310	50	2651	72	25	108	15	220	5668
Percent	9.7	88.7	1.3	0.3		60.4	1.8	36.6	1.2		1.9	84.5	11.7	1.9		32.7	11.4	49.1	6.8		
05:30 Volume	57	471	5	0	533	120	0	78	0	198	18	568	79	14	679	15	0	19	2	36	1446
Peak Factor																					0.980
High Int.	05:30 PM					05:15 PM					05:30 PM					04:45 PM					
Volume	57	471	5	0	533	119	3	79	5	206	18	568	79	14	679	18	4	45	3	70	
Peak Factor					0.955					0.922					0.976					0.786	



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Tel: (410)-737-6564

Weather: SUNNY
Counted By: RK, DEB
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Lockwood Drive
Site Code : 00000000
Start Date : 10/17/2007
Page No : 1

Groups Printed- Unshifted

	MD 650 From North					LOCKWOOD DR From East					MD 650 From South					LOCKWOOD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	4	398	11	3	416	92	56	33	0	181	30	241	67	10	348	14	18	28	5	65	1010
06:45 AM	5	421	25	11	462	71	45	23	2	141	36	262	21	9	328	10	16	32	5	63	994
Total	9	819	36	14	878	163	101	56	2	322	66	503	88	19	676	24	34	60	10	128	2004
07:00 AM	9	392	22	8	431	41	55	19	0	115	19	116	12	1	148	22	14	29	5	70	764
07:15 AM	9	523	30	4	566	49	37	12	1	99	22	216	10	3	251	16	22	53	1	92	1008
07:30 AM	1	547	37	6	591	60	39	6	0	105	8	119	15	3	145	20	16	49	7	92	933
07:45 AM	11	553	53	7	624	71	30	13	1	115	30	160	12	3	205	23	16	45	6	90	1034
Total	30	2015	142	25	2212	221	161	50	2	434	79	611	49	10	749	81	68	176	19	344	3739
08:00 AM	6	535	50	7	598	76	41	14	3	134	24	203	23	7	257	18	22	47	0	87	1076
08:15 AM	12	529	43	6	590	73	68	19	2	162	36	214	12	6	268	25	17	52	4	98	1118
08:30 AM	9	536	30	3	578	85	65	33	0	183	41	286	19	3	349	24	18	48	4	94	1204
08:45 AM	13	538	57	5	613	49	52	42	0	143	38	218	58	9	323	21	30	37	1	89	1168
Total	40	2138	180	21	2379	283	226	108	5	622	139	921	112	25	1197	88	87	184	9	368	4566
09:00 AM	7	408	31	6	452	38	22	18	0	78	27	126	14	17	184	31	36	46	3	116	830
09:15 AM	13	473	28	4	518	48	30	23	1	102	27	119	17	11	174	29	33	31	6	99	893
*** BREAK ***																					
Total	20	881	59	10	970	86	52	41	1	180	54	245	31	28	358	60	69	77	9	215	1723
*** BREAK ***																					
04:00 PM	19	273	30	5	327	60	63	48	5	176	56	509	59	30	654	53	48	24	8	133	1290
04:15 PM	14	288	17	3	322	88	42	23	2	155	45	503	72	15	635	51	48	25	5	129	1241
04:30 PM	16	304	20	15	355	94	30	20	3	147	41	507	84	18	650	62	52	51	2	167	1319
04:45 PM	15	287	26	20	348	96	27	31	0	154	36	561	66	11	674	48	54	42	15	159	1335
Total	64	1152	93	43	1352	338	162	122	10	632	178	2080	281	74	2613	214	202	142	30	588	5185
05:00 PM	16	343	24	14	397	101	30	29	1	161	42	563	75	36	716	83	52	32	4	171	1445
05:15 PM	21	319	13	18	371	70	21	33	2	126	43	596	72	11	722	66	31	40	18	155	1374
05:30 PM	28	308	14	8	358	107	32	35	3	177	39	542	72	19	672	62	55	35	8	160	1367
05:45 PM	24	297	23	4	348	113	33	31	0	177	25	573	83	9	690	63	65	34	3	165	1380
Total	89	1267	74	44	1474	391	116	128	6	641	149	2274	302	75	2800	274	203	141	33	651	5566
06:00 PM	31	296	15	30	372	91	29	28	0	148	48	540	98	10	696	64	57	19	2	142	1358
06:15 PM	20	285	23	11	339	100	40	16	0	156	33	467	91	18	609	58	55	35	3	151	1255
06:30 PM	16	312	29	31	388	126	44	31	0	201	36	526	128	10	700	50	74	18	1	143	1432
06:45 PM	18	291	26	5	340	121	29	26	0	176	41	461	121	6	629	39	56	35	7	137	1282
Total	85	1184	93	77	1439	438	142	101	0	681	158	1994	438	44	2634	211	242	107	13	573	5327
Grand Total	337	9456	677	234	10704	1920	960	606	26	3512	823	8628	1301	275	11027	952	905	887	123	2867	28110
Apprch %	3.1	88.3	6.3	2.2		54.7	27.3	17.3	0.7		7.5	78.2	11.8	2.5		33.2	31.6	30.9	4.3		
Total %	1.2	33.6	2.4	0.8	38.1	6.8	3.4	2.2	0.1	12.5	2.9	30.7	4.6	1.0	39.2	3.4	3.2	3.2	0.4	10.2	

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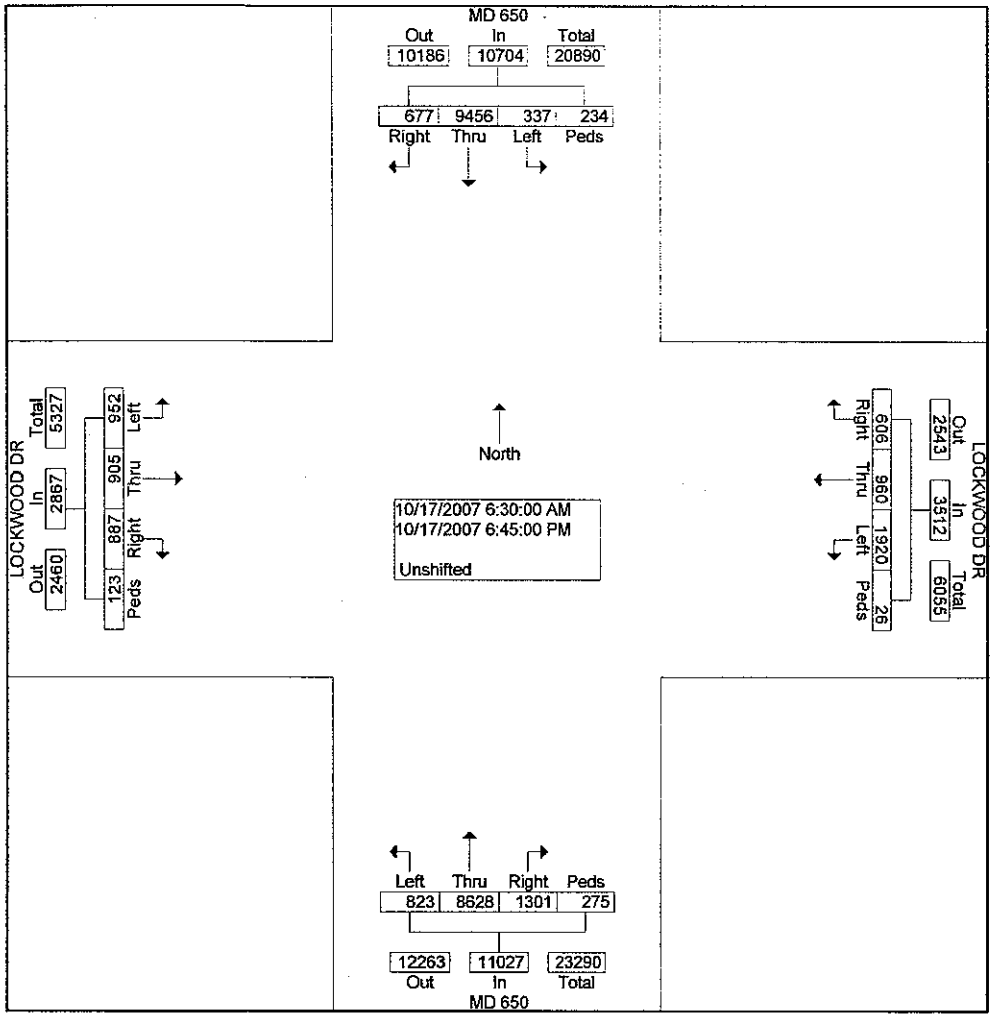
Weather: SUNNY
Counted By: RK, DEB
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Lockwood Drive
Site Code : 00000000
Start Date : 10/17/2007
Page No : 2



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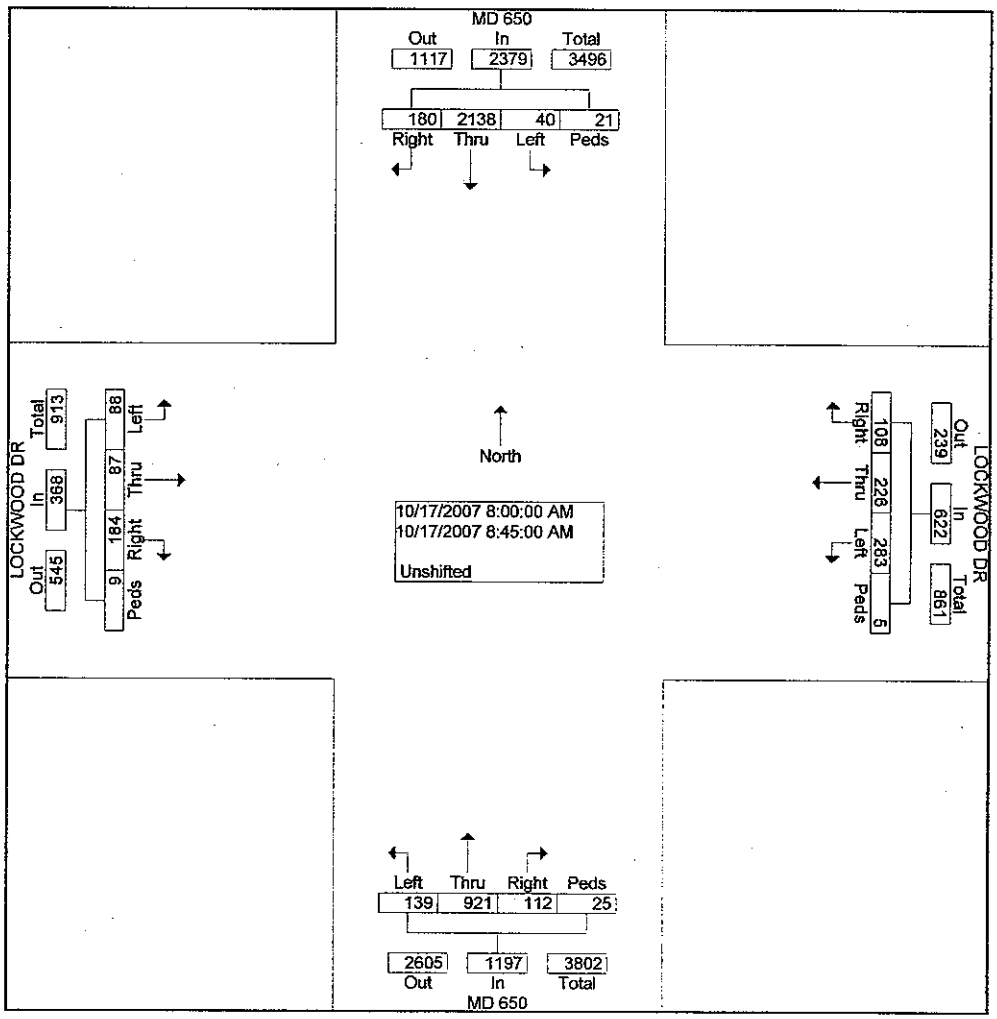
Tel: (410)-737-6564

Weather: SUNNY
Counted By: RK, DEB
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Lockwood Drive
Site Code : 00000000
Start Date : 10/17/2007

	MD 650 From North					LOCKWOOD DR From East					MD 650 From South					LOCKWOOD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	08:00 AM																				
Volume	40	2138	180	21	2379	283	226	108	5	622	139	921	112	25	1197	88	87	184	9	368	4566
Percent	1.7	89.9	7.6	0.9		45.5	36.3	17.4	0.8		11.6	76.9	9.4	2.1		23.9	23.6	50.0	2.4		
08:30 Volume	9	536	30	3	578	85	65	33	0	183	41	286	19	3	349	24	18	48	4	94	1204
Peak Factor																					0.948
High Int.	08:45 AM					08:30 AM					08:30 AM					08:15 AM					
Volume	13	538	57	5	613	85	65	33	0	183	41	286	19	3	349	25	17	52	4	98	
Peak Factor					0.970					0.850					0.857					0.939	



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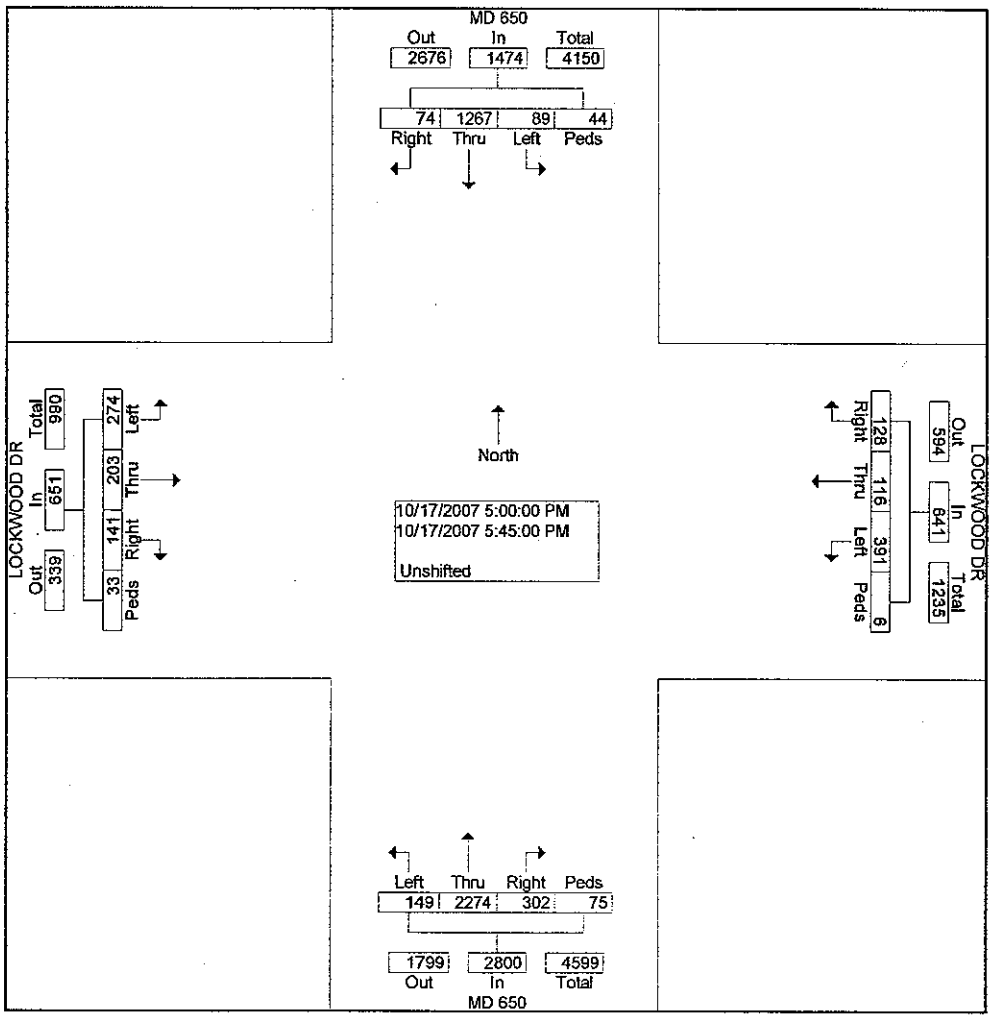
Baltimore, MD, 21227

Weather: SUNNY
Counted By: RK, DEB
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Lockwood Drive
Site Code : 00000000
Start Date : 10/17/2007
Page No : 4

	MD 650 From North					LOCKWOOD DR From East					MD 650 From South					LOCKWOOD DR From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	89	1267	74	44	1474	391	116	128	6	641	149	2274	302	75	2800	274	203	141	33	651	5566
Percent	6.0	86.0	5.0	3.0		61.0	18.1	20.0	0.9		5.3	81.2	10.8	2.7		42.1	31.2	21.7	5.1		
05:00 Volume	16	343	24	14	397	101	30	29	1	161	42	563	75	36	716	83	52	32	4	171	1445
Peak Factor																					0.963
High Int.	05:00 PM					05:30 PM					05:15 PM					05:00 PM					
Volume	16	343	24	14	397	107	32	35	3	177	43	596	72	11	722	83	52	32	4	171	
Peak Factor					0.928					0.905					0.970					0.952	



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1504 Joh Avenue, Suite 160
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Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Mahan Road
Site Code : 00000000
Start Date : 10/18/2007

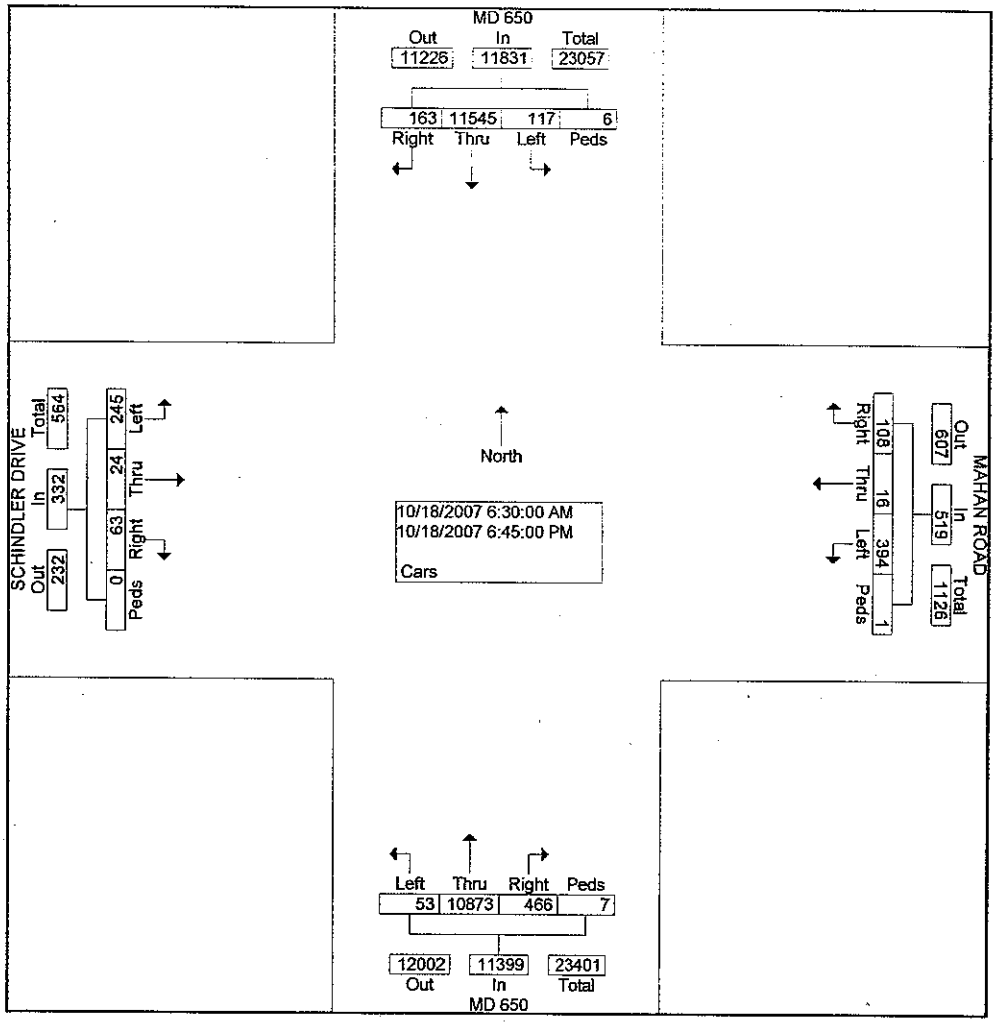
Groups Printed- Cars

	MD 650 From North					MAHAN ROAD From East					MD 650 From South					SCHINDLER DRIVE From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	8	461	3	0	472	0	1	1	0	2	7	358	39	0	404	10	0	0	0	10	888
06:45 AM	8	510	2	0	520	2	0	5	0	7	1	342	35	0	378	15	0	5	0	20	925
Total	16	971	5	0	992	2	1	6	0	9	8	700	74	0	782	25	0	5	0	30	1813
07:00 AM	9	512	5	0	526	4	1	1	0	6	2	319	19	0	340	10	0	6	0	16	888
07:15 AM	6	636	3	1	646	6	0	4	0	10	4	321	33	0	358	13	1	8	0	22	1036
07:30 AM	4	712	6	0	722	3	1	0	0	4	2	319	52	1	374	10	0	3	0	13	1113
07:45 AM	8	602	5	0	615	5	0	3	0	8	1	365	43	0	409	9	2	4	0	15	1047
Total	27	2462	19	1	2509	18	2	8	0	28	9	1324	147	1	1481	42	3	21	0	66	4084
08:00 AM	9	546	1	0	556	1	1	1	0	3	3	351	32	3	389	11	1	0	0	12	960
08:15 AM	7	429	2	0	438	3	0	2	1	6	1	357	40	1	399	9	0	2	0	11	854
08:30 AM	9	501	7	0	517	2	1	3	0	6	1	341	40	0	382	11	1	5	0	17	922
08:45 AM	10	623	2	1	636	2	0	4	0	6	2	320	31	0	353	7	2	2	0	11	1006
Total	35	2099	12	1	2147	8	2	10	1	21	7	1369	143	4	1523	38	4	9	0	51	3742
09:00 AM	3	556	5	0	564	2	1	0	0	3	3	290	49	1	343	12	0	3	0	15	925
09:15 AM	10	528	4	0	542	1	0	3	0	4	4	287	28	0	319	6	1	1	0	8	873
*** BREAK ***																					
Total	13	1084	9	0	1106	3	1	3	0	7	7	577	77	1	662	18	1	4	0	23	1798
*** BREAK ***																					
04:00 PM	5	398	6	1	410	46	1	9	0	56	1	533	6	0	540	7	0	2	0	9	1015
04:15 PM	1	387	15	0	403	33	0	9	0	42	1	560	3	1	565	6	1	4	0	11	1021
04:30 PM	2	422	7	0	431	39	1	12	0	52	1	547	3	0	551	8	0	4	0	12	1046
04:45 PM	0	372	10	0	382	32	0	7	0	39	1	579	1	0	581	11	1	6	0	18	1020
Total	8	1579	38	1	1626	150	2	37	0	189	4	2219	13	1	2237	32	2	16	0	50	4102
05:00 PM	3	389	15	1	408	27	3	5	0	35	1	639	1	0	641	7	0	1	0	8	1092
05:15 PM	1	506	6	0	513	46	2	10	0	58	2	654	1	0	657	15	0	1	0	16	1244
05:30 PM	5	460	12	0	477	23	1	2	0	26	4	633	5	0	642	15	0	2	0	17	1162
05:45 PM	1	359	7	0	367	30	0	8	0	38	3	609	3	0	615	14	1	0	0	15	1035
Total	10	1714	40	1	1765	126	6	25	0	157	10	2535	10	0	2555	51	1	4	0	56	4533
06:00 PM	4	394	12	1	411	23	1	5	0	29	2	576	0	0	578	8	0	0	0	8	1026
06:15 PM	1	440	7	0	448	30	0	8	0	38	0	530	1	0	531	12	1	1	0	14	1031
06:30 PM	2	389	12	1	404	15	1	2	0	18	2	533	1	0	536	13	0	0	0	13	971
06:45 PM	1	413	9	0	423	19	0	4	0	23	4	510	0	0	514	6	12	3	0	21	981
Total	8	1636	40	2	1686	87	2	19	0	108	8	2149	2	0	2159	39	13	4	0	56	4009
Grand Total	117	11545	163	6	11831	394	16	108	1	519	53	10873	466	7	11399	245	24	63	0	332	24081
Apprch %	1.0	97.6	1.4	0.1		75.9	3.1	20.8	0.2		0.5	95.4	4.1	0.1		73.8	7.2	19.0	0.0		
Total %	0.5	47.9	0.7	0.0	49.1	1.6	0.1	0.4	0.0	2.2	0.2	45.2	1.9	0.0	47.3	1.0	0.1	0.3	0.0	1.4	

Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Mahan Road
Site Code : 00000000
Start Date : 10/18/2007
Page No : 2



Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
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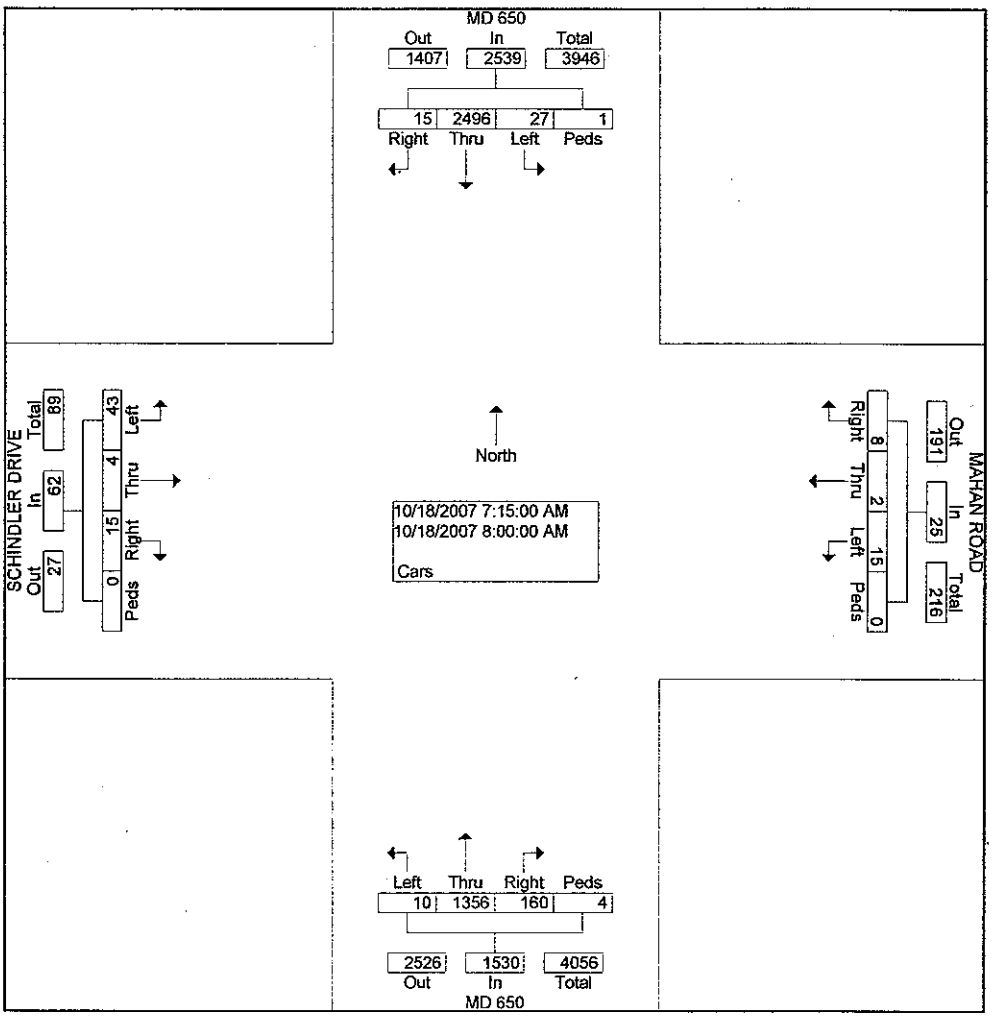
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Mahan Road
Site Code : 00000000
Start Date : 10/18/2007

	MD 650 From North					MAHAN ROAD From East					MD 650 From South					SCHINDLER DRIVE From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	27	2496	15	1	2539	15	2	8	0	25	10	1356	160	4	1530	43	4	15	0	62	4156
Percent	1.1	98.3	0.6	0.0		60.0	8.0	32.0	0.0		0.7	88.6	10.5	0.3		69.4	6.5	24.2	0.0		
07:30 Volume	4	712	6	0	722	3	1	0	0	4	2	319	52	1	374	10	0	3	0	13	1113
Peak Factor																					0.934
High Int.	07:30 AM					07:15 AM					07:45 AM					07:15 AM					
Volume	4	712	6	0	722	6	0	4	0	10	1	365	43	0	409	13	1	8	0	22	
Peak Factor					0.879					0.625					0.935					0.705	

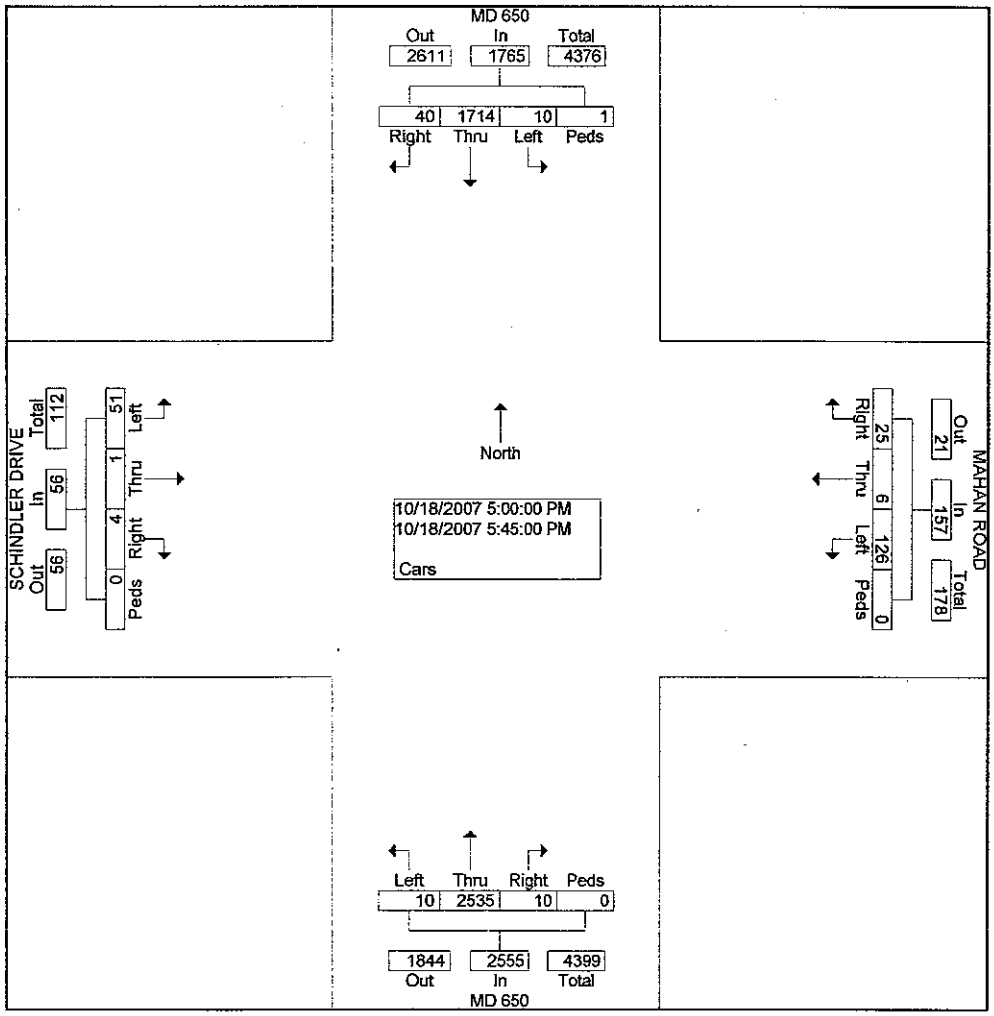


Sabra, Wang & Associates,inc.
1504 Joh Avenue, Suite 160
Baltimore, MD, 21227
Tel: (410)-737-6564

Weather: SUNNY
Counted By: AK, JY
Town: WHITE OAK
County: MONTGOMERY

File Name : MD 650 @ Mahan Road
Site Code : 00000000
Start Date : 10/18/2007
Page No : 4

	MD 650 From North					MAHAN ROAD From East					MD 650 From South					SCHINDLER DRIVE From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	10	1714	40	1	1765	126	6	25	0	157	10	2535	10	0	2555	51	1	4	0	56	4533
Percent	0.6	97.1	2.3	0.1		80.3	3.8	15.9	0.0		0.4	99.2	0.4	0.0		91.1	1.8	7.1	0.0		
05:15 Volume	1	506	6	0	513	46	2	10	0	58	2	654	1	0	657	15	0	1	0	16	1244
Peak Factor																					0.911
High Int.	05:15 PM					05:15 PM					05:15 PM					05:30 PM					
Volume	1	506	6	0	513	46	2	10	0	58	2	654	1	0	657	15	0	2	0	17	
Peak Factor					0.860					0.677					0.972					0.824	



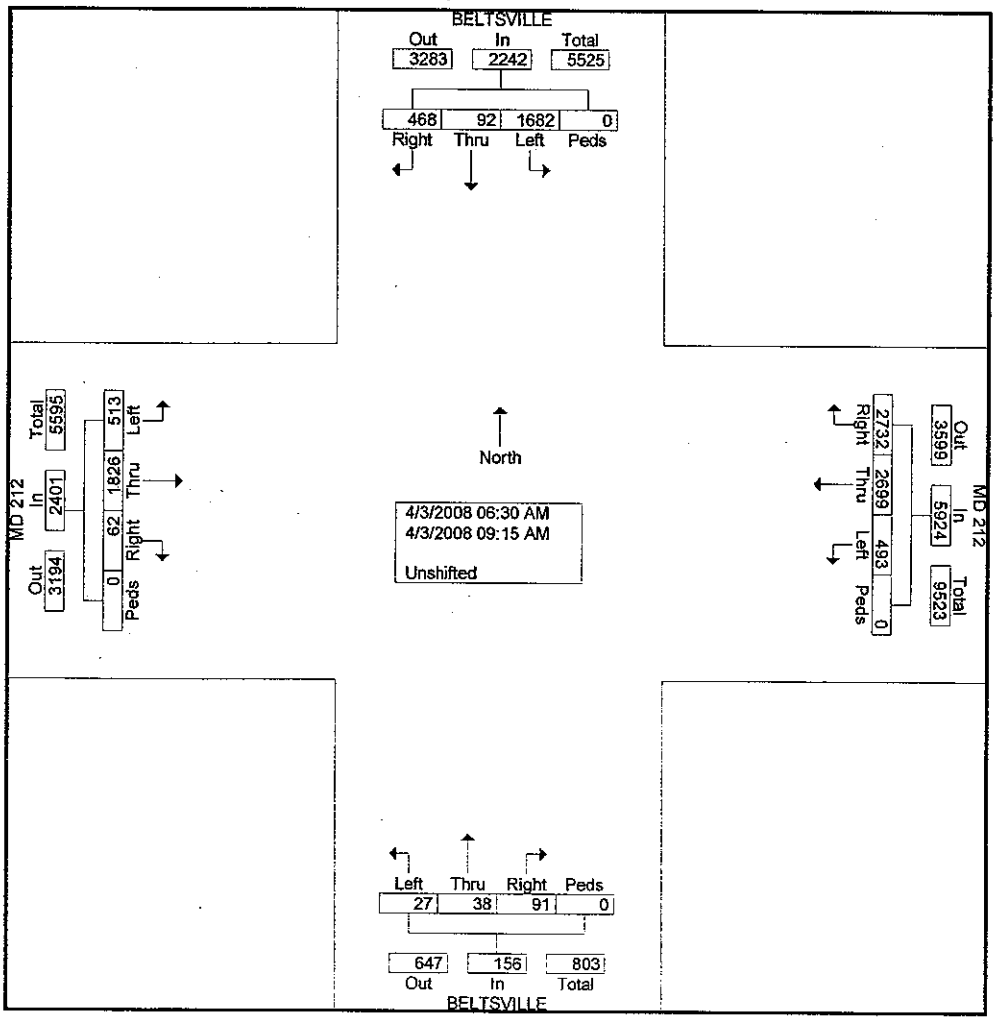
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Cloudy
Counted By: SK & CH
Town: White Oak
County: Prince George's

File Name : Beltsville@Powder Mill
Site Code : 00000007
Start Date : 4/3/2008
Page No : 1

Groups Printed- Unshifted

	BELTSVILLE From North					MD 212 From East					BELTSVILLE From South					MD 212 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 AM	18	2	90	0	110	149	248	18	0	415	3	2	2	0	7	3	118	26	0	147	679
06:45 AM	24	0	94	0	118	217	322	12	0	551	1	1	0	0	2	3	106	40	0	149	820
Total	42	2	184	0	228	366	570	30	0	966	4	3	2	0	9	6	224	66	0	296	1499
07:00 AM	48	3	107	0	158	183	349	21	0	553	8	3	1	0	12	2	123	29	0	154	877
07:15 AM	55	2	141	0	198	232	303	22	0	557	5	1	0	0	6	1	148	66	0	215	976
07:30 AM	65	3	207	0	275	233	285	29	0	547	10	5	2	0	17	2	207	72	0	281	1120
07:45 AM	67	5	139	0	211	283	218	43	0	544	9	7	1	0	17	6	184	51	0	241	1013
Total	235	13	594	0	842	931	1155	115	0	2201	32	16	4	0	52	11	662	218	0	891	3986
08:00 AM	31	2	171	0	204	296	184	39	0	519	14	1	3	0	18	9	189	50	0	248	989
08:15 AM	41	5	157	0	203	288	192	58	0	538	8	3	4	0	15	4	135	38	0	177	933
08:30 AM	27	45	133	0	205	257	158	44	0	459	10	2	5	0	17	5	174	37	0	216	897
08:45 AM	37	4	166	0	207	226	152	54	0	432	6	3	4	0	13	8	138	40	0	186	838
Total	136	56	627	0	819	1067	686	195	0	1948	38	9	16	0	63	26	636	165	0	827	3657
09:00 AM	29	8	141	0	178	178	170	59	0	407	8	5	2	0	15	12	122	33	0	167	767
09:15 AM	26	13	136	0	175	190	118	94	0	402	9	5	3	0	17	7	182	31	0	220	814
Grand Total	468	92	1682	0	2242	2732	2699	493	0	5924	91	38	27	0	156	62	1826	513	0	2401	10723
Apprch %	20.9	4.1	75	0		46.1	45.6	8.3	0		58.3	24.4	17.3	0		2.6	76.1	21.4	0		
Total %	4.4	0.9	15.7	0	20.9	25.5	25.2	4.6	0	55.2	0.8	0.4	0.3	0	1.5	0.6	17	4.8	0	22.4	

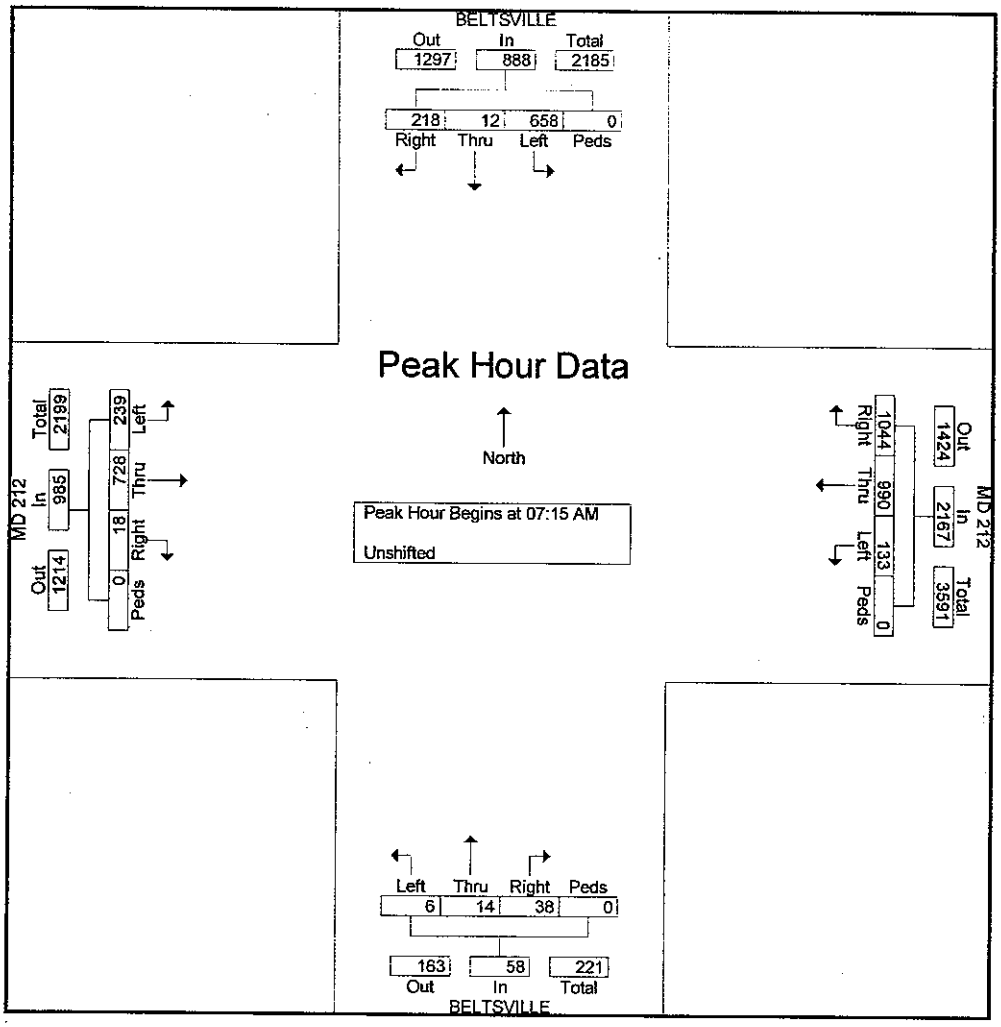


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Cloudy
Counted By: SK & CH
Town: White Oak
County: Prince George's

File Name : Beltsville@Powder Mill
Site Code : 00000007
Start Date : 4/3/2008
Page No : 2

	BELTSVILLE From North					MD 212 From East					BELTSVILLE From South					MD 212 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	55	2	141	0	198	232	**303**	22	0	**557**	5	1	0	0	6	1	148	66	0	215	976
07:30 AM	65	3	**207**	0	**275**	233	285	29	0	547	10	5	2	0	17	2	**207**	**72**	0	**281**	**1120**
07:45 AM	**67**	**5**	139	0	211	283	218	**43**	0	544	9	**7**	1	0	17	6	184	51	0	241	1013
08:00 AM	31	2	171	0	204	**296**	184	39	0	519	**14**	1	**3**	0	**18**	**9**	189	50	0	248	989
Total Volume	218	12	658	0	888	1044	990	133	0	2167	38	14	6	0	58	18	728	239	0	985	4098
% App. Total	24.5	1.4	74.1	0		48.2	45.7	6.1	0		65.5	24.1	10.3	0		1.8	73.9	24.3	0		
PHF	.813	.600	.795	.000	.807	.882	.817	.773	.000	.973	.679	.500	.500	.000	.806	.500	.879	.830	.000	.876	.915



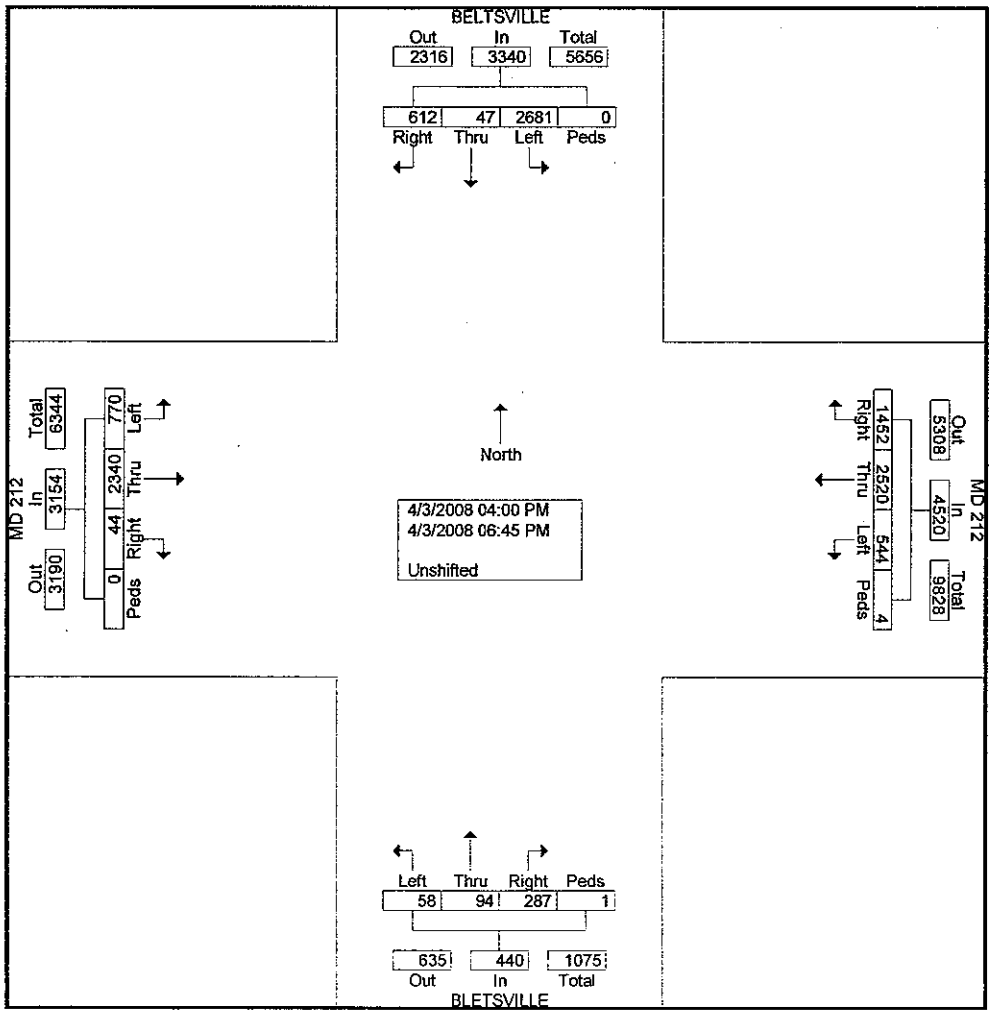
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Rain
Counted By: SK & CH
Town: White Oak
County: Prince George's

File Name : Beltsville@Powder Mill
Site Code : 00000008
Start Date : 4/3/2008
Page No : 1

Groups Printed- Unshifted

	BELTSVILLE From North					MD 212 From East					BLETSVILLE From South					MD 212 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	34	1	222	0	257	94	128	35	0	257	23	3	5	1	32	1	205	59	0	265	811
04:15 PM	54	7	209	0	270	97	173	30	4	304	14	2	1	0	17	4	203	48	0	255	846
04:30 PM	36	7	203	0	246	117	156	37	0	310	27	10	6	0	43	6	211	61	0	278	877
04:45 PM	50	5	240	0	295	105	158	57	0	320	54	16	11	0	81	2	236	57	0	295	991
Total	174	20	874	0	1068	413	615	159	4	1191	118	31	23	1	173	13	855	225	0	1093	3525
05:00 PM	49	4	255	0	308	149	174	62	0	385	43	12	6	0	61	4	225	68	0	297	1051
05:15 PM	43	3	281	0	327	125	144	54	0	323	33	7	8	0	48	5	205	59	0	269	967
05:30 PM	59	1	248	0	308	118	218	38	0	374	23	8	3	0	34	3	199	82	0	284	1000
05:45 PM	48	3	198	0	249	148	308	45	0	501	17	9	5	0	31	6	202	73	0	281	1062
Total	199	11	982	0	1192	540	844	199	0	1583	116	36	22	0	174	18	831	282	0	1131	4080
06:00 PM	63	3	246	0	312	120	258	35	0	413	13	10	4	0	27	4	192	81	0	277	1029
06:15 PM	60	4	197	0	261	135	331	38	0	504	16	5	2	0	23	4	166	60	0	230	1018
06:30 PM	69	4	225	0	298	156	317	58	0	531	14	8	3	0	25	4	151	64	0	219	1073
06:45 PM	47	5	157	0	209	88	155	55	0	298	10	4	4	0	18	1	145	58	0	204	729
Total	239	16	825	0	1080	499	1061	186	0	1746	53	27	13	0	93	13	654	263	0	930	3849
Grand Total	612	47	2681	0	3340	1452	2520	544	4	4520	287	94	58	1	440	44	2340	770	0	3154	11454
Apprch %	18.3	1.4	80.3	0		32.1	55.8	12	0.1		65.2	21.4	13.2	0.2		1.4	74.2	24.4	0		
Total %	5.3	0.4	23.4	0	29.2	12.7	22	4.7	0	39.5	2.5	0.8	0.5	0	3.8	0.4	20.4	6.7	0	27.5	

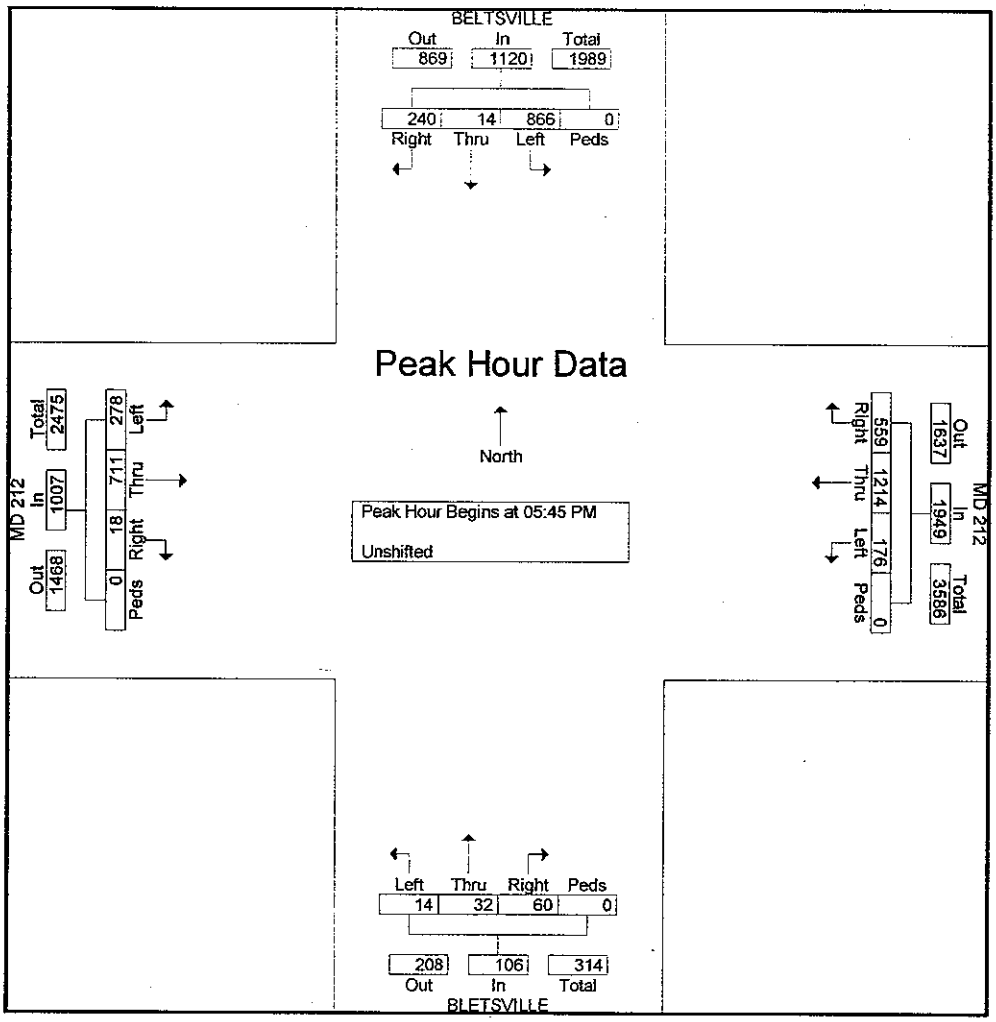


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Rain
Counted By: SK & CH
Town: White Oak
County: Prince George's

File Name : Beltsville@Powder Mill
Site Code : 00000008
Start Date : 4/3/2008
Page No : 2

	BELTSVILLE From North					MD 212 From East					BLETSVILLE From South					MD 212 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:45 PM																					
05:45 PM	48	3	198	0	249	148	308	45	0	501	**17**	9	**5**	0	**31**	**6**	**202**	73	0	281	1062
06:00 PM	63	3	**246**	0	**312**	120	258	35	0	413	13	**10**	4	0	27	4	192	**81**	0	277	1029
06:15 PM	60	**4**	197	0	261	135	**331**	38	0	504	16	5	2	0	23	4	166	60	0	230	1018
06:30 PM	**69**	4	225	0	298	**156**	317	**58**	0	**531**	14	8	3	0	25	4	151	64	0	219	**1073**
Total Volume	240	14	866	0	1120	559	1214	176	0	1949	60	32	14	0	106	18	711	278	0	1007	4182
% App. Total	21.4	1.2	77.3	0		28.7	62.3	9	0		56.6	30.2	13.2	0		1.8	70.6	27.6	0		
PHF	.870	.875	.880	.000	.897	.896	.917	.759	.000	.918	.882	.800	.700	.000	.855	.750	.880	.858	.000	.896	.974



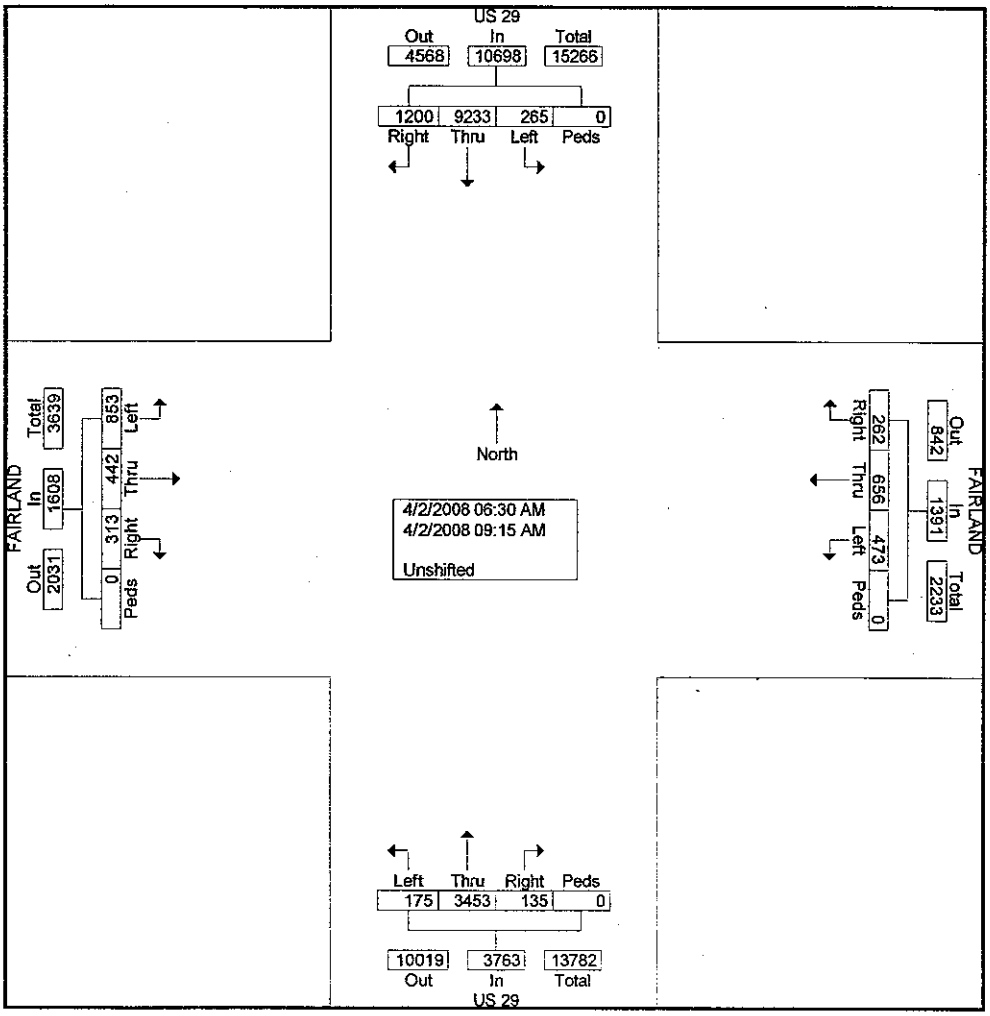
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted BY: YR & SK
Town: White Oak
County: Montgomery

File Name : US 29@Fairland Road
Site Code : 00000001
Start Date : 4/2/2008
Page No : 1

Groups Printed- Unshifted

	US 29 From North					FAIRLAND From East					US 29 From South					FAIRLAND From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 AM	110	847	9	0	966	10	51	37	0	98	6	227	14	0	247	26	28	37	0	91	1402
06:45 AM	116	860	15	0	991	18	62	43	0	123	10	194	19	0	223	26	16	62	0	104	1441
Total	226	1707	24	0	1957	28	113	80	0	221	16	421	33	0	470	52	44	99	0	195	2843
07:00 AM	95	809	15	0	919	28	62	34	0	124	12	268	20	0	300	17	23	68	0	108	1451
07:15 AM	121	858	37	0	1016	30	66	55	0	151	9	275	18	0	302	25	33	93	0	151	1620
07:30 AM	100	819	20	0	939	38	61	33	0	132	13	320	8	0	341	17	29	107	0	153	1565
07:45 AM	110	792	34	0	936	15	71	34	0	120	6	317	11	0	334	23	44	80	0	147	1537
Total	426	3278	106	0	3810	111	260	156	0	527	40	1180	57	0	1277	82	129	348	0	559	6173
08:00 AM	116	730	35	0	881	24	46	38	0	108	16	351	14	0	381	20	55	66	0	141	1511
08:15 AM	119	783	24	0	926	18	68	43	0	129	18	342	19	0	379	17	56	78	0	151	1585
08:30 AM	92	762	27	0	881	28	57	45	0	130	12	320	9	0	341	21	35	73	0	129	1481
08:45 AM	93	715	15	0	823	19	38	46	0	103	11	307	10	0	328	34	39	85	0	158	1412
Total	420	2990	101	0	3511	89	209	172	0	470	57	1320	52	0	1429	92	185	302	0	579	5989
09:00 AM	63	621	17	0	701	17	50	46	0	113	12	263	10	0	285	52	43	58	0	153	1252
09:15 AM	65	637	17	0	719	17	24	19	0	60	10	269	23	0	302	35	41	46	0	122	1203
Grand Total	1200	9233	265	0	10698	262	656	473	0	1391	135	3453	175	0	3763	313	442	853	0	1608	17460
Apprch %	11.2	86.3	2.5	0		18.8	47.2	34	0		3.6	91.8	4.7	0		19.5	27.5	53	0		
Total %	6.9	52.9	1.5	0	61.3	1.5	3.8	2.7	0	8	0.8	19.8	1	0	21.6	1.8	2.5	4.9	0	9.2	

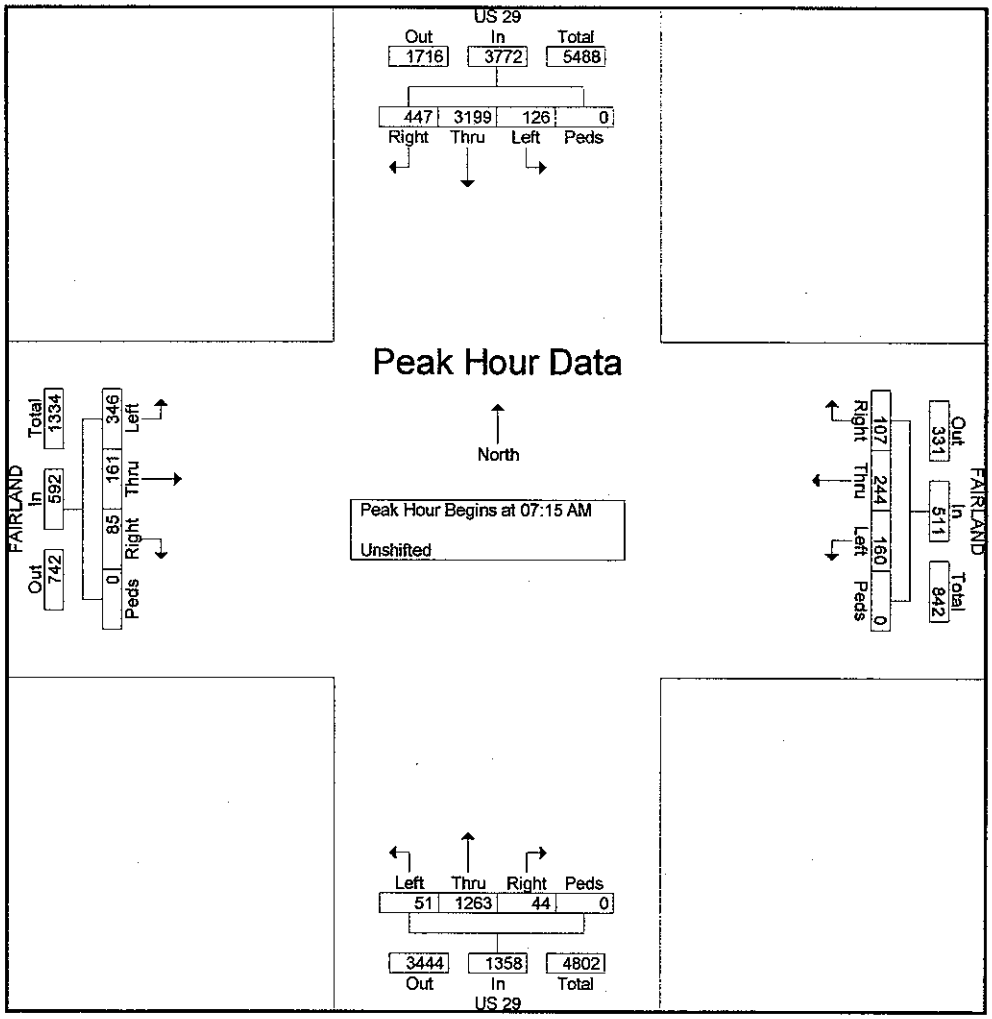


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted BY: YR & SK
Town: White Oak
County: Montgomery

File Name : US 29@Fairland Road
Site Code : 00000001
Start Date : 4/2/2008
Page No : 2

	US 29 From North					FAIRLAND From East					US 29 From South					FAIRLAND From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	**121**	**858**	**37**	0	**1016**	30	66	**55**	0	**151**	9	275	**18**	0	302	**25**	33	93	0	151	**1620**
07:30 AM	100	819	20	0	939	**38**	61	33	0	132	13	320	8	0	341	17	29	**107**	0	**153**1565	
07:45 AM	110	792	34	0	936	15	**71**	34	0	120	6	317	11	0	334	23	**44**	80	0	147	1537
08:00 AM	116	730	35	0	881	24	46	38	0	108	**16**	**351**	14	0	**381**	20	**55**	66	0	141	1511
Total Volume	447	3199	126	0	3772	107	244	160	0	511	44	1263	51	0	1358	85	161	346	0	592	6233
% App. Total	11.9	84.8	3.3	0		20.9	47.7	31.3	0		3.2	93	3.8	0		14.4	27.2	58.4	0		
PHF	.924	.932	.851	.000	.928	.704	.859	.727	.000	.846	.688	.900	.708	.000	.891	.850	.732	.808	.000	.967	.962



3445

1358

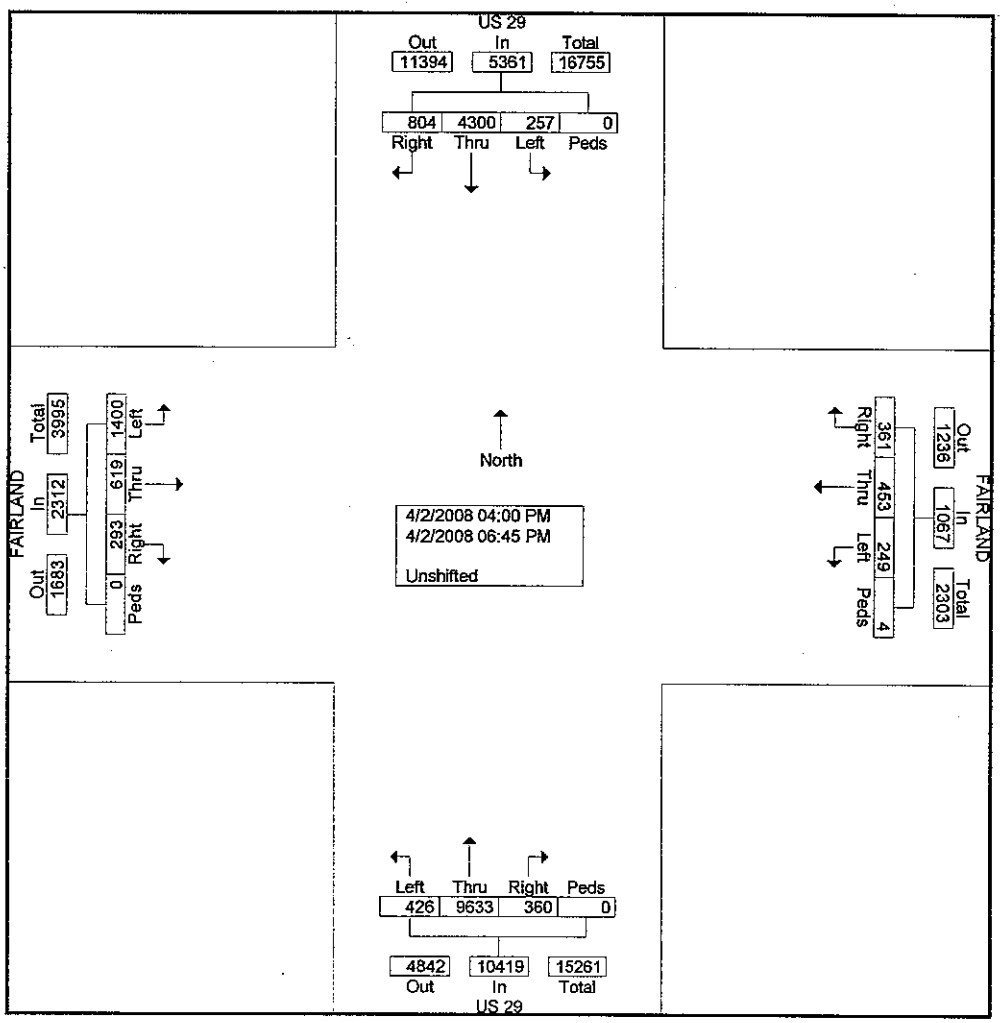
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: YR & SK
Town: White Oak
County: Montgomery

File Name : US 29@Fairland Road
Site Code : 00000002
Start Date : 4/2/2008
Page No : 1

Groups Printed- Unshifted

	US 29 From North					FAIRLAND From East					US 29 From South					FAIRLAND From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	52	299	23	0	374	24	38	21	0	83	29	712	34	0	775	30	37	110	0	177	1409
04:15 PM	64	323	25	0	412	28	56	13	1	98	31	762	34	0	827	24	55	100	0	179	1516
04:30 PM	59	319	13	0	391	31	25	34	0	90	19	837	38	0	894	24	62	133	0	219	1594
04:45 PM	62	331	15	0	408	32	45	21	0	98	30	829	25	0	884	24	59	143	0	226	1616
Total	237	1272	76	0	1585	115	164	89	1	369	109	3140	131	0	3380	102	213	486	0	801	6135
05:00 PM	79	389	14	0	482	24	46	11	1	82	29	878	40	0	947	24	50	126	0	200	1711
05:15 PM	86	400	24	0	510	31	43	27	0	101	31	892	29	0	952	18	51	123	0	192	1755
05:30 PM	79	423	29	0	531	30	41	14	0	85	23	834	45	0	902	27	52	126	0	205	1723
05:45 PM	89	384	27	0	500	31	37	25	0	93	37	859	37	0	933	29	60	130	0	219	1745
Total	333	1596	94	0	2023	116	167	77	1	361	120	3463	151	0	3734	98	213	505	0	816	6934
06:00 PM	80	361	29	0	470	34	29	27	0	90	31	804	38	0	873	19	54	123	0	196	1629
06:15 PM	59	392	21	0	472	35	30	22	0	87	35	829	39	0	903	20	46	123	0	189	1651
06:30 PM	52	347	18	0	417	31	30	14	0	75	33	785	30	0	848	35	39	75	0	149	1489
06:45 PM	43	332	19	0	394	30	33	20	2	85	32	612	37	0	681	19	54	88	0	161	1321
Total	234	1432	87	0	1753	130	122	83	2	337	131	3030	144	0	3305	93	193	409	0	695	6090
Grand Total	804	4300	257	0	5361	361	453	249	4	1067	360	9633	426	0	10419	293	619	1400	0	2312	19159
Apprch %	15	80.2	4.8	0		33.8	42.5	23.3	0.4		3.5	92.5	4.1	0		12.7	26.8	60.6	0		
Total %	4.2	22.4	1.3	0	28	1.9	2.4	1.3	0	5.6	1.9	50.3	2.2	0	54.4	1.5	3.2	7.3	0	12.1	

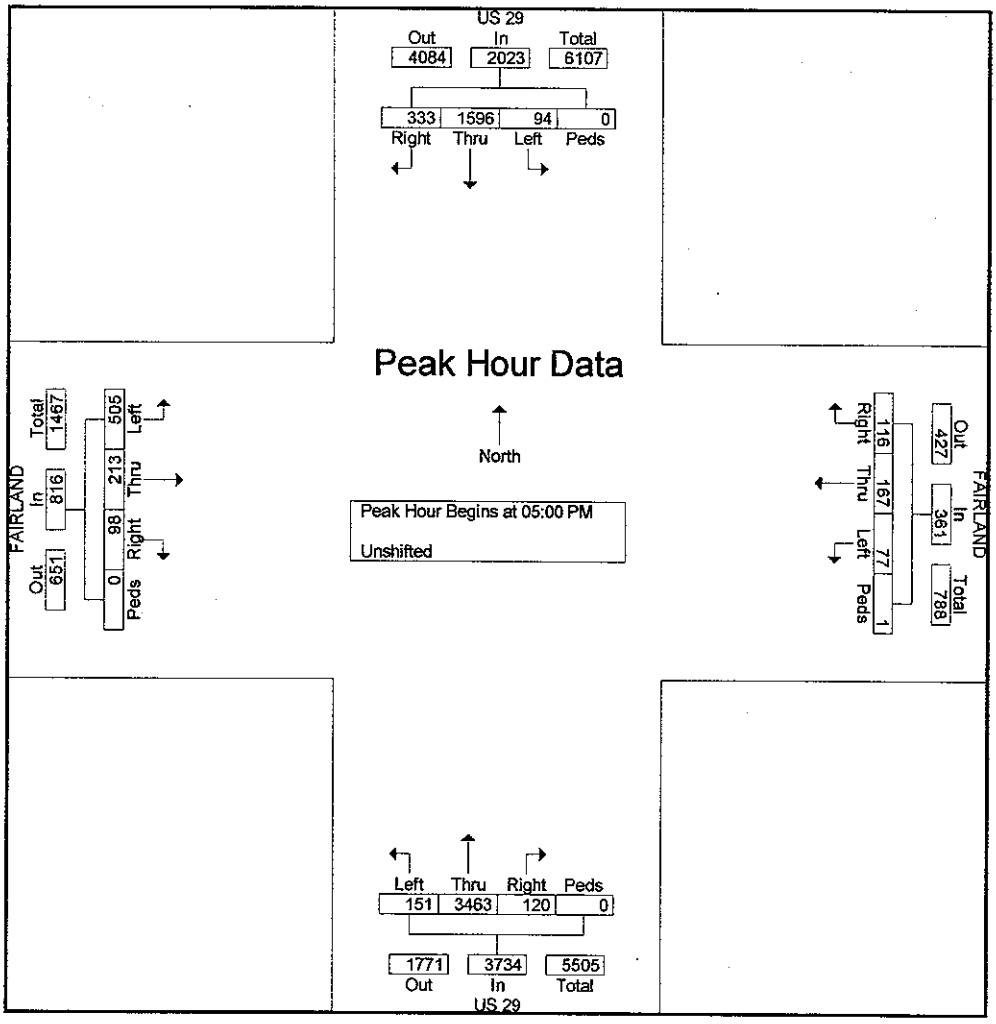


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: YR & SK
Town: White Oak
County: Montgomery

File Name : US 29@Fairland Road
Site Code : 00000002
Start Date : 4/2/2008
Page No : 2

	US 29 From North					FAIRLAND From East					US 29 From South					FAIRLAND From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	79	389	14	0	482	24	**46**	11	**1**	82	29	878	40	0	947	24	50	126	0	200	1711
05:15 PM	86	400	24	0	510	**31**	43	**27**	0	**101**	31	**892**	29	0	**952**	18	51	123	0	192	**1755**
05:30 PM	79	**423**	**29**	0	**531**	30	41	14	0	85	23	834	**45**	0	902	27	52	126	0	205	1723
05:45 PM	**89**	384	27	0	500	31	37	25	0	93	**37**	859	37	0	933	**29**	**60**	**130**	0	**219**	1745
Total Volume	333	1596	94	0	2023	116	167	77	1	361	120	3463	151	0	3734	98	213	505	0	816	6934
% App. Total	16.5	78.9	4.6	0		32.1	46.3	21.3	0.3		3.2	92.7	4	0		12	26.1	61.9	0		
PHF	.935	.943	.810	.000	.952	.935	.908	.713	.250	.894	.811	.971	.839	.000	.981	.845	.888	.971	.000	.932	.988



1770

3734

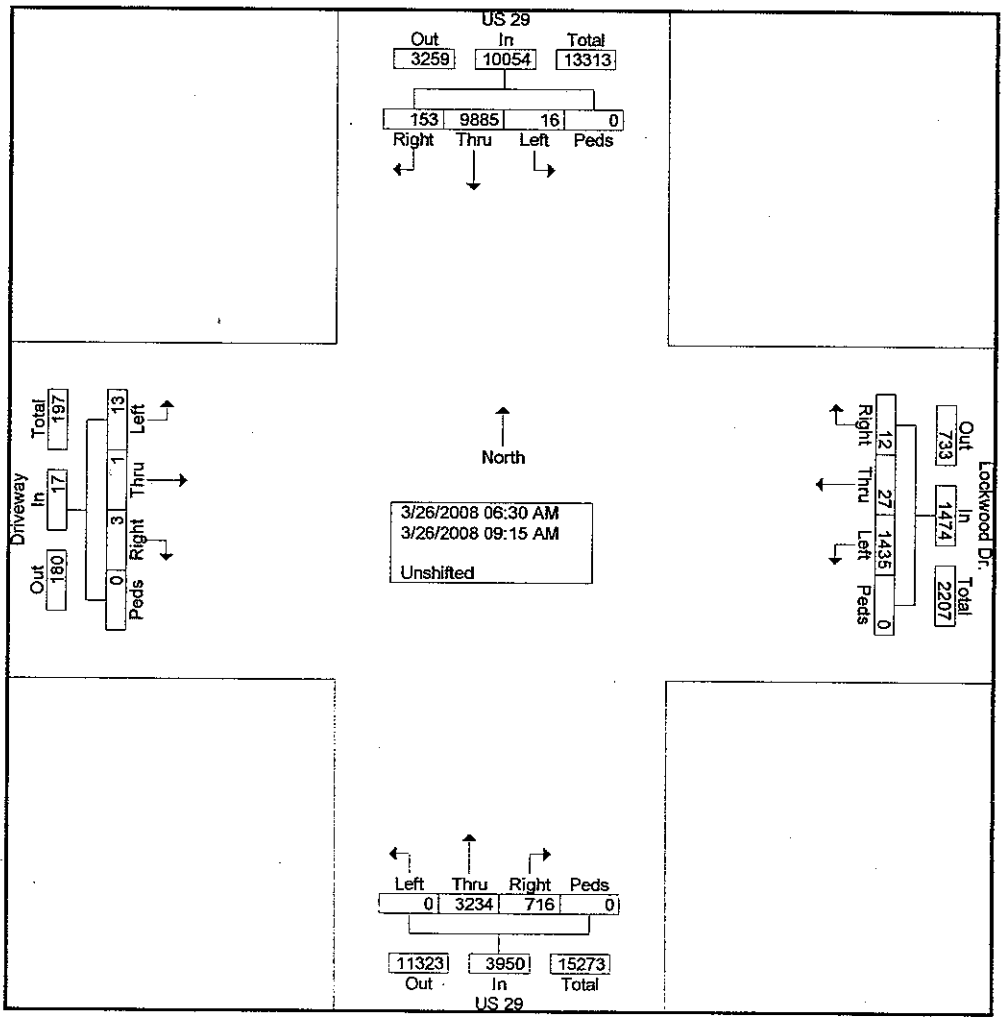
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: YR & SK
Town: White Oak
COunty: Montgomery

File Name : US 29@Lockwood Dr.
Site Code : 00000005
Start Date : 3/26/2008
Page No : 1

Groups Printed- Unshifted

	US 29 From North					Lockwood Dr. From East					US 29 From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 AM	1	924	0	0	925	0	0	94	0	94	18	171	0	0	189	0	0	0	0	0	1208
06:45 AM	5	971	0	0	976	0	1	99	0	100	42	177	0	0	219	0	1	0	0	1	1296
Total	6	1895	0	0	1901	0	1	193	0	194	60	348	0	0	408	0	1	0	0	1	2504
07:00 AM	6	901	0	0	907	0	1	119	0	120	56	177	0	0	233	0	0	0	0	0	1260
07:15 AM	6	830	0	0	836	0	1	113	0	114	53	235	0	0	288	0	0	0	0	0	1238
07:30 AM	9	840	0	0	849	0	0	136	0	136	48	249	0	0	297	1	0	1	0	2	1284
07:45 AM	4	859	0	0	863	1	5	145	0	151	72	305	0	0	377	0	0	2	0	2	1393
Total	25	3430	0	0	3455	1	7	513	0	521	229	966	0	0	1195	1	0	3	0	4	5175
08:00 AM	16	840	2	0	858	1	2	136	0	139	64	319	0	0	383	0	0	1	0	1	1381
08:15 AM	34	822	2	0	858	1	1	134	0	136	80	337	0	0	417	0	0	3	0	3	1414
08:30 AM	29	718	3	0	750	2	8	152	0	162	66	312	0	0	378	1	0	2	0	3	1293
08:45 AM	16	747	2	0	765	3	3	140	0	146	76	323	0	0	399	0	0	2	0	2	1312
Total	95	3127	9	0	3231	7	14	562	0	583	286	1291	0	0	1577	1	0	8	0	9	5400
09:00 AM	14	704	2	0	720	1	3	81	0	85	71	311	0	0	382	0	0	0	0	0	1187
09:15 AM	13	729	5	0	747	3	2	86	0	91	70	318	0	0	388	1	0	2	0	3	1229
Grand Total	153	9885	16	0	10054	12	27	1435	0	1474	716	3234	0	0	3950	3	1	13	0	17	15495
Apprch %	1.5	98.3	0.2	0		0.8	1.8	97.4	0		18.1	81.9	0	0		17.6	5.9	76.5	0		
Total %	1	63.8	0.1	0	64.9	0.1	0.2	9.3	0	9.5	4.6	20.9	0	0	25.5	0	0	0.1	0	0.1	

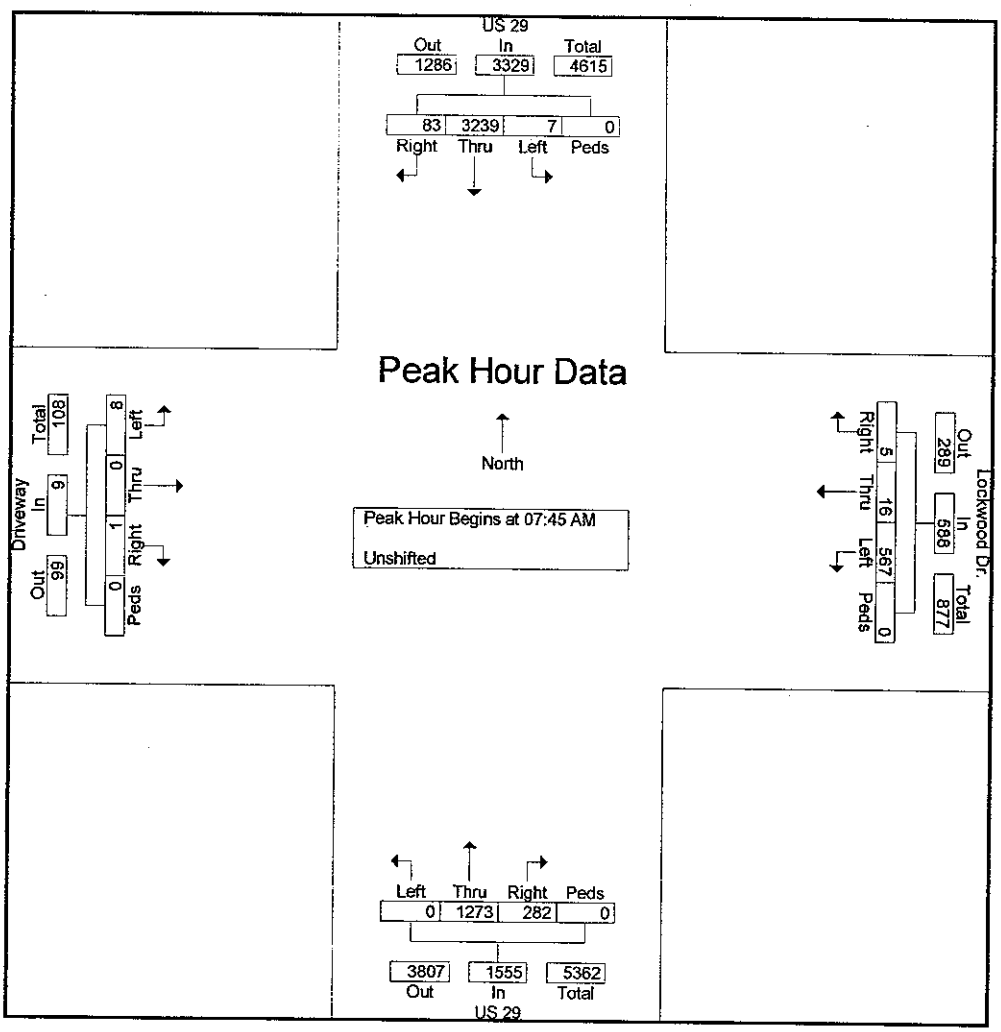


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: YR & SK
Town: White Oak
COunty: Montgomery

File Name : US 29@Lockwood Dr.
Site Code : 00000005
Start Date : 3/26/2008
Page No : 2

	US 29 From North					Lockwood Dr. From East					US 29 From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	4	**859**	0	0	**863**	1	5	145	0	151	72	305	0	0	377	0	0	2	0	2	1393
08:00 AM	16	840	2	0	858	1	2	136	0	139	64	319	0	0	383	0	0	1	0	1	1381
08:15 AM	**34**	822	2	0	858	1	1	134	0	136	**80**	**337**	0	0	**417**	0	0	**3**	0	**3**	**1414**
08:30 AM	29	718	**3**	0	750	**2**	**8**	**152**	0	**162**	66	312	0	0	378	**1**	0	2	0	3	1293
Total Volume	83	3239	7	0	3329	5	16	567	0	588	282	1273	0	0	1555	1	0	8	0	9	5481
% App. Total	2.5	97.3	0.2	0		0.9	2.7	96.4	0		18.1	81.9	0	0		11.1	0	88.9	0		
PHF	.610	.943	.583	.000	.964	.625	.500	.933	.000	.907	.881	.944	.000	.000	.932	.250	.000	.667	.000	.750	.969



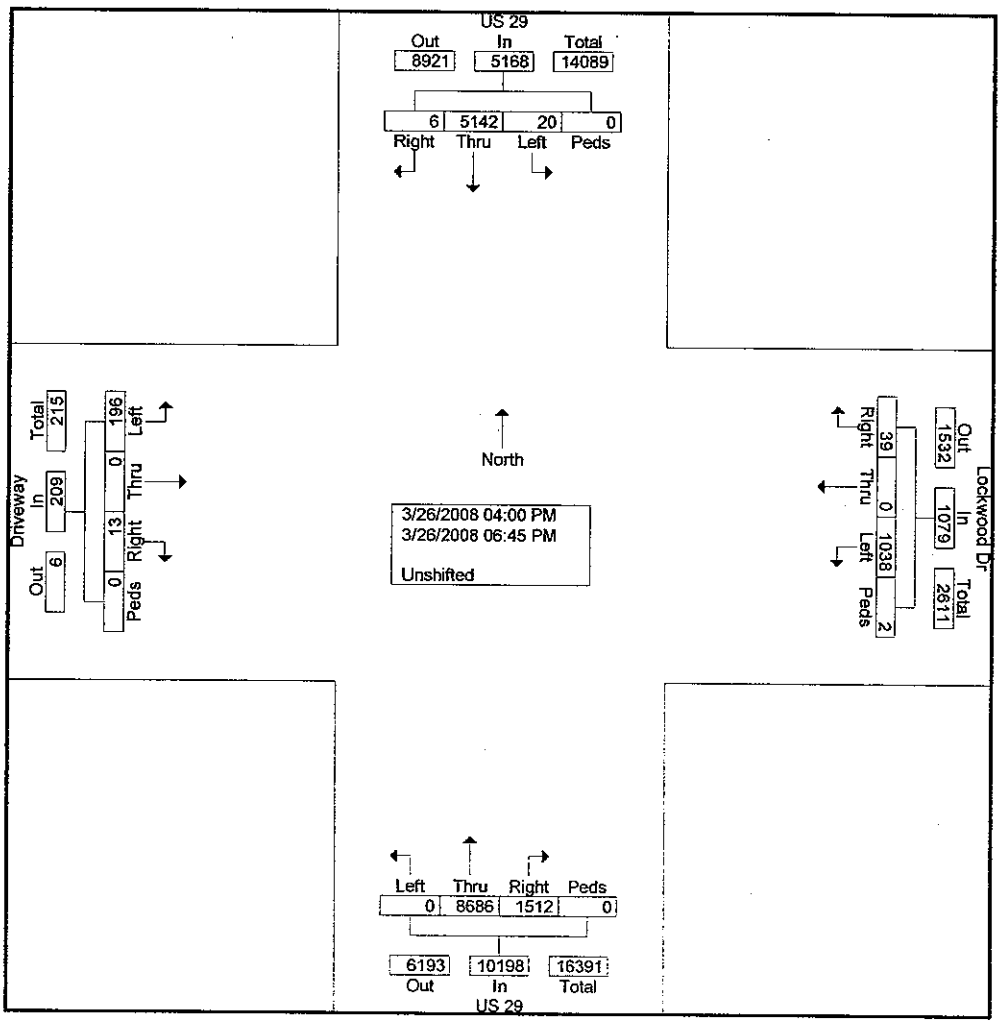
G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: Y.R. & S.K.
Town: White Oak
County: Montgomery

File Name : US 29@Lockwood Dr
Site Code : 00000006
Start Date : 3/26/2008
Page No : 1

Groups Printed- Unshifted

	US 29 From North					Lockwood Dr From East					US 29 From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	1	399	3	0	403	5	0	116	0	121	99	663	0	0	762	0	0	11	0	11	1297
04:15 PM	1	404	1	0	406	5	0	87	0	92	113	624	0	0	737	1	0	5	0	6	1241
04:30 PM	1	385	2	0	388	6	0	90	2	98	122	702	0	0	824	3	0	10	0	13	1323
04:45 PM	0	442	3	0	445	1	0	73	0	74	115	758	0	0	873	0	0	17	0	17	1409
Total	3	1630	9	0	1642	17	0	366	2	385	449	2747	0	0	3196	4	0	43	0	47	5270
05:00 PM	0	429	1	0	430	5	0	97	0	102	132	776	0	0	908	3	0	36	0	39	1479
05:15 PM	1	462	1	0	464	4	0	86	0	90	133	795	0	0	928	0	0	31	0	31	1513
05:30 PM	0	458	3	0	461	5	0	82	0	87	123	775	0	0	898	1	0	32	0	33	1479
05:45 PM	1	450	3	0	454	2	0	91	0	93	156	825	0	0	981	2	0	14	0	16	1544
Total	2	1799	8	0	1809	16	0	356	0	372	544	3171	0	0	3715	6	0	113	0	119	6015
06:00 PM	1	411	0	0	412	2	0	97	0	99	151	761	0	0	912	1	0	14	0	15	1438
06:15 PM	0	415	1	0	416	2	0	67	0	69	122	759	0	0	881	2	0	13	0	15	1381
06:30 PM	0	428	1	0	429	1	0	82	0	83	135	642	0	0	777	0	0	7	0	7	1296
06:45 PM	0	459	1	0	460	1	0	70	0	71	111	606	0	0	717	0	0	6	0	6	1254
Total	1	1713	3	0	1717	6	0	316	0	322	519	2768	0	0	3287	3	0	40	0	43	5369
Grand Total	6	5142	20	0	5168	39	0	1038	2	1079	1512	8686	0	0	10198	13	0	196	0	209	16654
Apprch %	0.1	99.5	0.4	0		3.6	0	96.2	0.2		14.8	85.2	0	0		6.2	0	93.8	0		
Total %	0	30.9	0.1	0	31	0.2	0	6.2	0	6.5	9.1	52.2	0	0	61.2	0.1	0	1.2	0	1.3	

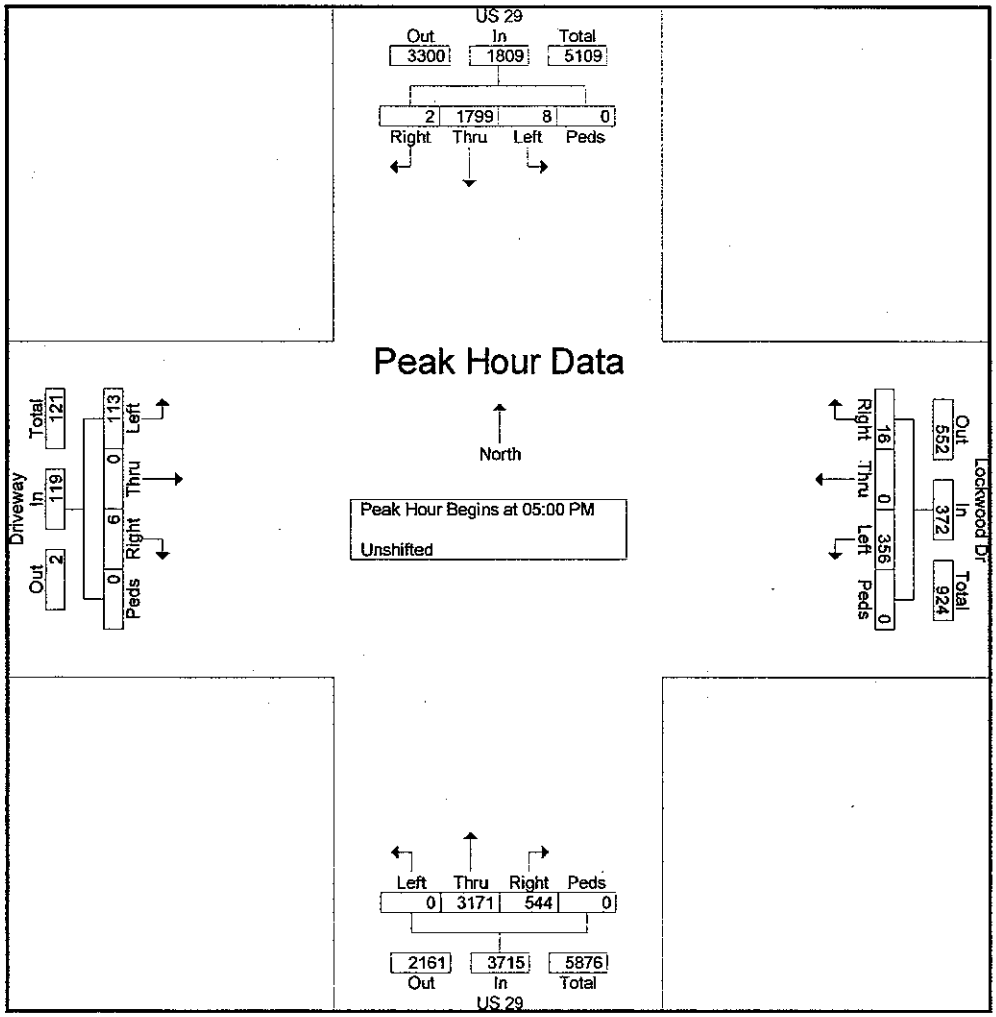


G & O
810 Gleneagles Court, Ste#106
Baltimore
MD 21286

Weather: Sunny
Counted By: Y.R. & S.K.
Town: White Oak
County: Montgomery

File Name : US 29@Lockwood Dr
Site Code : 00000006
Start Date : 3/26/2008
Page No : 2

	US 29 From North					Lockwood Dr From East					US 29 From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	429	1	0	430	**5**	0	**97**	0	**102**	132	776	0	0	908	**3**	0	**36**	0	**39**	1479
05:15 PM	**1**	**462**	1	0	**464**	4	0	86	0	90	133	795	0	0	928	0	0	31	0	31	1513
05:30 PM	0	458	**3**	0	461	5	0	82	0	87	123	775	0	0	898	1	0	32	0	33	1479
05:45 PM	1	450	3	0	454	2	0	91	0	93	**156**	**825**	0	0	**981**	2	0	14	0	16	**1544**
Total Volume	2	1799	8	0	1809	16	0	356	0	372	544	3171	0	0	3715	6	0	113	0	119	6015
% App. Total	0.1	99.4	0.4	0		4.3	0	95.7	0		14.6	85.4	0	0		5	0	95	0		
PHF	.500	.973	.667	.000	.975	.800	.000	.918	.000	.912	.872	.961	.000	.000	.947	.500	.000	.785	.000	.763	.974



Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: sunny
Counted By: Anita, Joyce
Town: White Oak
County: Montgomery

File Name : US 29 @ STEWART LANE
Site Code : 00000000
Start Date : 10/23/2007
Page No : 1

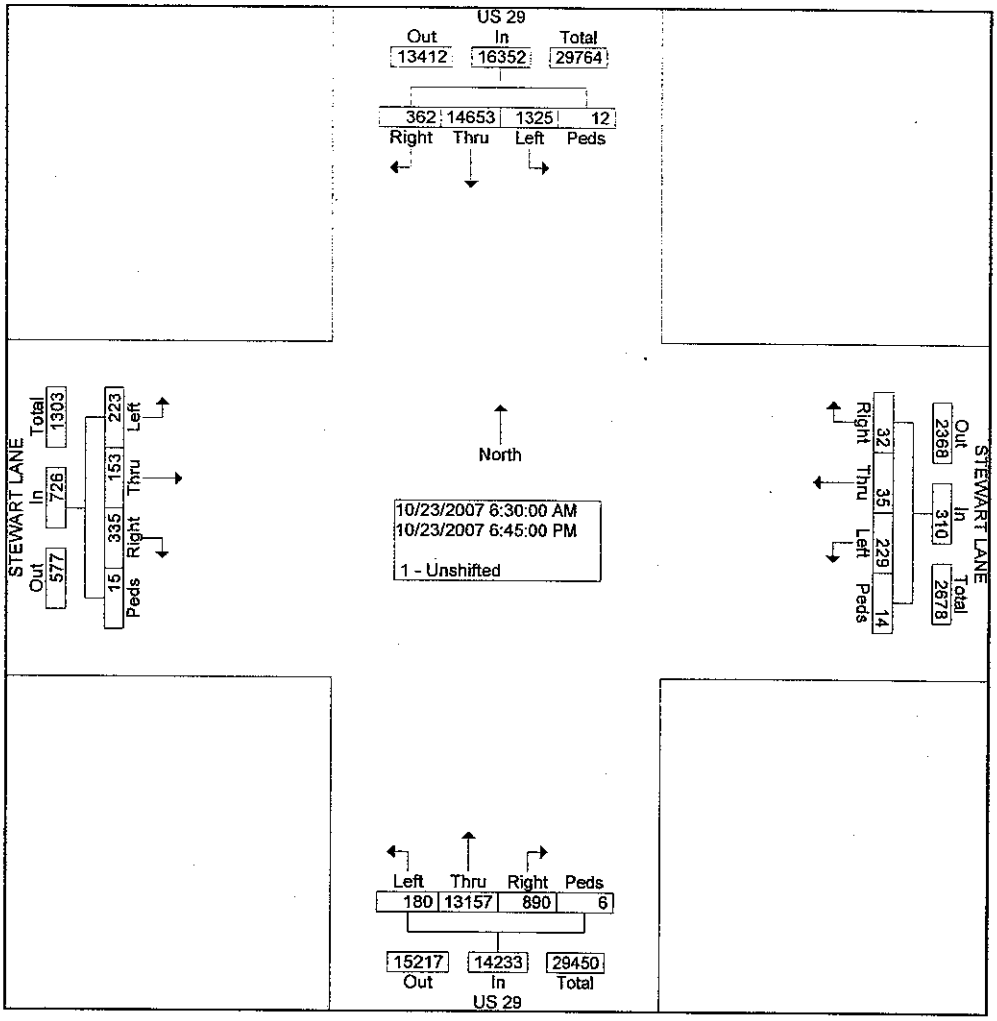
Groups Printed- 1 - Unshifted

	US 29 From North					STEWART LANE From East					US 29 From South					STEWART LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	14	793	27	0	834	4	1	12	0	17	24	214	0	0	238	9	2	2	0	13	1102
06:45 AM	12	817	45	0	874	5	2	15	1	23	14	253	0	0	267	18	5	4	1	28	1192
Total	26	1610	72	0	1708	9	3	27	1	40	38	467	0	0	505	27	7	6	1	41	2294
07:00 AM	9	757	8	0	774	0	1	14	0	15	15	277	4	0	296	13	2	8	0	23	1108
07:15 AM	19	875	24	0	918	0	3	11	1	15	16	316	3	0	335	17	4	4	0	25	1293
07:30 AM	25	713	32	0	770	0	6	7	0	13	29	339	4	0	372	24	5	17	1	47	1202
07:45 AM	19	699	32	0	750	4	0	11	2	17	30	396	3	0	429	15	4	11	1	31	1227
Total	72	3044	96	0	3212	4	10	43	3	60	90	1328	14	0	1432	69	15	40	2	126	4830
08:00 AM	16	747	41	0	804	2	1	10	2	15	23	388	12	0	423	26	13	8	0	47	1289
08:15 AM	28	813	48	1	890	2	5	11	0	18	18	445	12	0	475	46	9	19	0	74	1457
08:30 AM	30	828	40	1	899	1	4	21	1	27	16	420	13	0	449	37	5	12	1	55	1430
08:45 AM	18	838	64	0	920	0	0	5	0	5	20	412	4	1	437	30	8	17	0	55	1417
Total	92	3226	193	2	3513	5	10	47	3	65	77	1665	41	1	1784	139	35	56	1	231	5593
09:00 AM	14	765	27	0	806	0	1	6	1	8	19	375	1	0	395	16	6	9	0	31	1240
09:15 AM	5	646	58	0	709	2	0	17	0	19	26	358	5	1	390	14	6	9	0	29	1147
*** BREAK ***																					
Total	19	1411	85	0	1515	2	1	23	1	27	45	733	6	1	785	30	12	18	0	60	2387
*** BREAK ***																					
04:00 PM	17	414	54	3	488	0	1	6	2	9	50	713	6	2	771	4	6	5	2	17	1285
04:15 PM	12	418	62	0	492	5	0	6	2	13	39	755	5	0	799	4	8	8	1	21	1325
04:30 PM	6	405	51	1	463	2	0	3	0	5	57	781	8	1	847	10	5	14	0	29	1344
04:45 PM	9	408	101	0	518	0	3	6	1	10	51	718	2	0	771	2	4	11	0	17	1316
Total	44	1645	268	4	1961	7	4	21	5	37	197	2967	21	3	3188	20	23	38	3	84	5270
05:00 PM	11	425	56	0	492	0	1	3	0	4	48	734	10	1	793	9	6	10	2	27	1316
05:15 PM	16	513	50	6	585	0	0	3	0	3	60	791	19	0	870	13	14	7	5	39	1497
05:30 PM	9	489	103	0	601	2	0	13	0	15	46	820	51	0	917	2	14	8	0	24	1557
05:45 PM	22	462	75	0	559	1	1	12	1	15	66	848	4	0	918	6	3	16	0	25	1517
Total	58	1889	284	6	2237	3	2	31	1	37	220	3193	84	1	3498	30	37	41	7	115	5887
06:00 PM	12	496	96	0	604	1	3	17	0	21	70	768	2	0	840	6	12	5	0	23	1488
06:15 PM	13	476	84	0	573	0	1	7	0	8	51	718	2	0	771	3	4	10	0	17	1369
06:30 PM	10	433	64	0	507	0	1	5	0	6	53	685	8	0	746	6	5	3	1	15	1274
06:45 PM	16	423	83	0	522	1	0	8	0	9	49	633	2	0	684	5	3	6	0	14	1229
Total	51	1828	327	0	2206	2	5	37	0	44	223	2804	14	0	3041	20	24	24	1	69	5360
Grand Total	362	14653	1325	12	16352	32	35	229	14	310	890	13157	180	6	14233	335	153	223	15	726	31621
Apprch %	2.2	89.6	8.1	0.1		10.3	11.3	73.9	4.5		6.3	92.4	1.3	0.0		46.1	21.1	30.7	2.1		
Total %	1.1	46.3	4.2	0.0	51.7	0.1	0.1	0.7	0.0	1.0	2.8	41.6	0.6	0.0	45.0	1.1	0.5	0.7	0.0	2.3	

Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: sunny
Counted By: Anita, Joyce
Town: White Oak
County: Montgomery

File Name : US 29 @ STEWART LANE
Site Code : 00000000
Start Date : 10/23/2007
Page No : 2

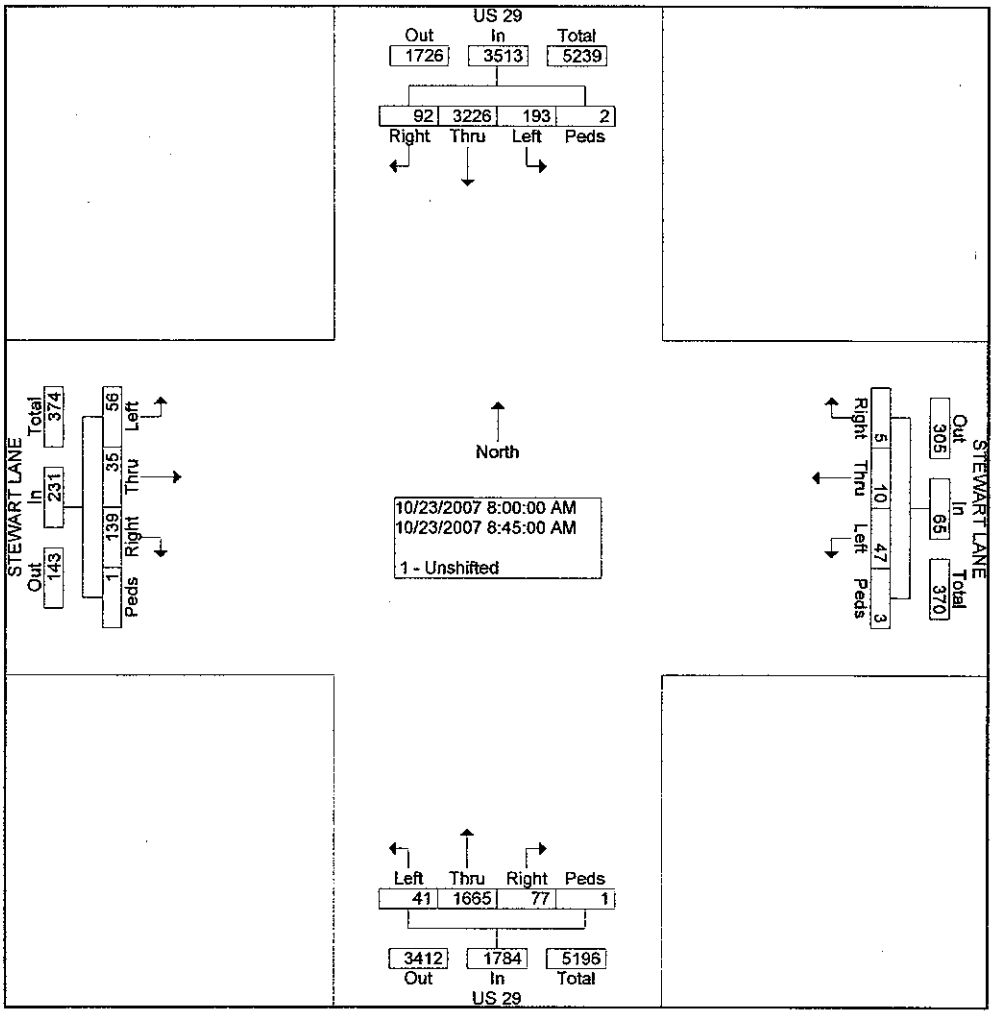


Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: sunny
Counted By: Anita, Joyce
Town: White Oak
County: Montgomery

File Name : US 29 @ STEWART LANE
Site Code : 00000000
Start Date : 10/23/2007

	US 29 From North					STEWART LANE From East					US 29 From South					STEWART LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	08:00 AM																				
Volume	92	3226	193	2	3513	5	10	47	3	65	77	1665	41	1	1784	139	35	56	1	231	5593
Percent	2.6	91.8	5.5	0.1		7.7	15.4	72.3	4.6		4.3	93.3	2.3	0.1		60.2	15.2	24.2	0.4		
08:15 Volume	28	813	48	1	890	2	5	11	0	18	18	445	12	0	475	46	9	19	0	74	1457
Peak Factor																					0.960
High Int.	08:45 AM					08:30 AM					08:15 AM					08:15 AM					
Volume	18	838	64	0	920	1	4	21	1	27	18	445	12	0	475	46	9	19	0	74	
Peak Factor					0.955					0.602					0.939					0.780	



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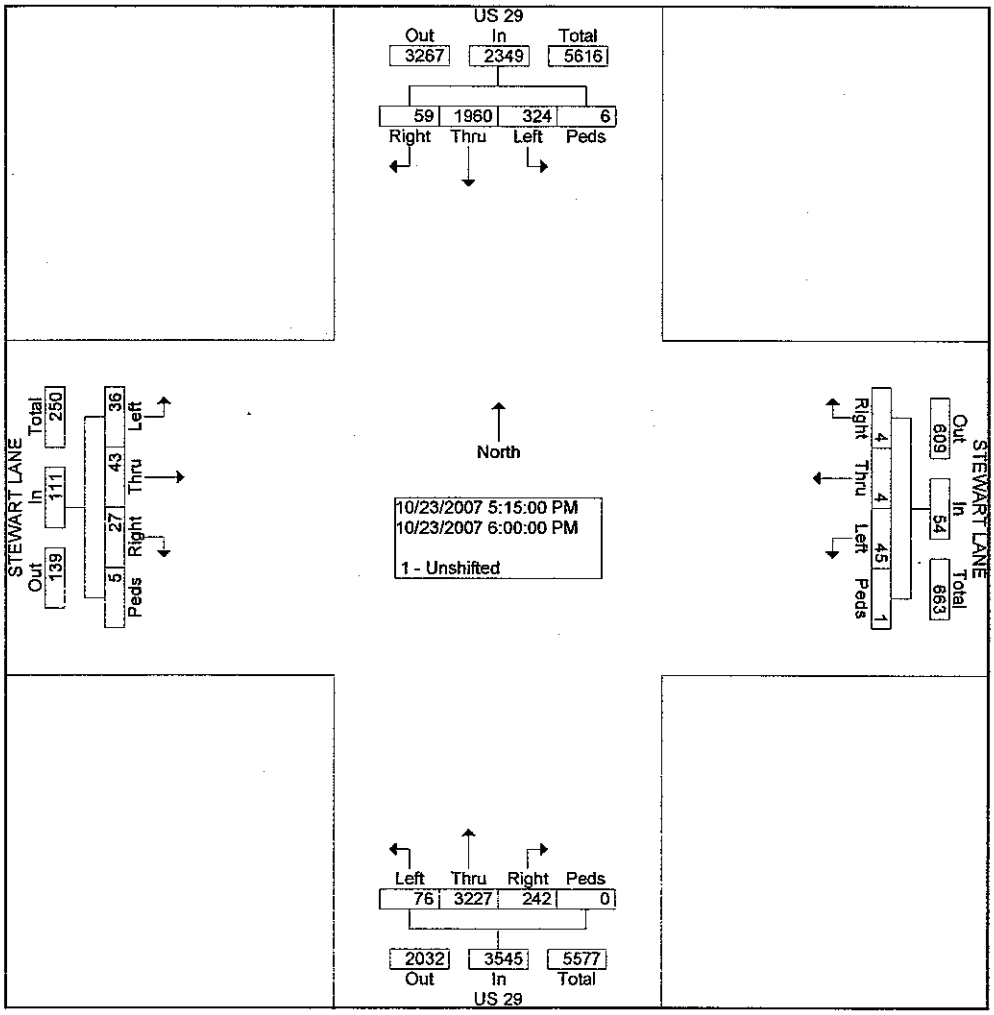
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: sunny
Counted By: Anita, Joyce
Town: White Oak
County: Montgomery

File Name : US 29 @ STEWART LANE
Site Code : 00000000
Start Date : 10/23/2007

	US 29 From North					STEWART LANE From East					US 29 From South					STEWART LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:15 PM																				
Volume	59	1960	324	6	2349	4	4	45	1	54	242	3227	76	0	3545	27	43	36	5	111	6059
Percent	2.5	83.4	13.8	0.3		7.4	7.4	83.3	1.9		6.8	91.0	2.1	0.0		24.3	38.7	32.4	4.5		
05:30 Volume	9	489	103	0	601	2	0	13	0	15	46	820	51	0	917	2	14	8	0	24	1557
Peak Factor																					0.973
High Int.	06:00 PM					06:00 PM					05:45 PM					05:15 PM					
Volume	12	496	96	0	604	1	3	17	0	21	66	848	4	0	918	13	14	7	5	39	
Peak Factor					0.972					0.643					0.965					0.712	



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1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 at Industrial Pkwy
Site Code : 00000000
Start Date : 10/24/2007
Page No : 1

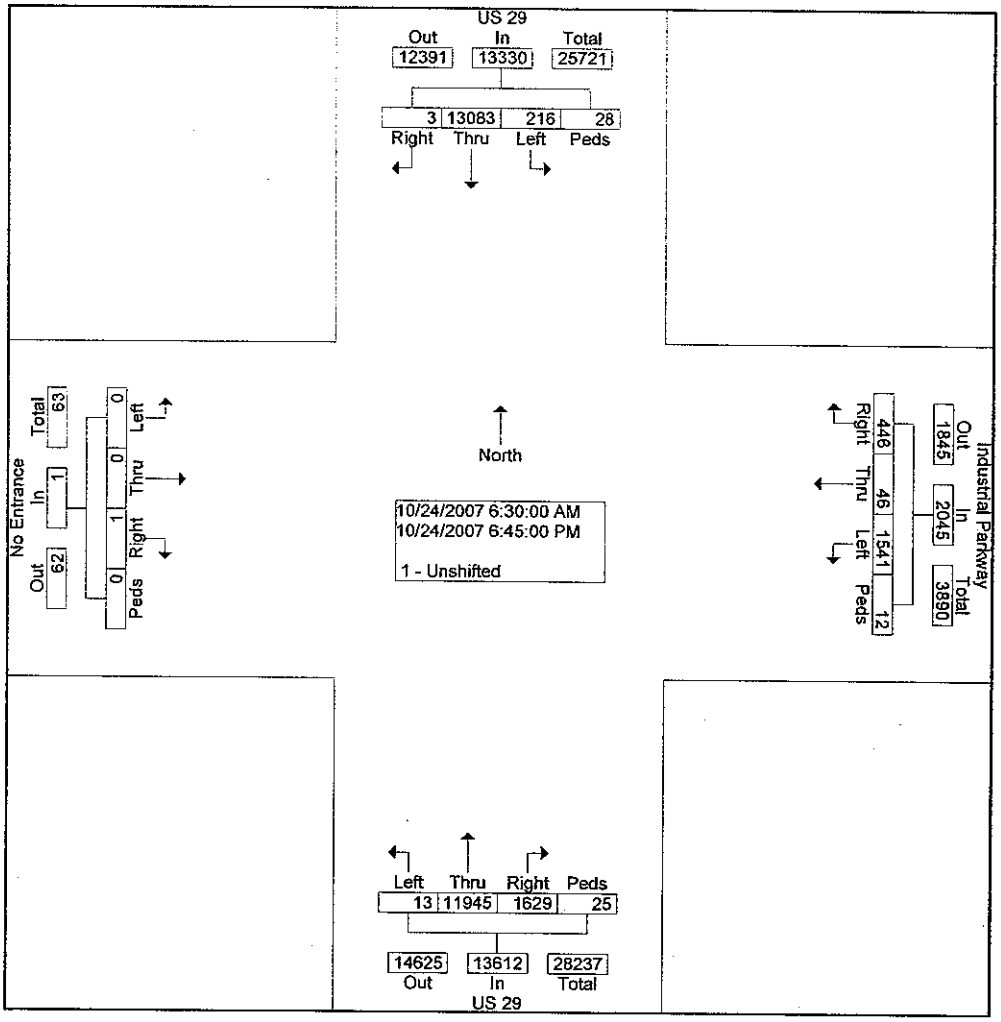
Groups Printed- 1 - Unshifted

	US 29 From North					Industrial Parkway From East					US 29 From South					No Entrance From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	3	792	5	1	801	6	0	59	0	65	18	181	0	1	200	1	0	0	0	1	1067
06:45 AM	0	723	4	1	728	13	0	84	0	97	32	211	0	2	245	0	0	0	0	0	1070
Total	3	1515	9	2	1529	19	0	143	0	162	50	392	0	3	445	1	0	0	0	1	2137
07:00 AM	0	716	2	3	721	19	1	72	0	92	35	257	0	4	296	0	0	0	0	0	1109
07:15 AM	0	793	2	0	795	15	0	88	0	103	38	292	0	0	330	0	0	0	0	0	1228
07:30 AM	0	799	5	0	804	29	0	54	3	86	51	314	0	0	365	0	0	0	0	0	1255
07:45 AM	0	732	3	0	735	14	0	63	0	77	39	378	0	2	419	0	0	0	0	0	1231
Total	0	3040	12	3	3055	77	1	277	3	358	163	1241	0	6	1410	0	0	0	0	0	4823
08:00 AM	0	647	2	2	651	12	0	69	0	81	58	362	0	2	422	0	0	0	0	0	1154
08:15 AM	0	651	6	0	657	27	0	76	0	103	50	393	0	1	444	0	0	0	0	0	1204
08:30 AM	0	561	8	0	569	21	0	54	0	75	68	418	0	1	487	0	0	0	0	0	1131
08:45 AM	0	497	5	3	505	19	5	56	0	80	56	378	0	2	436	0	0	0	0	0	1021
Total	0	2356	21	5	2382	79	5	255	0	339	232	1551	0	6	1789	0	0	0	0	0	4510
09:00 AM	0	600	10	1	611	18	0	56	0	74	71	331	0	1	403	0	0	0	0	0	1088
09:15 AM	0	593	12	1	606	22	0	40	0	62	59	315	0	0	374	0	0	0	0	0	1042
*** BREAK ***																					
Total	0	1193	22	2	1217	40	0	96	0	136	130	646	0	1	777	0	0	0	0	0	2130
*** BREAK ***																					
04:00 PM	0	377	19	0	396	24	0	59	0	83	95	503	0	0	598	0	0	0	0	0	1077
04:15 PM	0	362	13	2	377	14	0	63	0	77	125	566	0	0	691	0	0	0	0	0	1145
04:30 PM	0	338	12	2	352	33	0	78	0	111	82	734	0	1	817	0	0	0	0	0	1280
04:45 PM	0	432	19	1	452	19	9	74	1	103	82	803	0	1	886	0	0	0	0	0	1441
Total	0	1509	63	5	1577	90	9	274	1	374	384	2606	0	2	2992	0	0	0	0	0	4943
05:00 PM	0	429	17	1	447	11	1	95	0	107	70	709	0	1	780	0	0	0	0	0	1334
05:15 PM	0	455	11	0	466	22	0	82	0	104	75	728	0	0	803	0	0	0	0	0	1373
05:30 PM	0	507	11	1	519	15	0	74	0	89	98	720	0	0	818	0	0	0	0	0	1426
05:45 PM	0	433	12	1	446	21	0	62	0	83	86	748	0	1	835	0	0	0	0	0	1364
Total	0	1824	51	3	1878	69	1	313	0	383	329	2905	0	2	3236	0	0	0	0	0	5497
06:00 PM	0	447	10	4	461	13	0	59	0	72	107	789	0	1	897	0	0	0	0	0	1430
06:15 PM	0	436	8	2	446	21	0	62	0	83	91	745	0	0	836	0	0	0	0	0	1365
06:30 PM	0	404	9	1	414	25	0	42	1	68	62	543	13	1	619	0	0	0	0	0	1101
06:45 PM	0	359	11	1	371	13	30	20	7	70	81	527	0	3	611	0	0	0	0	0	1052
Total	0	1646	38	8	1692	72	30	183	8	293	341	2604	13	5	2963	0	0	0	0	0	4948
Grand Total	3	13083	216	28	13330	446	46	1541	12	2045	1629	11945	13	25	13612	1	0	0	0	1	28988
Apprch %	0.0	98.1	1.6	0.2		21.8	2.2	75.4	0.6		12.0	87.8	0.1	0.2		100.0	0.0	0.0	0.0		
Total %	0.0	45.1	0.7	0.1	46.0	1.5	0.2	5.3	0.0	7.1	5.6	41.2	0.0	0.1	47.0	0.0	0.0	0.0	0.0	0.0	

Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 at Industrial Pkwy
Site Code : 00000000
Start Date : 10/24/2007



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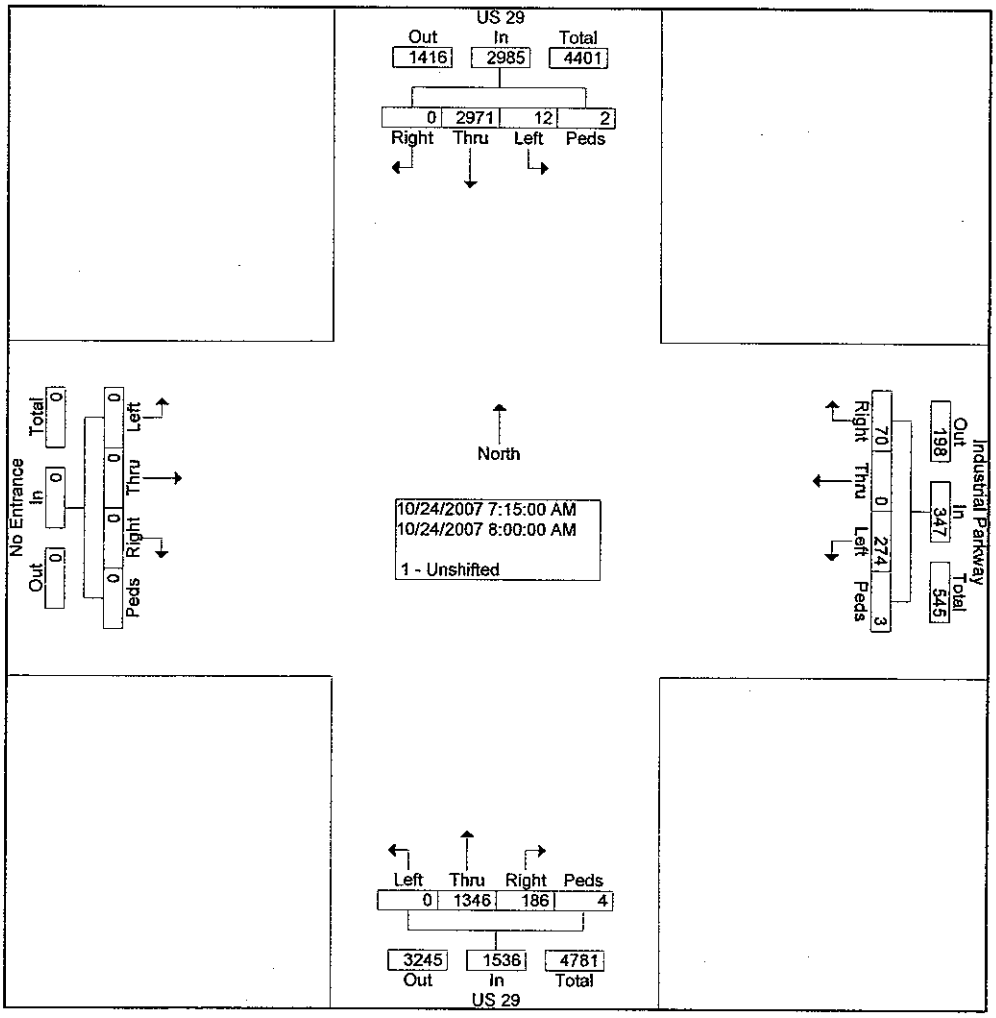
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 at Industrial Pkwy
Site Code : 00000000
Start Date : 10/24/2007
Page No : 3

	US 29 From North					Industrial Parkway From East					US 29 From South					No Entrance From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	2971	12	2	2985	70	0	274	3	347	186	1346	0	4	1536	0	0	0	0	0	4868
Percent	0.0	99.5	0.4	0.1		20.2	0.0	79.0	0.9		12.1	87.6	0.0	0.3		0.0	0.0	0.0	0.0		
07:30 Volume	0	799	5	0	804	29	0	54	3	86	51	314	0	0	365	0	0	0	0	0	1255
Peak Factor																					0.970
High Int.	07:30 AM					07:15 AM					08:00 AM					6:15:00 AM					
Volume	0	799	5	0	804	15	0	88	0	103	58	362	0	2	422						
Peak Factor					0.928					0.842					0.910						



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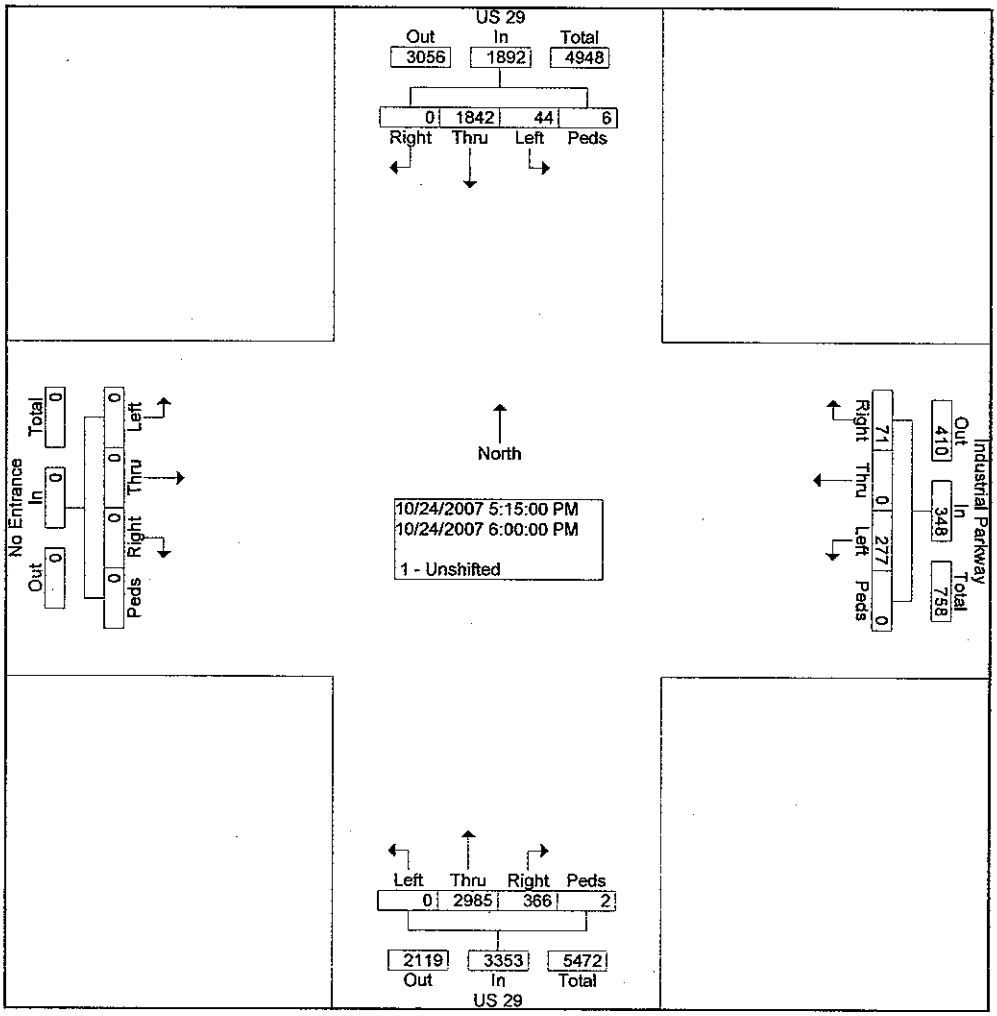
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 at Industrial Pkwy
Site Code : 00000000
Start Date : 10/24/2007

	US 29 From North					Industrial Parkway From East					US 29 From South					No Entrance From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:15 PM																				
Volume	0	1842	44	6	1892	71	0	277	0	348	366	2985	0	2	3353	0	0	0	0	0	5593
Percent	0.0	97.4	2.3	0.3		20.4	0.0	79.6	0.0		10.9	89.0	0.0	0.1		0.0	0.0	0.0	0.0		
06:00 Volume	0	447	10	4	461	13	0	59	0	72	107	789	0	1	897	0	0	0	0	0	1430
Peak Factor																					0.978
High Int.	05:30 PM					05:15 PM					06:00 PM										
Volume	0	507	11	1	519	22	0	82	0	104	107	789	0	1	897						
Peak Factor					0.911					0.837					0.935						



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1504 Joh Avenue Suite 160
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Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 @ Tech Road
Site Code : 00000000
Start Date : 10/25/2007
Page No : 1

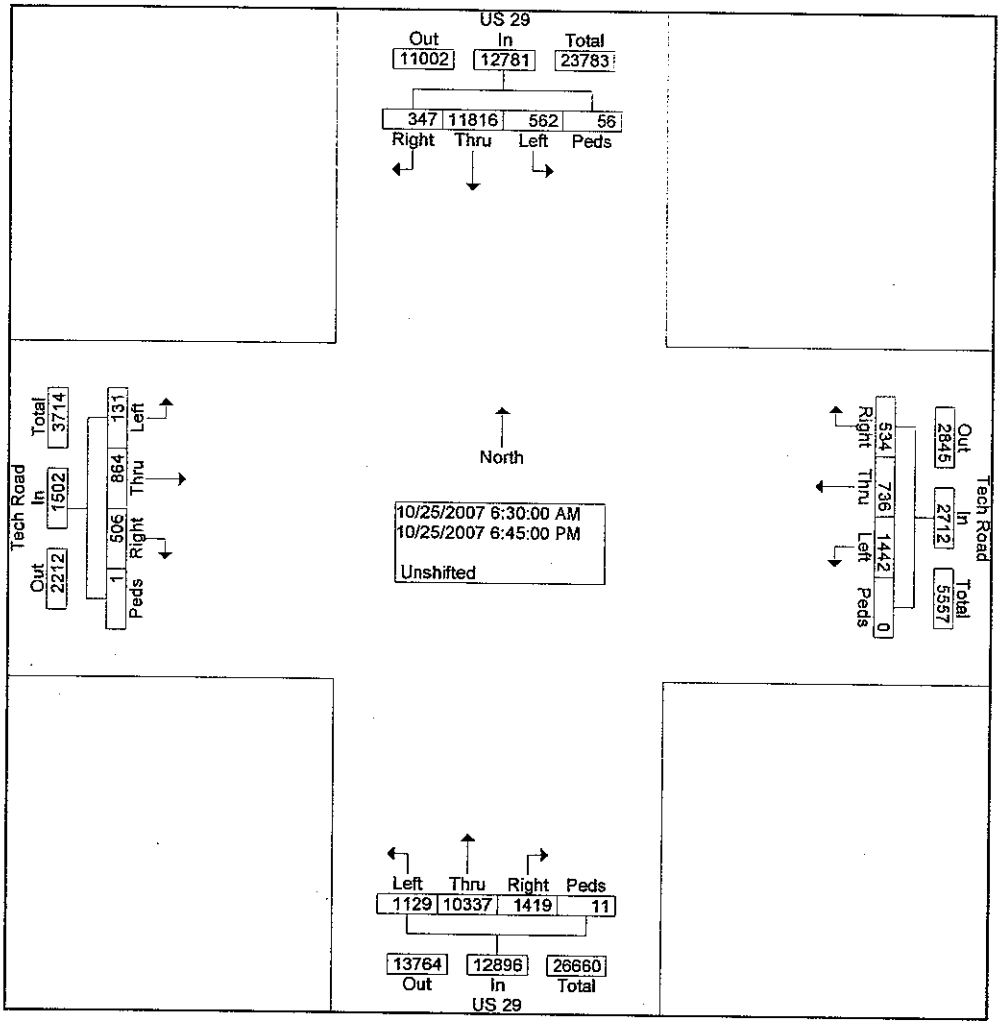
Groups Printed- Unshifted

	US 29 From North					Tech Road From East					US 29 From South					Tech Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	1	672	6	0	679	11	11	37	0	59	42	151	16	0	209	22	18	2	0	42	989
06:45 AM	14	687	14	0	715	9	14	48	0	71	55	148	13	6	222	56	38	3	0	97	1105
Total	15	1359	20	0	1394	20	25	85	0	130	97	299	29	6	431	78	56	5	0	139	2094
07:00 AM	14	782	15	1	812	8	15	26	0	49	37	161	31	0	229	31	31	3	1	66	1156
07:15 AM	28	771	22	3	824	8	12	54	0	74	32	223	19	0	274	32	44	5	0	81	1253
07:30 AM	41	706	18	3	768	9	14	37	0	60	59	245	31	0	335	35	41	6	0	82	1245
07:45 AM	36	771	19	1	827	11	18	26	0	55	74	258	24	0	356	17	44	2	0	63	1301
Total	119	3030	74	8	3231	36	59	143	0	238	202	887	105	0	1194	115	160	16	1	292	4955
08:00 AM	34	679	22	0	735	16	23	26	0	65	63	280	29	0	372	17	48	11	0	76	1248
08:15 AM	28	666	42	1	737	16	16	28	0	60	52	284	38	0	374	27	52	8	0	87	1258
08:30 AM	17	607	33	1	658	15	24	38	0	77	63	287	43	0	393	24	41	2	0	67	1195
08:45 AM	18	604	44	1	667	14	20	35	0	69	81	281	32	0	394	13	47	5	0	65	1195
Total	97	2556	141	3	2797	61	83	127	0	271	259	1132	142	0	1533	81	188	26	0	295	4896
09:00 AM	28	530	50	0	608	18	21	28	0	67	76	252	28	0	356	6	48	8	0	62	1093
09:15 AM	11	474	38	4	527	16	18	49	0	83	90	217	30	0	337	18	40	2	0	60	1007
*** BREAK ***																					
Total	39	1004	88	4	1135	34	39	77	0	150	166	469	58	0	693	24	88	10	0	122	2100
*** BREAK ***																					
04:00 PM	6	291	23	3	323	35	46	79	0	160	33	581	37	0	651	13	37	10	0	60	1194
04:15 PM	3	261	22	2	288	36	47	90	0	173	53	571	52	0	676	13	37	3	0	53	1190
04:30 PM	6	308	21	2	337	51	45	89	0	185	54	630	65	0	749	11	33	7	0	51	1322
04:45 PM	9	306	12	5	332	32	51	117	0	200	55	625	69	0	749	17	32	8	0	57	1338
Total	24	1166	78	12	1280	154	189	375	0	718	195	2407	223	0	2825	54	139	28	0	221	5044
05:00 PM	3	317	23	5	348	42	54	100	0	196	66	640	71	0	777	27	29	5	0	61	1382
05:15 PM	10	352	17	3	382	26	40	95	0	161	88	650	83	0	821	18	29	9	0	56	1420
05:30 PM	6	361	17	3	387	41	54	82	0	177	74	668	62	0	804	24	29	4	0	57	1425
05:45 PM	9	340	28	3	380	33	29	95	0	157	64	657	83	0	804	13	27	3	0	43	1384
Total	28	1370	85	14	1497	142	177	372	0	691	292	2615	299	0	3206	82	114	21	0	217	5611
06:00 PM	8	349	26	2	385	30	45	86	0	161	47	662	62	2	773	13	32	4	0	49	1368
06:15 PM	8	336	17	9	370	26	46	68	0	140	61	686	77	3	827	16	23	6	0	45	1382
06:30 PM	5	340	12	3	360	15	27	62	0	104	41	644	73	0	758	22	32	6	0	60	1282
06:45 PM	4	306	21	1	332	16	46	47	0	109	59	536	61	0	656	21	32	9	0	62	1159
Total	25	1331	76	15	1447	87	164	263	0	514	208	2528	273	5	3014	72	119	25	0	216	5191
Grand Total	347	11816	562	56	12781	534	736	1442	0	2712	1419	10337	1129	11	12896	506	864	131	1	1502	29891
Apprch %	2.7	92.4	4.4	0.4		19.7	27.1	53.2	0.0		11.0	80.2	8.8	0.1		33.7	57.5	8.7	0.1		
Total %	1.2	39.5	1.9	0.2	42.8	1.8	2.5	4.8	0.0	9.1	4.7	34.6	3.8	0.0	43.1	1.7	2.9	0.4	0.0	5.0	

Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 @ Tech Road
Site Code : 00000000
Start Date : 10/25/2007

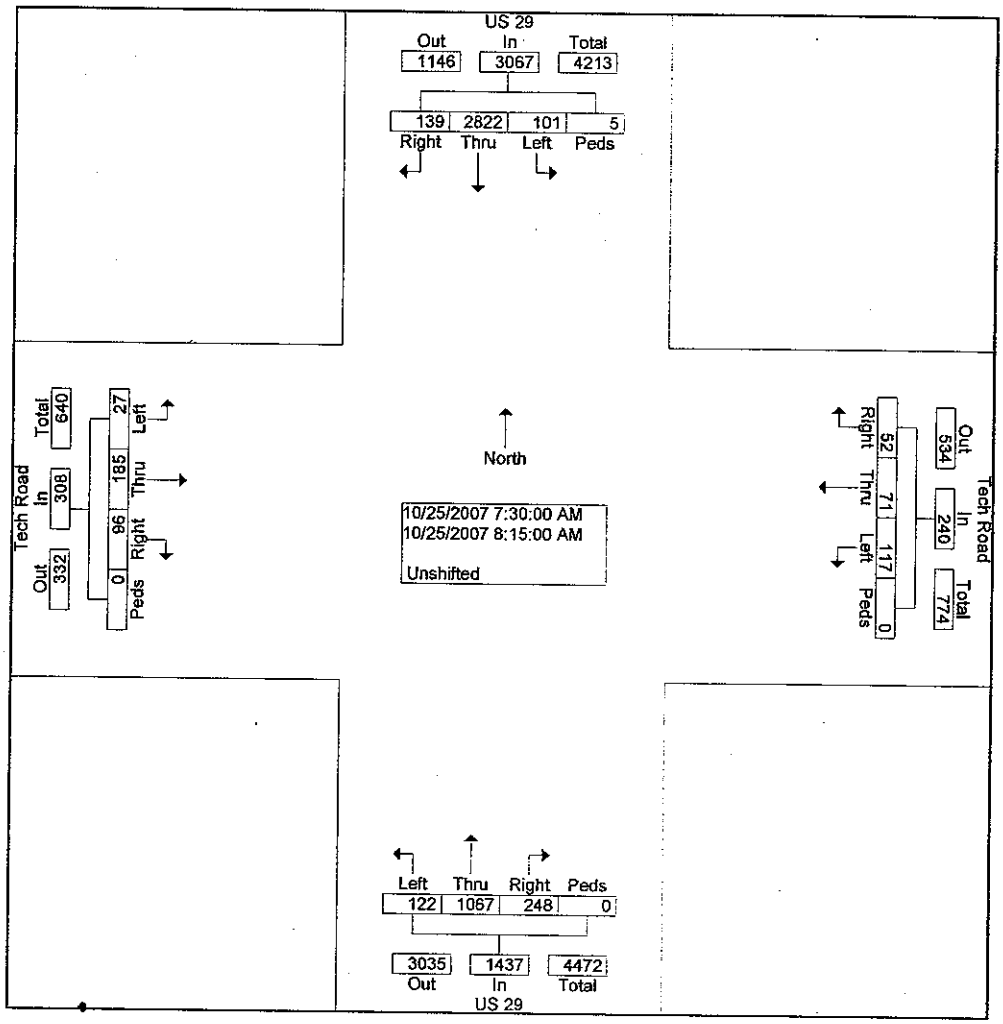


Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 @ Tech Road
Site Code : 00000000
Start Date : 10/25/2007

	US 29 From North					Tech Road From East					US 29 From South					Tech Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	139	2822	101	5	3067	52	71	117	0	240	248	1067	122	0	1437	96	185	27	0	308	5052
Percent	4.5	92.0	3.3	0.2		21.7	29.6	48.8	0.0		17.3	74.3	8.5	0.0		31.2	60.1	8.8	0.0		
07:45 Volume	36	771	19	1	827	11	18	26	0	55	74	258	24	0	356	17	44	2	0	63	1301
Peak Factor																					0.971
High Int.	07:45 AM					08:00 AM					08:15 AM					08:15 AM					
Volume	36	771	19	1	827	16	23	26	0	65	52	284	38	0	374	27	52	8	0	87	
Peak Factor					0.927					0.923					0.961					0.885	

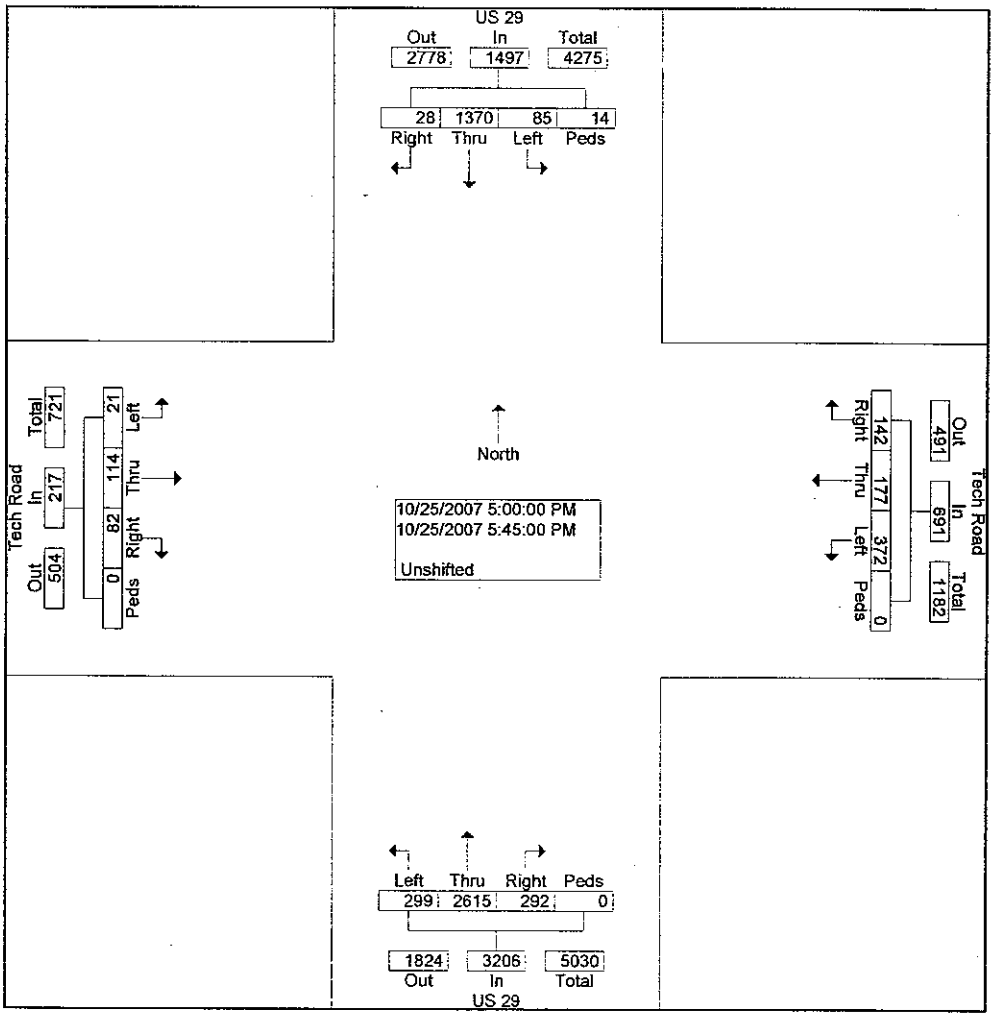


Sabra, Wang & Associates, Inc.
1504 Joh Avenue Suite 160
Baltimore, MD 21227
(410) 737-6564

Weather: Rain
Counted By: Alan, Deb
Town: Calverton
County: Montgomery

File Name : US 29 @ Tech Road
Site Code : 00000000
Start Date : 10/25/2007

	US 29 From North					Tech Road From East					US 29 From South					Tech Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	28	1370	85	14	1497	142	177	372	0	691	292	2615	299	0	3206	82	114	21	0	217	5611
Percent	1.9	91.5	5.7	0.9		20.5	25.6	53.8	0.0		9.1	81.6	9.3	0.0		37.8	52.5	9.7	0.0		
05:30 Volume	6	361	17	3	387	41	54	82	0	177	74	668	62	0	804	24	29	4	0	57	1425
Peak Factor																					0.984
High Int.	05:30 PM					05:00 PM					05:15 PM					05:00 PM					
Volume	6	361	17	3	387	42	54	100	0	196	88	650	83	0	821	27	29	5	0	61	
Peak Factor					0.967					0.881					0.976					0.889	



Appendix B: Existing Level of Service Worksheets

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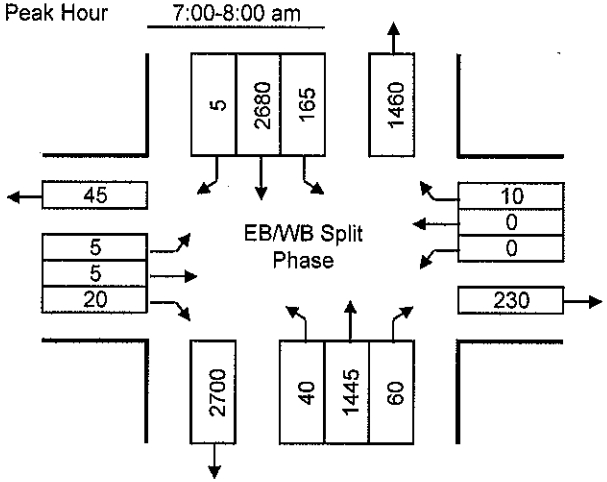
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: EXISTING
Design Year: 2012

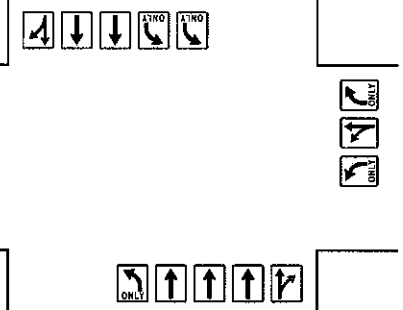
Location: POWDER MILL@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

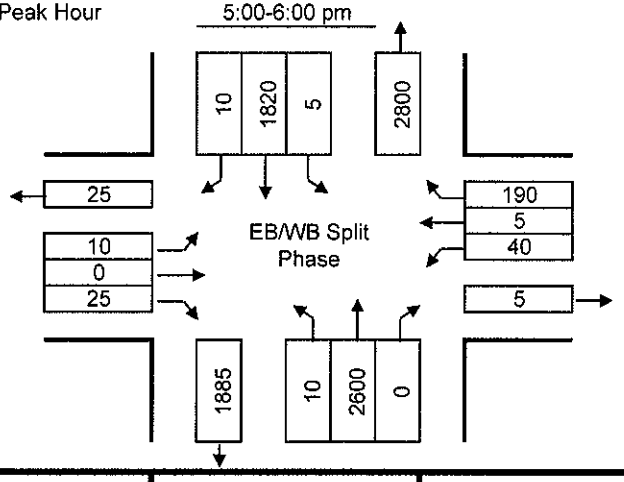
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MICHELSON DR.	EB	EB
WB Approach:	MICHELSON DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1505	1.00	0.30	452	99	551	
SBTR + NBL	2685	1.00	0.37	993	40	1033	*
EBLTR	30	1.00	1.00	30	0	30	*
WBR	10	1.00	1.00	10	0	10	*
					Critical Volume	1073	OK
					V/C	0.73	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2600	1.00	0.30	780	3	783	*
SBTR + NBL	1830	1.00	0.37	677	10	687	
EBLTR	35	1.00	1.00	35	0	35	*
WBR	190	1.00	1.00	190	0	190	*
					Critical Volume	1008	OK
					V/C	0.68	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

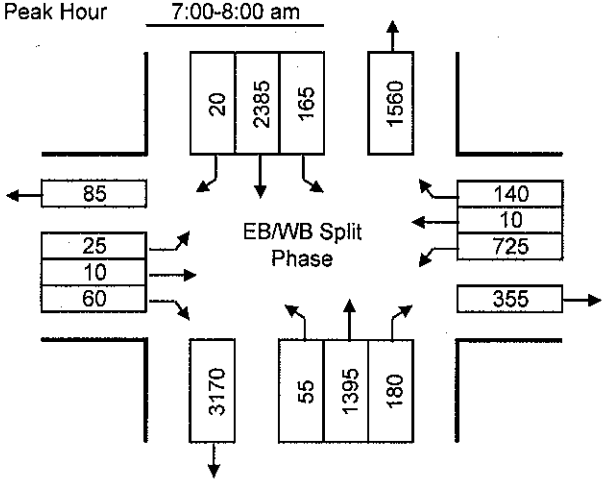
SHA

Count Date: 10/1/2007
Conditions: EXISTING
Design Year: 2012

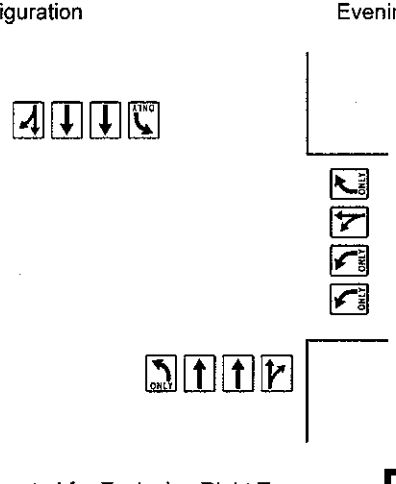
Location: MD 650@POWDER MILL
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

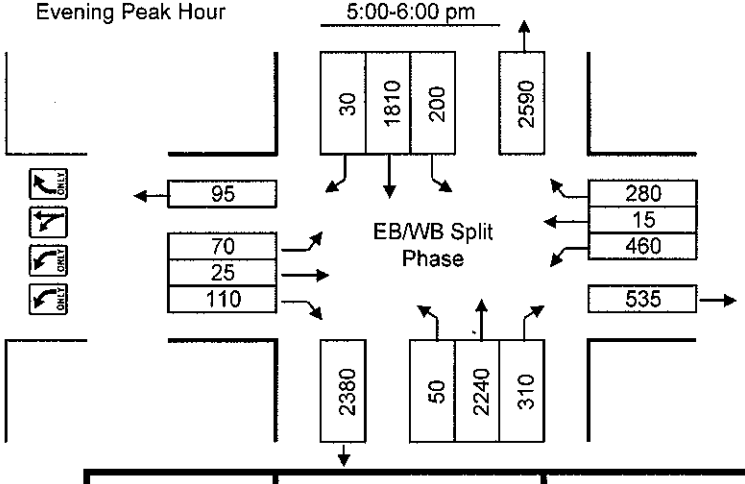
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	POWDER MILL RD	EB	EB 110
WB Approach:	POWDER MILL RD	WB	WB 200

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Fairland / White Oak Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1575	1.00	0.37	583	165	748	
SBTR + NBL	2405	1.00	0.37	890	55	945	*
EBR	60	1.00	1.00	60	0	60	*
WBLT	735	1.00	0.37	272	0	272	*
					Critical Volume	1277	OK
					V/C	0.87	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2550	1.00	0.37	944	200	1144	*
SBTR + NBL	1840	1.00	0.37	681	50	731	
EBL	70	1.00	1.00	70	0	70	*
WBLT	475	1.00	0.37	176	0	176	*
					Critical Volume	1390	OK
					V/C	0.94	

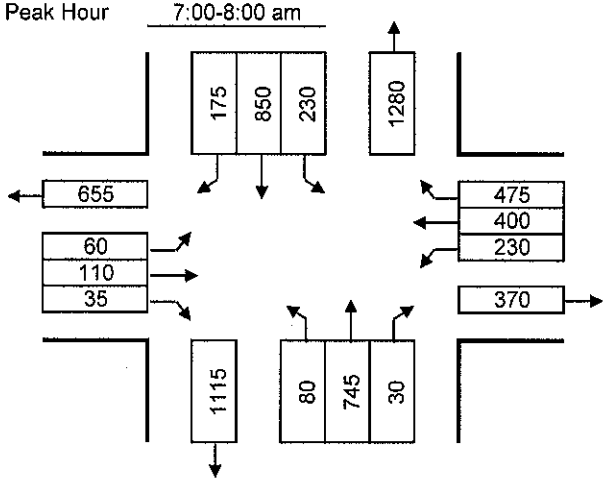
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/25/2007
Conditions: EXISTING
Design Year: 2012

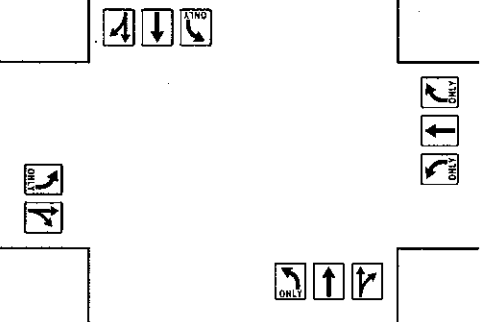
Location: CHERRY HILL@BROADBIRCH
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

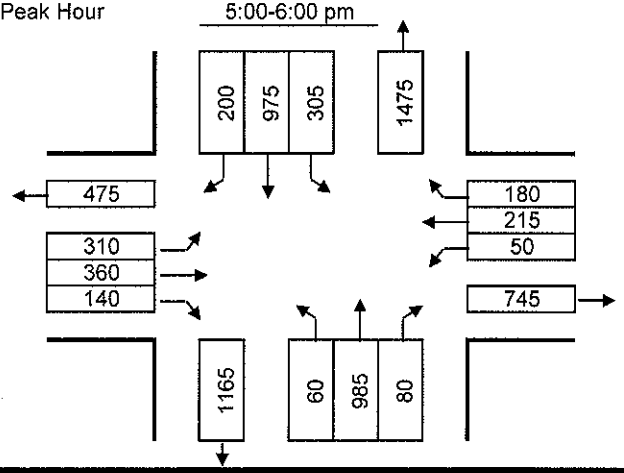
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	BROADBIRCH	EB	EB
WB Approach:	BROADBIRCH	WB 230	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	775	1.00	0.53	411	230	641	*
SBTR + NBL	1025	1.00	0.53	543	80	623	
EBTR + WBL	145	1.00	1.00	145	230	375	
WBT + EBL	400	1.00	1.00	400	60	460	*
					Critical Volume	1101	OK
					V/C	0.75	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1065	1.00	0.53	564	305	869	*
SBTR + NBL	1175	1.00	0.53	623	60	683	
EBTR + WBL	500	1.00	1.00	500	50	550	*
WBT + EBL	215	1.00	1.00	215	310	525	
					Critical Volume	1419	OK
					V/C	0.96	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

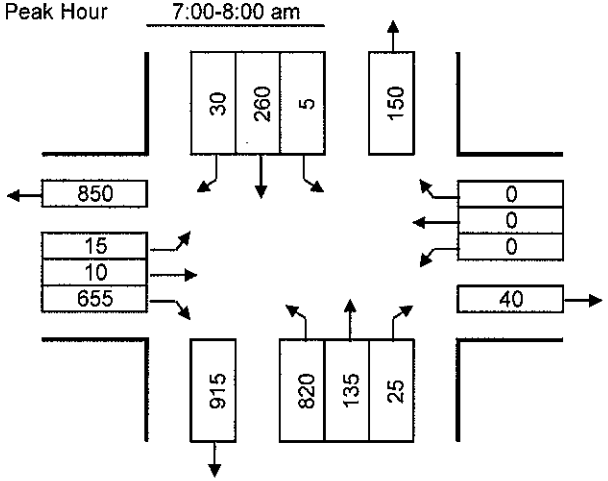
SHA

Count Date: 10/18/2007
Conditions: EXISTING
Design Year: 2012

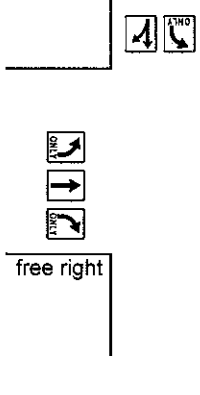
Location: BELTSVILLE@CALVERTON BLVD
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

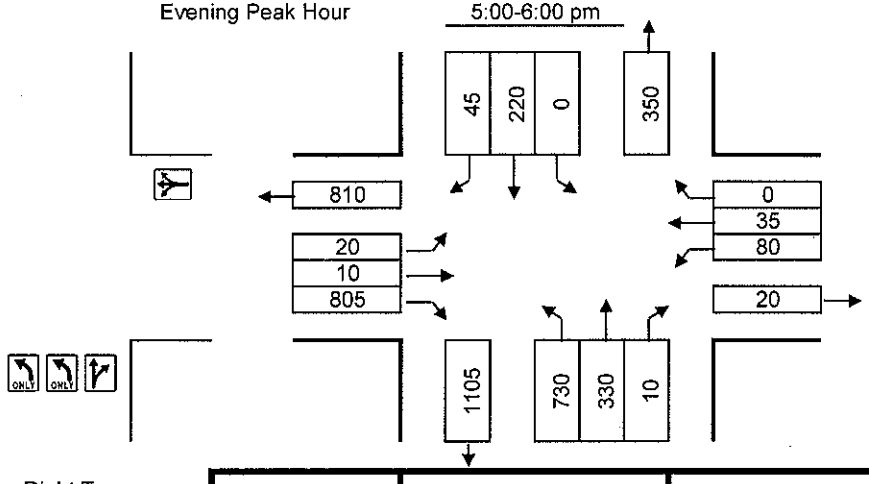
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	CALVERTON BLVD	EB 655	EB 805
WB Approach:	CALVERTON BLVD	WB	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume
1 =	1.00	A	≤	1000
2 =	0.55	B	≤	1150
3 =	0.37	C	≤	1300
4 =	0.29	D	≤	1450
Dbl-left	0.60	E	≤	1600
		F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	160	1.00	1.00	160	5	165	
SBTR + NBL	290	1.00	1.00	290	492	782	*
EBT	10	1.00	1.00	10	0	10	
WBT + EBL	0	1.10	1.00	0	15	15	*
					Critical Volume	797	A
					V/C	0.50	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR	340	1.00	1.00	340	0	340	
SBTR + NBL	265	1.00	1.00	265	438	703	*
EBT + WBL	10	1.00	1.00	10	80	90	
WBLT + EBL	115	1.10	1.00	123	20	143	*
					Critical Volume	846	A
					V/C	0.53	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

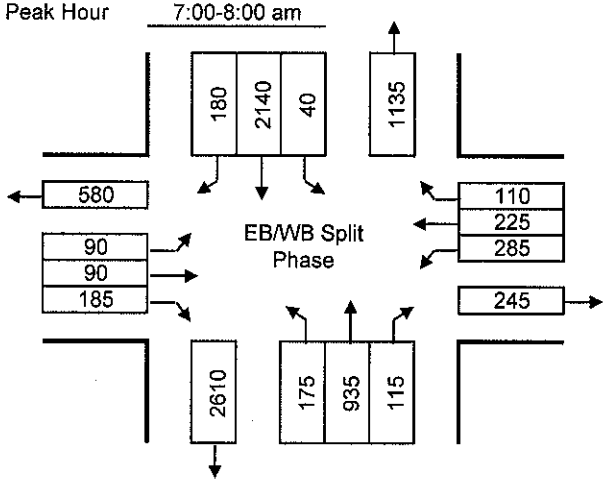
SHA

Count Date: 10/17/2007
Conditions: EXISTING
Design Year: 2012

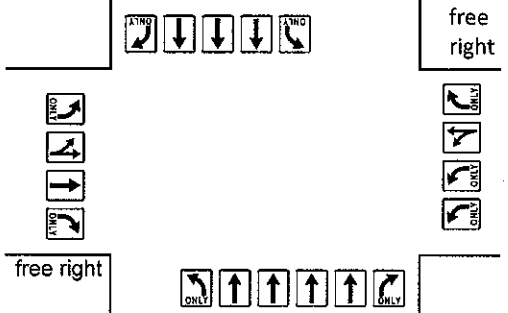
Location: MD 650 @ LOCKWOOD DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

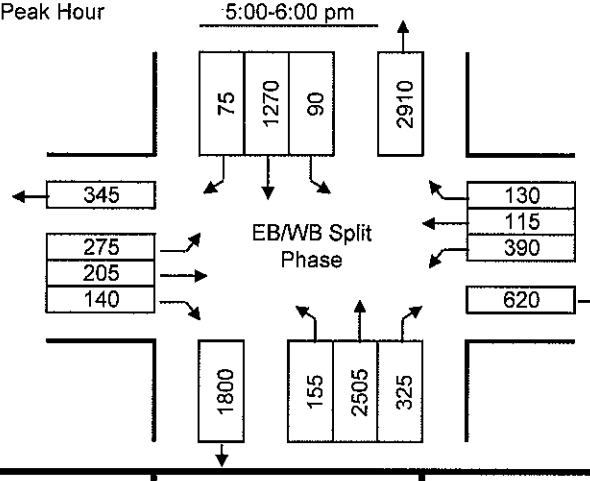
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	LOCKWOOD DRIVE	EB 185	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	935	1.00	0.30	281	40	321	
SBT + NBL	2140	1.00	0.37	792	175	967	*
EBLT	180	1.00	0.37	67	0	67	*
WBLT	510	1.00	0.37	189	0	189	*
					Critical Volume	1223	OK
					V/C	0.83	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2505	1.00	0.30	752	90	842	*
SBT + NBL	1270	1.00	0.37	470	155	625	
EBLT	480	1.00	0.37	178	0	178	*
WBLT	505	1.00	0.37	187	0	187	*
					Critical Volume	1207	OK
					V/C	0.82	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

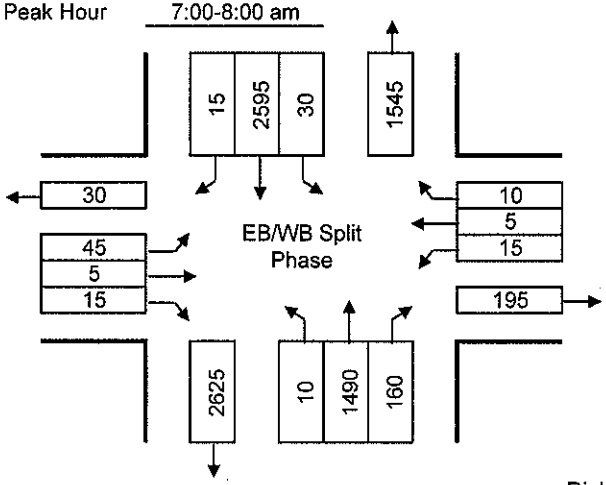
SHA

Count Date: 10/1/2007
Conditions: EXISTING
Design Year: 2012

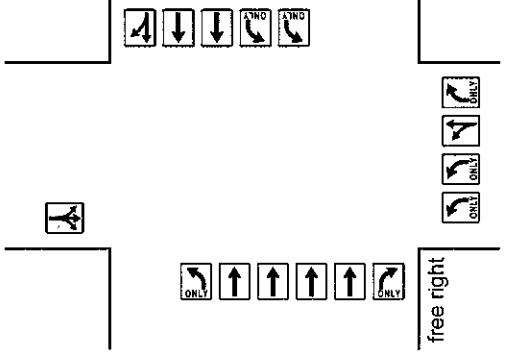
Location: MD 650 @ MAHAN ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

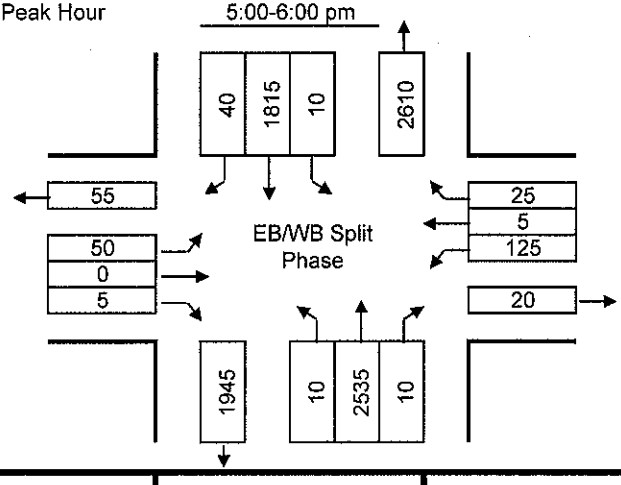
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MAHAN ROAD	EB	EB
WB Approach:	MAHAN ROAD	WB 10	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1490	1.00	0.30	447	18	465	
SBTR + NBL	2610	1.00	0.37	966	10	976	*
EBLTR	65	1.00	1.00	65	0	65	*
WBLT	20	1.00	0.37	7	0	7	*
					Critical Volume	1048	OK
					V/C	0.71	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2535	1.00	0.30	761	6	767	*
SBTR + NBL	1855	1.00	0.37	686	10	696	
EBLTR	55	1.00	1.00	55	0	55	*
WBLT	130	1.00	0.37	48	0	48	*
					Critical Volume	870	OK
					V/C	0.59	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

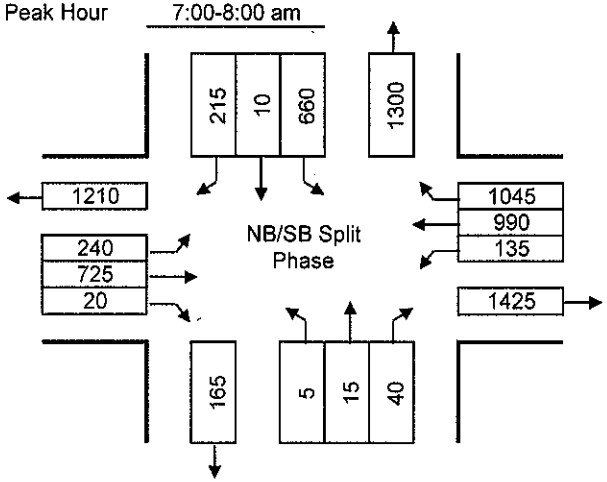
SHA

Count Date: 2/21/2008
Conditions: EXISTING
Design Year: 2012

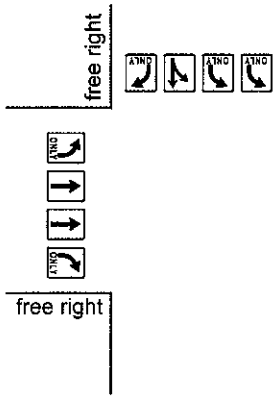
Location: BELTSVILLE@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

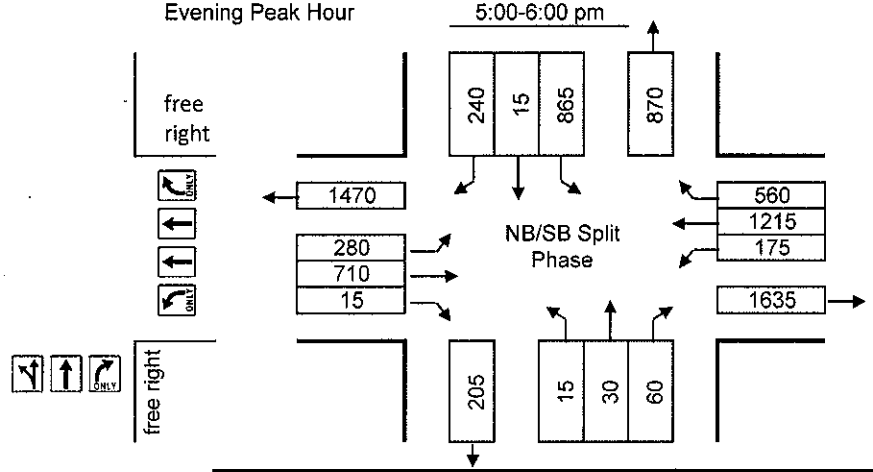
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM		PM	
NB Approach:	BELTSVILLE	NB	40	NB	60
SB Approach:	BELTSVILLE	SB		SB	
EB Approach:	POWDER MILL RD	EB		EB	
WB Approach:	POWDER MILL RD	WB	1045	WB	

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.37
4 =	0.29
Dbl-left	0.60

Service Level		Critical Lane Volume
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	20	1.00	0.55	11	0	11	*
SBLT	670	1.00	0.37	248	0	248	*
EBT + WBL	725	1.00	0.55	399	135	534	
WBT + EBL	990	1.00	0.55	545	240	785	*
					Critical Volume	1044	B
					V/C	0.65	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	45	1.00	0.55	25	0	25	*
SBLT	880	1.00	0.37	326	0	326	*
EBT + WBL	710	1.00	0.55	391	175	566	
WBT + EBL	1215	1.00	0.55	668	280	948	*
					Critical Volume	1299	C
					V/C	0.81	

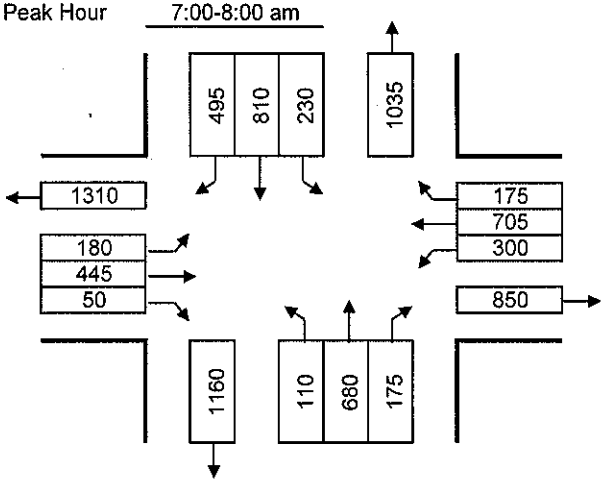
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/23/2007
Conditions: EXISTING
Design Year: 2012

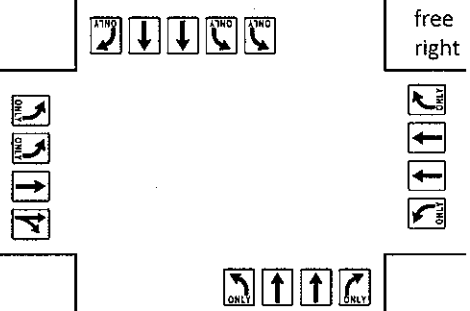
Location: CHERRY HILL@POWDER MILL
Computed By: Y.R.
Date: 7/14/08

Prince George's County Method

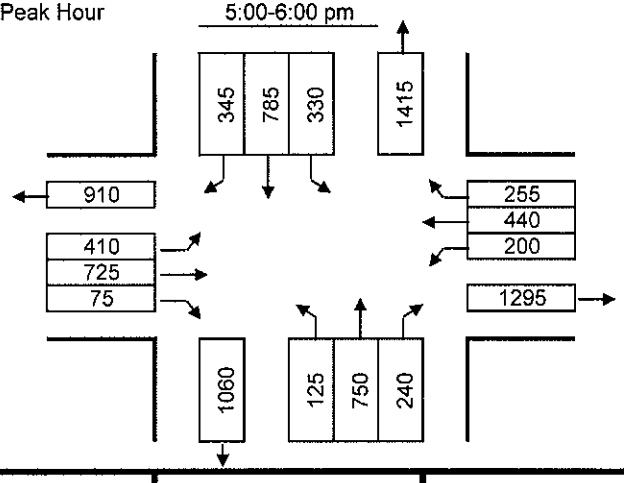
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB 108	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.37
4 =	0.29
Dbl-left	0.60

Service Level		Critical Lane Volume
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	680	1.00	0.55	374	138	512	
SBT + NBL	810	1.00	0.55	446	110	556	*
EBTR + WBL	495	1.00	0.55	272	300	572	*
WBT + EBL	705	1.00	0.55	388	108	496	
					Critical Volume	1128	B
					V/C	0.71	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	750	1.00	0.55	413	198	611	*
SBT + NBL	785	1.00	0.55	432	125	557	
EBTR + WBL	800	1.00	0.55	440	200	640	*
WBR + EBL	255	1.00	1.00	255	246	501	
					Critical Volume	1251	C
					V/C	0.78	

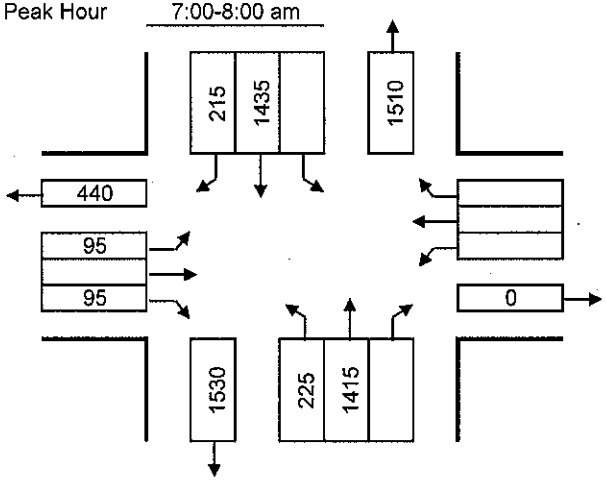
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/20/2008 & 10/26/2008
Conditions: EXISTING
Design Year: 2012

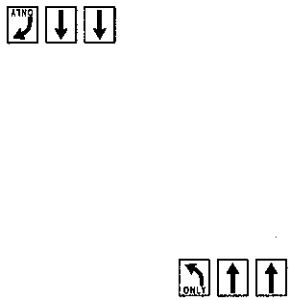
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

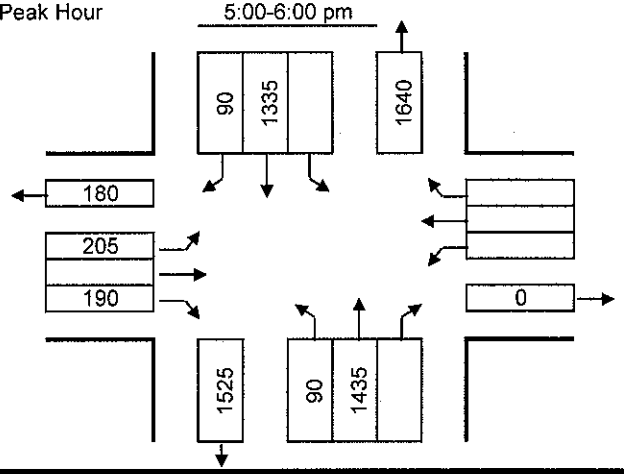
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	PROSPERITY DRIVE	EB	EB
WB Approach:	PROSPERITY DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1415	1.00	0.53	750	0	750	
SBT + NBL	1435	1.00	0.53	761	225	986	*
EBL	95	1.00	1.00	95	0	95	*
					Critical Volume	1081	OK
					V/C	0.73	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1435	1.00	0.53	761	0	761	
SBT + NBL	1335	1.00	0.53	708	90	798	*
EBL	205	1.00	1.00	205	0	205	*
					Critical Volume	1003	OK
					V/C	0.68	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

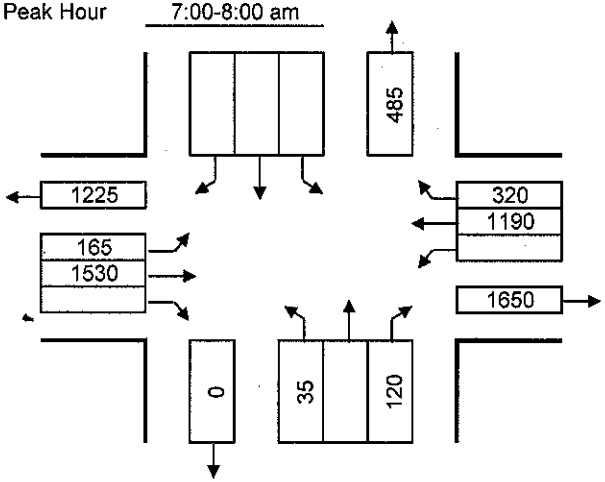
SHA

Count Date: 10/24/2007
Conditions: EXISTING
Design Year: 2012

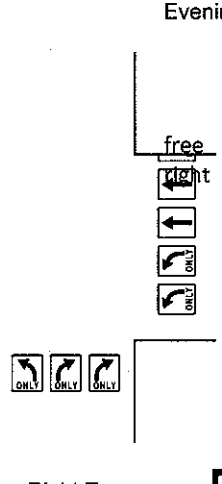
Location: US 29 NB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

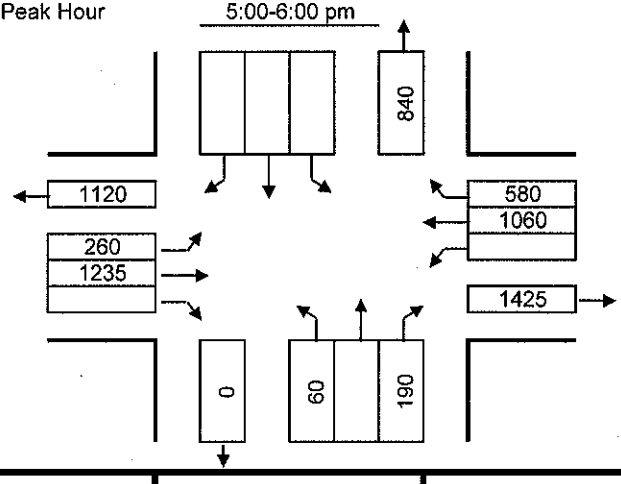
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB 580

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	120	1.00	0.53	64	0	64	*
EBT	1530	1.00	0.53	811	0	811	*
WBT + EBL	1190	1.00	0.53	631	99	730	
					Critical Volume	875	OK
					V/C	0.59	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	190	1.00	0.53	101	0	101	*
EBT	1235	1.00	0.53	655	0	655	
WBT + EBL	1060	1.00	0.53	562	156	718	*
					Critical Volume	819	OK
					V/C	0.56	

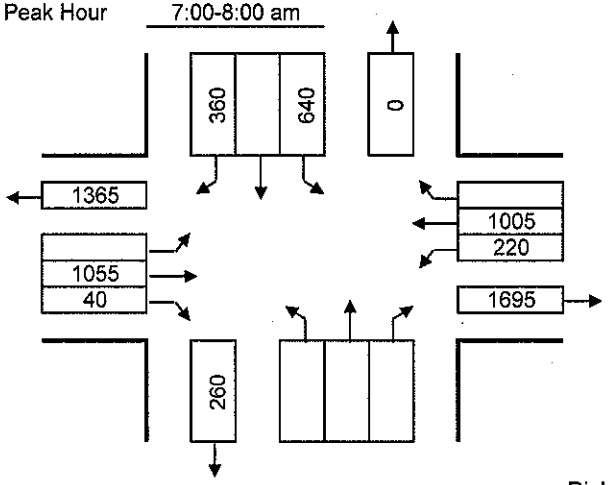
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: EXISTING
Design Year: 2012

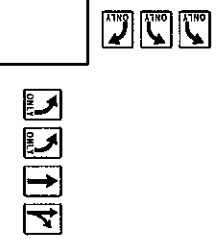
Location: US 29 SB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

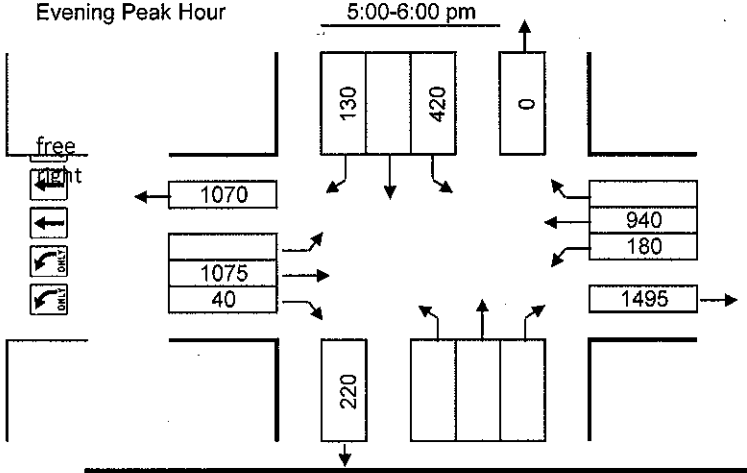
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 SB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	640	1.00	0.60	384	0	384	*
EBTR + WBL	1095	1.00	0.53	580	132	712	*
WBT	1005	1.00	0.53	533	0	533	
					Critical Volume	1096	OK
					V/C	0.74	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	420	1.00	0.60	252	0	252	*
EBTR + WBL	1115	1.00	0.53	591	108	699	*
WBT	940	1.00	0.53	498	0	498	
					Critical Volume	951	OK
					V/C	0.64	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

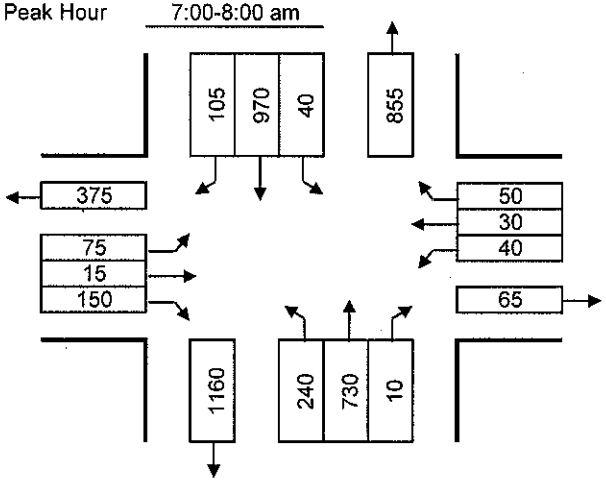
SHA

Count Date: 10/18/2007
Conditions: SUNNY
Design Year: EXISTING

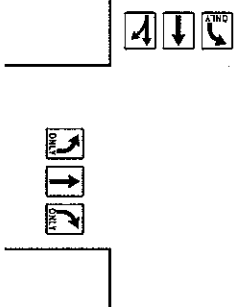
Location: PLUM ORCHARD@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

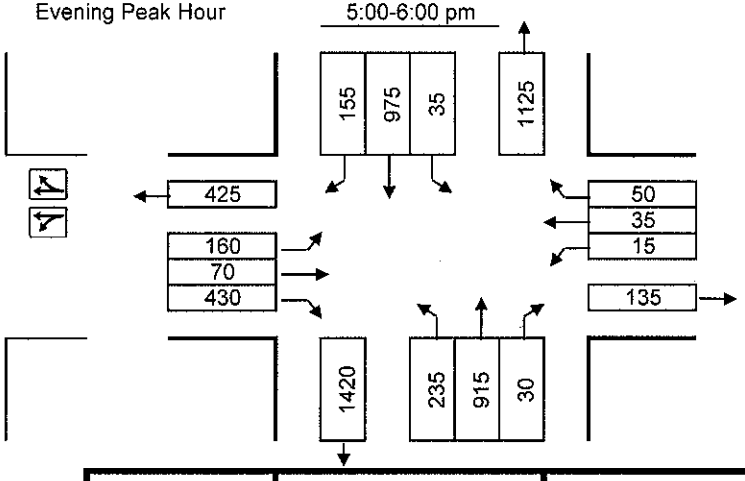
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PLUM ORCHARD DR.	EB 150	EB 235
WB Approach:	PLUM ORCHARD DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	740	1.00	0.53	392	40	432	
SBTR + NBL	1075	1.00	0.53	570	240	810	*
EBT + WBL	15	1.00	1.00	15	40	55	
WBLTR + EBL	120	1.10	0.53	66	75	141	*
					Critical Volume	951	OK
					V/C	0.64	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	945	1.00	0.53	501	35	536	
SBTR + NBL	1130	1.00	0.53	599	235	834	*
EBR + WBL	195	1.00	1.00	195	15	210	
WBLTR + EBL	100	2.00	0.53	61	160	221	*
					Critical Volume	1055	OK
					V/C	0.72	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

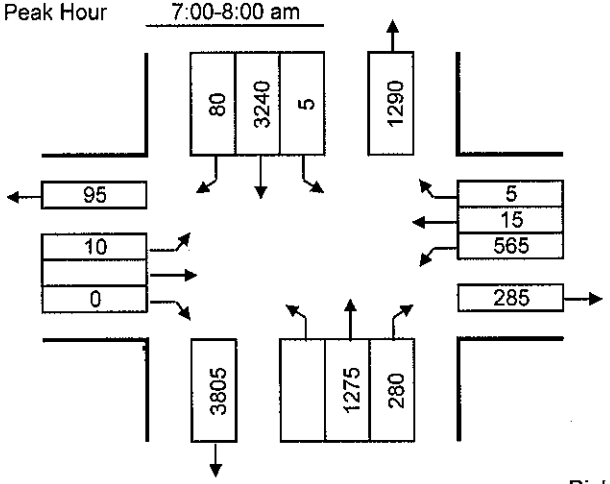
SHA

Count Date: 10/20/2008 & 10/26/2008
Conditions: EXISTING
Design Year: 2012

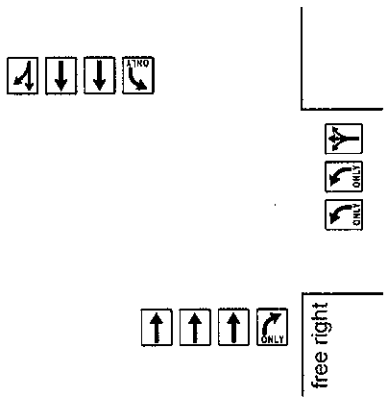
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

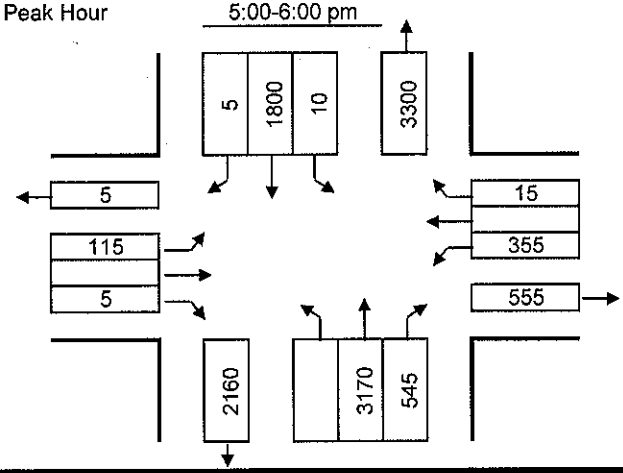
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	DRIVEWAY	EB	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1275	1.00	0.37	472	5	477	
SBTR	3320	1.00	0.37	1228	0	1228	*
EBT + WBL	0	1.00	1.00	0	226	226	
WBLTR + EBL	585	1.10	0.37	237	10	247	*
					Critical Volume	1475	OK
					V/C	1.00	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3170	1.00	0.37	1173	10	1183	*
SBTR	1805	1.00	0.37	668	0	668	
EBTR + WBL	5	1.00	1.00	5	142	147	
WBLTR + EBL	370	1.10	0.37	150	115	265	*
					Critical Volume	1448	OK
					V/C	0.98	

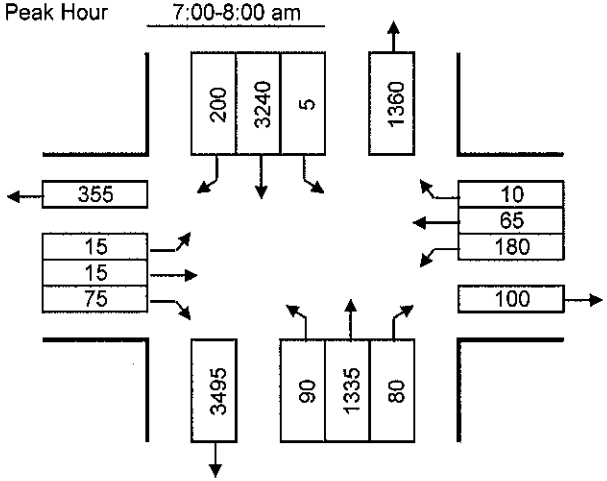
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/19/2008
Conditions: EXISTING
Design Year: 2012

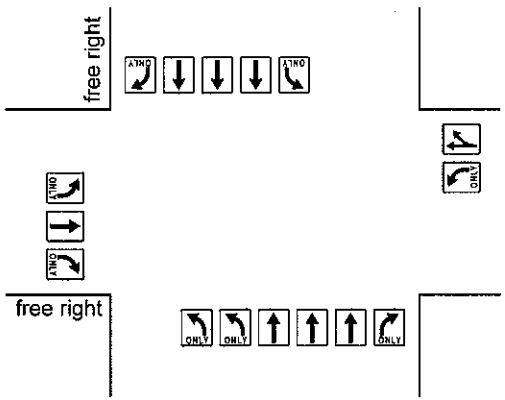
Location: US 29@ MUSGROVE
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

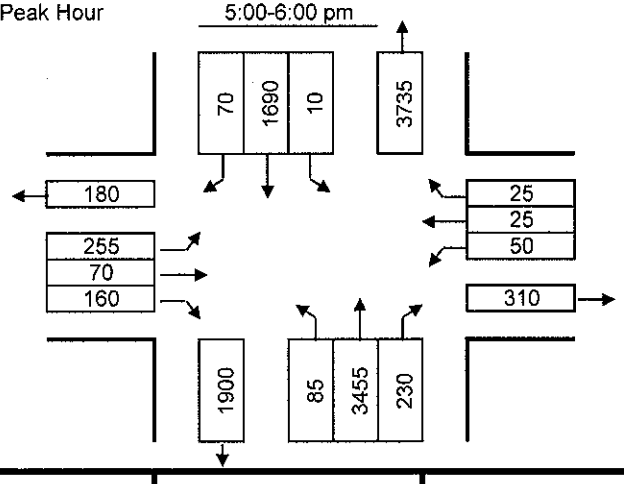
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	MUSGROVE RAOD	EB 75	EB
WB Approach:	MUSGROVE ROAD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1335	1.00	0.37	494	5	499	
SBT + NBL	3240	1.00	0.37	1199	54	1253	*
EBT + WBL	15	1.00	1.00	15	180	195	*
WBTR + EBL	75	1.00	1.00	75	15	90	
					Critical Volume	1448	OK
					V/C	0.98	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3455	1.00	0.37	1278	10	1288	*
SBT + NBL	1690	1.00	0.37	625	51	676	
EBR + WBL	160	1.00	1.00	160	50	210	
WBTR + EBL	50	1.00	1.00	50	255	305	*
					Critical Volume	1593	F
					V/C	1.08	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

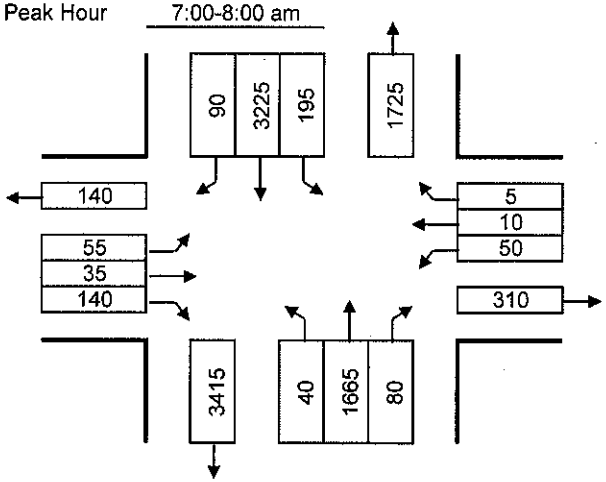
SHA

Count Date: 10/23/2007
Conditions: EXISTING
Design Year: 2012

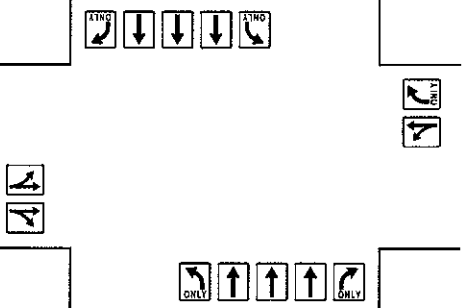
Location: US 29@STEWART LANE
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

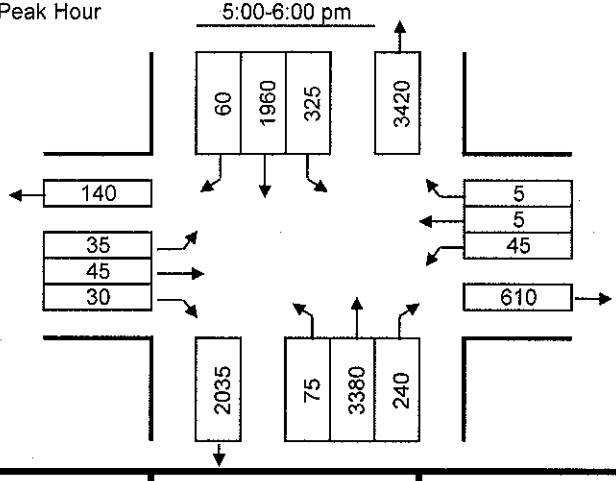
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	STEWART LANE	EB	EB
WB Approach:	STEWART LANE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1665	1.00	0.37	616	195	811	
SBT + NBL	3225	1.00	0.37	1193	40	1233	*
EBR + WBL	140	1.10	1.00	140	50	190	*
WBLT + EBL	60	1.10	1.00	65	55	120	
					Critical Volume	1423	OK
					V/C	0.96	

De facto RT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3380	1.00	0.37	1251	325	1576	*
SBT + NBL	1960	1.00	0.37	725	75	800	
EBLTR + WBL	110	1.10	0.53	60	45	105	*
WBLT + EBL	50	1.10	1.00	55	35	90	
					Critical Volume	1681	F
					V/C	1.14	

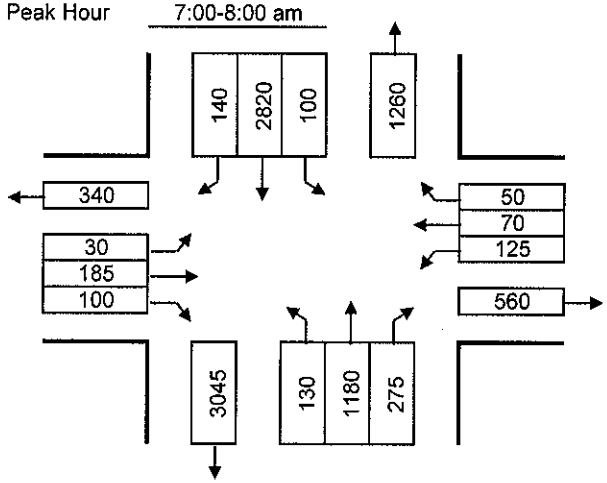
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/25/2007
Conditions: EXISTING
Design Year: 2012

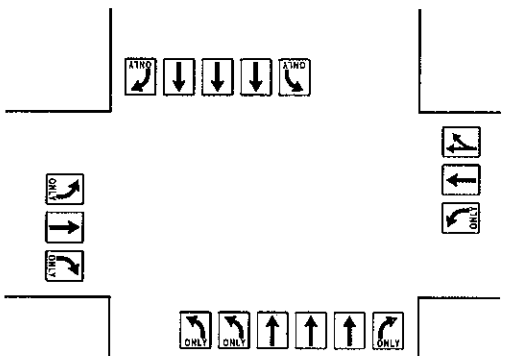
Location: US 29@ TECH ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

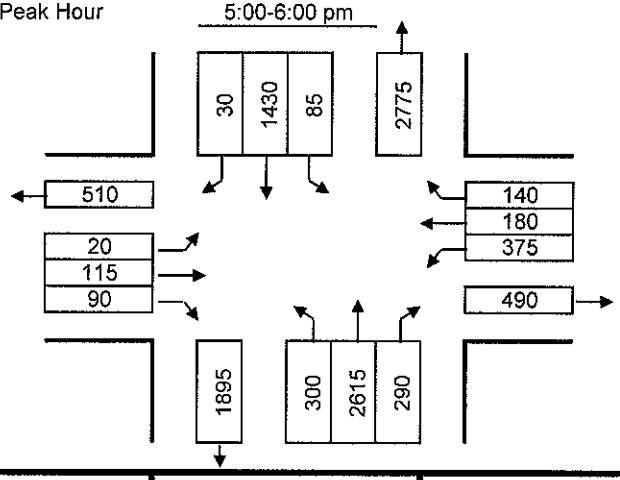
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	TECH RD	EB	EB
WB Approach:	TECH RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1180	1.00	0.37	437	100	537	
SBT + NBL	2820	1.00	0.37	1043	78	1121	*
EBT + WBL	185	1.00	1.00	185	125	310	*
WBTR + EBL	120	1.00	0.53	64	30	94	
					Critical Volume	1431	OK
					V/C	0.97	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2615	1.00	0.37	968	85	1053	*
SBT + NBL	1430	1.00	0.37	529	180	709	
EBT + WBL	115	1.00	1.00	115	375	490	*
WBTR + EBL	320	1.00	0.53	170	20	190	
					Critical Volume	1543	F
					V/C	1.05	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

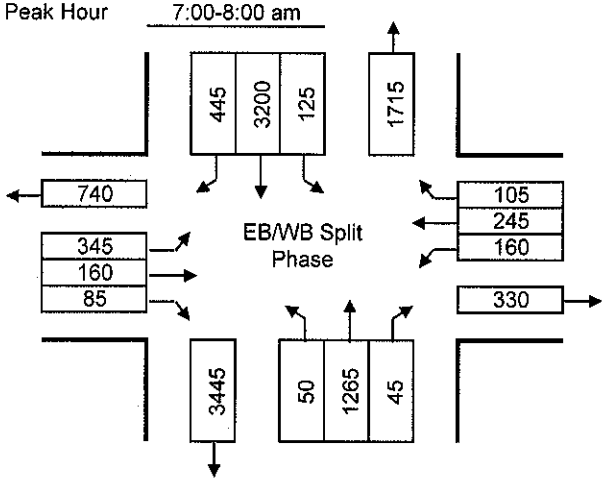
SHA

Count Date: 4/2/2008
Conditions: EXISTING
Design Year: 2012

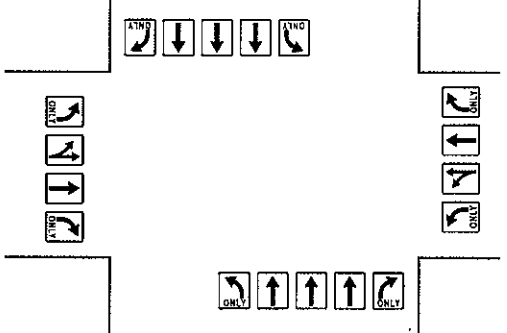
Location: US 29 @ FAIRLAND ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

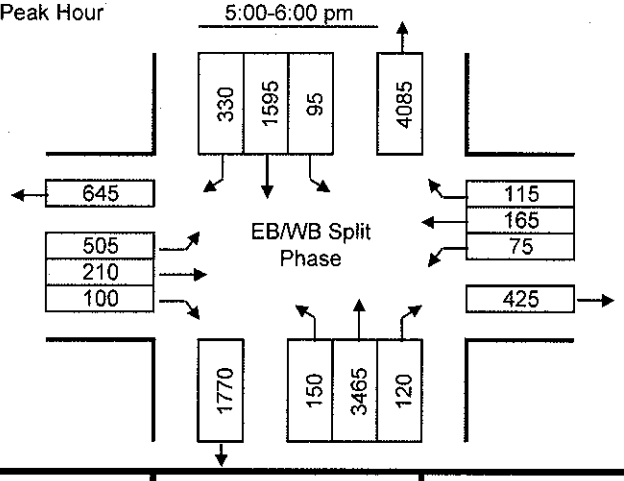
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	FAIRLAND ROAD	EB	EB
WB Approach:	FAIRLAND ROAD	WB	WB 79

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1265	1.00	0.37	468	125	593	
SBT + NBL	3200	1.00	0.37	1184	50	1234	*
EBL	345	1.00	0.60	207	0	207	*
WBLT	405	1.00	0.37	150	0	150	*
					Critical Volume	1591	F
					V/C	1.08	

De facto LT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3465	1.00	0.37	1282	95	1377	*
SBT + NBL	1595	1.00	0.37	590	150	740	
EBL	505	1.00	0.60	303	0	303	*
WBLT	240	1.00	0.37	89	0	89	*
					Critical Volume	1769	F
					V/C	1.20	

De facto LT lane(s) assumed for EB approach.

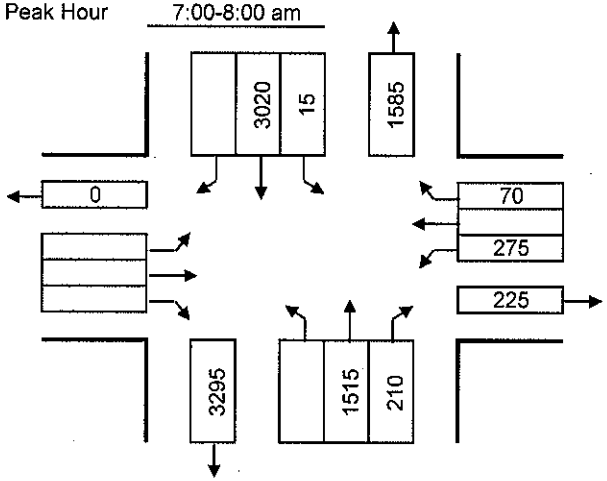
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: EXISTING
Design Year: 2012

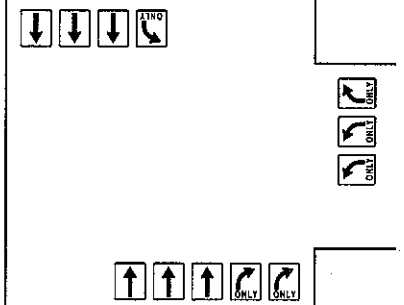
Location: US 29@ INDUSTRIAL PKWY
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

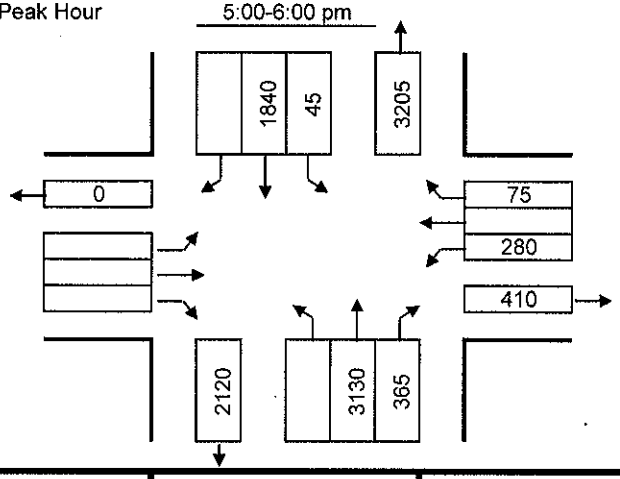
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn
Overlap Phasing or Right Turn on Red:

NB Approach: US 29
SB Approach: US 29
EB Approach: Industrial Pkwy
WB Approach: Industrial Pkwy

AM	NB	
	SB	
	EB	
	WB	
PM	NB	
	SB	
	EB	
	WB	

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1515	1.00	0.37	561	15	576	
SBT	3020	1.00	0.37	1117	0	1117	*
WBL	275	1.00	0.60	165	0	165	*
					Critical Volume	1282	OK
					V/C	0.87	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3130	1.00	0.37	1158	45	1203	*
SBT	1840	1.00	0.37	681	0	681	
WBL	280	1.00	0.60	168	0	168	*
					Critical Volume	1371	OK
					V/C	0.93	

Appendix C: No-Action and Action Level of Service Worksheets (without ICC)

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Maryland State Highway Administration
Turning Movement Summary and Level of Service

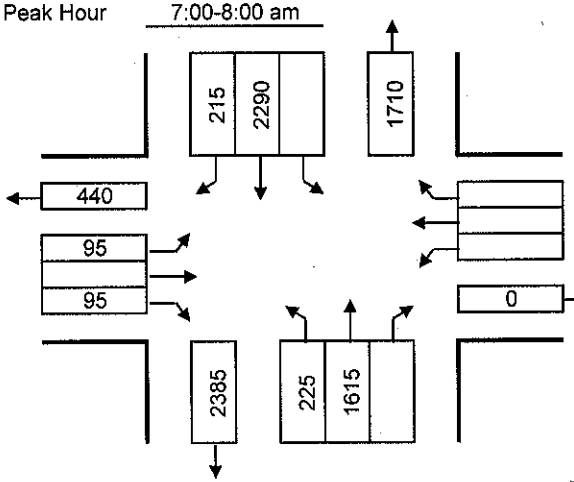
SHA

Count Date: 10/20/2008 & 10/26/2008
Conditions: BACKGROUND
Design Year: 2012

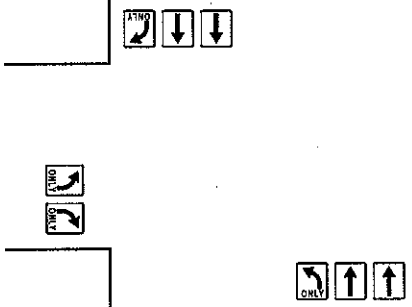
Location: CHERRY HILL@ PROSPERITY DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

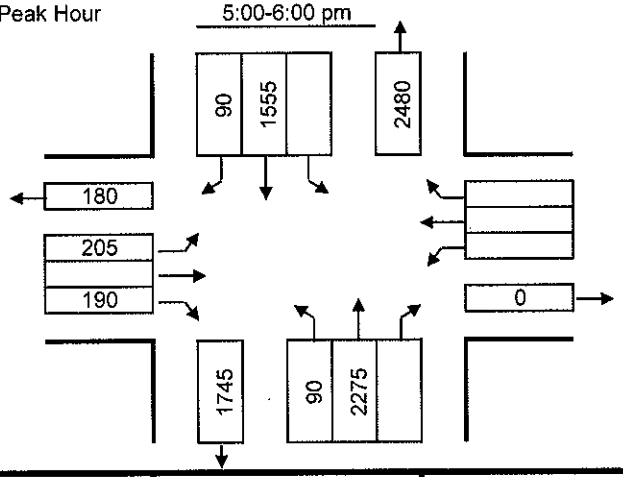
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PROSPERITY DRIVE	EB	EB
WB Approach:	PROSPERITY DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1615	1.00	0.53	856	0	856	
SBT + NBL	2290	1.00	0.53	1214	225	1439	*
EBL	95	1.00	1.00	95	0	95	*
					Critical Volume	1534	F
					V/C	1.04	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	2275	1.00	0.53	1206	0	1206	*
SBT + NBL	1555	1.00	0.53	824	90	914	
EBL	205	1.00	1.00	205	0	205	*
					Critical Volume	1411	OK
					V/C	0.96	

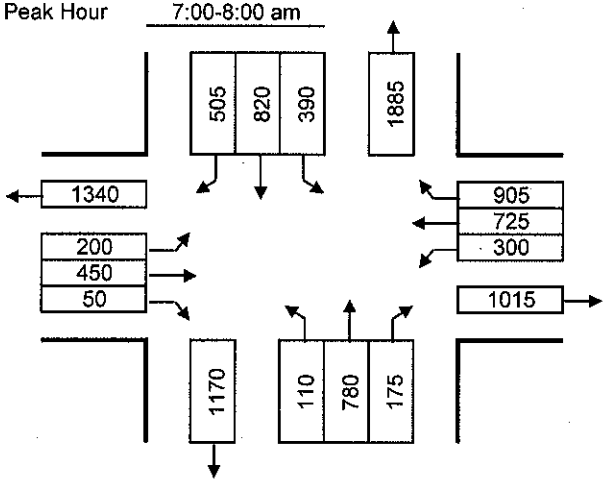
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 10/23/2007
Conditions: BACKGROUND
Design Year: 2012

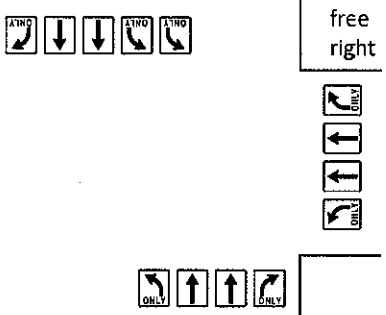
Location: CHERRY HILL@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

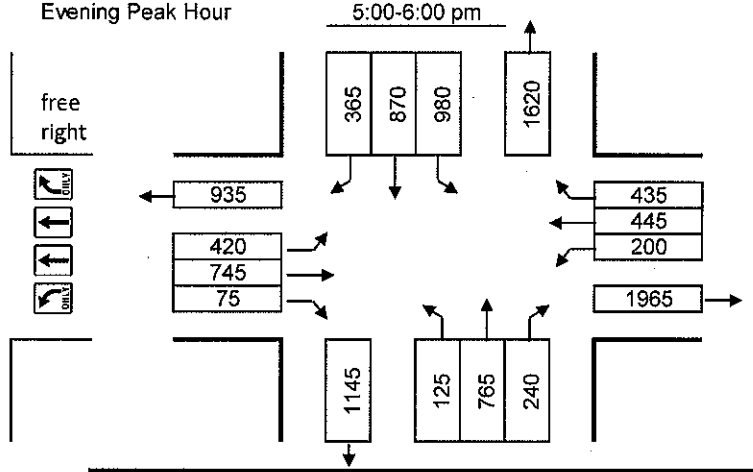
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB 905	WB 435

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume
1 =	1.00	A	≤	1000
2 =	0.55	B	≤	1150
3 =	0.37	C	≤	1300
4 =	0.29	D	≤	1450
Dbl-left	0.60	E	≤	1600
		F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	780	1.00	0.55	429	234	663	*
SBR + NBL	505	1.00	1.00	505	110	615	
EBTR + WBL	500	1.00	0.55	275	300	575	*
WBT + EBL	725	1.00	0.55	399	120	519	
					Critical Volume	1238	C
					V/C	0.77	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	765	1.00	0.55	421	588	1009	*
SBT + NBL	870	1.00	0.55	479	125	604	
EBTR + WBL	820	1.00	0.55	451	200	651	*
WBT + EBL	445	1.00	0.55	245	252	497	
					Critical Volume	1660	F
					V/C	1.04	

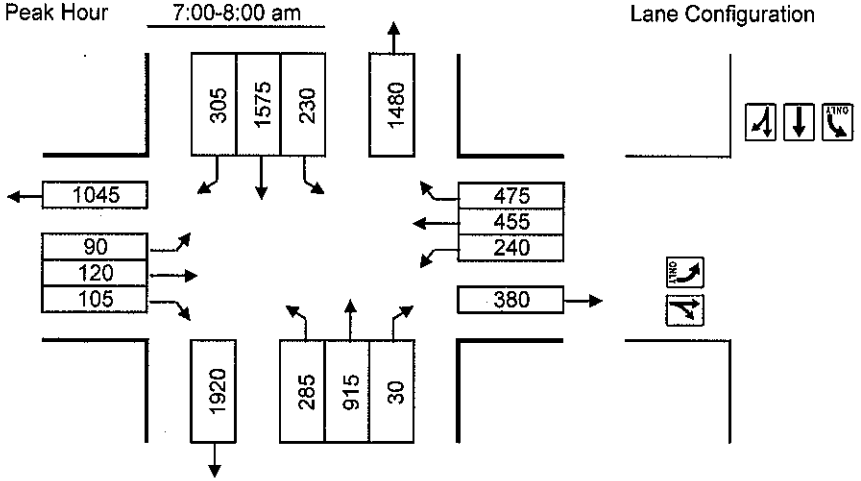
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/25/2007
Conditions: BACKGROUND
Design Year: 2012

Location: CHERRY HILL@BROADBIRCH
Computed By: Y.R. Date: 7/14/08

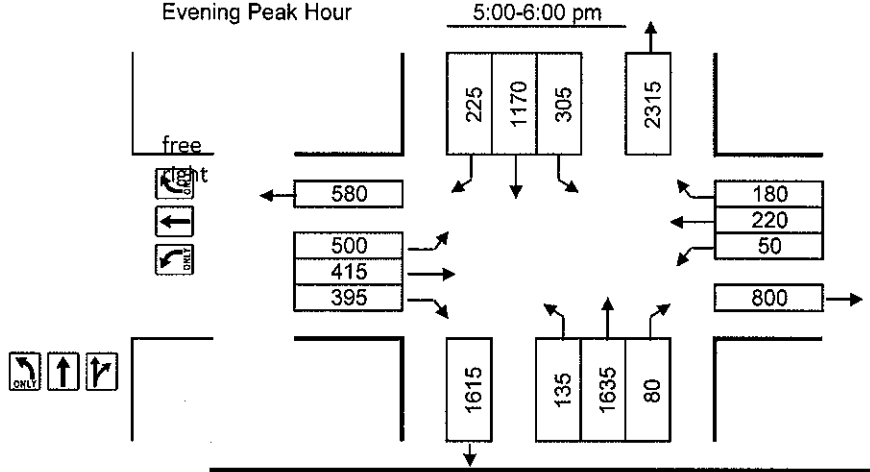
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	BROADBIRCH	EB	EB
WB Approach:	BROADBIRCH	WB 475	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	945	1.00	0.53	501	230	731	
SBTR + NBL	1880	1.00	0.53	996	285	1281	*
EBTR + WBL	225	1.00	1.00	225	240	465	
WBT + EBL	455	1.00	1.00	455	90	545	*
					Critical Volume	1826	F
					V/C	1.24	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1715	1.00	0.53	909	305	1214	*
SBTR + NBL	1395	1.00	0.53	739	135	874	
EBTR + WBL	810	1.00	1.00	810	50	860	*
WBT + EBL	220	1.00	1.00	220	500	720	
					Critical Volume	2074	F
					V/C	1.41	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

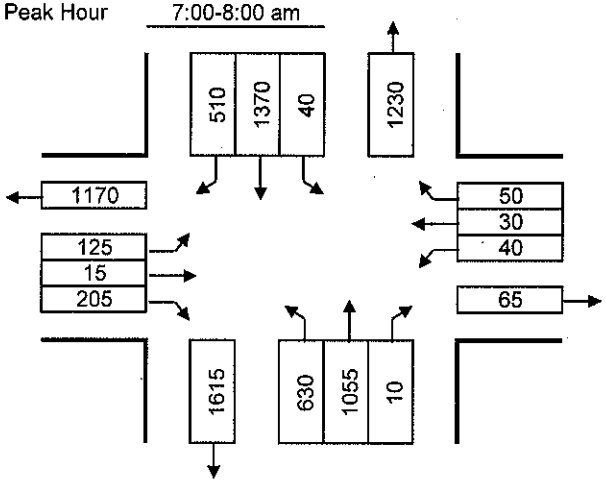
SHA

Count Date: 10/18/2007
Conditions: BACKGROUND
Design Year: 2012

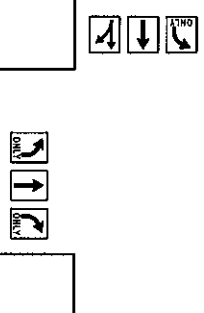
Location: PLUM ORCHARD DR.@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

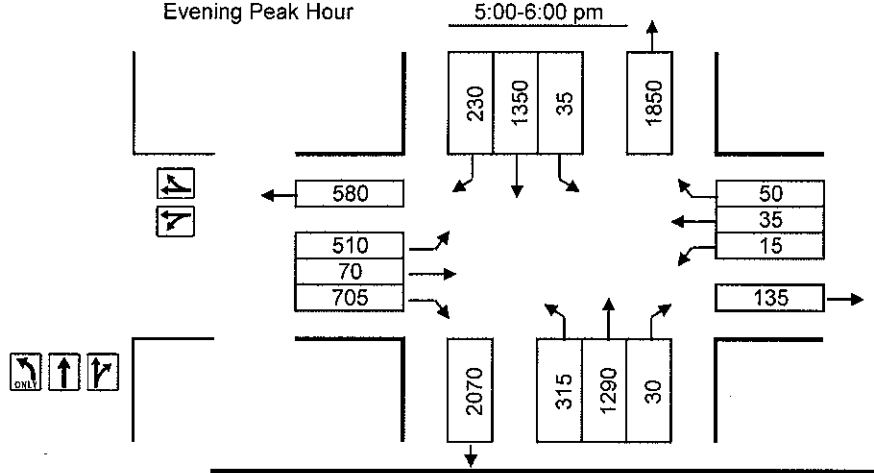
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PLUM ORCHARD DR.	EB 205	EB 270
WB Approach:	PLUM ORCHARD DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1065	1.00	0.53	564	40	604	
SBTR + NBL	1880	1.00	0.53	996	630	1626	*
EBT + WBL	15	1.00	1.00	15	40	55	
WBLTR + EBL	120	1.10	0.53	66	125	191	*
					Critical Volume	1817	F
					V/C	1.23	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1320	1.00	0.53	700	35	735	
SBTR + NBL	1580	1.00	0.53	837	315	1152	*
EBR + WBL	435	1.00	1.00	435	15	450	
WBLTR + EBL	100	2.00	0.53	61	510	571	*
					Critical Volume	1723	F
					V/C	1.17	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

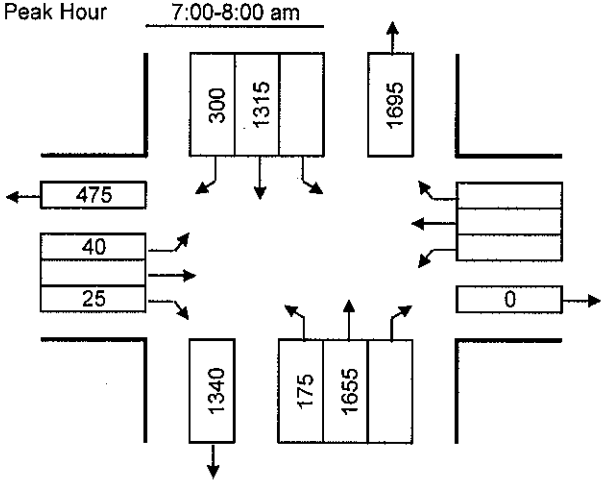
SHA

Count Date:
Conditions: BACKGROUND
Design Year: 2012

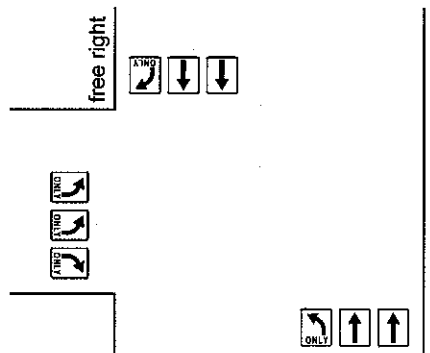
Location: Site Access @ Cherry Hill
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

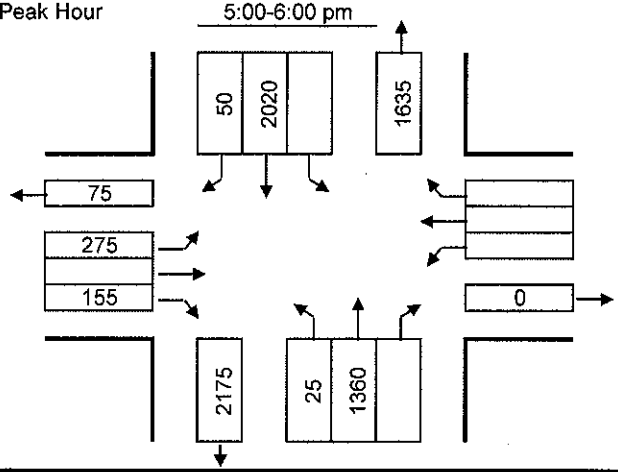
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	Site Access	EB	EB
WB Approach:		WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1655	1.00	0.53	877	0	877	*
SBT + NBL	1315	1.00	0.53	697	175	872	
EBR	25	1.00	1.00	25	0	25	*
					Critical Volume	902	OK
					V/C	0.61	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1360	1.00	0.53	721	0	721	
SBT + NBL	2020	1.00	0.53	1071	25	1096	*
EBL	275	1.00	0.60	165	0	165	*
				Critical Volume		1261	OK
				V/C		0.85	

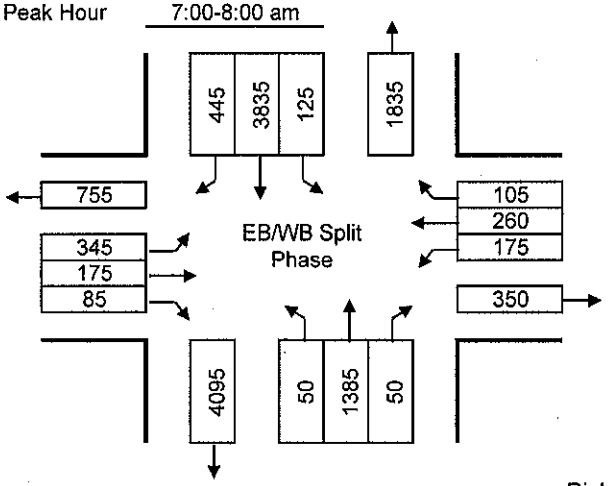
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/14/2008
Conditions: BACKGROUND
Design Year: 2012

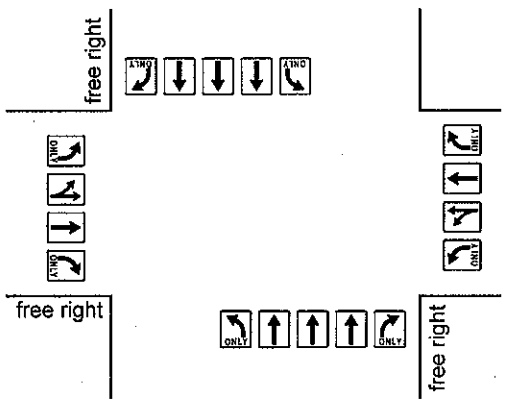
Location: US 29@ FAIRLAND ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

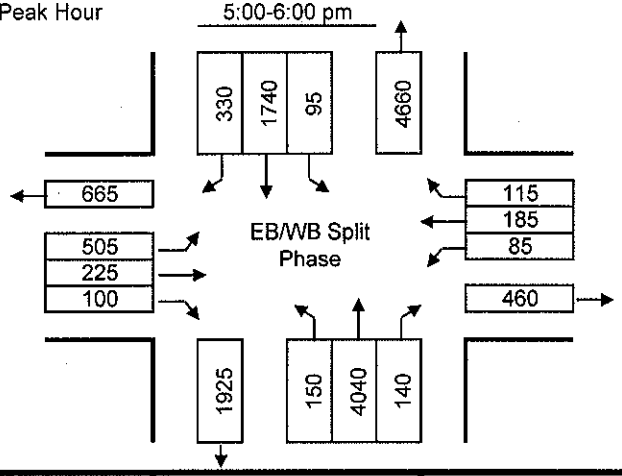
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	FAIRLAND RD	EB	EB
WB Approach:	FAIRLAND RD	WB	WB 70

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1385	1.00	0.37	512	125	637	
SBT + NBL	3835	1.00	0.37	1419	50	1469	*
EBL	345	1.00	0.60	207	0	207	*
WBLT	435	1.00	0.37	161	0	161	*
					Critical Volume	1837	F
					V/C	1.25	

De facto LT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4040	1.00	0.37	1495	95	1590	*
SBT + NBL	1740	1.00	0.37	644	150	794	
EBL	505	1.00	0.60	303	0	303	*
WBLT	270	1.00	0.37	100	0	100	*
					Critical Volume	1993	F
					V/C	1.35	

De facto LT lane(s) assumed for EB approach.

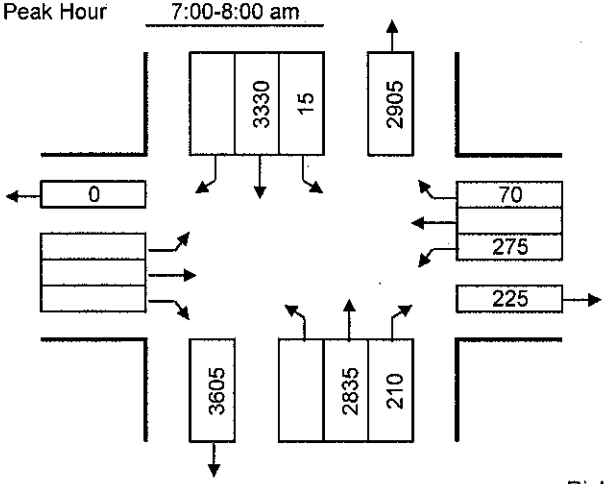
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: BACKGROUND
Design Year: 2012

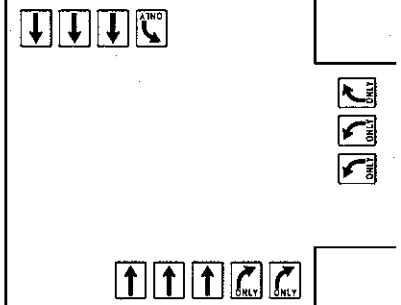
Location: US 29@ INDUSTRIAL PKWY
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

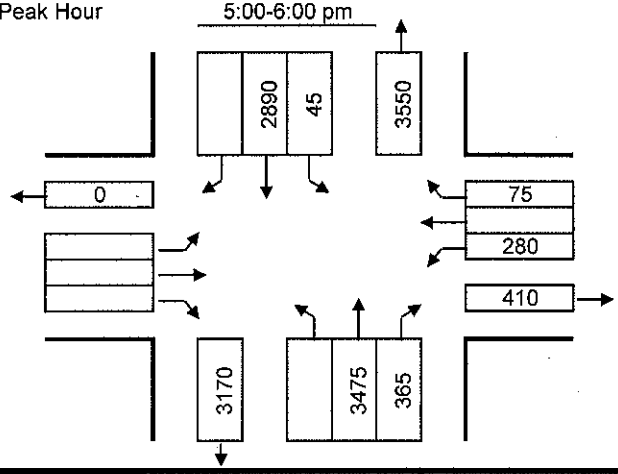
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	Industrial Pkwy	EB	EB
WB Approach:	Industrial Pkwy	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2835	1.00	0.37	1049	15	1064	
SBT	3330	1.00	0.37	1232	0	1232	*
WBL	275	1.00	0.60	165	0	165	*
					Critical Volume	1397	OK
					V/C	0.95	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3475	1.00	0.37	1286	45	1331	*
SBT	2890	1.00	0.37	1069	0	1069	
WBL	280	1.00	0.60	168	0	168	*
					Critical Volume	1499	F
					V/C	1.02	

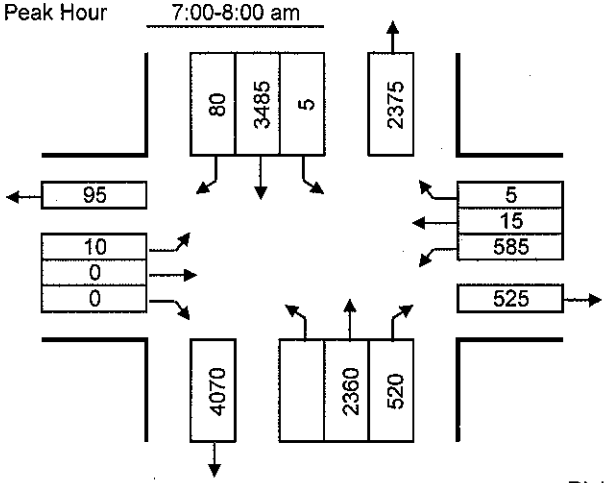
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/26/2008
Conditions: BACKGROUND
Design Year: 2012

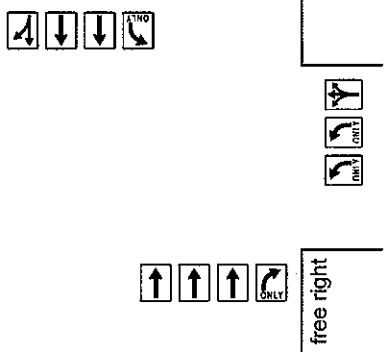
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

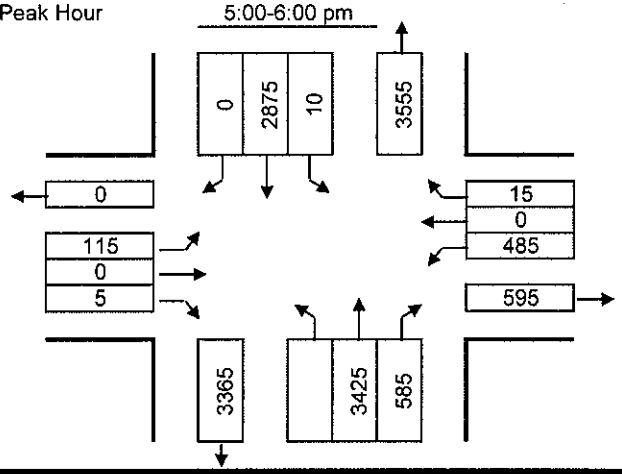
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	DRIVEWAY	EB	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2360	1.00	0.37	873	5	878	
SBTR	3565	1.00	0.37	1319	0	1319	*
EBT + WBL	0	1.00	1.00	0	234	234	
WBLTR + EBL	605	1.10	0.37	245	10	255	*
					Critical Volume	1574	F
					V/C	1.07	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3425	1.00	0.37	1267	10	1277	*
SBT	2875	1.00	0.37	1064	0	1064	
EBTR + WBL	5	1.00	1.00	5	194	199	
WBLTR + EBL	500	1.10	0.37	203	115	318	*
					Critical Volume	1595	F
					V/C	1.08	

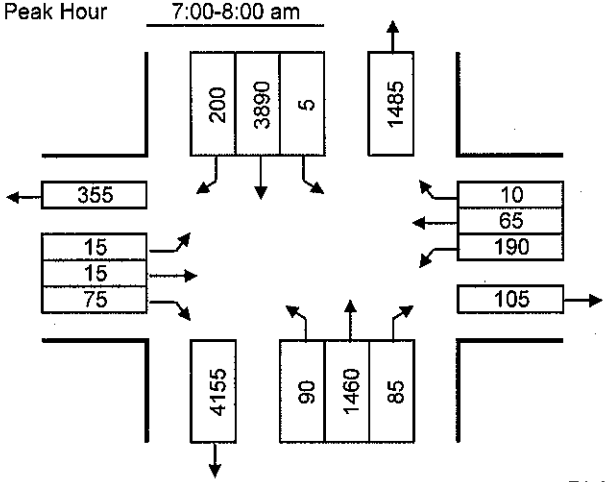
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 2/19/2008
Conditions: BACKGROUND
Design Year: 2012

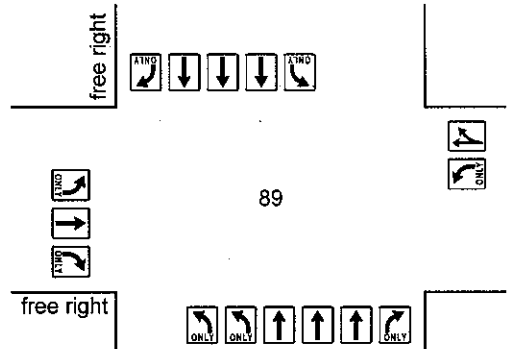
Location: US 29@ MUSGROVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

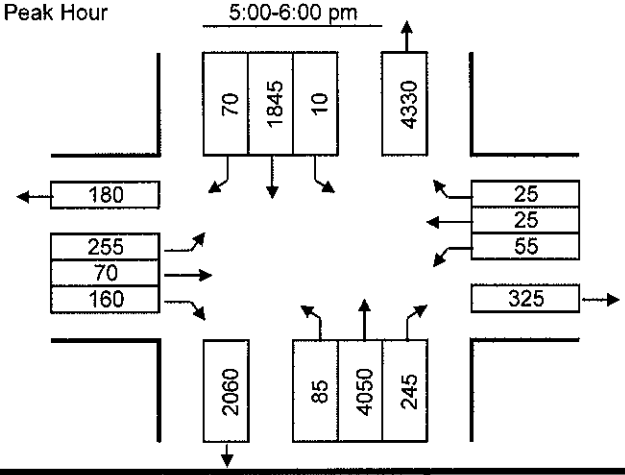
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	MUSGROVE RAOD	EB 75	EB
WB Approach:	MUSGROVE ROAD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard
= 1475
for
Aspen Hill
Policy
Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1460	1.00	0.37	540	5	545	
SBT + NBL	3890	1.00	0.37	1439	54	1493	*
EBT + WBL	15	1.00	1.00	15	190	205	*
WBTR + EBL	75	1.00	1.00	75	15	90	
					Critical Volume	1698	F
					V/C	1.15	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4050	1.00	0.37	1499	10	1509	*
SBT + NBL	1845	1.00	0.37	683	51	734	
EBR + WBL	160	1.00	1.00	160	55	215	
WBTR + EBL	50	1.00	1.00	50	255	305	*
					Critical Volume	1814	F
					V/C	1.23	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

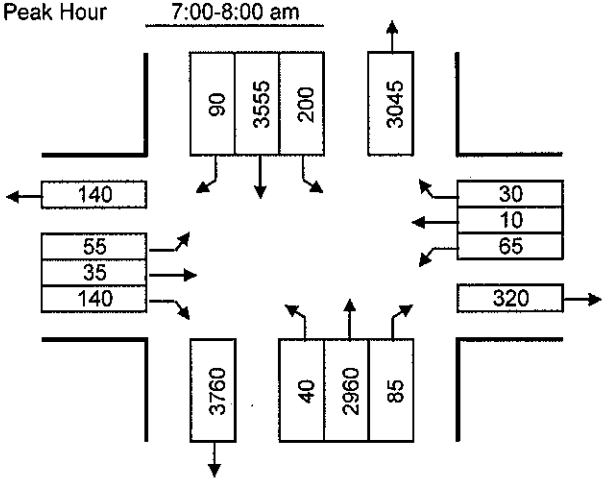
SHA

Count Date: 10/23/2007
Conditions: BACKGROUND
Design Year: 2012

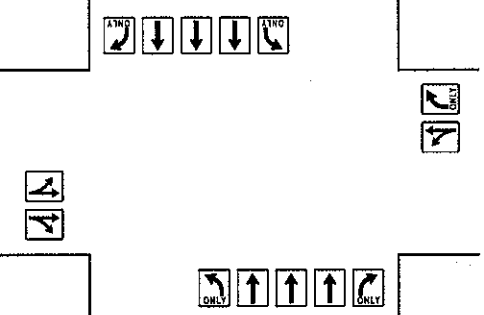
Location: US 29@STEWART LANE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

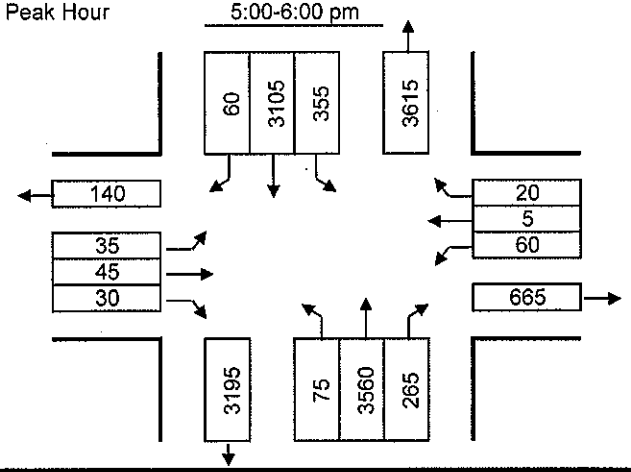
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	STEWART LANE	EB	EB
WB Approach:	STEWART LANE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2960	1.00	0.37	1095	200	1295	
SBT + NBL	3555	1.00	0.37	1315	40	1355	*
EBR + WBL	140	1.10	1.00	140	65	205	*
WBLT + EBL	75	1.10	1.00	82	55	137	
					Critical Volume	1560	F
					V/C	1.06	

De facto RT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3560	1.00	0.37	1317	355	1672	*
SBT + NBL	3105	1.00	0.37	1149	75	1224	
EBLTR + WBL	110	1.10	0.53	60	60	120	*
WBLT + EBL	65	1.10	1.00	71	35	106	
					Critical Volume	1792	F
					V/C	1.21	

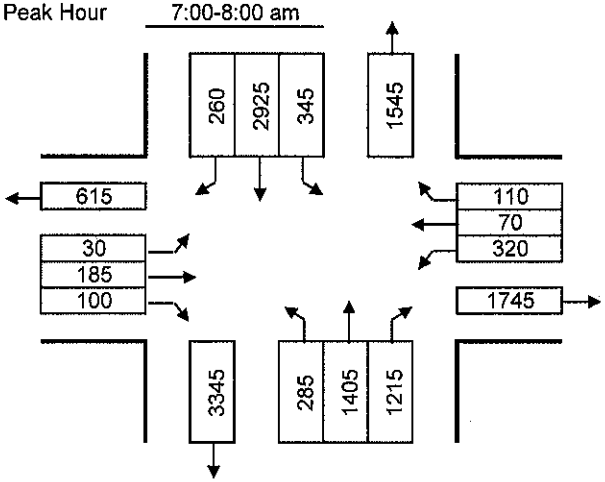
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 10/25/2007
Conditions: BACKGROUND
Design Year: 2012

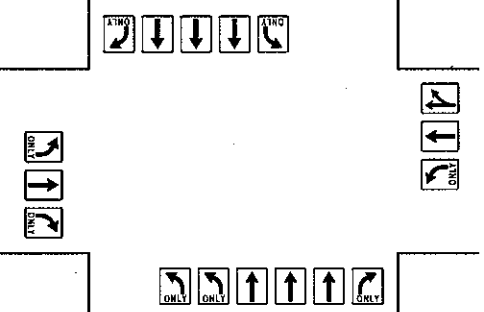
Location: US 29@ TECH ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

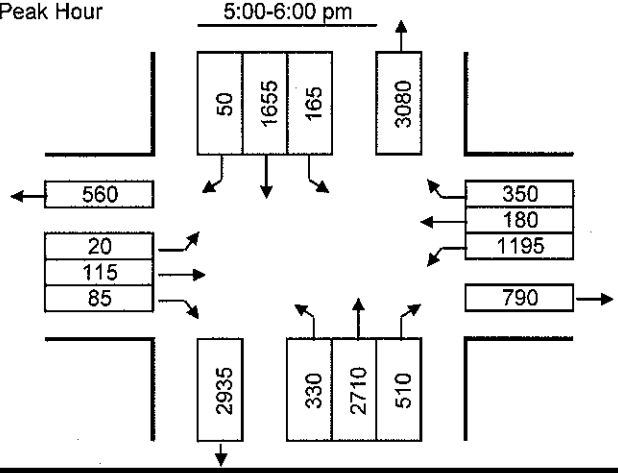
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB 159	NB
SB Approach:	US 29	SB	SB
EB Approach:	TECH RD	EB	EB
WB Approach:	TECH RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR + SBL	1056	1.00	1.00	1056	345	1401	*
SBT + NBL	2925	1.00	0.37	1082	171	1253	
EBT + WBL	185	1.00	1.00	185	320	505	*
WBR + EBL	110	1.00	1.00	110	30	140	
					Critical Volume	1906	F
					V/C	1.29	

De facto RT lane(s) assumed for WB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2710	1.00	0.37	1003	165	1168	*
SBT + NBL	1655	1.00	0.37	612	198	810	
EBT + WBL	115	1.00	1.00	115	1195	1310	*
WBR + EBL	350	1.00	1.00	350	20	370	
					Critical Volume	2478	F
					V/C	1.68	

De facto RT lane(s) assumed for WB approach.

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

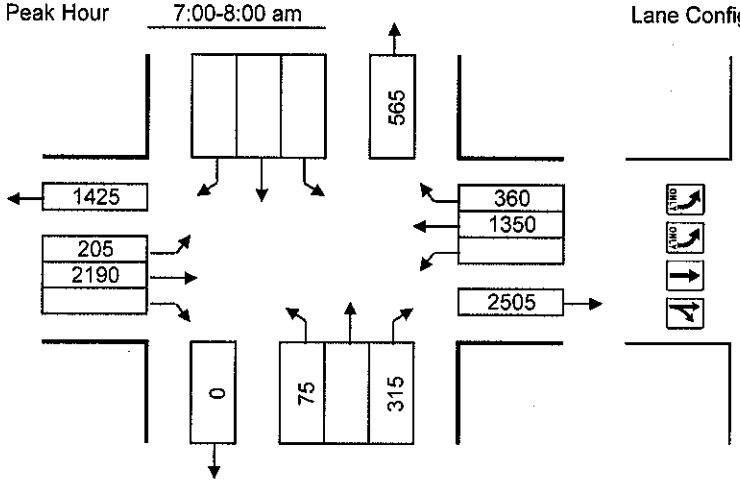
SHA

Count Date: 10/24/2007
Conditions: BACKGROUND
Design Year: 2012

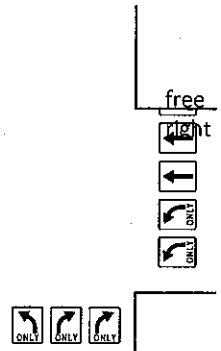
Location: US 29 NB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

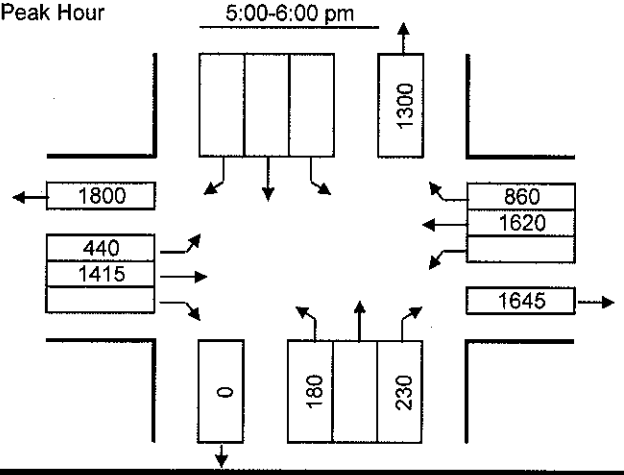
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	315	1.00	0.53	167	0	167	*
EBT	2190	1.00	0.53	1161	0	1161	*
WBT + EBL	1350	1.00	0.53	716	123	839	
					Critical Volume	1328	OK
					V/C	0.90	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBL	180	1.00	1.00	180	0	180	*
EBT	1415	1.00	0.53	750	0	750	
WBR + EBL	860	1.00	1.00	860	264	1124	*
				Critical Volume		1304	OK
				V/C		0.88	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

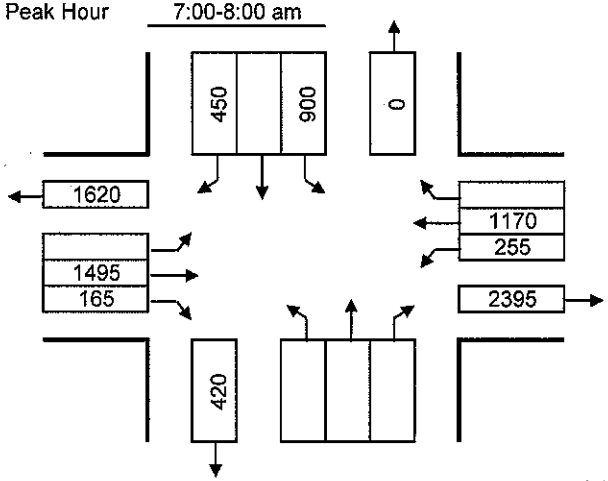
SHA

Count Date: 10/24/2007
Conditions: BACKGROUND
Design Year: 2012

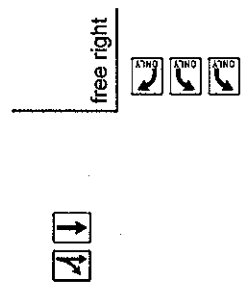
Location: US 29 SB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

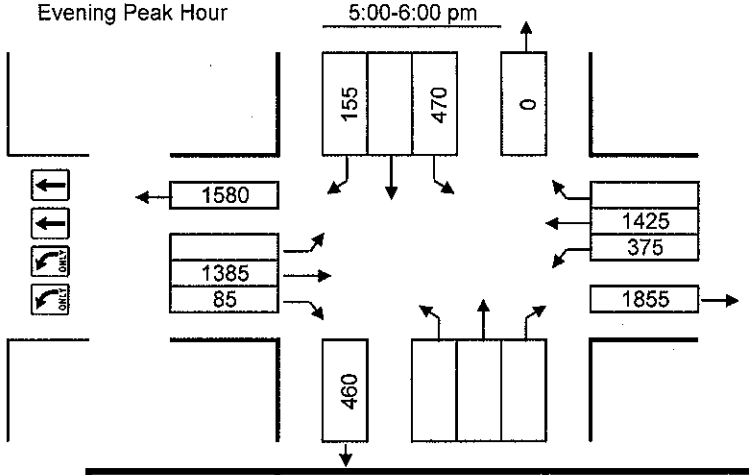
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	900	1.00	0.60	540	0	540	*
EBTR + WBL	1660	1.00	0.53	880	153	1033	*
WBT	1170	1.00	0.53	620	0	620	
					Critical Volume	1573	F
					V/C	1.07	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	470	1.00	0.60	282	0	282	*
EBTR + WBL	1470	1.00	0.53	779	225	1004	*
WBT	1425	1.00	0.53	755	0	755	
					Critical Volume	1286	OK
					V/C	0.87	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

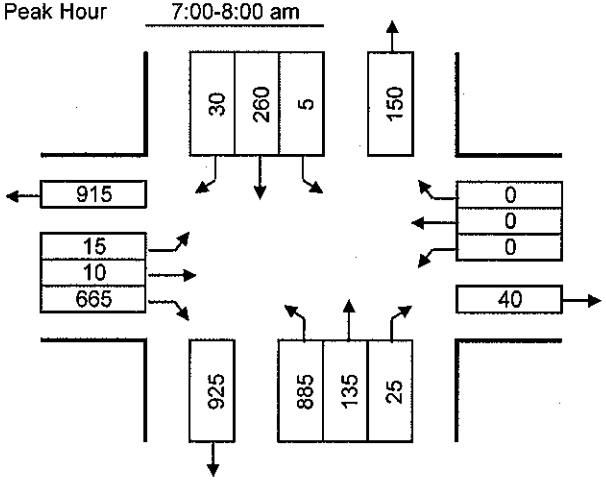
SHA

Count Date: 10/18/2007
Conditions: BACKGROUND
Design Year: 2012

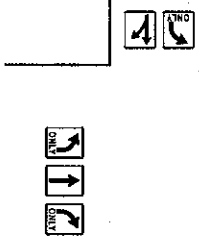
Location: BELTSVILLE@CALVERTON BLVD
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

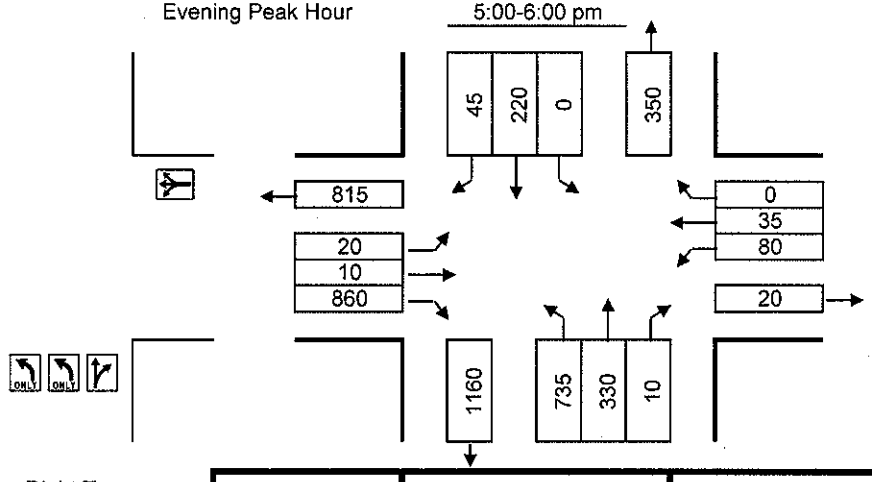
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	CALVERTON BLVD	EB 655	EB 805
WB Approach:	CALVERTON BLVD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.37
4 =	0.29
Dbl-left	0.60

Service Level		Critical Lane Volume
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	160	1.00	1.00	160	5	165	
SBTR + NBL	290	1.00	1.00	290	531	821	*
EBT	10	1.00	1.00	10	0	10	
WBT + EBL	0	1.10	1.00	0	15	15	*
					Critical Volume	836	A
					V/C	0.52	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR	340	1.00	1.00	340	0	340	
SBTR + NBL	265	1.00	1.00	265	441	706	*
EBR + WBL	55	1.00	1.00	55	80	135	
WBLT + EBL	115	1.10	1.00	123	20	143	*
					Critical Volume	849	A
					V/C	0.53	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

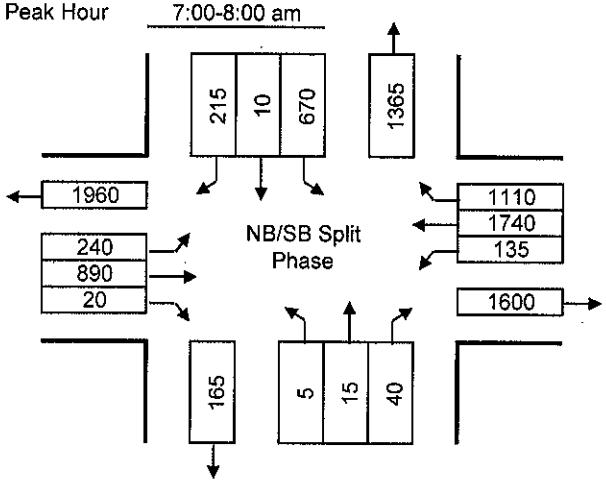
SHA

Count Date: 2/21/2008
Conditions: BACKGROUND
Design Year: 2012

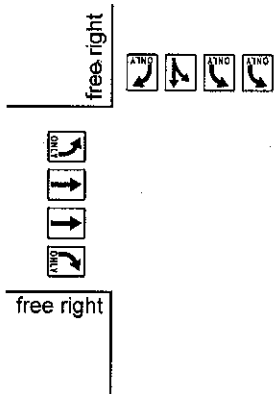
Location: BELTSVILLE@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

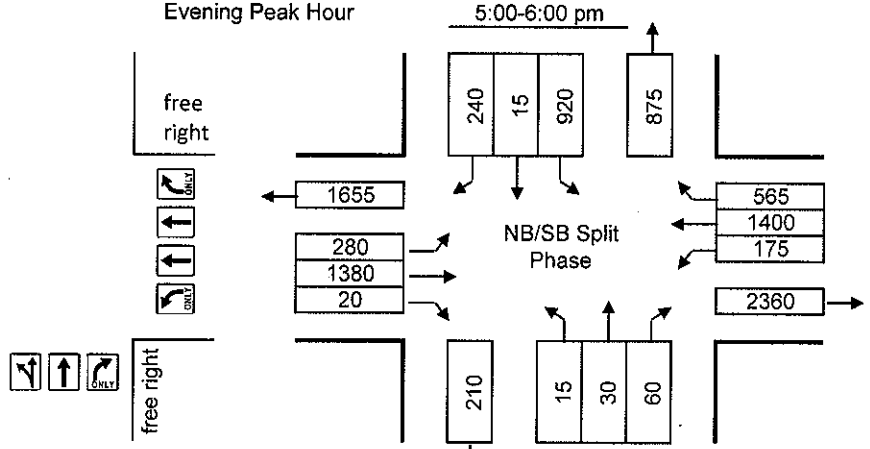
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB 40	NB 60
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB 1110	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume
1 =	1.00	A	≤	1000
2 =	0.55	B	≤	1150
3 =	0.37	C	≤	1300
4 =	0.29	D	≤	1450
Dbl-left	0.60	E	≤	1600
		F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	20	1.00	0.55	11	0	11	*
SBLT	680	1.00	0.37	252	0	252	*
EBT + WBL	890	1.00	0.55	490	135	625	
WBT + EBL	1740	1.00	0.55	957	240	1197	*
					Critical Volume	1460	E
					V/C	0.91	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	45	1.00	0.55	25	0	25	*
SBLT	935	1.00	0.37	346	0	346	*
EBT + WBL	1380	1.00	0.55	759	175	934	
WBT + EBL	1400	1.00	0.55	770	280	1050	*
					Critical Volume	1421	D
					V/C	0.89	

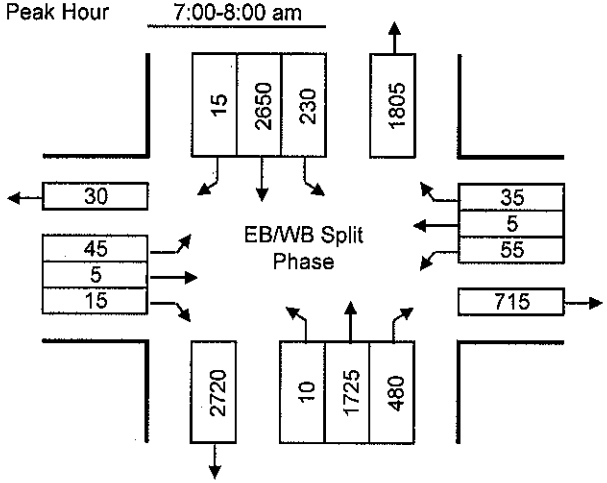
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/1/2007
Conditions: BACKGROUND
Design Year: 2012

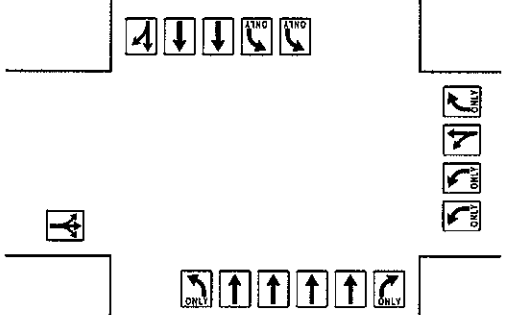
Location: MD 650 @ MAHAN ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

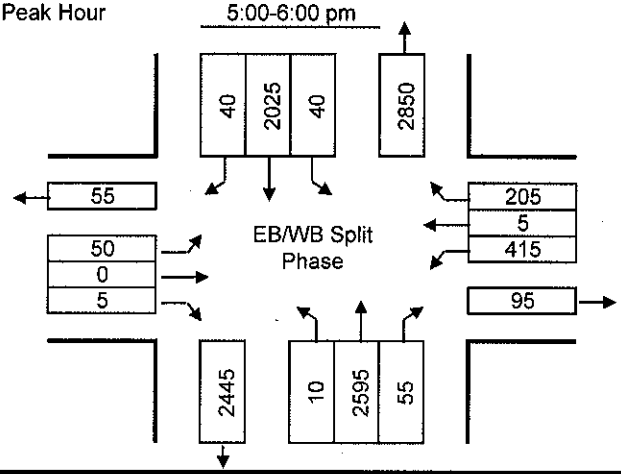
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MAHAN ROAD	EB	EB
WB Approach:	MAHAN ROAD	WB 35	WB 24

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1725	1.00	0.30	518	138	656	
SBTR + NBL	2665	1.00	0.37	986	10	996	*
EBLTR	65	1.00	1.00	65	0	65	*
WBLT	60	1.00	0.37	22	0	22	*
					Critical Volume	1083	OK
					V/C	0.73	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2595	1.00	0.30	779	24	803	*
SBTR + NBL	2065	1.00	0.37	764	10	774	
EBLTR	55	1.00	1.00	55	0	55	*
WBR	181	1.00	1.00	181	0	181	*
					Critical Volume	1039	OK
					V/C	0.70	

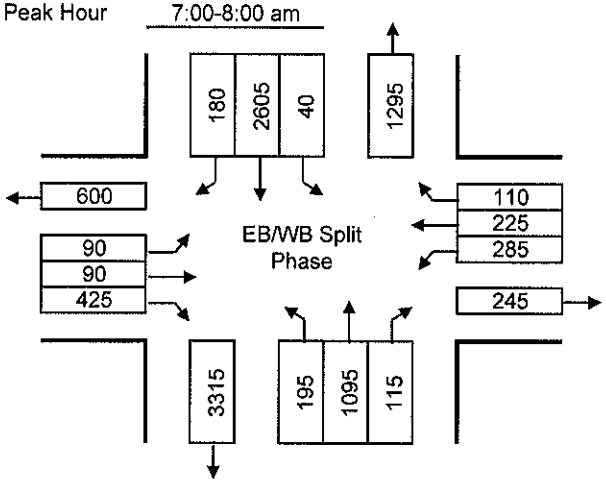
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: BACKGROUND
Design Year: 2012

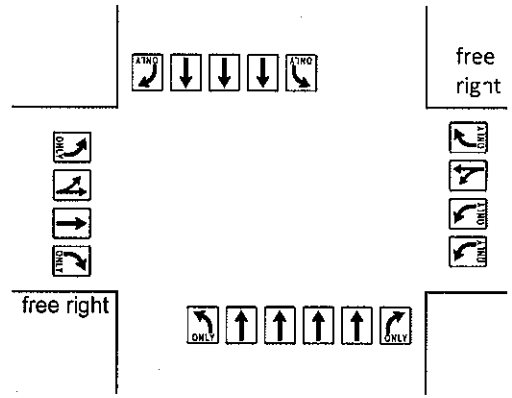
Location: MD 650 @ LOCKWOOD DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

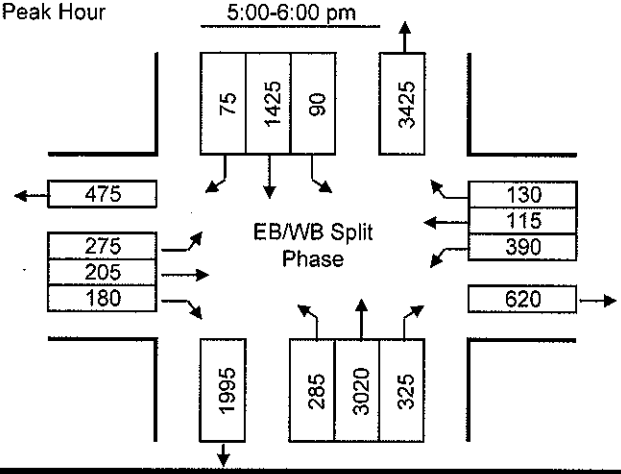
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	LOCKWOOD DRIVE	EB 425	EB 180
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1095	1.00	0.30	329	40	369	
SBT + NBL	2605	1.00	0.37	964	195	1159	*
EBLT	180	1.00	0.37	67	0	67	*
WBLT	510	1.00	0.37	189	0	189	*
					Critical Volume	1415	OK
					V/C	0.96	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3020	1.00	0.30	906	90	996	*
SBT + NBL	1425	1.00	0.37	527	285	812	
EBLT	480	1.00	0.37	178	0	178	*
WBLT	505	1.00	0.37	187	0	187	*
					Critical Volume	1361	OK
					V/C	0.92	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

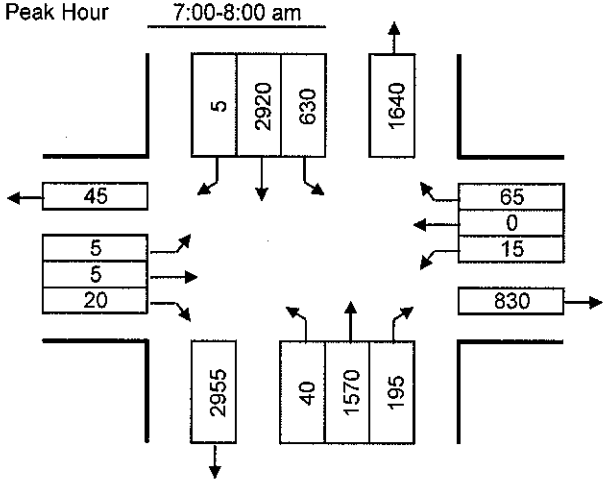
SHA

Count Date: 10/17/2007
Conditions: BACKGROUND
Design Year: 2012

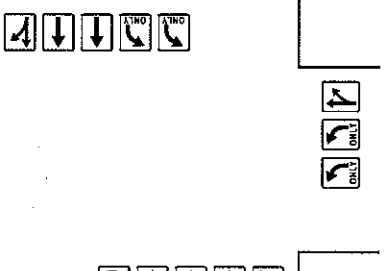
Location: MD 650@MICHELSON
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

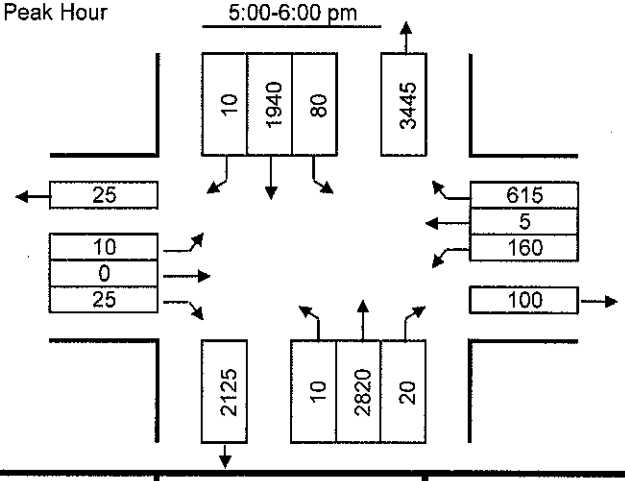
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MICHELSON DR.	EB	EB
WB Approach:	MICHELSON DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≤ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1765	1.00	0.30	530	378	908	
SBTR + NBL	2925	1.00	0.37	1082	40	1122	*
EBLTR + WBL	30	1.10	1.00	31	9	40	
WBTR + EBL	65	1.00	1.00	65	5	70	*
					Critical Volume	1192	OK
					V/C	0.81	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2840	1.00	0.30	852	48	900	*
SBTR + NBL	1950	1.00	0.37	722	10	732	
EBLTR + WBL	35	3.00	1.00	55	96	151	
WBTR + EBL	620	1.00	1.00	620	10	630	*
					Critical Volume	1530	F
					V/C	1.04	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

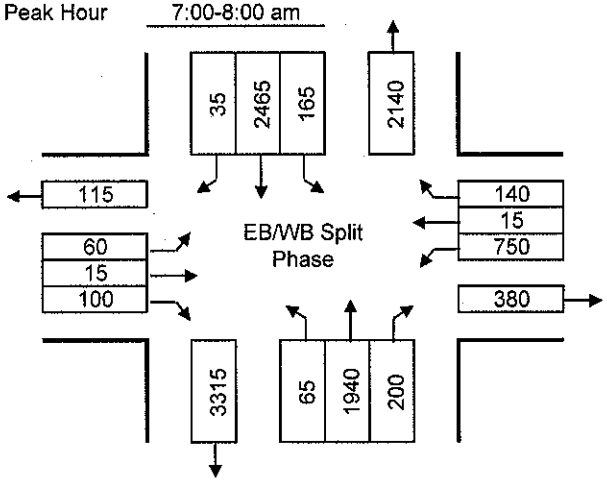
SHA

Count Date: 10/1/2007
Conditions: BACKGROUND
Design Year: 2012

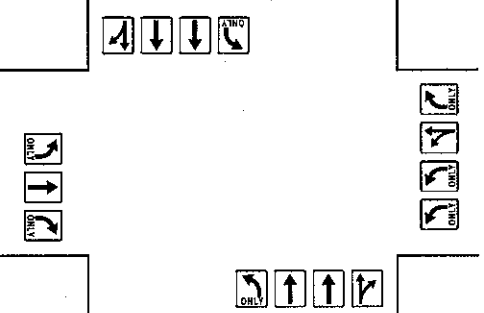
Location: MD 650@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

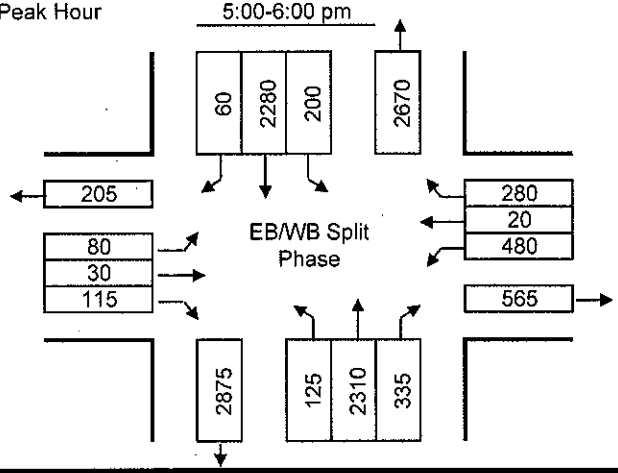
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	POWDER MILL RD	EB	EB 115
WB Approach:	POWDER MILL RD	WB	WB 200

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Fairland / White Oak Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2140	1.00	0.37	792	165	957	
SBTR + NBL	2500	1.00	0.37	925	65	990	*
EBR	100	1.00	1.00	100	0	100	*
WBLT	765	1.00	0.37	283	0	283	*
					Critical Volume	1373	OK
					V/C	0.93	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2645	1.00	0.37	979	200	1179	*
SBTR + NBL	2340	1.00	0.37	866	125	991	
EBL	80	1.00	1.00	80	0	80	*
WBLT	500	1.00	0.37	185	0	185	*
					Critical Volume	1444	OK
					V/C	0.98	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

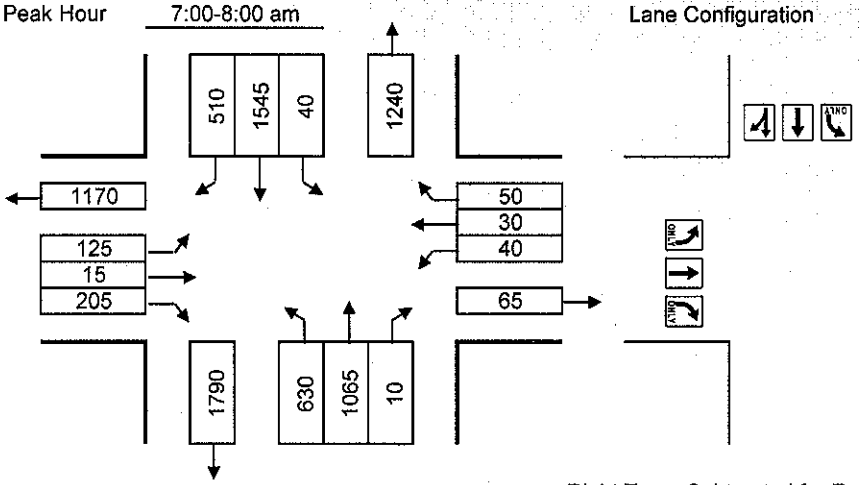
SHA

Count Date: 10/18/2007
Conditions: PROPOSED
Design Year: 2012

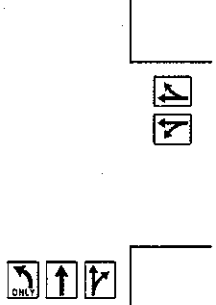
Location: PLUM ORCHARD DR.@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

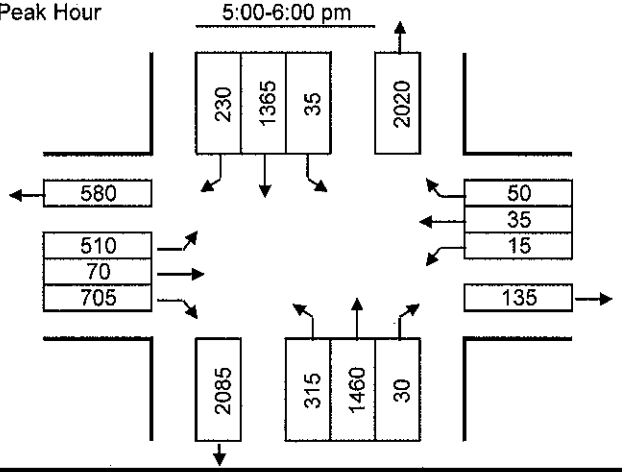
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PLUM ORCHARD DR.	EB	EB
WB Approach:	PLUM ORCHARD DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1075	1.00	0.53	570	40	610	
SBTR + NBL	2055	1.00	0.53	1089	630	1719	*
EBR + WBL	205	1.00	1.00	205	40	245	*
WBLTR + EBL	120	2.00	0.53	85	125	210	
					Critical Volume	1964	F
					V/C	1.33	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1490	1.00	0.53	790	35	825	
SBTR + NBL	1595	1.00	0.53	845	315	1160	*
EBR + WBL	705	1.00	1.00	705	15	720	*
WBLTR + EBL	100	3.00	0.53	69	510	579	
					Critical Volume	1880	F
					V/C	1.27	

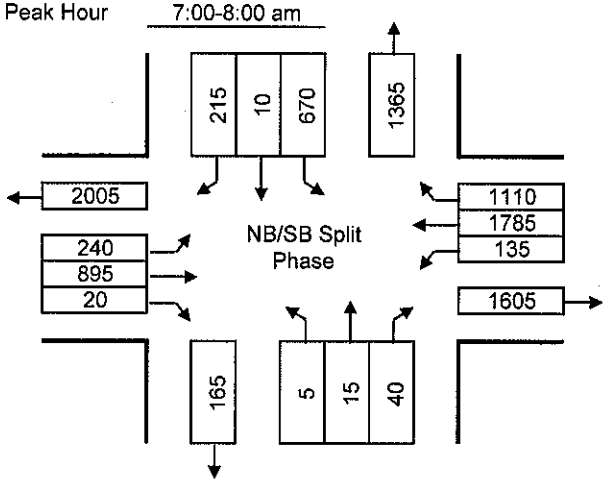
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 2/21/2008
Conditions: PROPOSED
Design Year: 2012

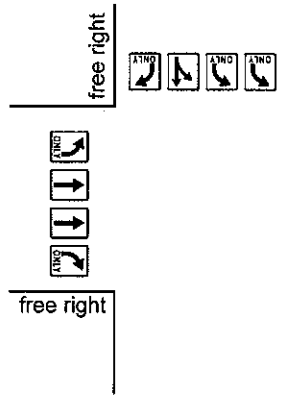
Location: BELTSVILLE@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

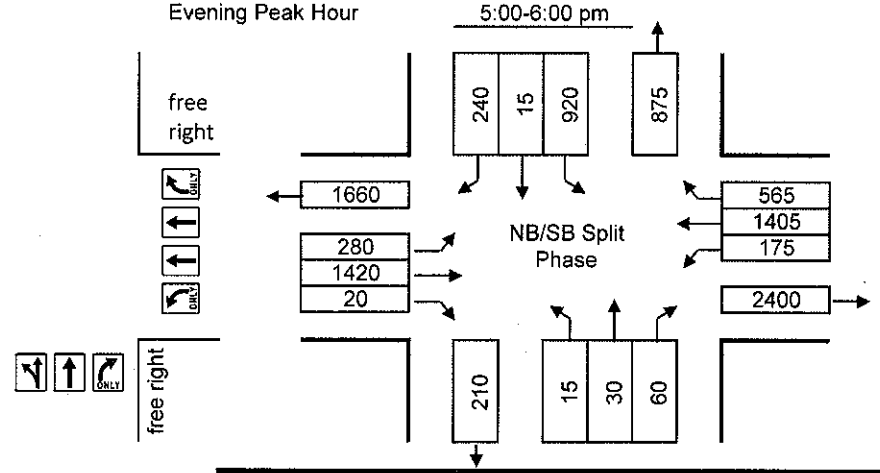
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM		PM	
NB Approach:	BELTSVILLE	NB	40	NB	60
SB Approach:	BELTSVILLE	SB		SB	
EB Approach:	POWDER MILL RD	EB		EB	
WB Approach:	POWDER MILL RD	WB	1110	WB	

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	20	1.00	0.55	11	0	11	*
SBLT	680	1.00	0.37	252	0	252	*
EBT + WBL	895	1.00	0.55	492	135	627	
WBT + EBL	1785	1.00	0.55	982	240	1222	*
					Critical Volume	1485	E
					V/C	0.93	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	45	1.00	0.55	25	0	25	*
SBLT	935	1.00	0.37	346	0	346	*
EBT + WBL	1420	1.00	0.55	781	175	956	
WBT + EBL	1405	1.00	0.55	773	280	1053	*
					Critical Volume	1424	D
					V/C	0.89	

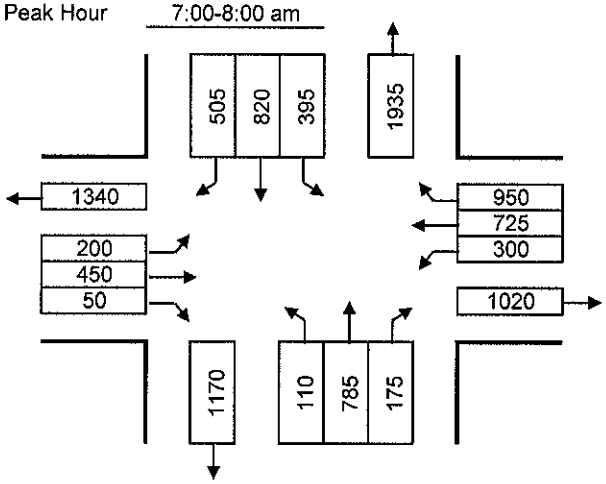
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/23/2007
Conditions: PROPOSED
Design Year: 2012

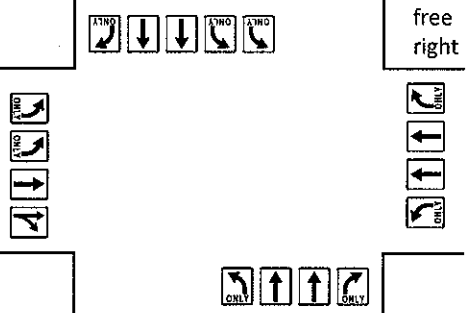
Location: CHERRY HILL@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

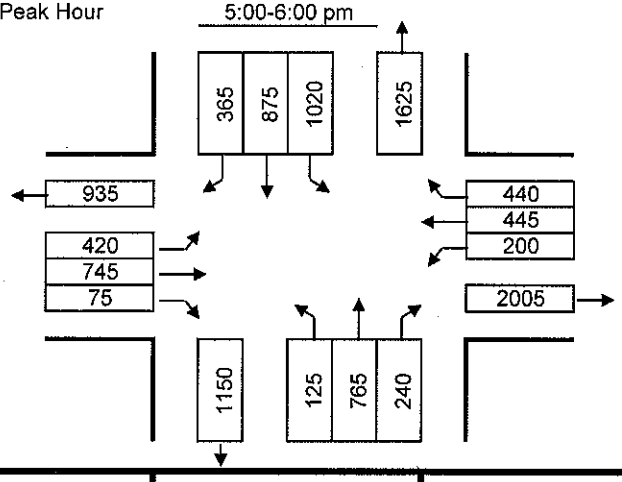
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB 950	WB 440

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume
1 =	1.00	A	≤	1000
2 =	0.55	B	≤	1150
3 =	0.37	C	≤	1300
4 =	0.29	D	≤	1450
Dbl-left	0.60	E	≤	1600
		F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	785	1.00	0.55	432	237	669	*
SBR + NBL	505	1.00	1.00	505	110	615	
EBTR + WBL	500	1.00	0.55	275	300	575	*
WBT + EBL	725	1.00	0.55	399	120	519	
					Critical Volume	1244	C
					V/C	0.78	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	765	1.00	0.55	421	612	1033	*
SBT + NBL	875	1.00	0.55	481	125	606	
EBTR + WBL	820	1.00	0.55	451	200	651	*
WBT + EBL	445	1.00	0.55	245	252	497	
					Critical Volume	1684	F
					V/C	1.05	

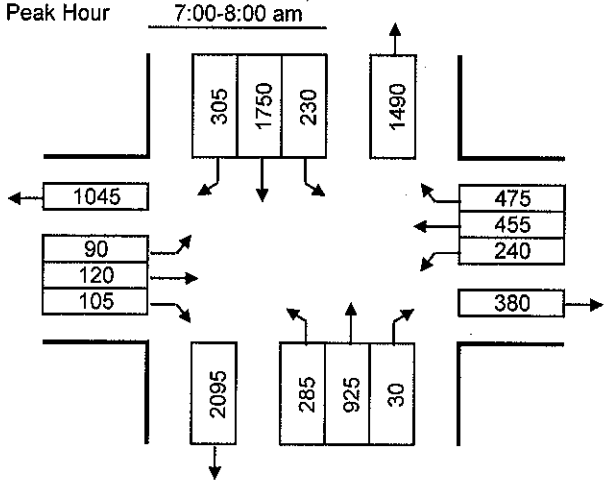
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/25/2007
Conditions: PROPOSED
Design Year: 2012

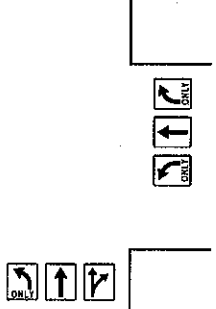
Location: CHERRY HILL@BROADBIRCH
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

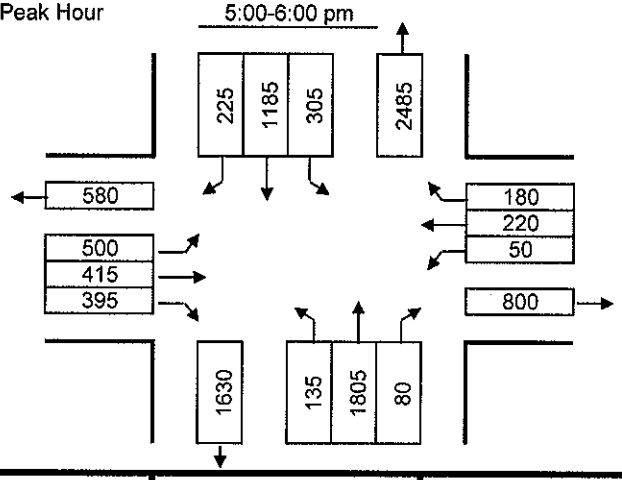
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	BROADBIRCH	EB	EB
WB Approach:	BROADBIRCH	WB 177	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	955	1.00	0.53	506	230	736	
SBTR + NBL	2055	1.00	0.53	1089	285	1374	*
EBTR + WBL	225	1.00	1.00	225	240	465	
WBT + EBL	455	1.00	1.00	455	90	545	*
					Critical Volume	1919	F
					V/C	1.30	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1885	1.00	0.53	999	305	1304	*
SBTR + NBL	1410	1.00	0.53	747	135	882	
EBTR + WBL	810	1.00	1.00	810	50	860	*
WBT + EBL	220	1.00	1.00	220	500	720	
					Critical Volume	2164	F
					V/C	1.47	

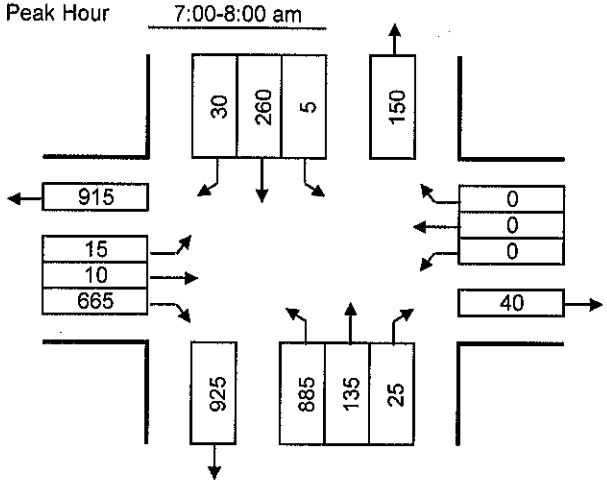
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/18/2007
Conditions: PROPOSED
Design Year: 2012

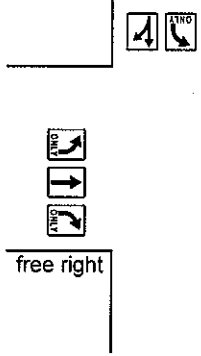
Location: BELTSVILLE@CALVERTON BLVD
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

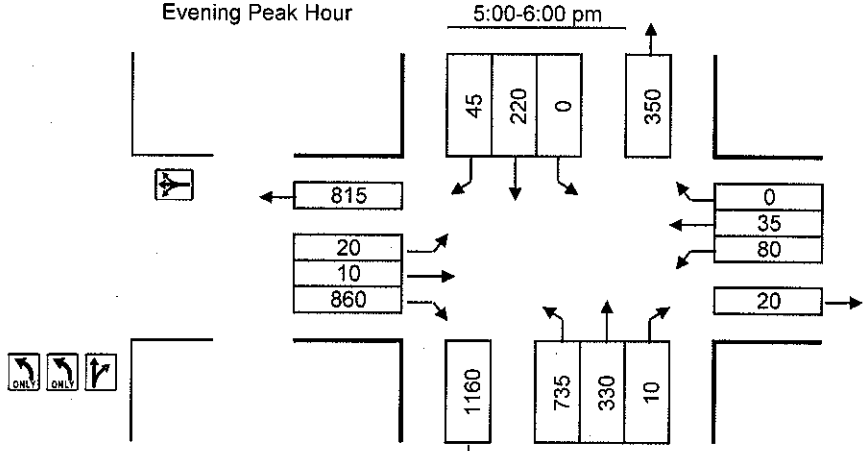
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	CALVERTON BLVD	EB 655	EB 805
WB Approach:	CALVERTON BLVD	WB	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	160	1.00	1.00	160	5	165	
SBTR + NBL	290	1.00	1.00	290	531	821	*
EBT	10	1.00	1.00	10	0	10	
WBT + EBL	0	1.10	1.00	0	15	15	*
					Critical Volume	836	A
					V/C	0.52	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR	340	1.00	1.00	340	0	340	
SBTR + NBL	265	1.00	1.00	265	441	706	*
EBR + WBL	55	1.00	1.00	55	80	135	
WBLT + EBL	115	1.10	1.00	123	20	143	*
					Critical Volume	849	A
					V/C	0.53	

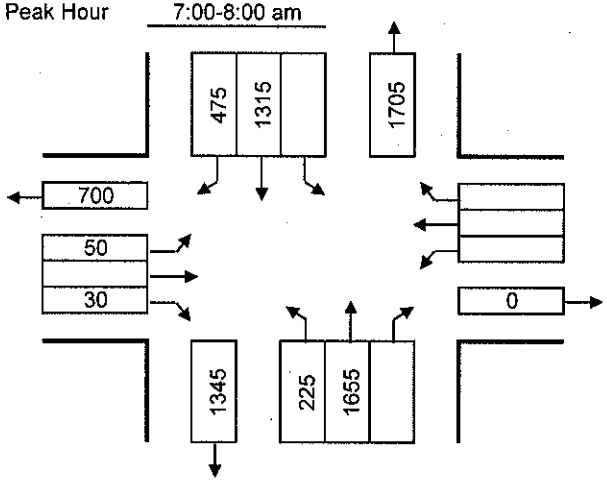
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date:
Conditions: PROPOSED
Design Year: 2012

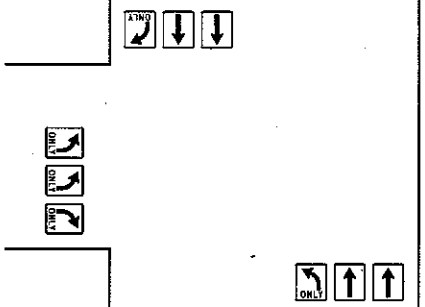
Location: Site Access @ Cherry Hill
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

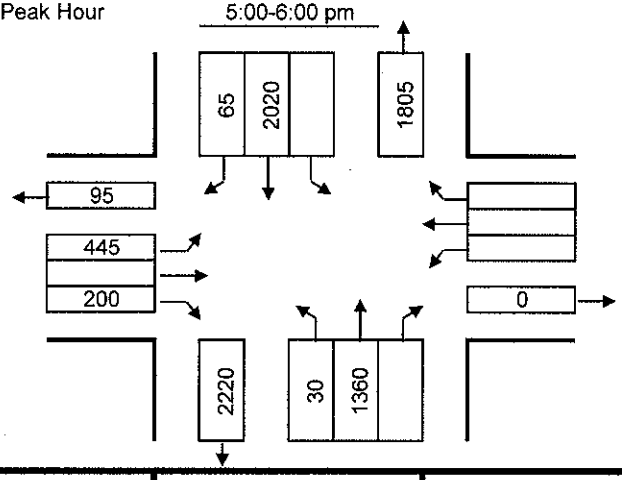
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	SITE ACCESS	EB	EB
WB Approach:		WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1655	1.00	0.53	877	0	877	
SBT + NBL	1315	1.00	0.53	697	225	922	*
EBL	50	1.00	0.60	30	0	30	*
					Critical Volume	952	OK
					V/C	0.65	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1360	1.00	0.53	721	0	721	
SBT + NBL	2020	1.00	0.53	1071	30	1101	*
EBL	445	1.00	0.60	267	0	267	*
					Critical Volume	1368	OK
					V/C	0.93	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

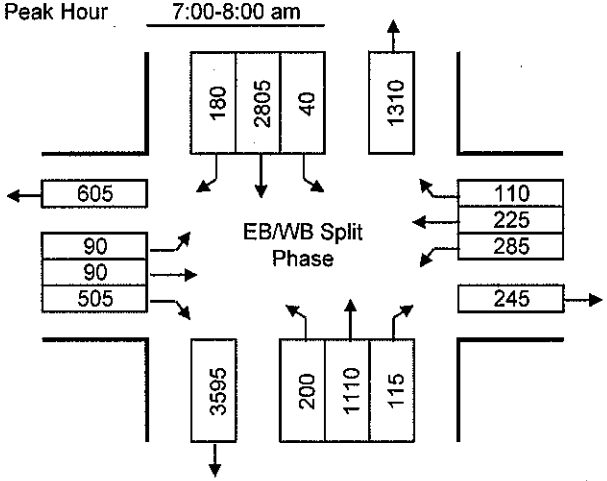
SHA

Count Date: 10/17/2007
Conditions: PROPOSED
Design Year: 2012

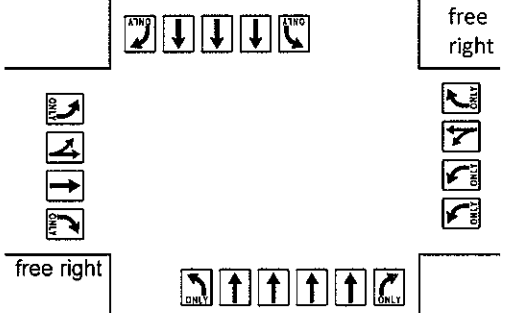
Location: MD 650 @ LOCKWOOD DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

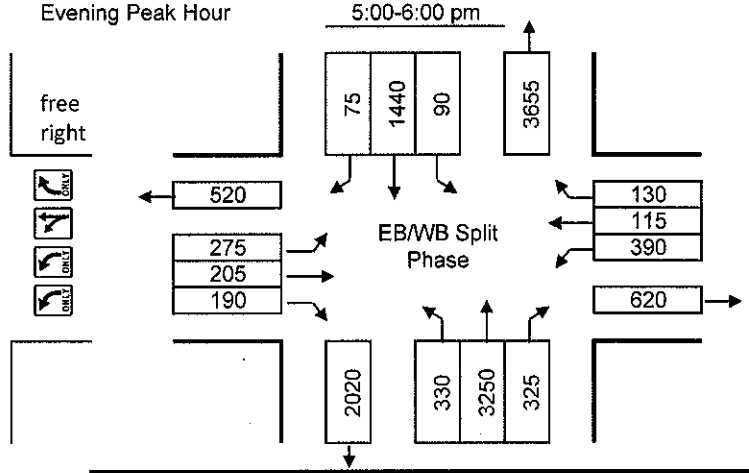
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	LOCKWOOD DRIVE	EB 505	EB 190
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1110	1.00	0.30	333	40	373	
SBT + NBL	2805	1.00	0.37	1038	200	1238	*
EBLT	180	1.00	0.37	67	0	67	*
WBLT	510	1.00	0.37	189	0	189	*
					Critical Volume	1494	F
					V/C	1.01	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3250	1.00	0.30	975	90	1065	*
SBT + NBL	1440	1.00	0.37	533	330	863	
EBLT	480	1.00	0.37	178	0	178	*
WBLT	505	1.00	0.37	187	0	187	*
					Critical Volume	1430	OK
					V/C	0.97	

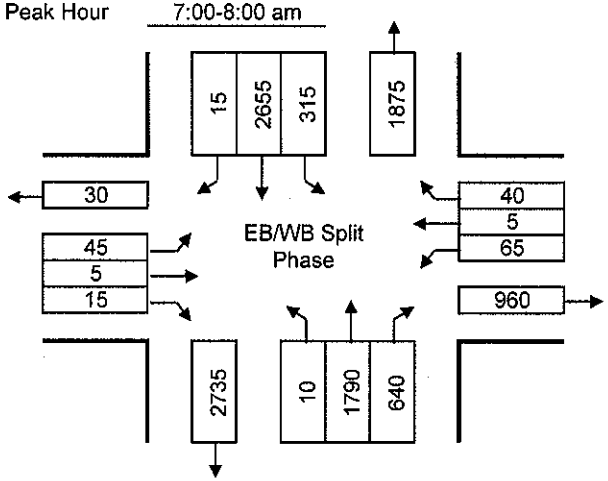
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/1/2007
Conditions: PROPOSED
Design Year: 2012

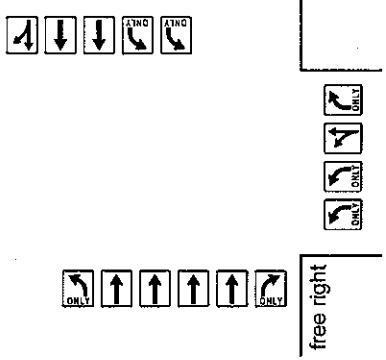
Location: MD 650 @ MAHAN ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

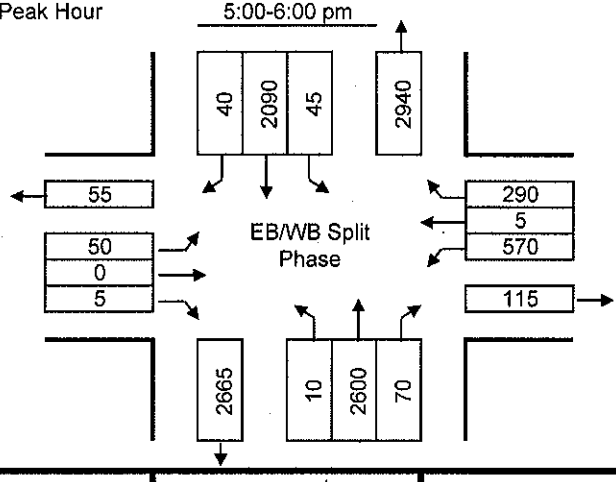
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MAHAN ROAD	EB	EB
WB Approach:	MAHAN ROAD	WB 40	WB 27

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR + SBL	640	1.00	1.00	640	189	829	
SBTR + NBL	2670	1.00	0.37	988	10	998	*
EBLTR	65	1.00	1.00	65	0	65	*
WBLT	70	1.00	0.37	26	0	26	*
					Critical Volume	1089	OK
					V/C	0.74	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2600	1.00	0.30	780	27	807	*
SBTR + NBL	2130	1.00	0.37	788	10	798	
EBLTR	55	1.00	1.00	55	0	55	*
WBR	263	1.00	1.00	263	0	263	*
					Critical Volume	1125	OK
					V/C	0.76	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

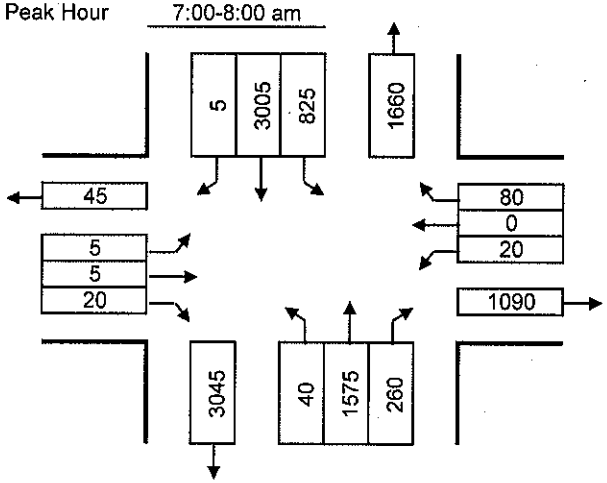
SHA

Count Date: 10/17/2007
Conditions: PROPOSED
Design Year: 2012

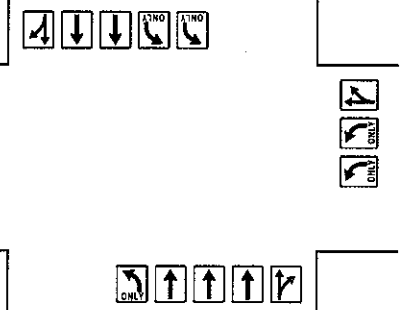
Location: MD 650@MICHELSON
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

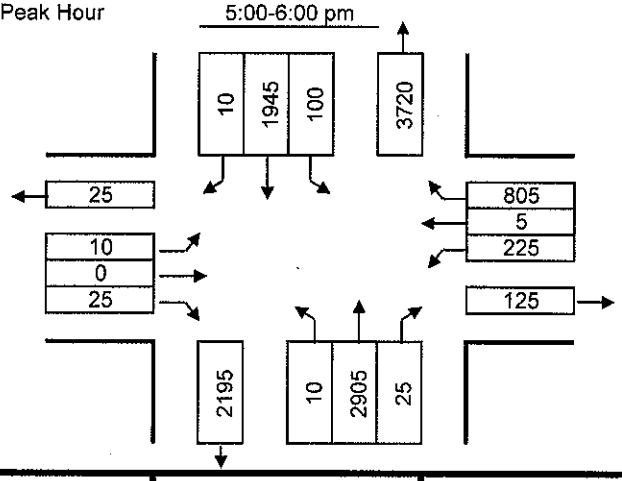
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn
Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MICHELSON DR.	EB	EB
WB Approach:	MICHELSON DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1835	1.00	0.30	551	495	1046	
SBTR + NBL	3010	1.00	0.37	1114	40	1154	*
EBLTR + WBL	30	1.10	1.00	31	12	43	
WBTR + EBL	80	1.00	1.00	80	5	85	*
					Critical Volume	1239	OK
					V/C	0.84	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2930	1.00	0.30	879	60	939	*
SBTR + NBL	1955	1.00	0.37	723	10	733	
EBLTR + WBL	35	4.00	1.00	65	135	200	
WBTR + EBL	810	1.00	1.00	810	10	820	*
					Critical Volume	1759	F
					V/C	1.19	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

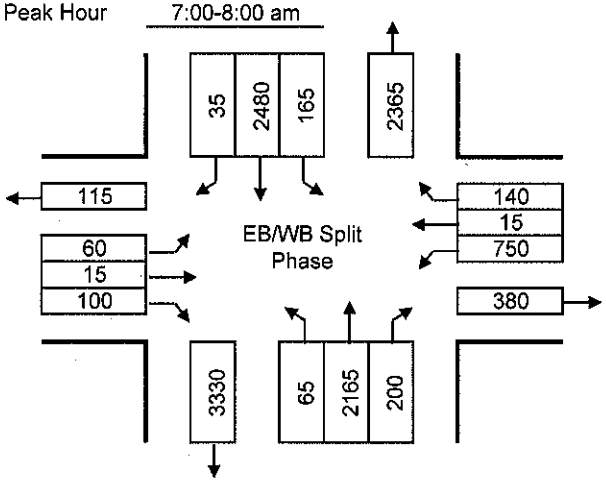
SHA

Count Date: 10/1/2007
Conditions: PROPOSED
Design Year: 2012

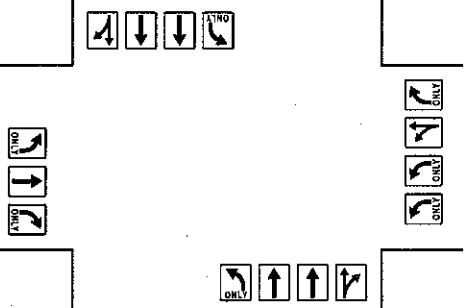
Location: MD 650@POWDER MILL
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

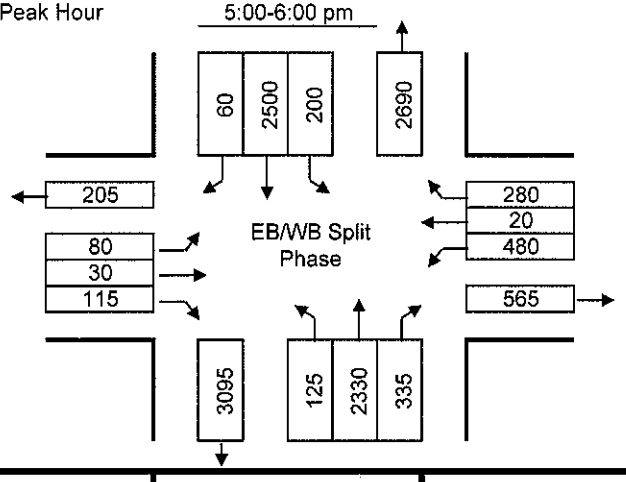
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	POWDER MILL RD	EB	EB 115
WB Approach:	POWDER MILL RD	WB	WB 200

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2365	1.00	0.37	875	165	1040	*
SBTR + NBL	2515	1.00	0.37	931	65	996	
EBR	100	1.00	1.00	100	0	100	*
WBLT	765	1.00	0.37	283	0	283	*
					Critical Volume	1423	OK
					V/C	0.96	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2665	1.00	0.37	986	200	1186	*
SBTR + NBL	2560	1.00	0.37	947	125	1072	
EBL	80	1.00	1.00	80	0	80	*
WBLT	500	1.00	0.37	185	0	185	*
					Critical Volume	1451	OK
					V/C	0.98	

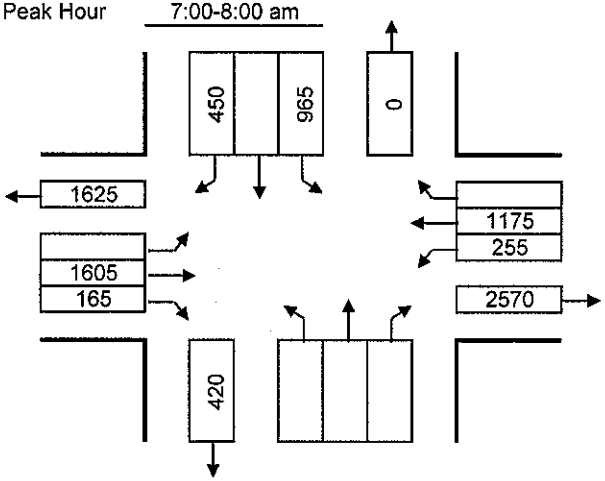
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: PROPOSED
Design Year: 2012

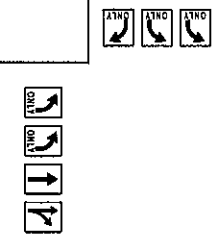
Location: US 29 SB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

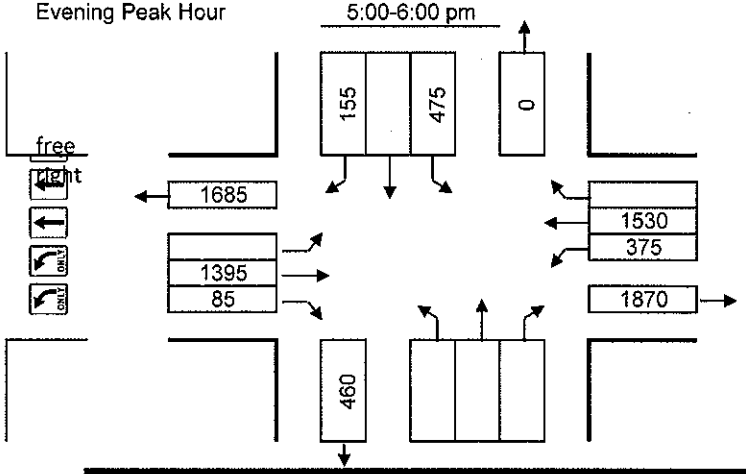
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	965	1.00	0.60	579	0	579	*
EBTR + WBL	1770	1.00	0.53	938	153	1091	*
WBT	1175	1.00	0.53	623	0	623	
					Critical Volume	1670	F
					V/C	1.13	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	475	1.00	0.60	285	0	285	*
EBTR + WBL	1480	1.00	0.53	784	225	1009	*
WBT	1530	1.00	0.53	811	0	811	
					Critical Volume	1294	OK
					V/C	0.88	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

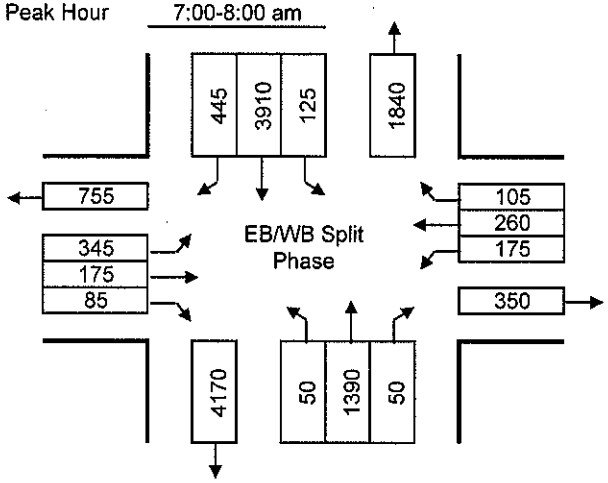
SHA

Count Date: 2/14/2008
Conditions: PROPOSED
Design Year: 2012

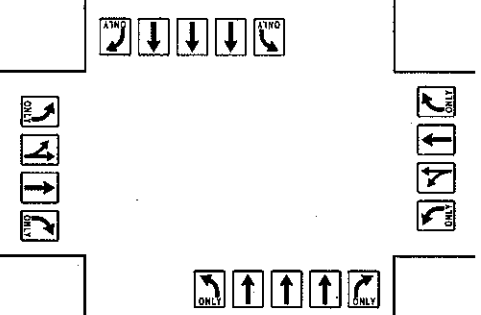
Location: US 29@ FAIRLAND ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

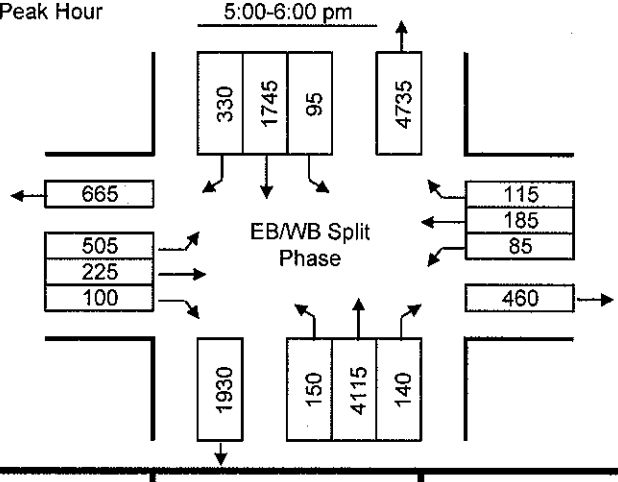
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	FAIRLAND RD	EB	EB
WB Approach:	FAIRLAND RD	WB	WB 69

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1390	1.00	0.37	514	125	639	
SBT + NBL	3910	1.00	0.37	1447	50	1497	*
EBL	345	1.00	0.60	207	0	207	*
WBLT	435	1.00	0.37	161	0	161	*
					Critical Volume	1865	F
					V/C	1.26	

De facto LT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4115	1.00	0.37	1523	95	1618	*
SBT + NBL	1745	1.00	0.37	646	150	796	
EBL	505	1.00	0.60	303	0	303	*
WBLT	270	1.00	0.37	100	0	100	*
					Critical Volume	2021	F
					V/C	1.37	

De facto LT lane(s) assumed for EB approach.

Maryland State Highway Administration
Turning Movement Summary and Level of Service

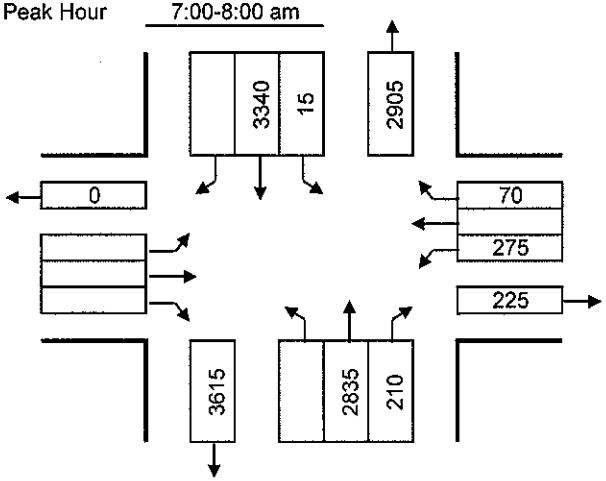
SHA

Count Date: 10/24/2007
Conditions: PROPOSED
Design Year: 2012

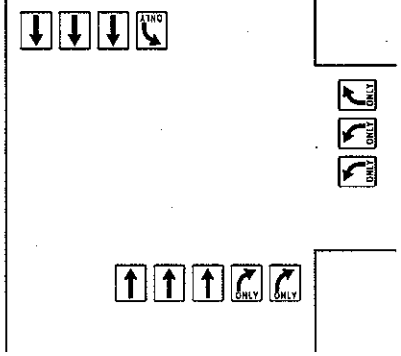
Location: US 29@ INDUSTRIAL PKWY
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

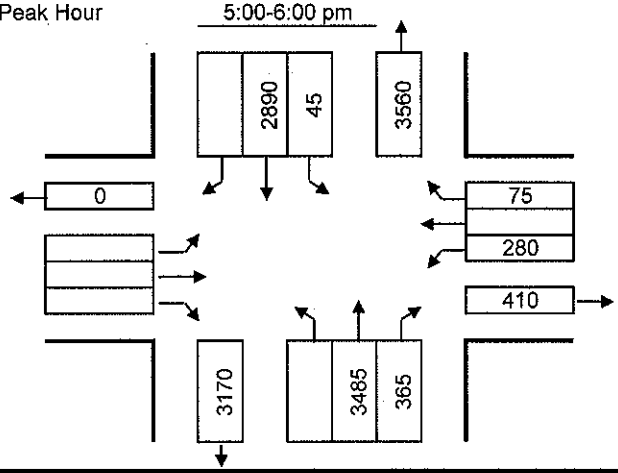
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	Industrial Pkwy	EB	EB
WB Approach:	Industrial Pkwy	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2835	1.00	0.37	1049	15	1064	
SBT	3340	1.00	0.37	1236	0	1236	*
WBL	275	1.00	0.60	165	0	165	*
					Critical Volume	1401	OK
					V/C	0.95	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3485	1.00	0.37	1289	45	1334	*
SBT	2890	1.00	0.37	1069	0	1069	
WBL	280	1.00	0.60	168	0	168	*
					Critical Volume	1502	F
					V/C	1.02	

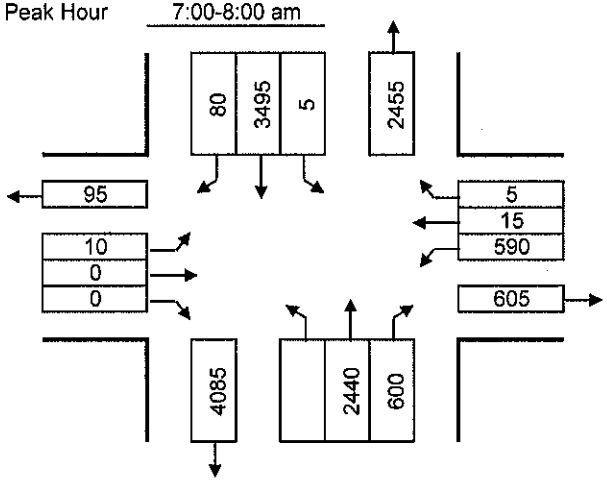
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/20/2008
Conditions: PROPOSED
Design Year: 2012

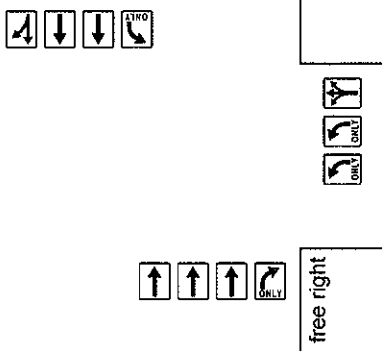
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

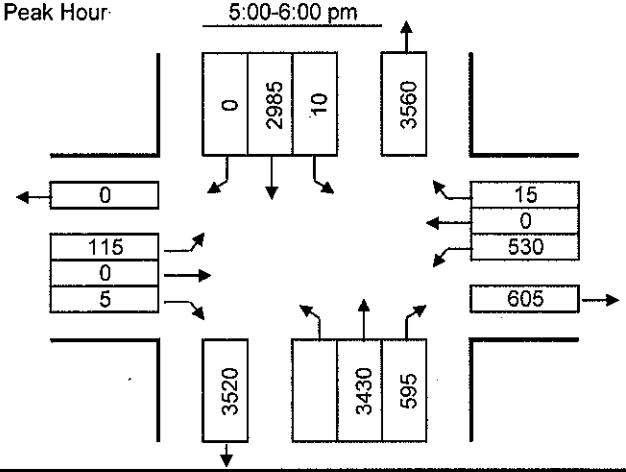
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	DRIVEWAY	EB	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2440	1.00	0.37	903	5	908	
SBTR	3575	1.00	0.37	1323	0	1323	*
EBT + WBL	0	1.00	1.00	0	236	236	
WBLTR + EBL	610	1.10	0.37	248	10	258	*
					Critical Volume	1581	F
					V/C	1.07	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3430	1.00	0.37	1269	10	1279	*
SBT	2985	1.00	0.37	1104	0	1104	
EBTR + WBL	5	1.00	1.00	5	212	217	
WBLTR + EBL	545	1.10	0.37	221	115	336	*
					Critical Volume	1615	F
					V/C	1.09	

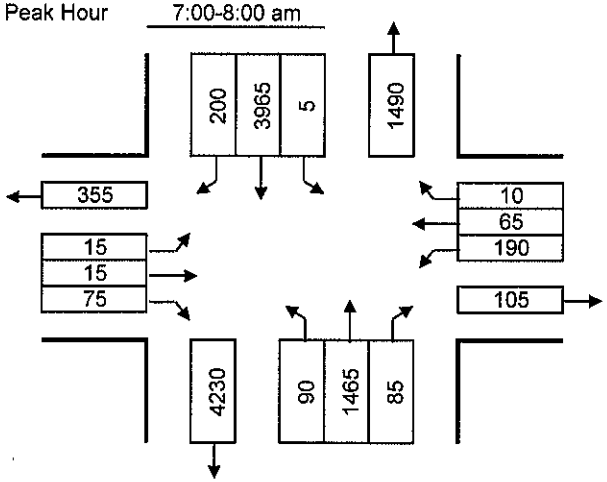
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/19/2008
Conditions: PROPOSED
Design Year: 2012

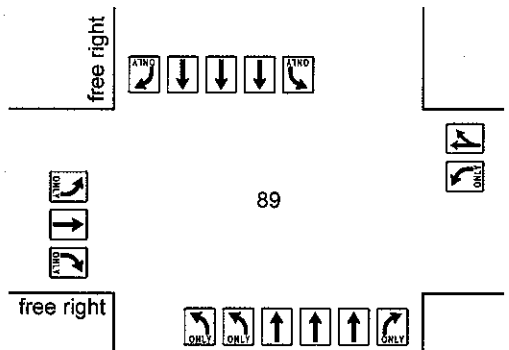
Location: US 29@ MUSGROVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

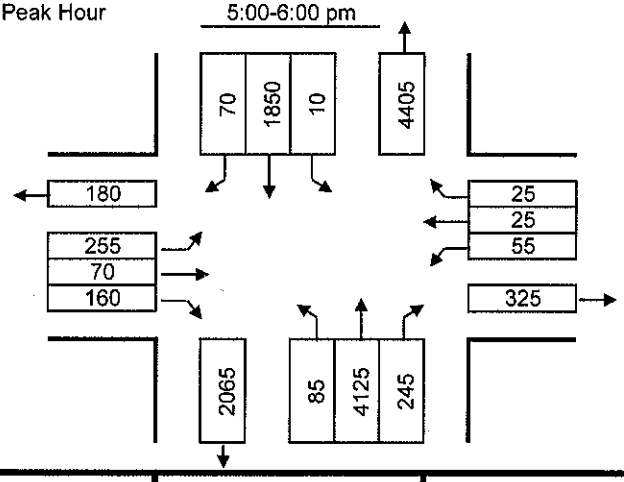
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	MUSGROVE RAOD	EB 75	EB
WB Approach:	MUSGROVE ROAD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1465	1.00	0.37	542	5	547	
SBT + NBL	3965	1.00	0.37	1467	54	1521	*
EBT + WBL	15	1.00	1.00	15	190	205	*
WBTR + EBL	75	1.00	1.00	75	15	90	
					Critical Volume	1726	F
					V/C	1.17	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4125	1.00	0.37	1526	10	1536	*
SBT + NBL	1850	1.00	0.37	685	51	736	
EBR + WBL	160	1.00	1.00	160	55	215	
WBTR + EBL	50	1.00	1.00	50	255	305	*
					Critical Volume	1841	F
					V/C	1.25	

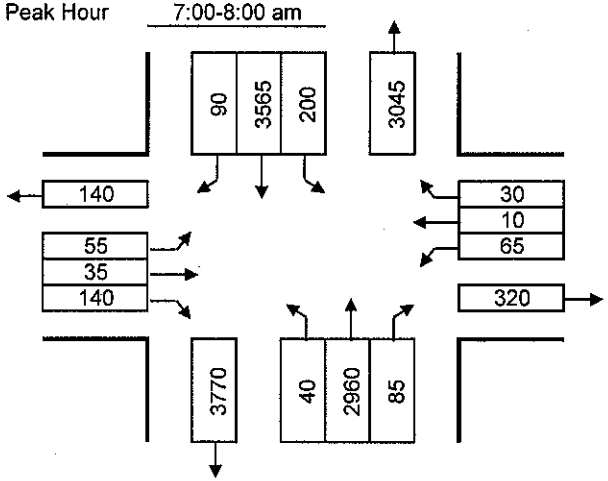
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/23/2007
Conditions: PROPOSED
Design Year: 2012

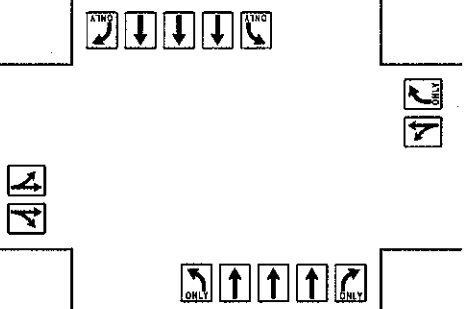
Location: US 29@STEWART LANE
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

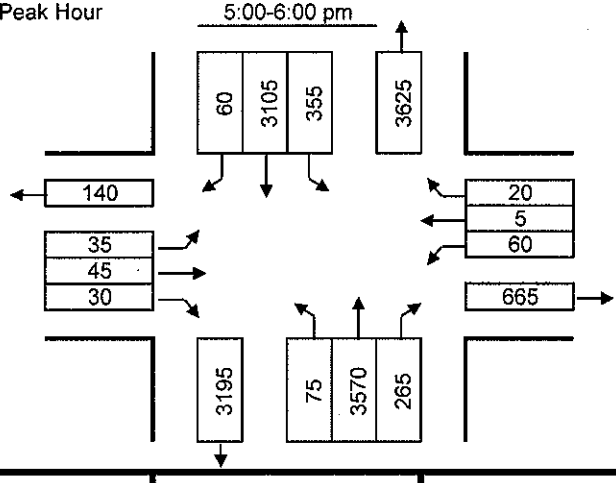
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	STEWART LANE	EB	EB
WB Approach:	STEWART LANE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2960	1.00	0.37	1095	200	1295	
SBT + NBL	3565	1.00	0.37	1319	40	1359	*
EBR + WBL	140	1.10	1.00	140	65	205	*
WBLT + EBL	75	1.10	1.00	82	55	137	
					Critical Volume	1564	F
					V/C	1.06	

De facto RT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3570	1.00	0.37	1321	355	1676	*
SBT + NBL	3105	1.00	0.37	1149	75	1224	
EBLTR + WBL	110	1.10	0.53	60	60	120	*
WBLT + EBL	65	1.10	1.00	71	35	106	
					Critical Volume	1796	F
					V/C	1.22	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

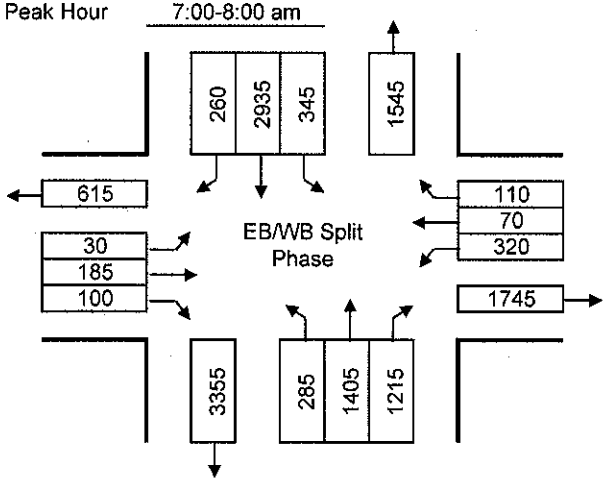
SHA

Count Date: 10/25/2007
Conditions: PROPOSED
Design Year: 2012

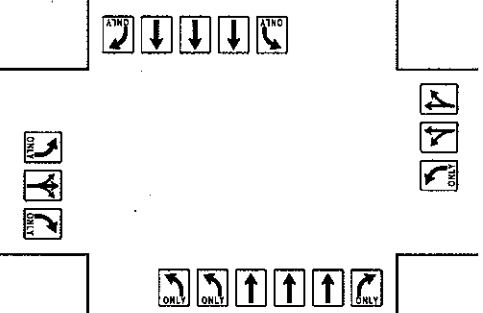
Location: US 29@ TECH ROAD
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

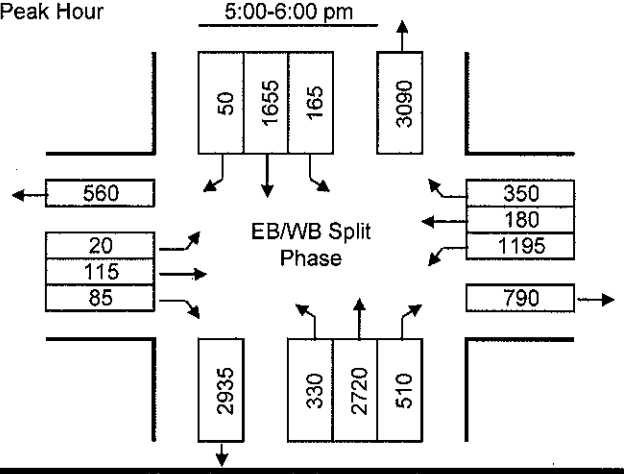
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB 159	NB
SB Approach:	US 29	SB	SB
EB Approach:	TECH RD	EB	EB
WB Approach:	TECH RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR + SBL	1056	1.00	1.00	1056	345	1401	*
SBT + NBL	2935	1.00	0.37	1086	171	1257	
EBLTR	315	1.00	0.60	189	0	189	*
WBL	320	1.00	0.60	192	0	192	*
					Critical Volume	1782	F
					V/C	1.21	

De facto LT lane(s) assumed for WB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2720	1.00	0.37	1006	165	1171	*
SBT + NBL	1655	1.00	0.37	612	198	810	
EBLTR	220	1.00	0.60	132	0	132	*
WBL	1195	1.00	0.60	717	0	717	*
					Critical Volume	2020	F
					V/C	1.37	

De facto LT lane(s) assumed for WB approach.

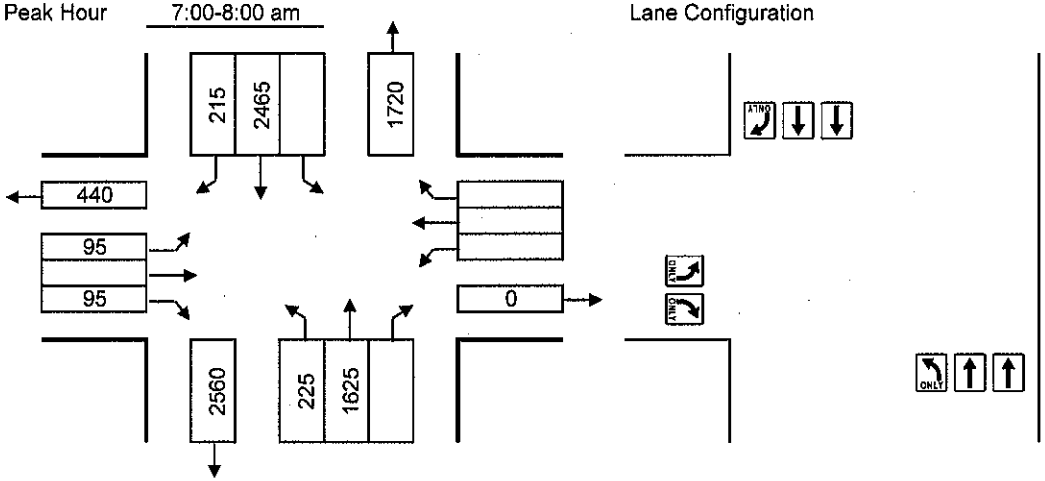
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/20/2008
Conditions: PROPOSED
Design Year: 2012

Location: CHERRY HILL @ PROSPERITY DRIVE
Computed By: Y.R. Date: 7/14/08

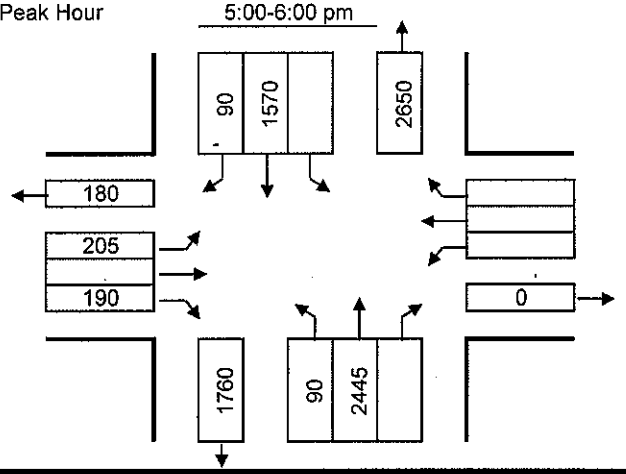
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	PROSPERITY DRIVE	EB	EB
WB Approach:	PROSPERITY DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1625	1.00	0.53	861	0	861	
SBT + NBL	2465	1.00	0.53	1306	225	1531	*
EBL	95	1.00	1.00	95	0	95	*
					Critical Volume	1626	F
					V/C	1.10	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	2445	1.00	0.53	1296	0	1296	*
SBT + NBL	1570	1.00	0.53	832	90	922	
EBL	205	1.00	1.00	205	0	205	*
					Critical Volume	1501	F
					V/C	1.02	

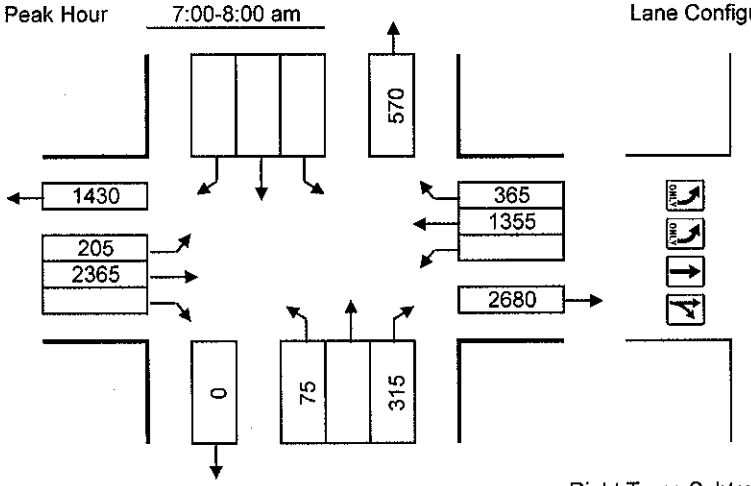
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: PROPOSED
Design Year: 2012

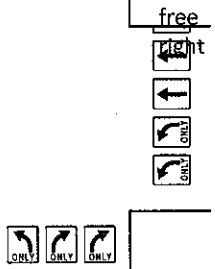
Location: US 29 NB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

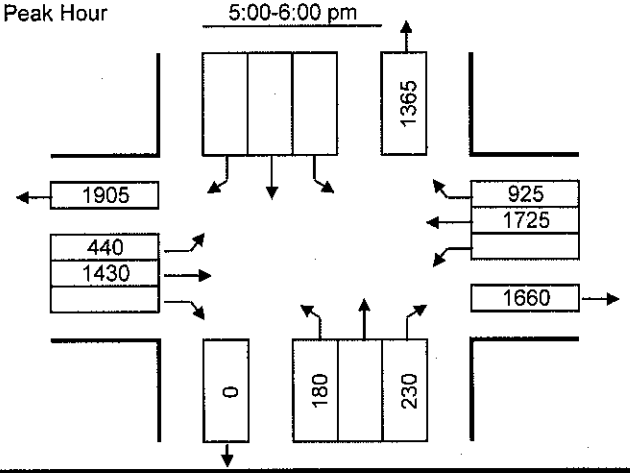
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

NB Approach: US 29 NB RAMP
SB Approach:
EB Approach: CHERRY HILL
WB Approach: CHERRY HILL

	AM	PM
NB		
SB		
EB		
WB		

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	315	1.00	0.53	167	0	167	*
EBT	2365	1.00	0.53	1253	0	1253	*
WBT + EBL	1355	1.00	0.53	718	123	841	
					Critical Volume	1420	OK
					V/C	0.96	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBL	180	1.00	1.00	180	0	180	*
EBT	1430	1.00	0.53	758	0	758	
WBR + EBL	925	1.00	1.00	925	264	1189	*
				Critical Volume		1369	OK
				V/C		0.93	

Appendix D: No-Action and Action Level of Service Worksheets (with ICC)

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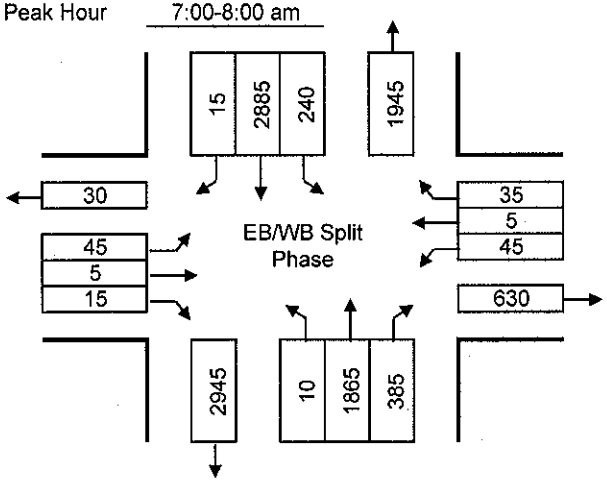
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/1/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

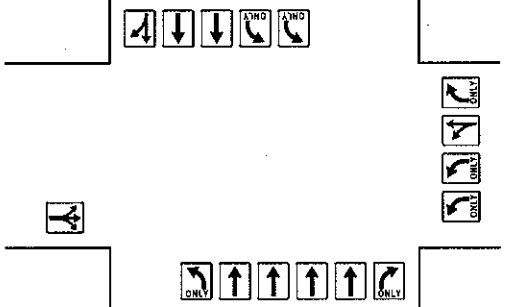
Location: MD 650 @ MAHAN ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

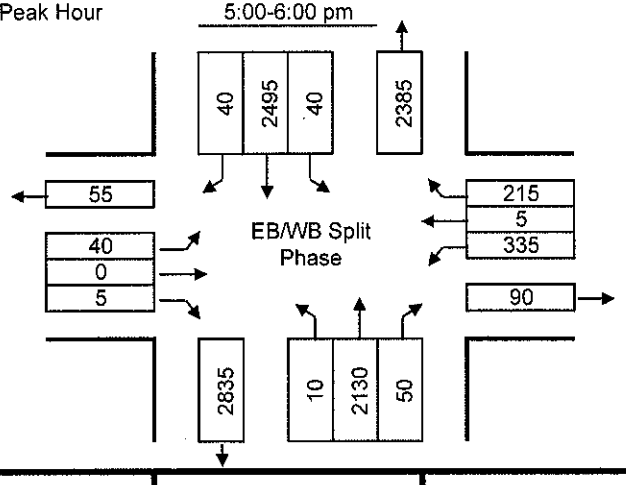
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MAHAN ROAD	EB	EB
WB Approach:	MAHAN ROAD	WB 35	WB 24

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1865	1.00	0.30	560	144	704	
SBTR + NBL	2900	1.00	0.37	1073	10	1083	*
EBLTR	65	1.00	1.00	65	0	65	*
WBLT	50	1.00	0.37	19	0	19	*
					Critical Volume	1167	OK
					V/C	0.79	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2130	1.00	0.30	639	24	663	
SBTR + NBL	2535	1.00	0.37	938	10	948	*
EBLTR	45	1.00	1.00	45	0	45	*
WBR	191	1.00	1.00	191	0	191	*
					Critical Volume	1184	OK
					V/C	0.80	

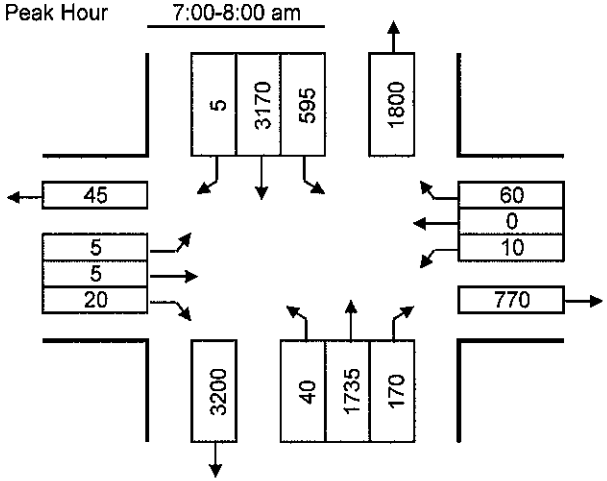
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

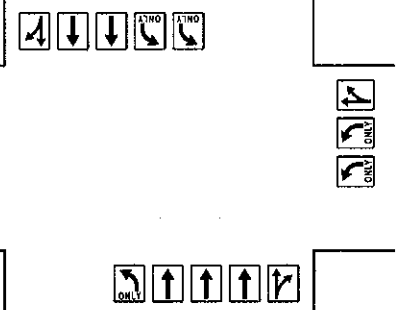
Location: MD 650@MICHELSON
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

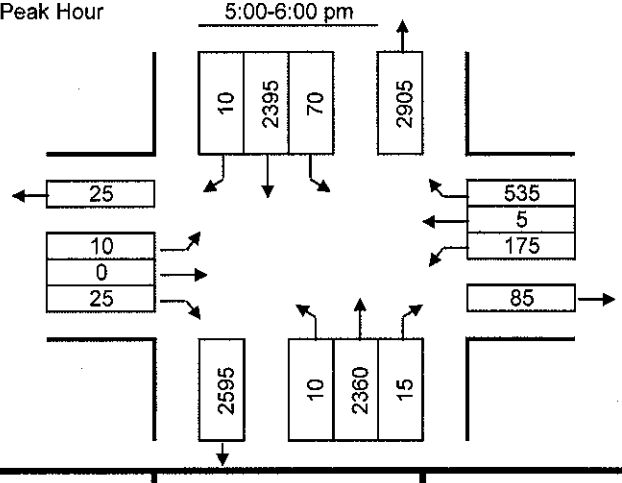
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MICHELSON DR.	EB	EB
WB Approach:	MICHELSON DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤ 1	199	1.1
≤ 1	599	2.0
≤ 1	799	3.0
≤ 1	999	4.0
≥ 1	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1905	1.00	0.30	572	357	929	
SBTR + NBL	3175	1.00	0.37	1175	40	1215	*
EBLTR + WBL	30	1.10	1.00	31	6	37	
WBTR + EBL	60	1.00	1.00	60	5	65	*
					Critical Volume	1280	OK
					V/C	0.87	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2375	1.00	0.30	713	42	755	
SBTR + NBL	2405	1.00	0.37	890	10	900	*
EBLTR + WBL	35	2.00	1.00	45	105	150	
WBTR + EBL	540	1.00	1.00	540	10	550	*
					Critical Volume	1450	OK
					V/C	0.98	

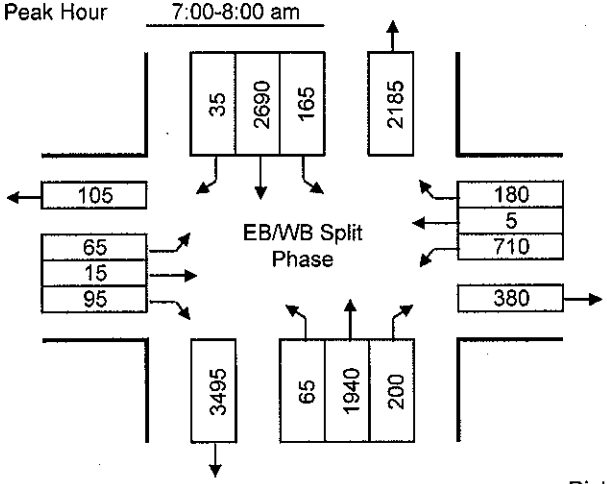
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 10/1/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

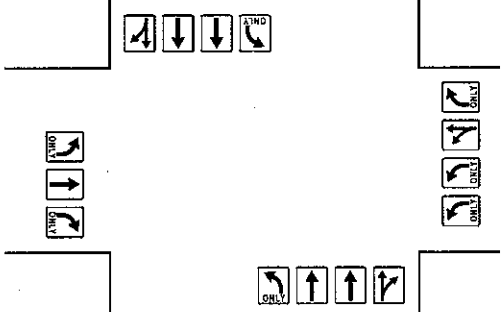
Location: MD 650@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

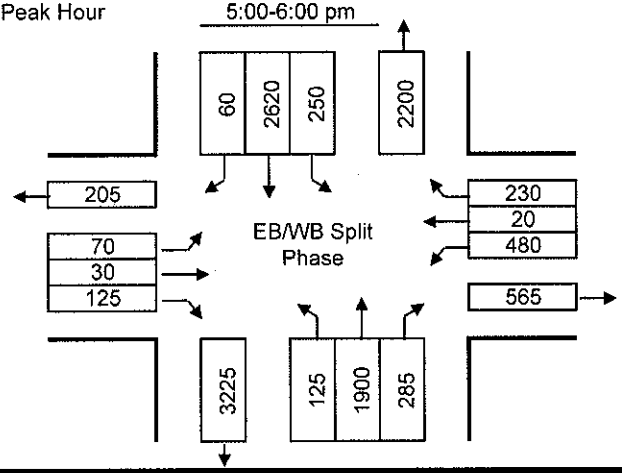
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	POWDER MILL RD	EB	EB 125
WB Approach:	POWDER MILL RD	WB	WB 230

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Fairland / White Oak Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2140	1.00	0.37	792	165	957	
SBTR + NBL	2725	1.00	0.37	1008	65	1073	*
EBR	95	1.00	1.00	95	0	95	*
WBLT	715	1.00	0.37	265	0	265	*
					Critical Volume	1433	OK
					V/C	0.97	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2185	1.00	0.37	808	250	1058	
SBTR + NBL	2680	1.00	0.37	992	125	1117	*
EBL	70	1.00	1.00	70	0	70	*
WBLT	500	1.00	0.37	185	0	185	*
					Critical Volume	1372	OK
					V/C	0.93	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

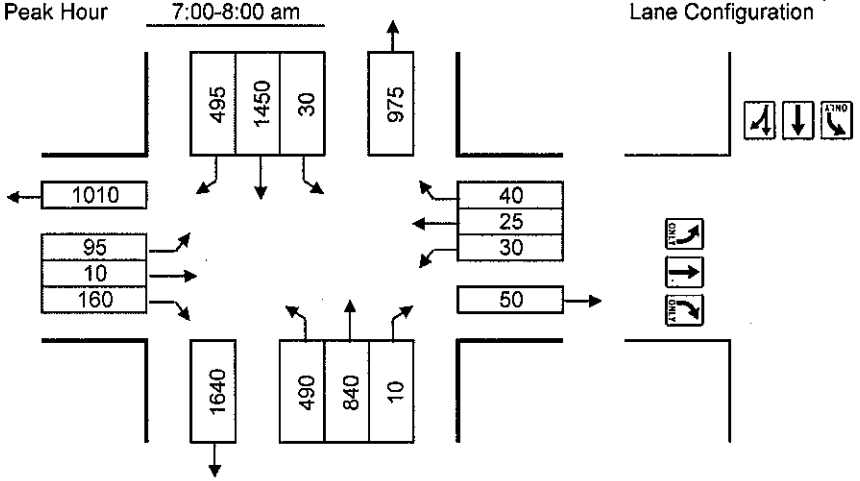
SHA

Count Date: 10/18/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

Location: PLUM ORCHARD DR.@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

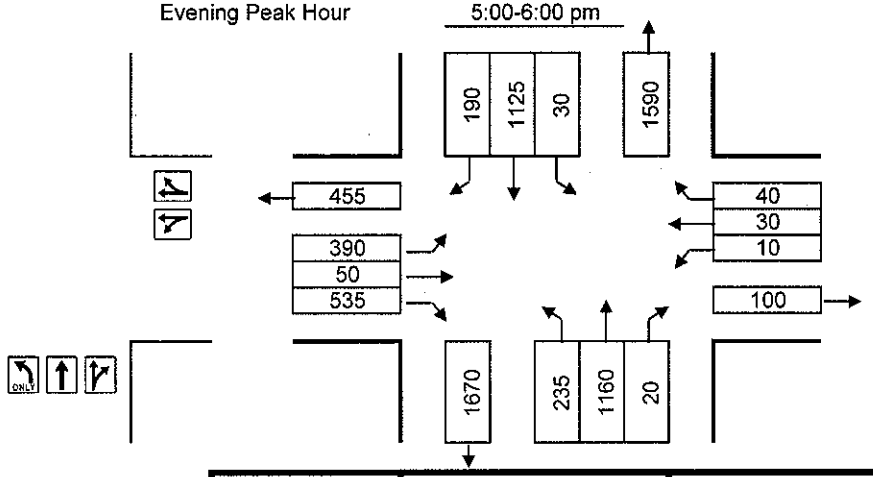
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PLUM ORCHARD DR.	EB 160	EB 235
WB Approach:	PLUM ORCHARD DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	850	1.00	0.53	451	30	481	
SBTR + NBL	1945	1.00	0.53	1031	490	1521	*
EBT + WBL	10	1.00	1.00	10	30	40	
WBLTR + EBL	95	1.10	0.53	52	95	147	*
					Critical Volume	1668	F
					V/C	1.13	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1180	1.00	0.53	625	30	655	
SBTR + NBL	1315	1.00	0.53	697	235	932	*
EBR + WBL	300	1.00	1.00	300	10	310	
WBLTR + EBL	80	2.00	0.53	48	390	438	*
					Critical Volume	1370	OK
					V/C	0.93	

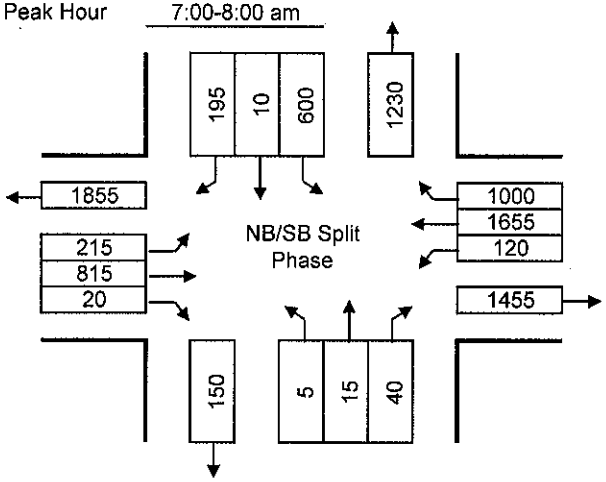
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 2/21/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

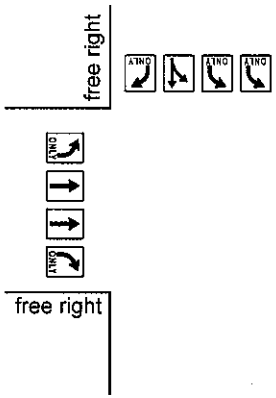
Location: BELTSVILLE@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

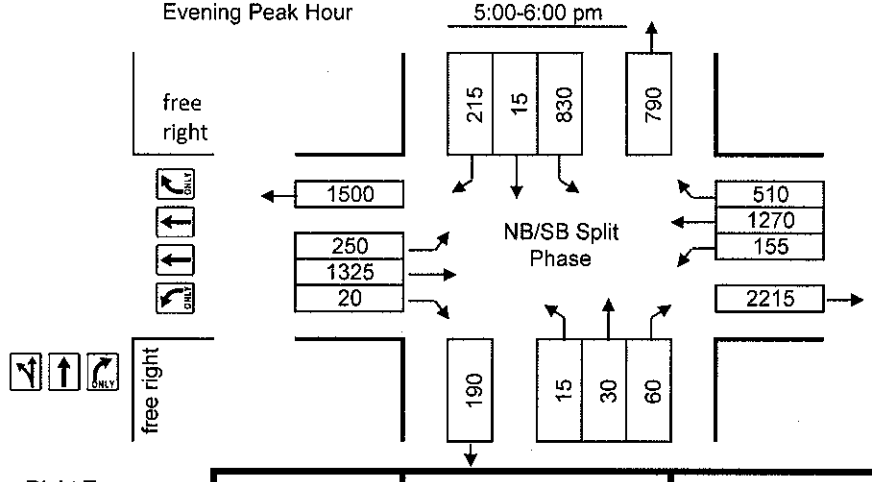
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM		PM	
NB Approach:	BELTSVILLE	NB	40	NB	60
SB Approach:	BELTSVILLE	SB		SB	
EB Approach:	POWDER MILL RD	EB		EB	
WB Approach:	POWDER MILL RD	WB	1000	WB	

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.37
4 =	0.29
Dbl-left	0.60

Service Level		Critical Lane Volume
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	20	1.00	0.55	11	0	11	*
SBLT	610	1.00	0.37	226	0	226	*
EBT + WBL	815	1.00	0.55	448	120	568	
WBT + EBL	1655	1.00	0.55	910	215	1125	*
					Critical Volume	1362	D
					V/C	0.85	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	45	1.00	0.55	25	0	25	*
SBLT	845	1.00	0.37	313	0	313	*
EBT + WBL	1325	1.00	0.55	729	155	884	
WBT + EBL	1270	1.00	0.55	699	250	949	*
					Critical Volume	1287	C
					V/C	0.80	

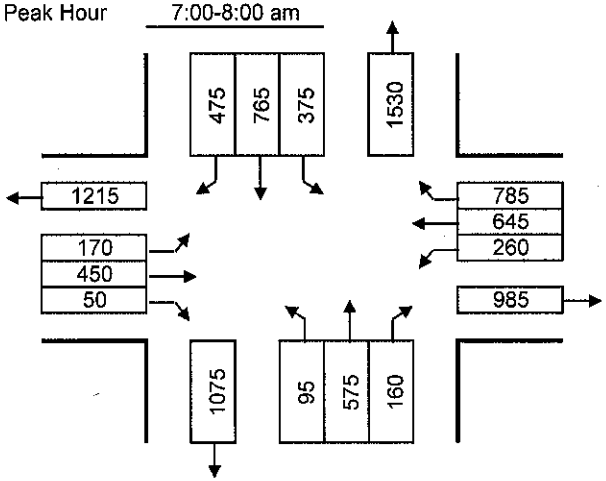
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/23/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

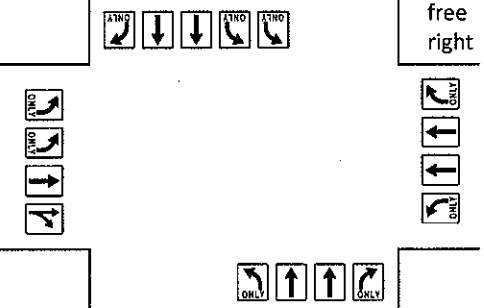
Location: CHERRY HILL@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

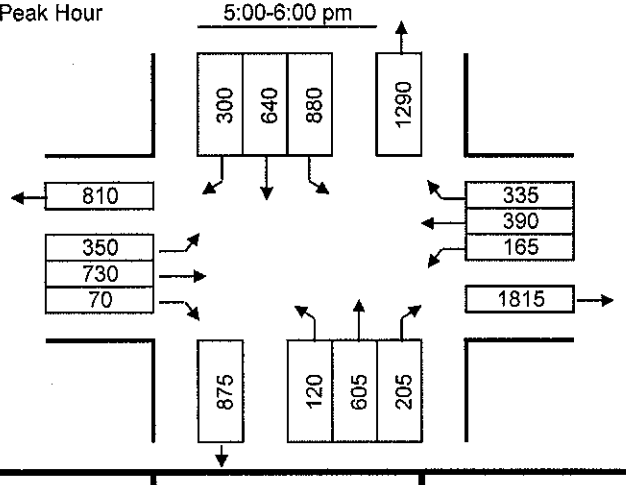
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB 102	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB 785	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	575	1.00	0.55	316	225	541	*
SBT + NBL	765	1.00	0.55	421	95	516	
EBTR + WBL	500	1.00	0.55	275	260	535	*
WBT + EBL	645	1.00	0.55	355	102	457	
					Critical Volume	1076	B
					V/C	0.67	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	605	1.00	0.55	333	528	861	*
SBT + NBL	640	1.00	0.55	352	120	472	
EBTR + WBL	800	1.00	0.55	440	165	605	*
WBR + EBL	335	1.00	1.00	335	210	545	
					Critical Volume	1466	E
					V/C	0.92	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

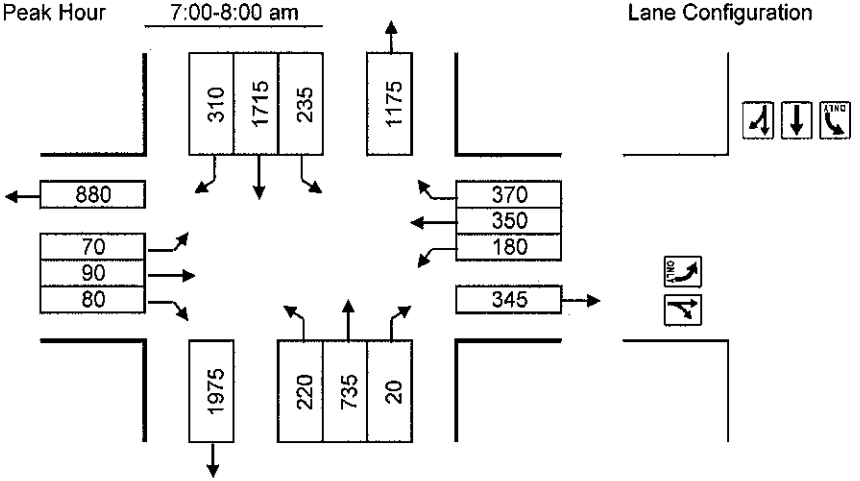
SHA

Count Date: 10/25/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

Location: CHERRY HILL@BROADBIRCH
Computed By: Y.R. Date: 7/14/08

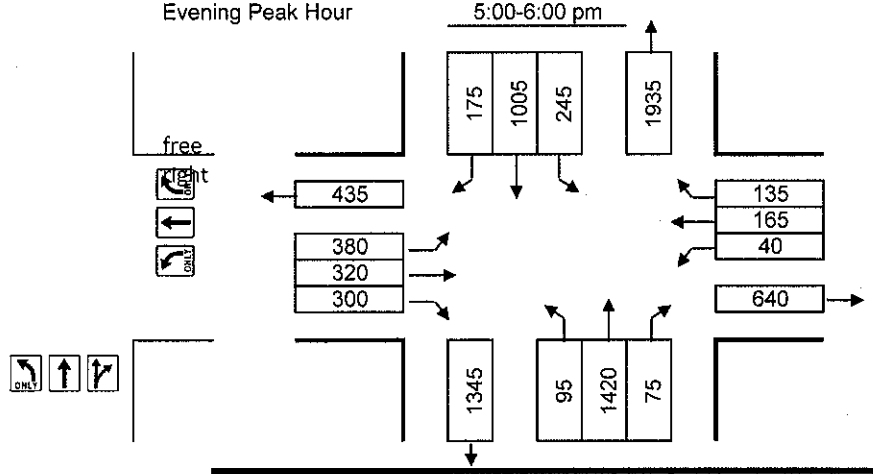
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	BROADBIRCH	EB	EB
WB Approach:	BROADBIRCH	WB 370	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	755	1.00	0.53	400	235	635	
SBTR + NBL	2025	1.00	0.53	1073	220	1293	*
EBTR + WBL	170	1.00	1.00	170	180	350	
WBT + EBL	350	1.00	1.00	350	70	420	*
					Critical Volume	1713	F
					V/C	1.16	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1495	1.00	0.53	792	245	1037	*
SBTR + NBL	1180	1.00	0.53	625	95	720	
EBTR + WBL	620	1.00	1.00	620	40	660	*
WBT + EBL	165	1.00	1.00	165	380	545	
					Critical Volume	1697	F
					V/C	1.15	

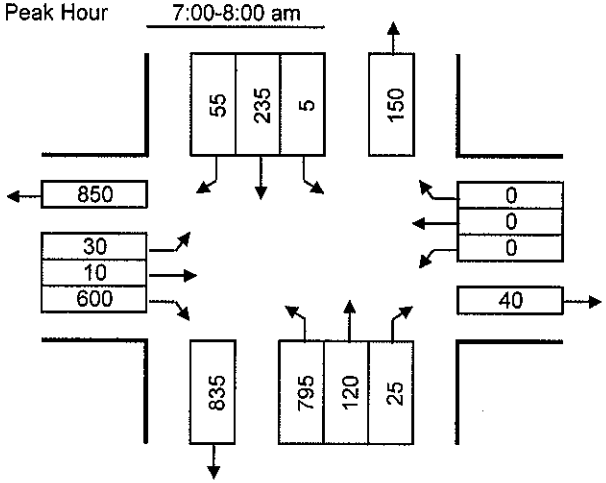
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/18/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

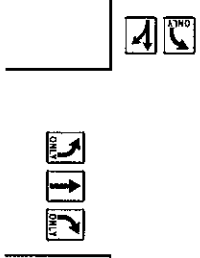
Location: BELTSVILLE@CALVERTON BLVD
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

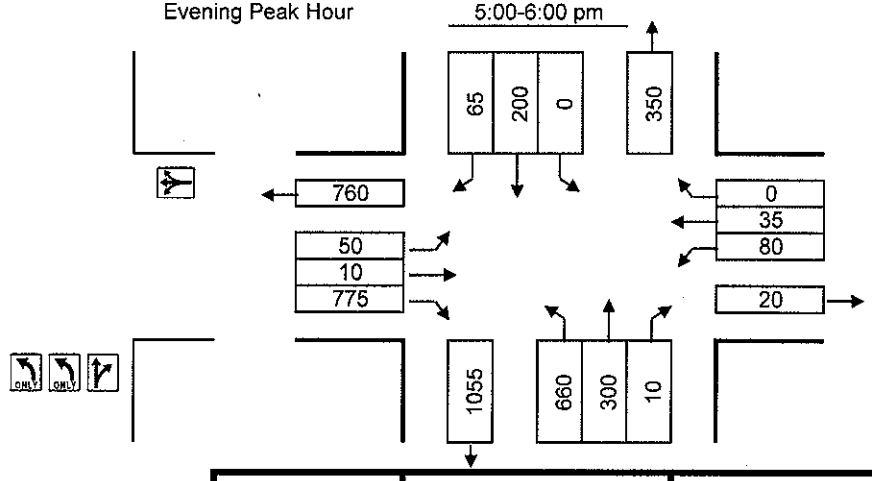
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	CALVERTON BLVD	EB 600	EB 775
WB Approach:	CALVERTON BLVD	WB	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	145	1.00	1.00	145	5	150	
SBTR + NBL	290	1.00	1.00	290	477	767	*
EBT	10	1.00	1.00	10	0	10	
WBT + EBL	0	1.10	1.00	0	30	30	*
					Critical Volume	797	A
					V/C	0.50	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR	310	1.00	1.00	310	0	310	
SBTR + NBL	265	1.00	1.00	265	396	661	*
EBT + WBL	10	1.00	1.00	10	80	90	
WBLT + EBL	115	1.10	1.00	123	50	173	*
					Critical Volume	834	A
					V/C	0.52	

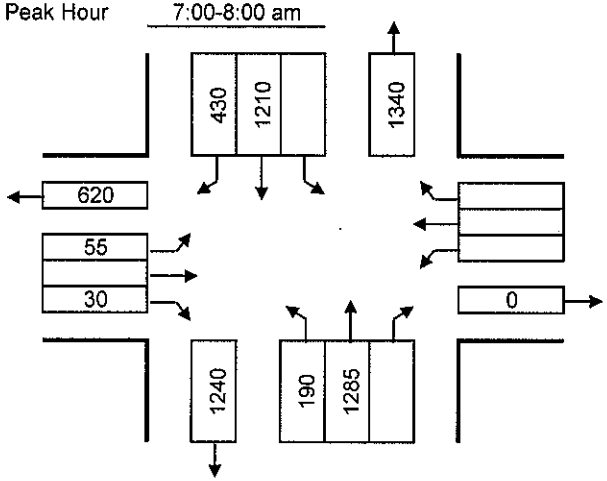
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date:
Conditions: BACKGROUND WITH ICC
Design Year: 2012

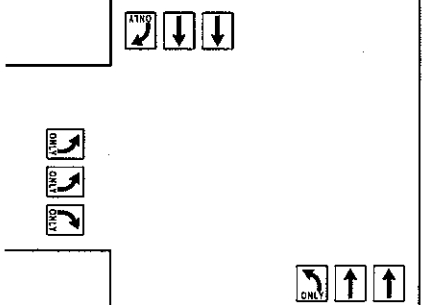
Location: Eastern Site Access @ Cherry Hill
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

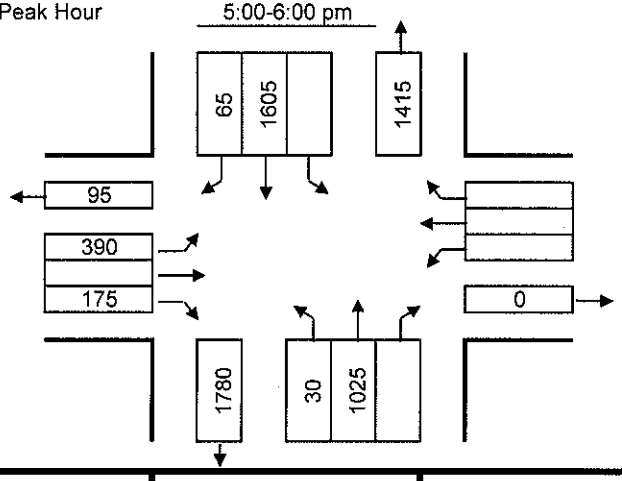
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	SITE ACCESS	EB 30	EB
WB Approach:		WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1285	1.00	0.53	681	0	681	
SBT + NBL	1210	1.00	0.53	641	190	831	*
EBL	55	1.00	0.60	33	0	33	*
					Critical Volume	864	OK
					V/C	0.59	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1025	1.00	0.53	543	0	543	
SBT + NBL	1605	1.00	0.53	851	30	881	*
EBL	390	1.00	0.60	234	0	234	*
					Critical Volume	1115	OK
					V/C	0.76	

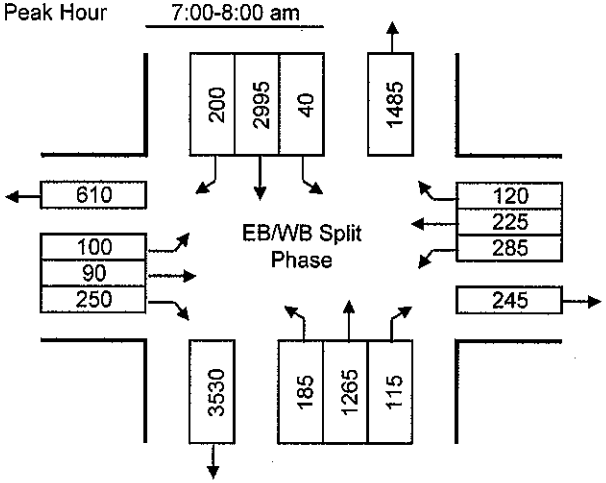
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

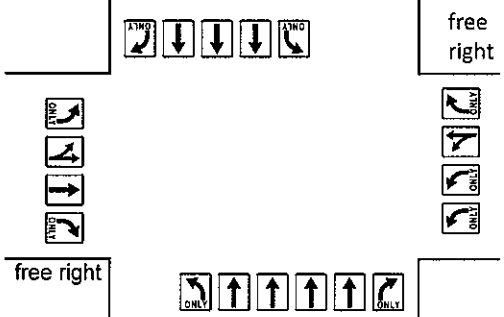
Location: MD 650 @ LOCKWOOD DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

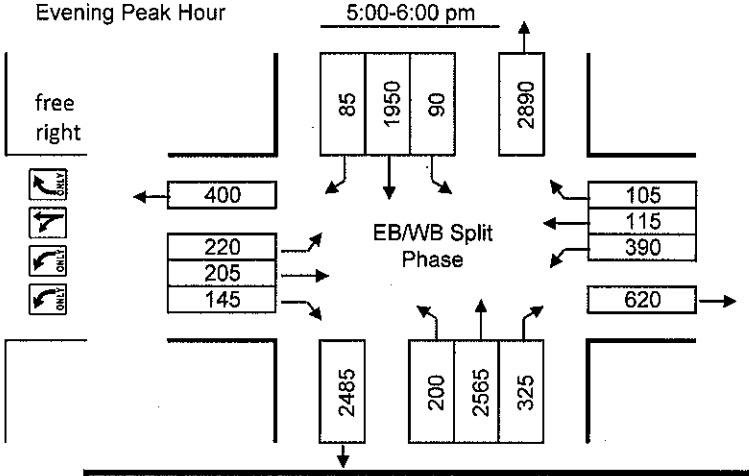
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	LOCKWOOD DRIVE	EB 250	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1265	1.00	0.30	380	40	420	
SBT + NBL	2995	1.00	0.37	1108	185	1293	*
EBLT	190	1.00	0.37	70	0	70	*
WBLT	510	1.00	0.37	189	0	189	*
					Critical Volume	1552	F
					V/C	1.05	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2565	1.00	0.30	770	90	860	
SBT + NBL	1950	1.00	0.37	722	200	922	*
EBLT	425	1.00	0.37	157	0	157	*
WBLT	505	1.00	0.37	187	0	187	*
					Critical Volume	1266	OK
					V/C	0.86	

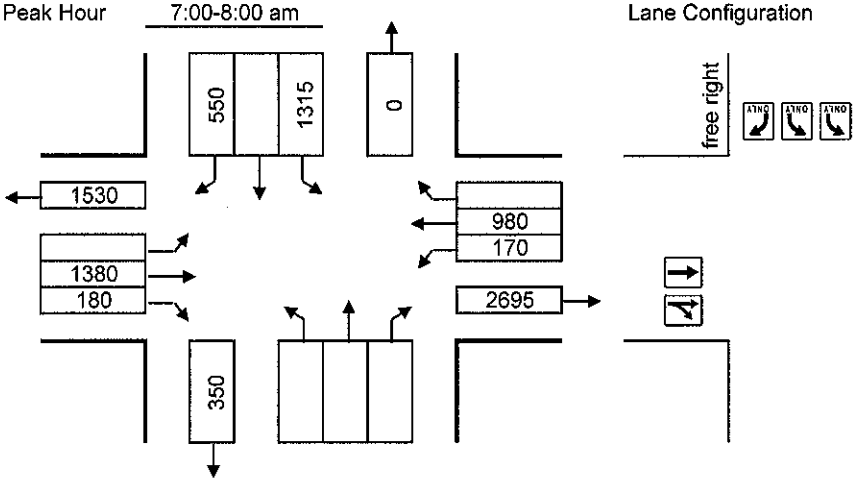
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

Location: US 29 SB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

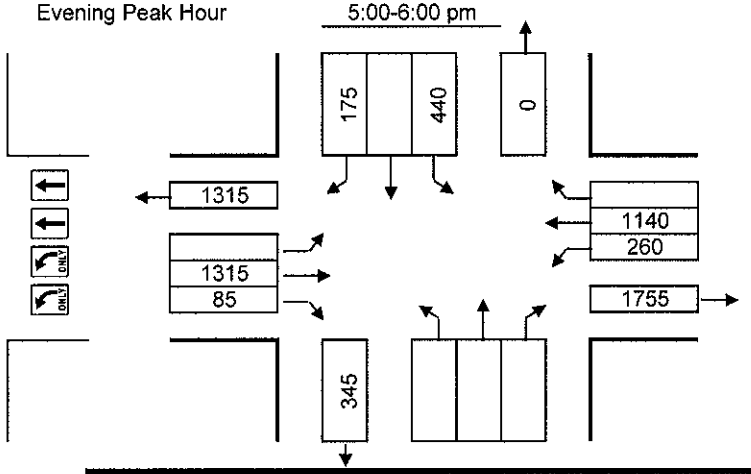
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	1315	1.00	0.60	789	0	789	*
EBTR + WBL	1560	1.00	0.53	827	102	929	*
WBT	980	1.00	0.53	519	0	519	
					Critical Volume	1718	F
					V/C	1.16	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	440	1.00	0.60	264	0	264	*
EBTR + WBL	1400	1.00	0.53	742	156	898	*
WBT	1140	1.00	0.53	604	0	604	
				Critical Volume		1162	OK
				V/C		0.79	

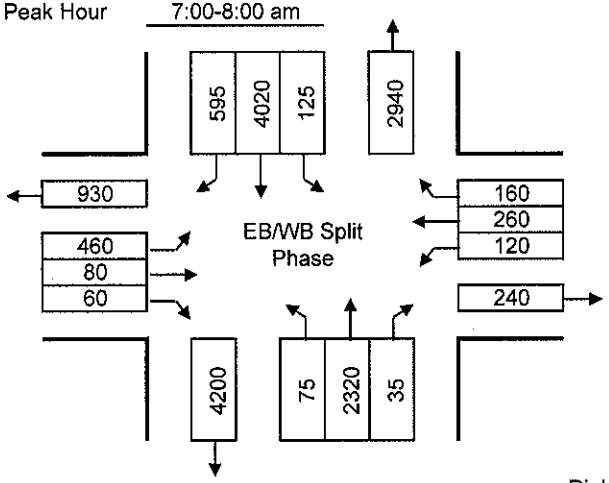
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/14/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

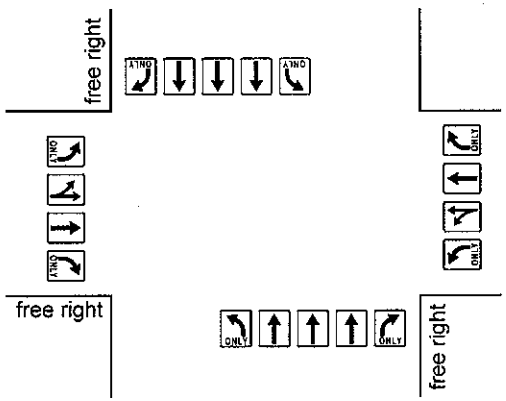
Location: US 29@ FAIRLAND ROAD
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

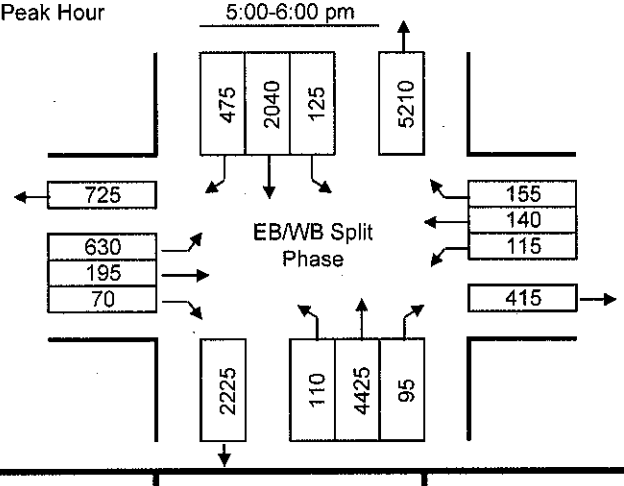
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	FAIRLAND RD	EB	EB
WB Approach:	FAIRLAND RD	WB 93	WB 83

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤ I ≤	599	2.0
≤ I ≤	799	3.0
≤ I ≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2320	1.00	0.37	858	125	983	
SBT + NBL	4020	1.00	0.37	1487	75	1562	*
EBL	460	1.00	0.60	276	0	276	*
WBLT	380	1.00	0.37	141	0	141	*
					Critical Volume	1979	F
					V/C	1.34	

De facto LT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4425	1.00	0.37	1637	125	1762	*
SBT + NBL	2040	1.00	0.37	755	110	865	
EBL	630	1.00	0.60	378	0	378	*
WBLT	255	1.00	0.37	94	0	94	*
					Critical Volume	2234	F
					V/C	1.51	

De facto LT lane(s) assumed for EB approach.

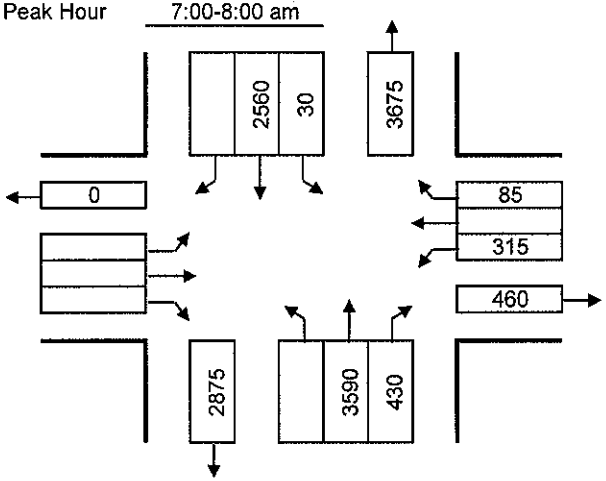
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

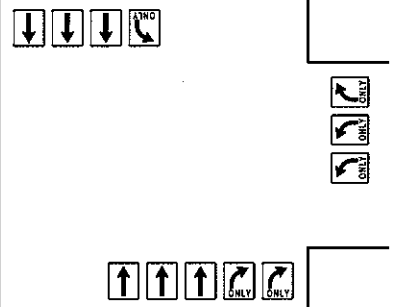
Location: US 29@ INDUSTRIAL PKWY
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

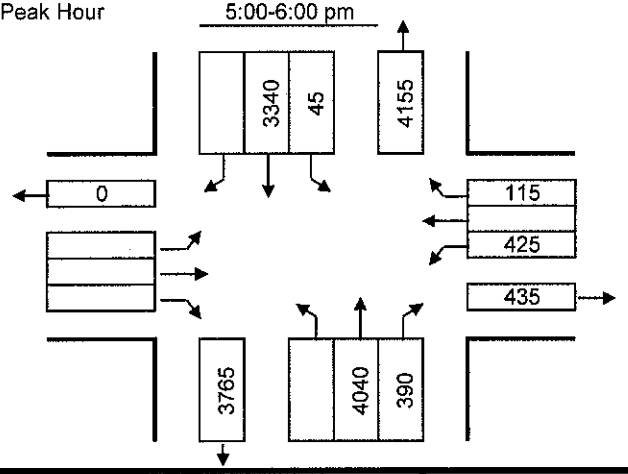
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	Industrial Pkwy	EB	EB
WB Approach:	Industrial Pkwy	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3590	1.00	0.37	1328	30	1358	*
SBT	2560	1.00	0.37	947	0	947	
WBL	315	1.00	0.60	189	0	189	*
					Critical Volume	1547	F
					V/C	1.05	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4040	1.00	0.37	1495	45	1540	*
SBT	3340	1.00	0.37	1236	0	1236	
WBL	425	1.00	0.60	255	0	255	*
					Critical Volume	1795	F
					V/C	1.22	

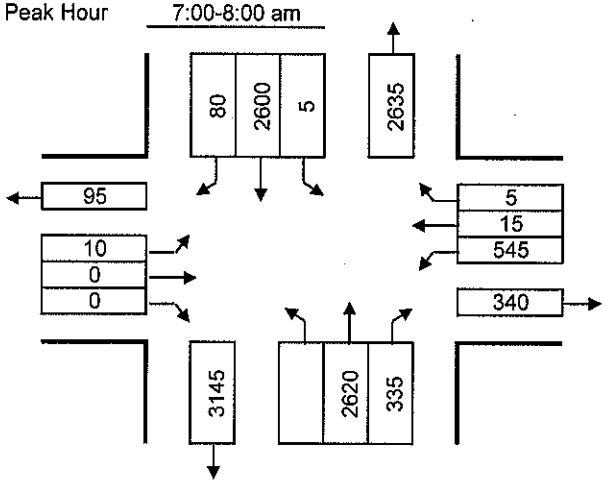
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 10/26/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

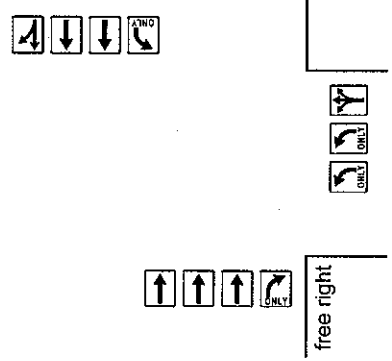
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

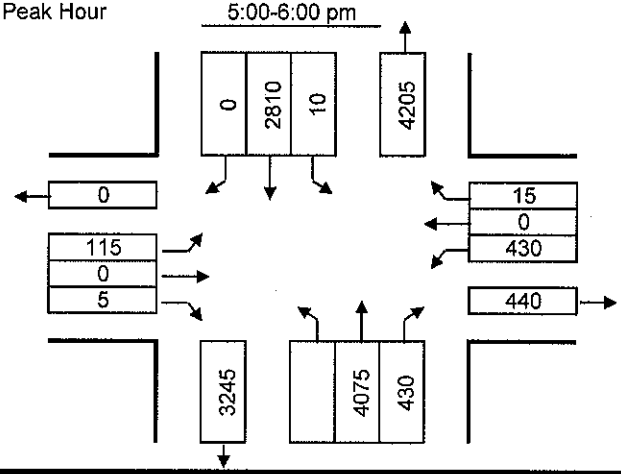
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	DRIVEWAY	EB	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2620	1.00	0.37	969	5	974	
SBTR	2680	1.00	0.37	992	0	992	*
EBT + WBL	0	1.00	1.00	0	218	218	
WBLTR + EBL	565	1.10	0.37	229	10	239	*
					Critical Volume	1231	OK
					V/C	0.83	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4075	1.00	0.37	1508	10	1518	*
SBT	2810	1.00	0.37	1040	0	1040	
EBTR + WBL	5	1.00	1.00	5	172	177	
WBLTR + EBL	445	1.10	0.37	181	115	296	*
					Critical Volume	1814	F
					V/C	1.23	

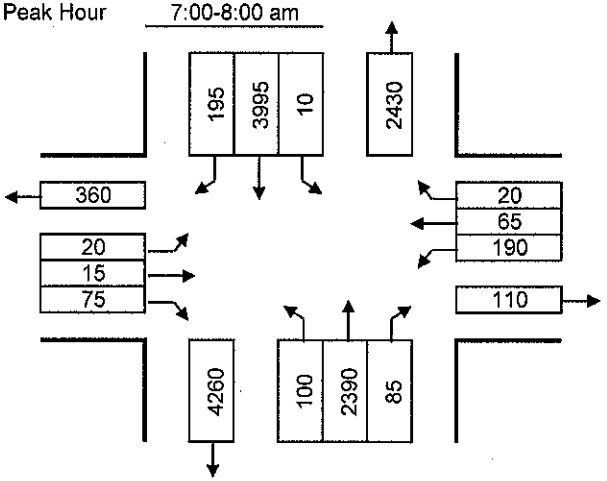
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/19/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

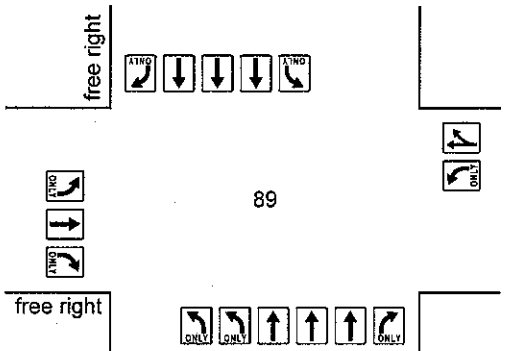
Location: US 29@ MUSGROVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

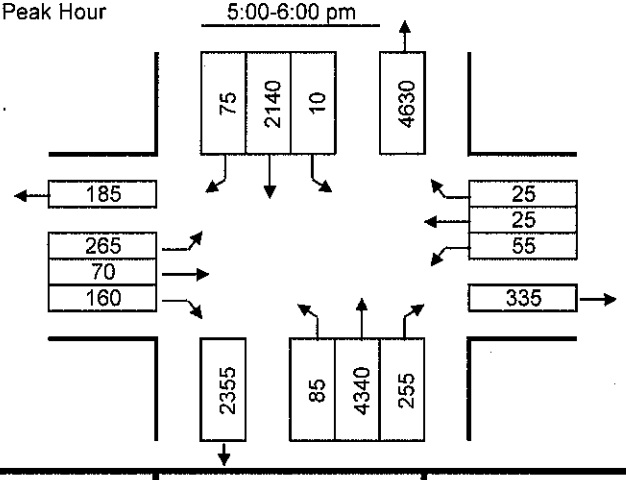
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	MUSGROVE RAOD	EB 75	EB
WB Approach:	MUSGROVE ROAD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤ I ≤	599	2.0
≤ I ≤	799	3.0
≤ I ≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2390	1.00	0.37	884	10	894	
SBT + NBL	3995	1.00	0.37	1478	60	1538	*
EBT + WBL	15	1.00	1.00	15	190	205	*
WBTR + EBL	85	1.00	1.00	85	20	105	
					Critical Volume	1743	F
					V/C	1.18	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4340	1.00	0.37	1606	10	1616	*
SBT + NBL	2140	1.00	0.37	792	51	843	
EBR + WBL	160	1.00	1.00	160	55	215	
WBTR + EBL	50	1.00	1.00	50	265	315	*
					Critical Volume	1931	F
					V/C	1.31	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

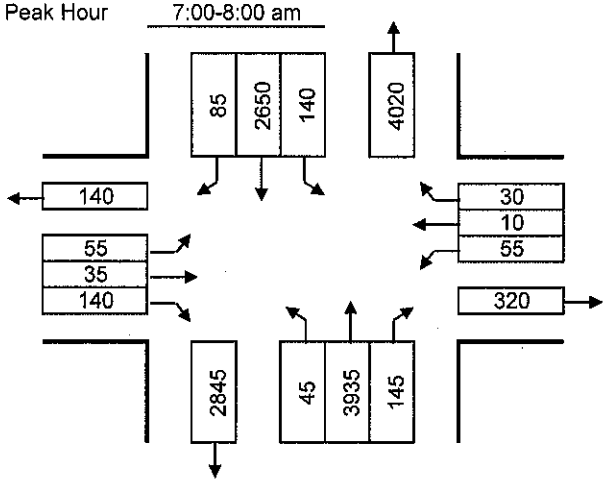
SHA

Count Date: 10/23/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

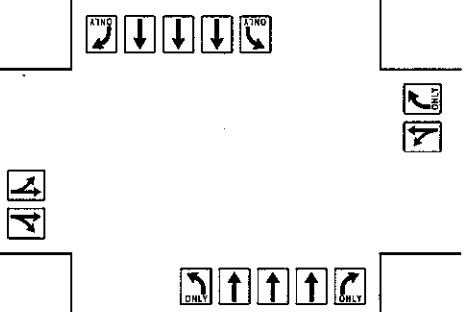
Location: US 29@STEWART LANE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

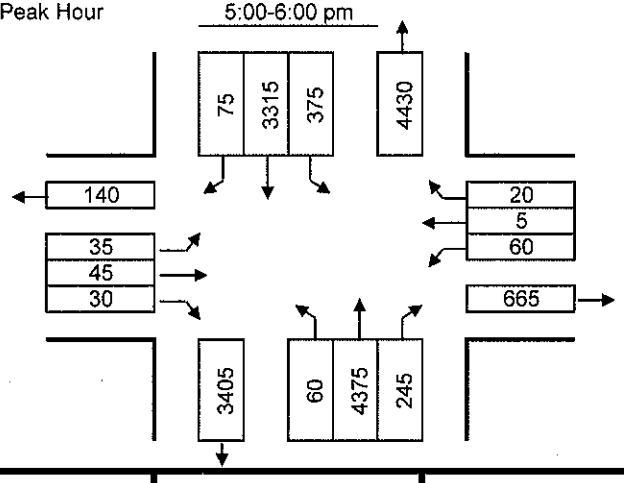
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	STEWART LANE	EB	EB
WB Approach:	STEWART LANE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3935	1.00	0.37	1456	140	1596	*
SBT + NBL	2650	1.00	0.37	981	45	1026	
EBR + WBL	140	1.10	1.00	140	55	195	*
WBLT + EBL	65	1.10	1.00	71	55	126	
					Critical Volume	1791	F
					V/C	1.21	

De facto RT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4375	1.00	0.37	1619	375	1994	*
SBT + NBL	3315	1.00	0.37	1227	60	1287	
EBLTR + WBL	110	1.10	0.53	60	60	120	*
WBLT + EBL	65	1.10	1.00	71	35	106	
					Critical Volume	2114	F
					V/C	1.43	

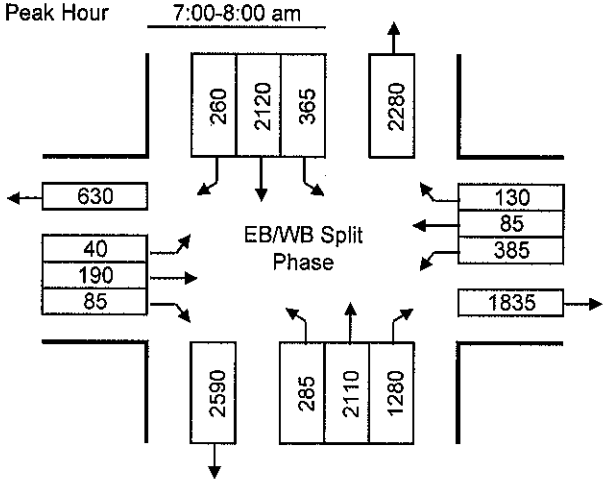
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/21/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

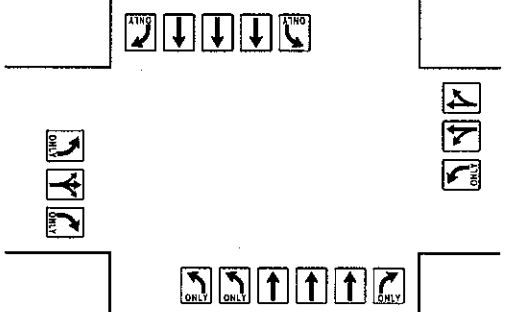
Location: TECH ROAD@US29
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

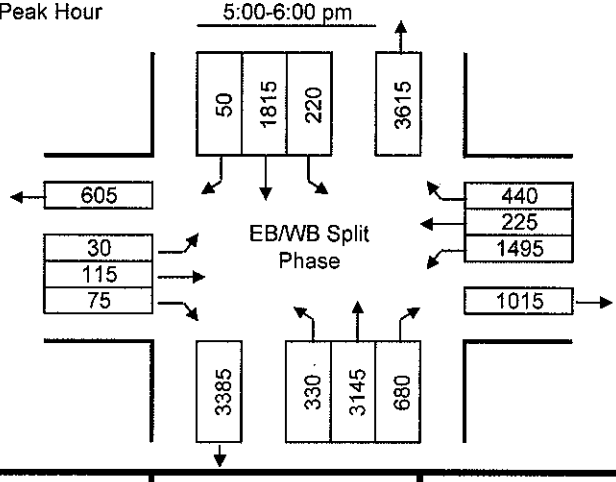
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB 181	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Fairland / White Oak Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR + SBL	1099	1.00	1.00	1099	365	1464	*
SBT + NBL	2120	1.00	0.37	784	171	955	
EBLTR	315	1.00	0.60	189	0	189	*
WBL	385	1.00	0.60	231	0	231	*
					Critical Volume	1884	F
					V/C	1.28	

De facto LT lane(s) assumed for WB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3145	1.00	0.37	1164	220	1384	*
SBT + NBL	1815	1.00	0.37	672	198	870	
EBLTR	220	1.00	0.60	132	0	132	*
WBL	1495	1.00	0.60	897	0	897	*
					Critical Volume	2413	F
					V/C	1.64	

De facto LT lane(s) assumed for WB approach.

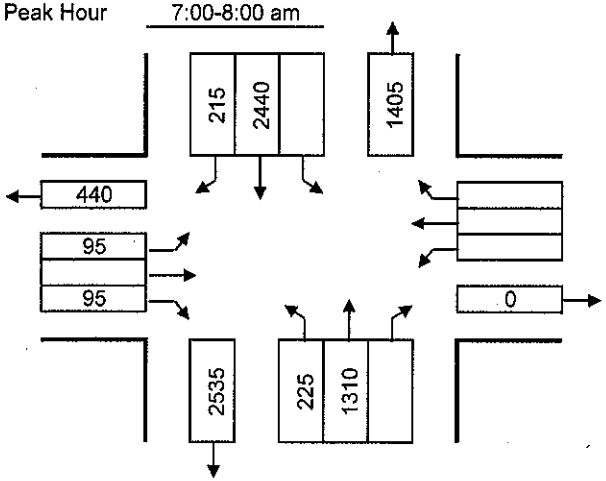
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/20/2008 & 10/26/2008
Conditions: BACKGROUND WITH ICC
Design Year: 2012

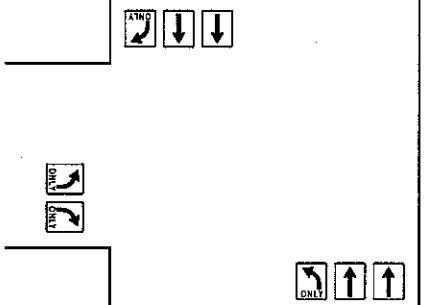
Location: US 29@ PROSPERITY DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

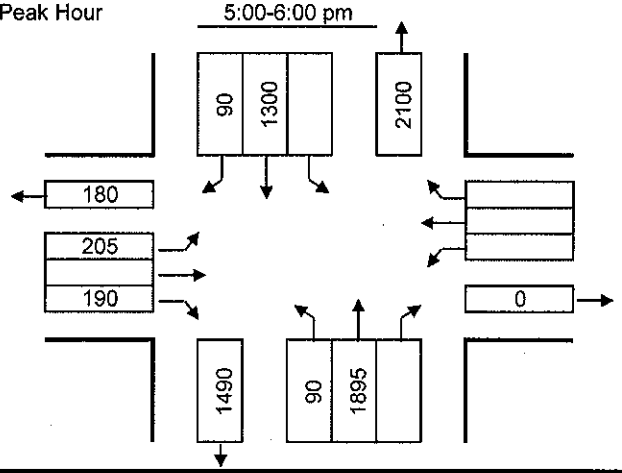
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	PROSPERITY DRIVE	EB	EB
WB Approach:	PROSPERITY DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1310	1.00	0.53	694	0	694	
SBT + NBL	2440	1.00	0.53	1293	225	1518	*
EBL	95	1.00	1.00	95	0	95	*
					Critical Volume	1613	F
					V/C	1.09	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1895	1.00	0.53	1004	0	1004	*
SBT + NBL	1300	1.00	0.53	689	90	779	
EBL	205	1.00	1.00	205	0	205	*
					Critical Volume	1209	OK
					V/C	0.82	

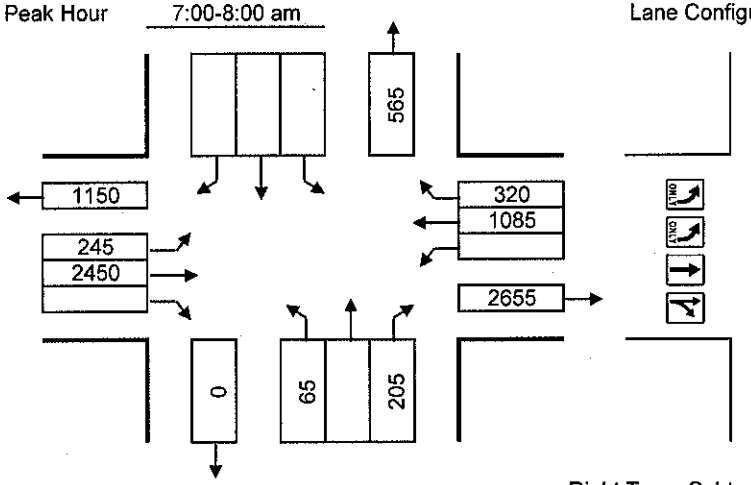
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: BACKGROUND WITH ICC
Design Year: 2012

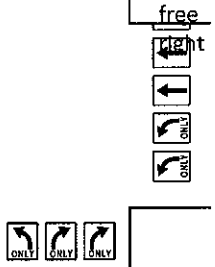
Location: US 29 NB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

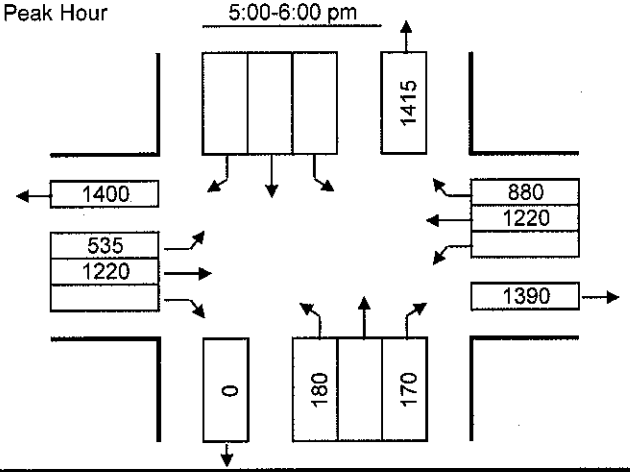
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB 880

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	205	1.00	0.53	109	0	109	*
EBT	2450	1.00	0.53	1299	0	1299	*
WBT + EBL	1085	1.00	0.53	575	147	722	
					Critical Volume	1408	OK
					V/C	0.95	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBL	180	1.00	1.00	180	0	180	*
EBT	1220	1.00	0.53	647	0	647	
WBT + EBL	1220	1.00	0.53	647	321	968	*
					Critical Volume	1148	OK
					V/C	0.78	

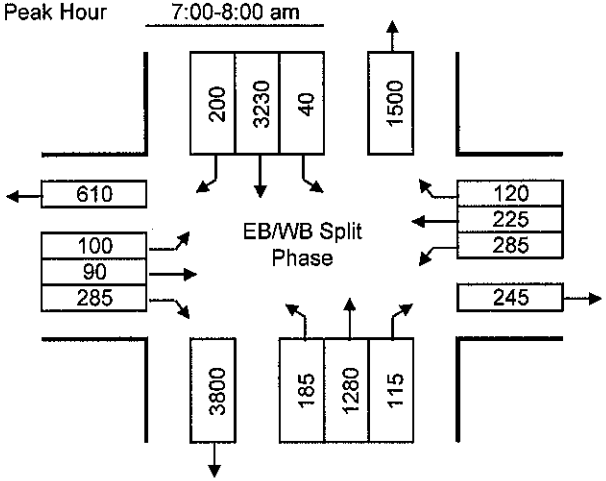
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

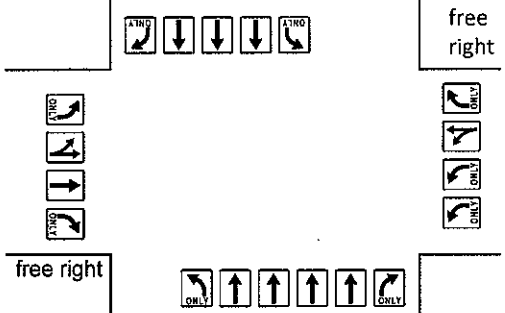
Location: MD 650 @ LOCKWOOD DRIVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

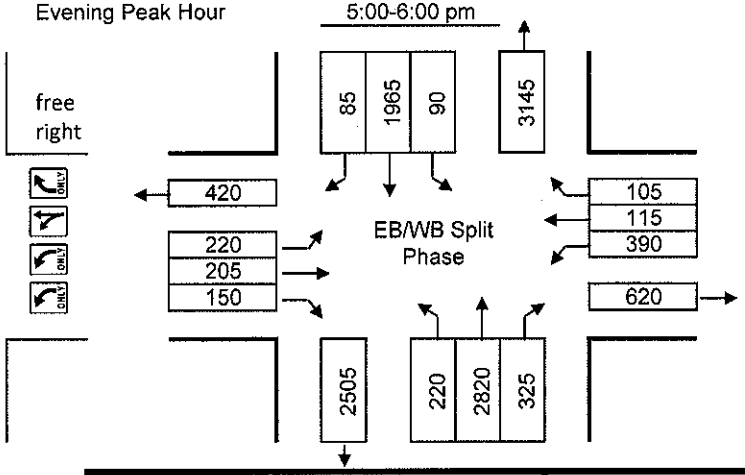
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	LOCKWOOD DRIVE	EB 285	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1280	1.00	0.30	384	40	424	
SBT + NBL	3230	1.00	0.37	1195	185	1380	*
EBLT	190	1.00	0.37	70	0	70	*
WBLT	510	1.00	0.37	189	0	189	*
					Critical Volume	1639	F
					V/C	1.11	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2820	1.00	0.30	846	90	936	
SBT + NBL	1965	1.00	0.37	727	220	947	*
EBLT	425	1.00	0.37	157	0	157	*
WBLT	505	1.00	0.37	187	0	187	*
					Critical Volume	1291	OK
					V/C	0.88	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

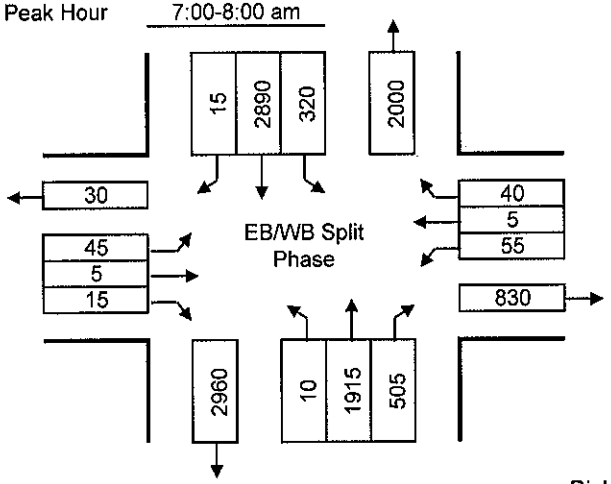
SHA

Count Date: 10/1/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

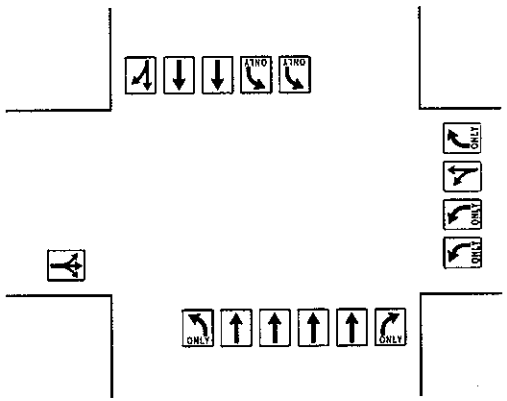
Location: MD 650 @ MAHAN ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

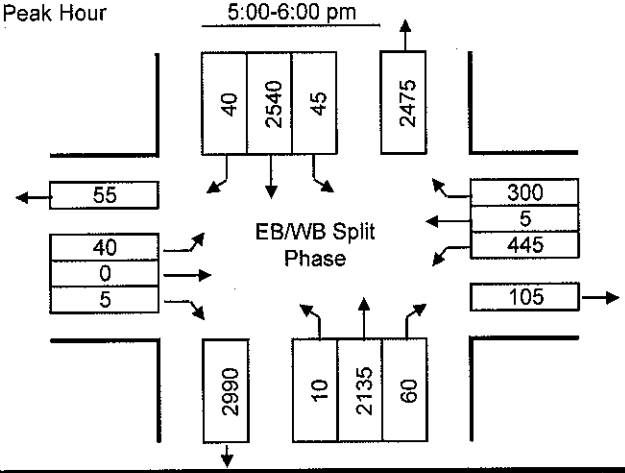
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MAHAN ROAD	EB	EB
WB Approach:	MAHAN ROAD	WB 40	WB 27

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	1915	1.00	0.30	575	192	767	
SBTR + NBL	2905	1.00	0.37	1075	10	1085	*
EBLTR	65	1.00	1.00	65	0	65	*
WBLT	60	1.00	0.37	22	0	22	*
					Critical Volume	1172	OK
					V/C	0.79	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2135	1.00	0.30	641	27	668	
SBTR + NBL	2580	1.00	0.37	955	10	965	*
EBLTR	45	1.00	1.00	45	0	45	*
WBR	273	1.00	1.00	273	0	273	*
					Critical Volume	1283	OK
					V/C	0.87	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/17/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

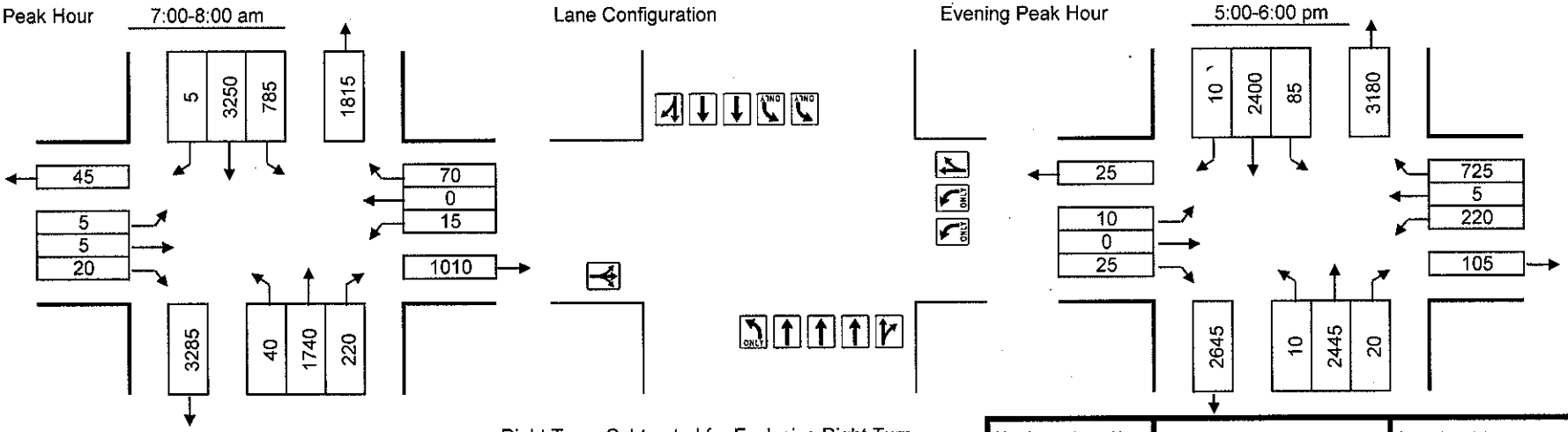
Location: MD 650@MICHELSON
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

Morning Peak Hour 7:00-8:00 am

Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	MICHELSON DR.	EB	EB
WB Approach:	MICHELSON DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1960	1.00	0.30	588	471	1059	
SBTR + NBL	3255	1.00	0.37	1204	40	1244	*
EBLTR + WBL	30	1.10	1.00	31	9	40	
WBTR + EBL	70	1.00	1.00	70	5	75	*
					Critical Volume	1319	OK
					V/C	0.89	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2465	1.00	0.30	740	51	791	
SBTR + NBL	2410	1.00	0.37	892	10	902	*
EBLTR + WBL	35	3.00	1.00	55	132	187	
WBTR + EBL	730	1.00	1.00	730	10	740	*
					Critical Volume	1642	F
					V/C	1.11	

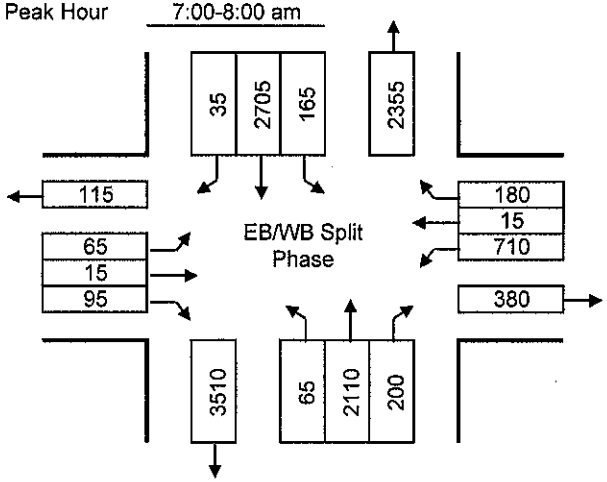
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/1/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

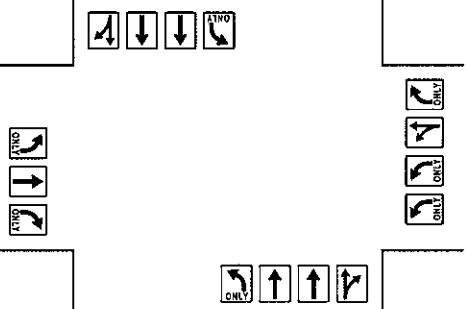
Location: MD 650@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

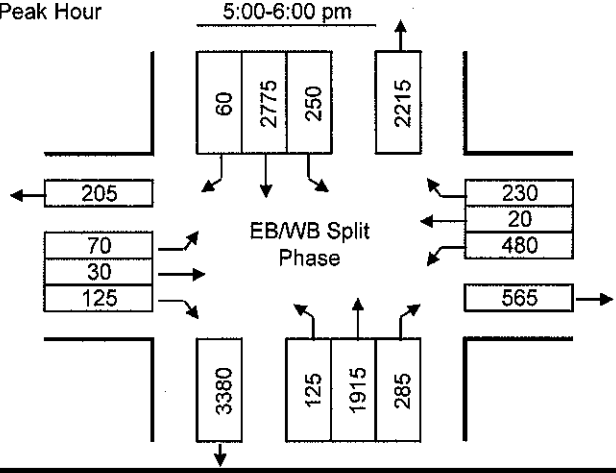
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	MD 650	NB	NB
SB Approach:	MD 650	SB	SB
EB Approach:	POWDER MILL RD	EB	EB 125
WB Approach:	POWDER MILL RD	WB	WB 230

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2310	1.00	0.37	855	165	1020	
SBTR + NBL	2740	1.00	0.37	1014	65	1079	*
EBR	95	1.00	1.00	95	0	95	*
WBLT	725	1.00	0.37	268	0	268	*
					Critical Volume	1442	OK
					V/C	0.98	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	2200	1.00	0.37	814	250	1064	
SBTR + NBL	2835	1.00	0.37	1049	125	1174	*
EBL	70	1.00	1.00	70	0	70	*
WBLT	500	1.00	0.37	185	0	185	*
					Critical Volume	1429	OK
					V/C	0.97	

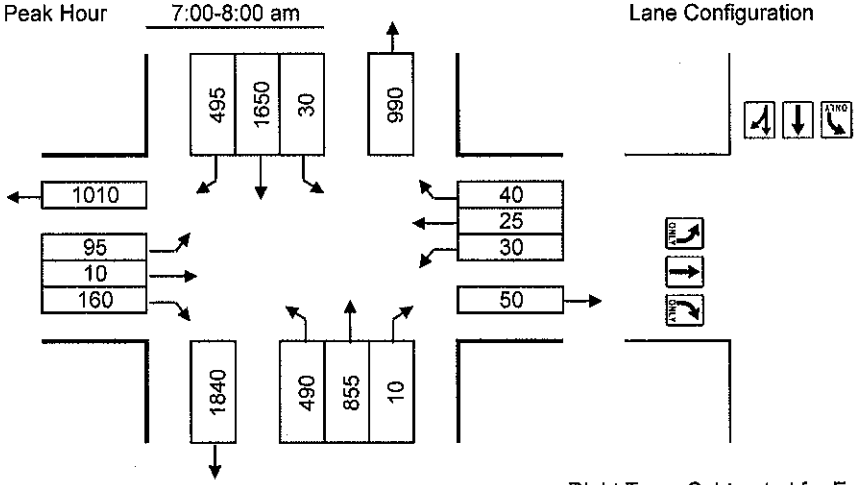
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/18/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

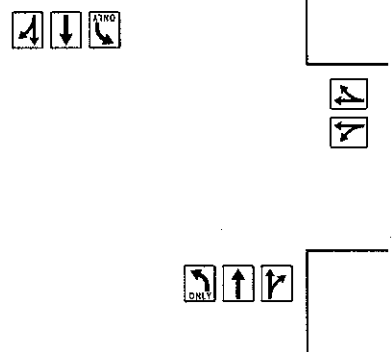
Location: PLUM ORCHARD DR.@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

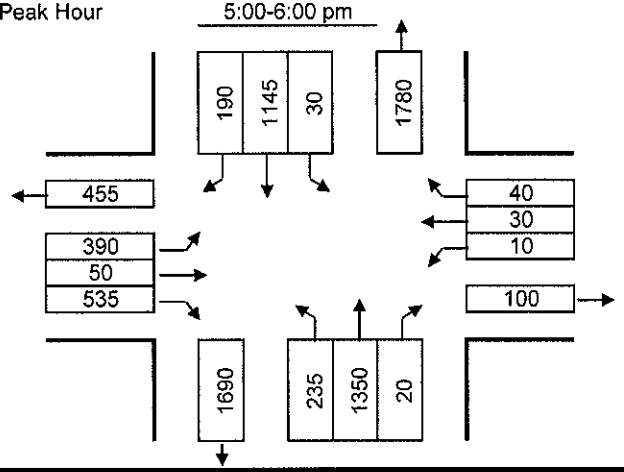
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	PLUM ORCHARD DR.	EB 160	EB 235
WB Approach:	PLUM ORCHARD DR.	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	865	1.00	0.53	458	30	488	
SBTR + NBL	2145	1.00	0.53	1137	490	1627	*
EBT + WBL	10	1.00	1.00	10	30	40	
WBLTR + EBL	95	1.10	0.53	52	95	147	*
					Critical Volume	1774	F
					V/C	1.20	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1370	1.00	0.53	726	30	756	
SBTR + NBL	1335	1.00	0.53	708	235	943	*
EBR + WBL	300	1.00	1.00	300	10	310	
WBLTR + EBL	80	2.00	0.53	48	390	438	*
					Critical Volume	1381	OK
					V/C	0.94	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

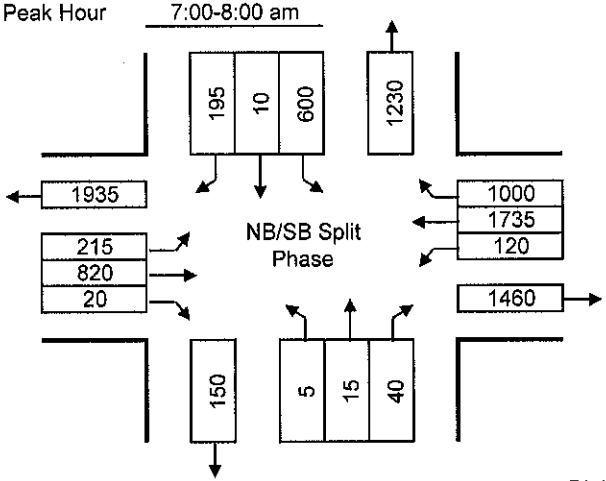
SHA

Count Date: 2/21/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

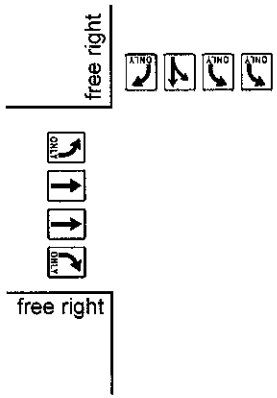
Location: BELTSVILLE@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

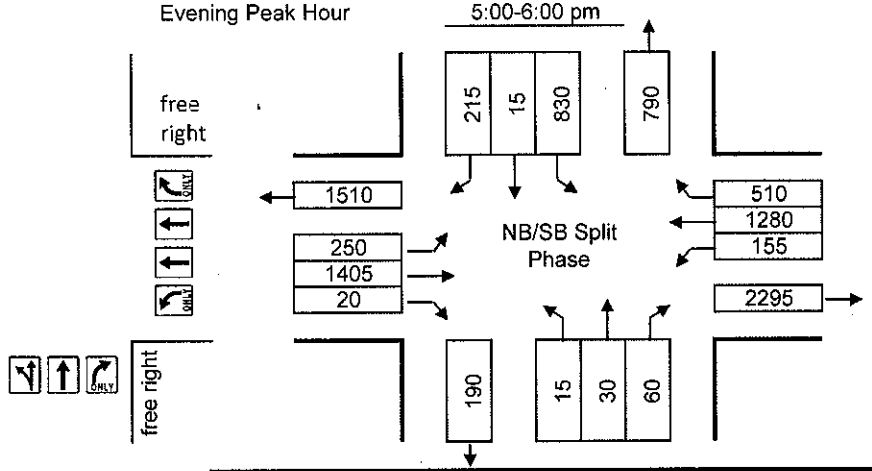
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM		PM	
NB Approach:	BELTSVILLE	NB	40	NB	60
SB Approach:	BELTSVILLE	SB		SB	
EB Approach:	POWDER MILL RD	EB		EB	
WB Approach:	POWDER MILL RD	WB	1000	WB	

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.37
4 =	0.29
Dbl-left	0.60

Service Level		Critical Lane Volume
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤ 199		1.1
≤ 599		2.0
≤ 799		3.0
≤ 999		4.0
≥ 1000		5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	20	1.00	0.55	11	0	11	*
SBLT	610	1.00	0.37	226	0	226	*
EBT + WBL	820	1.00	0.55	451	120	571	
WBT + EBL	1735	1.00	0.55	954	215	1169	*
					Critical Volume	1406	D
					V/C	0.88	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBLT	45	1.00	0.55	25	0	25	*
SBLT	845	1.00	0.37	313	0	313	*
EBT + WBL	1405	1.00	0.55	773	155	928	
WBT + EBL	1280	1.00	0.55	704	250	954	*
					Critical Volume	1292	C
					V/C	0.81	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

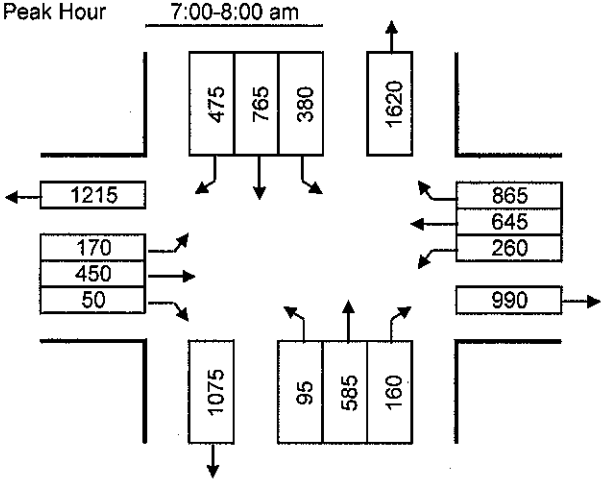
SHA

Count Date: 10/23/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

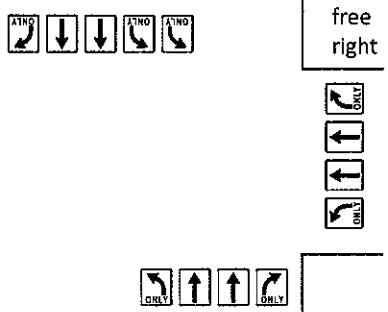
Location: CHERRY HILL@POWDER MILL
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

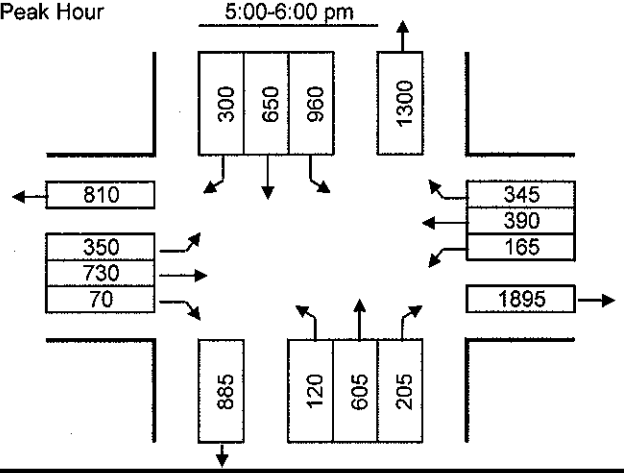
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB 102	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB 865	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	585	1.00	0.55	322	228	550	*
SBT + NBL	765	1.00	0.55	421	95	516	
EBTR + WBL	500	1.00	0.55	275	260	535	*
WBT + EBL	645	1.00	0.55	355	102	457	
					Critical Volume	1085	B
					V/C	0.68	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	605	1.00	0.55	333	576	909	*
SBT + NBL	650	1.00	0.55	358	120	478	
EBTR + WBL	800	1.00	0.55	440	165	605	*
WBR + EBL	345	1.00	1.00	345	210	555	
					Critical Volume	1514	E
					V/C	0.95	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

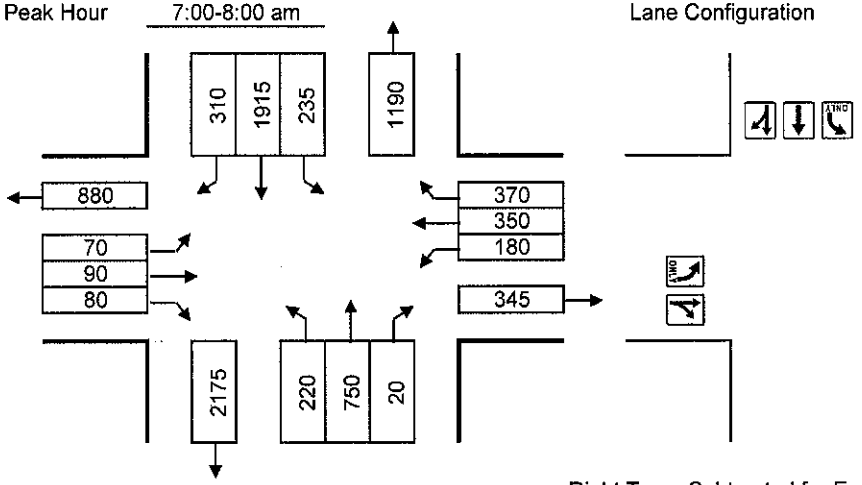
SHA

Count Date: 10/25/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

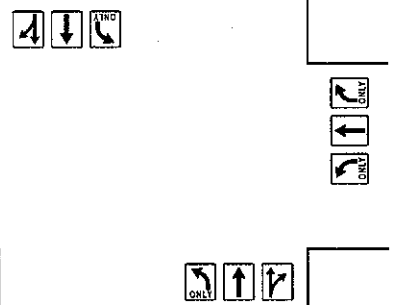
Location: CHERRY HILL@BROADBIRCH
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

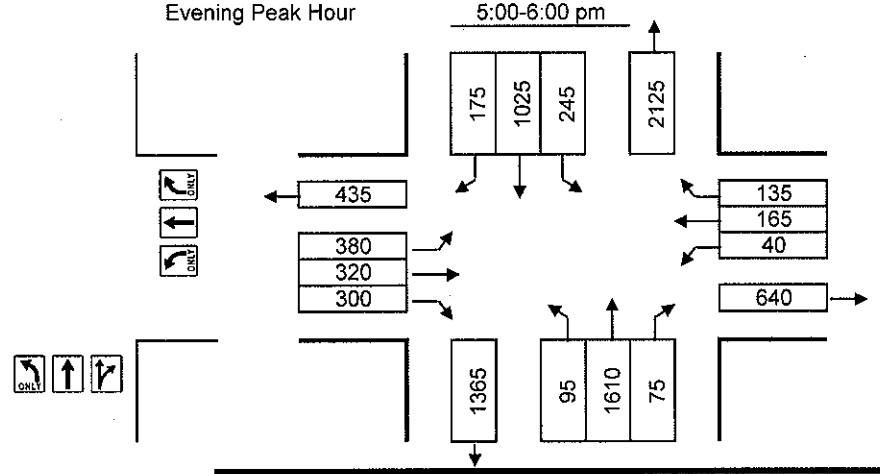
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	BROADBIRCH	EB	EB
WB Approach:	BROADBIRCH	WB 203	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	770	1.00	0.53	408	235	643	
SBTR + NBL	2225	1.00	0.53	1179	220	1399	*
EBTR + WBL	170	1.00	1.00	170	180	350	
WBT + EBL	350	1.00	1.00	350	70	420	*
					Critical Volume	1819	F
					V/C	1.23	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	1685	1.00	0.53	893	245	1138	*
SBTR + NBL	1200	1.00	0.53	636	95	731	
EBTR + WBL	620	1.00	1.00	620	40	660	*
WBT + EBL	165	1.00	1.00	165	380	545	
					Critical Volume	1798	F
					V/C	1.22	

Maryland State Highway Administration
Turning Movement Summary and
Level of Service

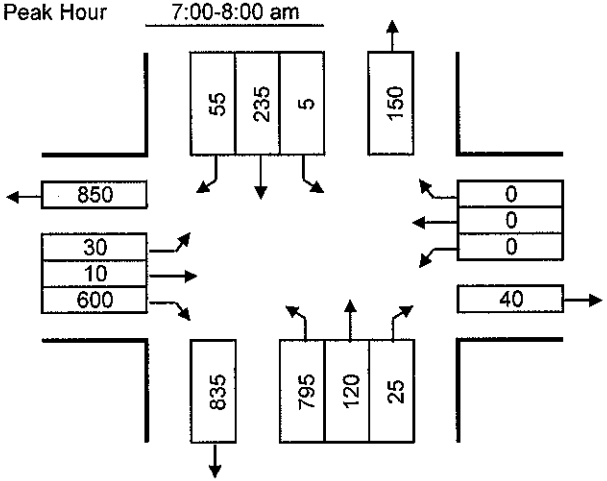
SHA

Count Date: 10/18/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

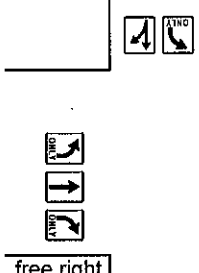
Location: BELTSVILLE@CALVERTON BLVD
Computed By: Y.R. Date: 7/14/08

Prince George's County Method

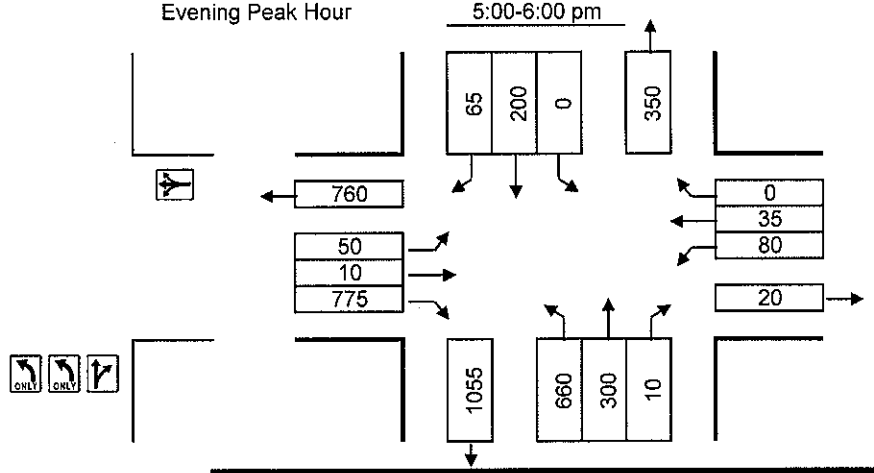
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	CALVERTON BLVD	EB 600	EB 775
WB Approach:	CALVERTON BLVD	WB	WB

Number of Lanes	Lane Use Factor	Service Level		Critical Lane Volume	Opposing Volume (vph)		PCE
1 =	1.00	A	≤	1000	≤	199	1.1
2 =	0.55	B	≤	1150	≤	599	2.0
3 =	0.37	C	≤	1300	≤	799	3.0
4 =	0.29	D	≤	1450	≤	999	4.0
Dbl-left	0.60	E	≤	1600	≥	1000	5.0
		F	>	1600			

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR + SBL	145	1.00	1.00	145	5	150	
SBTR + NBL	290	1.00	1.00	290	477	767	*
EBT	10	1.00	1.00	10	0	10	
WBT + EBL	0	1.10	1.00	0	30	30	*
					Critical Volume	797	A
					V/C	0.50	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBTR	310	1.00	1.00	310	0	310	
SBTR + NBL	265	1.00	1.00	265	396	661	*
EBT + WBL	10	1.00	1.00	10	80	90	
WBLT + EBL	115	1.10	1.00	123	50	173	*
					Critical Volume	834	A
					V/C	0.52	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

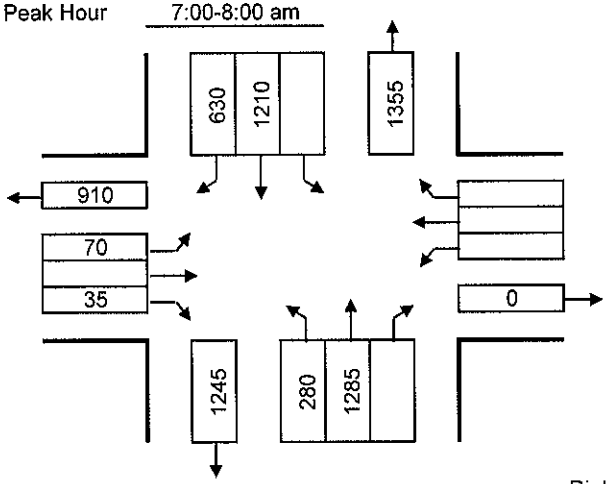
SHA

Count Date:
Conditions: PROPOSED WITH ICC
Design Year: 2012

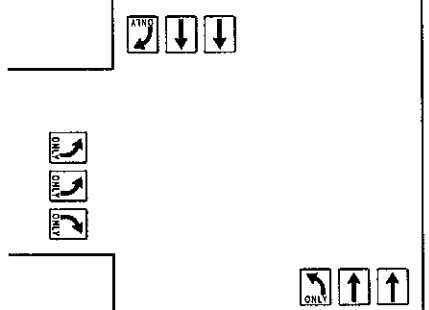
Location: Eastern Site Access @ Cherry Hill
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

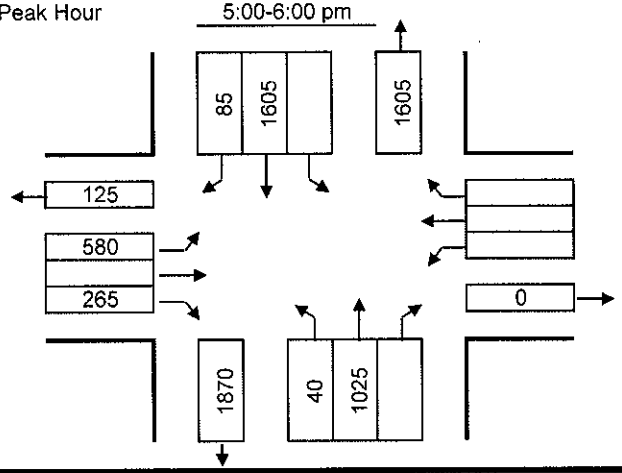
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	CHERRY HILL	NB	NB
SB Approach:	CHERRY HILL	SB	SB
EB Approach:	SITE ACCESS	EB 35	EB
WB Approach:		WB	WB

Number of Lanes	Lane Use Factor		Opposing Volume (vph)	PCE
1 =	1.00	Congestion Standard	≤ 199	1.1
2 =	0.53	= 1475	≤ 599	2.0
3 =	0.37	for	≤ 799	3.0
4 =	0.30	Aspen Hill	≤ 999	4.0
Dbl-left	0.60	Policy Area	≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1285	1.00	0.53	681	0	681	
SBT + NBL	1210	1.00	0.53	641	280	921	*
EBL	70	1.00	0.60	42	0	42	*
					Critical Volume	963	OK
					V/C	0.65	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1025	1.00	0.53	543	0	543	
SBT + NBL	1605	1.00	0.53	851	40	891	*
EBL	580	1.00	0.60	348	0	348	*
					Critical Volume	1239	OK
					V/C	0.84	

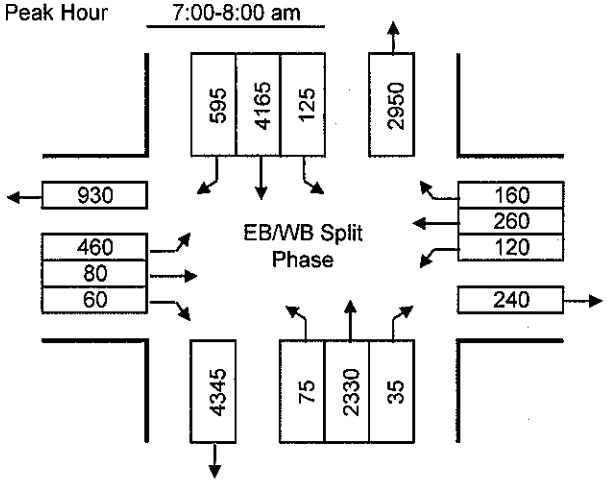
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/14/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

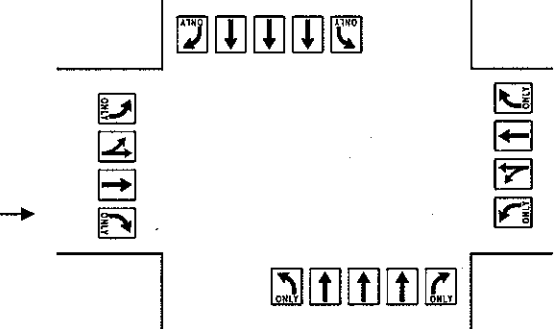
Location: US 29@ FAIRLAND ROAD
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

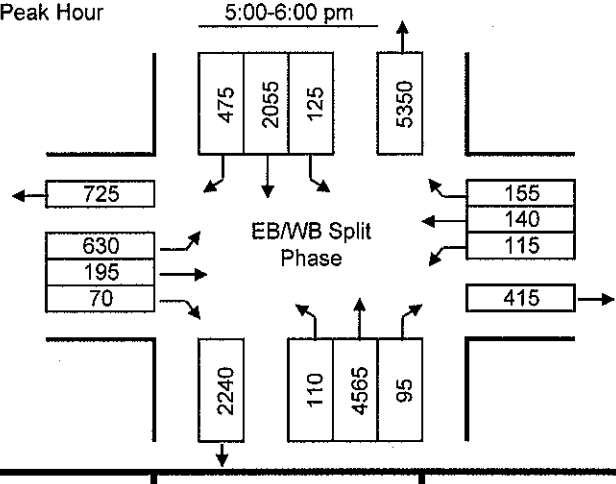
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM		PM	
NB Approach:	US 29		NB		NB
SB Approach:	US 29		SB		SB
EB Approach:	FAIRLAND RD		EB		EB
WB Approach:	FAIRLAND RD		WB 91		WB 81

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2330	1.00	0.37	862	125	987	
SBT + NBL	4165	1.00	0.37	1541	75	1616	*
EBL	460	1.00	0.60	276	0	276	*
WBLT	380	1.00	0.37	141	0	141	*
					Critical Volume	2033	F
					V/C	1.38	

De facto LT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4565	1.00	0.37	1689	125	1814	*
SBT + NBL	2055	1.00	0.37	760	110	870	
EBL	630	1.00	0.60	378	0	378	*
WBLT	255	1.00	0.37	94	0	94	*
					Critical Volume	2286	F
					V/C	1.55	

De facto LT lane(s) assumed for EB approach.

Maryland State Highway Administration
Turning Movement Summary and Level of Service

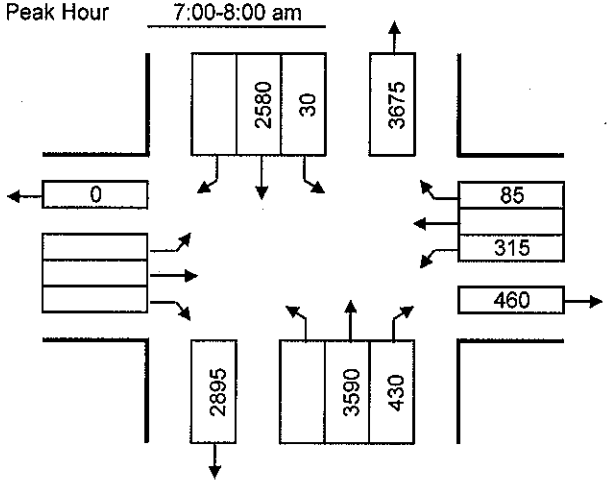
SHA

Count Date: 10/24/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

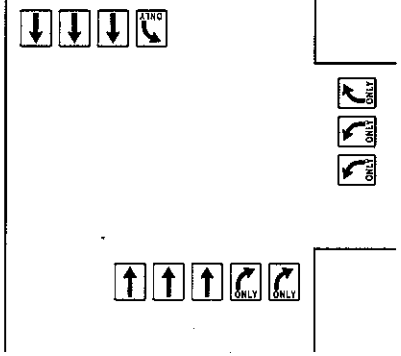
Location: US 29@ INDUSTRIAL PKWY
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

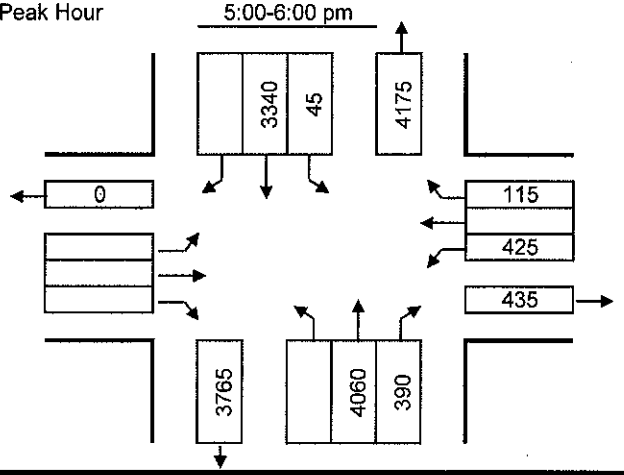
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	Industrial Pkwy	EB	EB
WB Approach:	Industrial Pkwy	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3590	1.00	0.37	1328	30	1358	*
SBT	2580	1.00	0.37	955	0	955	
WBL	315	1.00	0.60	189	0	189	*
					Critical Volume	1547	F
					V/C	1.05	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4060	1.00	0.37	1502	45	1547	*
SBT	3340	1.00	0.37	1236	0	1236	
WBL	425	1.00	0.60	255	0	255	*
					Critical Volume	1802	F
					V/C	1.22	

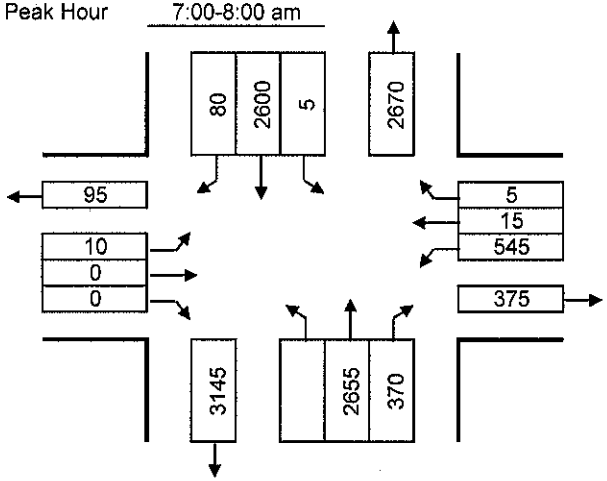
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/20/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

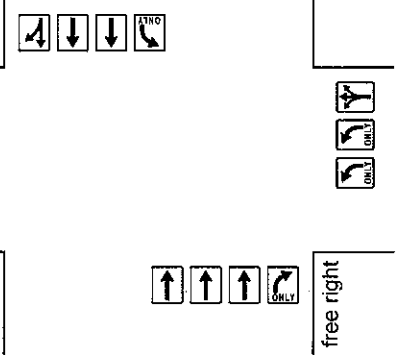
Location: US 29@ LOCKWOOD DR.
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

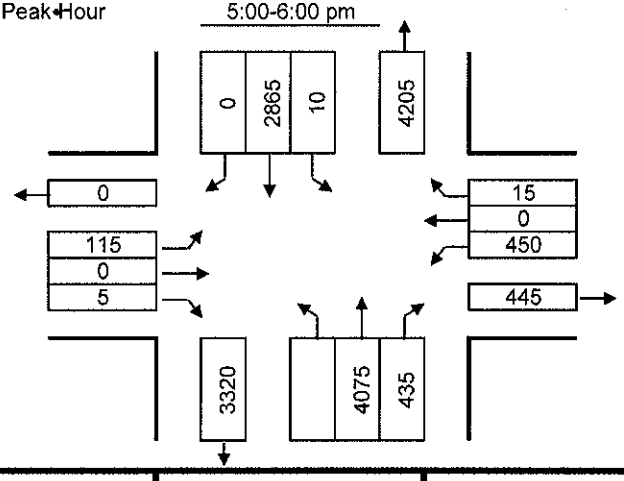
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	DRIVEWAY	EB	EB
WB Approach:	LOCKWOOD DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2655	1.00	0.37	982	5	987	
SBTR	2680	1.00	0.37	992	0	992	*
EBT + WBL	0	1.00	1.00	0	218	218	
WBLTR + EBL	565	1.10	0.37	229	10	239	*
					Critical Volume	1231	OK
					V/C	0.83	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4075	1.00	0.37	1508	10	1518	*
SBT	2865	1.00	0.37	1060	0	1060	
EBTR + WBL	5	1.00	1.00	5	180	185	
WBLTR + EBL	465	1.10	0.37	189	115	304	*
				Critical Volume		1822	F
				V/C		1.24	

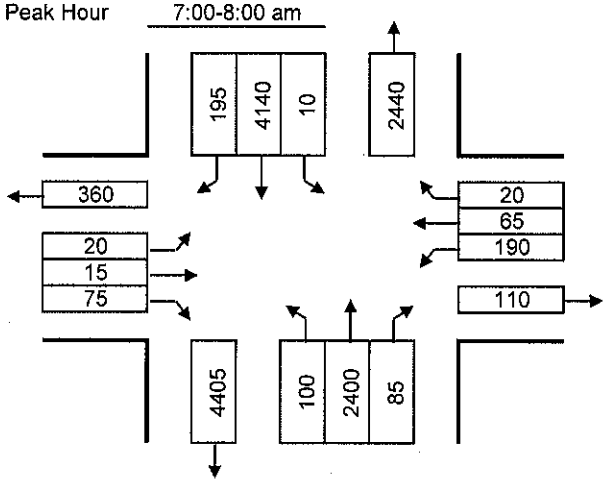
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 2/19/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

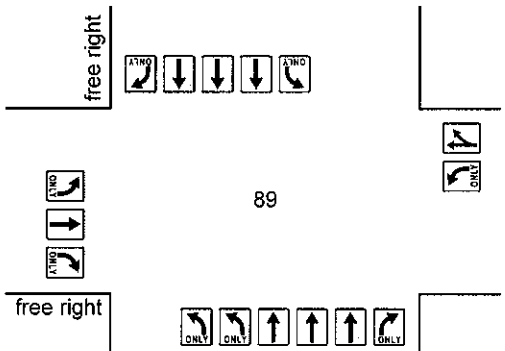
Location: US 29@ MUSGROVE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

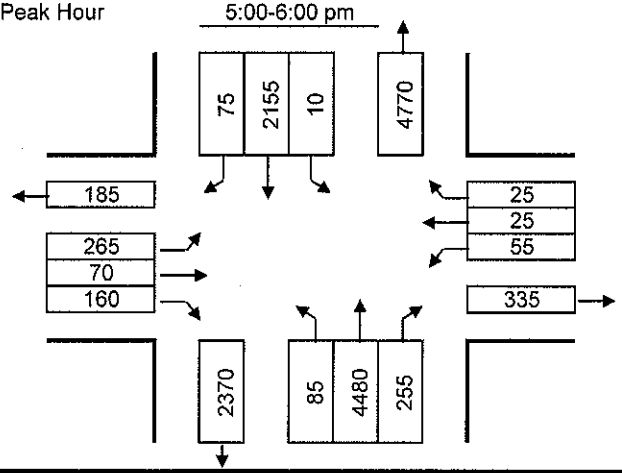
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	MUSGROVE RAOD	EB 75	EB
WB Approach:	MUSGROVE ROAD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	2400	1.00	0.37	888	10	898	
SBT + NBL	4140	1.00	0.37	1532	60	1592	*
EBT + WBL	15	1.00	1.00	15	190	205	*
WBTR + EBL	85	1.00	1.00	85	20	105	
					Critical Volume	1797	F
					V/C	1.22	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4480	1.00	0.37	1658	10	1668	*
SBT + NBL	2155	1.00	0.37	797	51	848	
EBR + WBL	160	1.00	1.00	160	55	215	
WBTR + EBL	50	1.00	1.00	50	265	315	*
					Critical Volume	1983	F
					V/C	1.34	

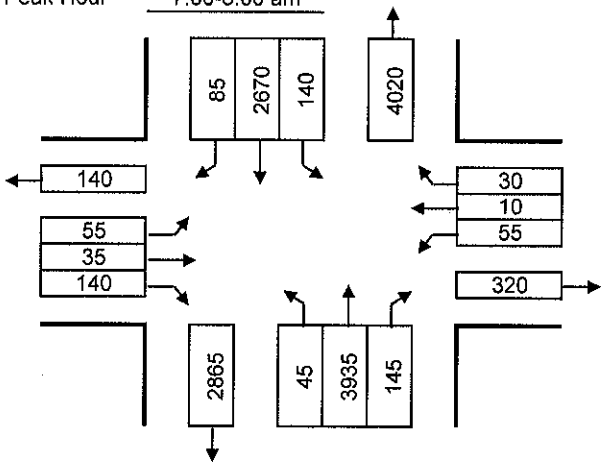
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/23/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

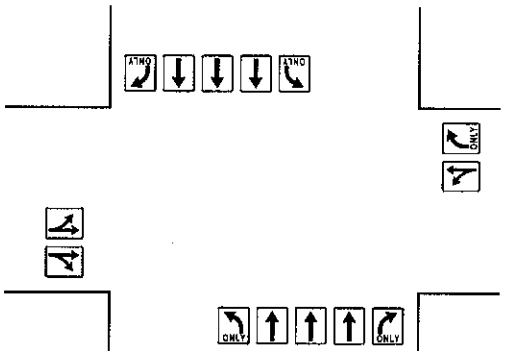
Location: US 29@STEWART LANE
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

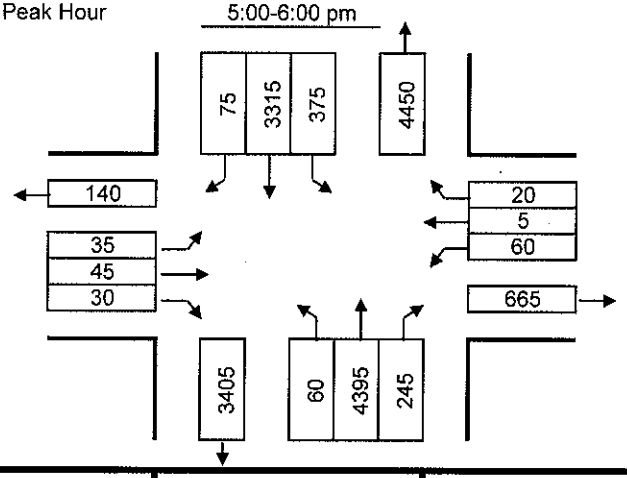
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	STEWART LANE	EB	EB
WB Approach:	STEWART LANE	WB	WB

Number of Lanes	Lane Use Factor		Opposing Volume (vph)	PCE
1 =	1.00	Congestion Standard	≤ 199	1.1
2 =	0.55	= 1475	≤ 599	2.0
3 =	0.40	for	≤ 799	3.0
4 =	0.30	Aspen Hill	≤ 999	4.0
Dbl-left	0.60	Policy Area	≤ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3935	1.00	0.37	1456	140	1596	*
SBT + NBL	2670	1.00	0.37	988	45	1033	
EBR + WBL	140	1.10	1.00	140	55	195	*
WBLT + EBL	65	1.10	1.00	71	55	126	
					Critical Volume	1791	F
					V/C	1.21	

De facto RT lane(s) assumed for EB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	4395	1.00	0.37	1626	375	2001	*
SBT + NBL	3315	1.00	0.37	1227	60	1287	
EBLTR + WBL	110	1.10	0.53	60	60	120	*
WBLT + EBL	65	1.10	1.00	71	35	106	
					Critical Volume	2121	F
					V/C	1.44	

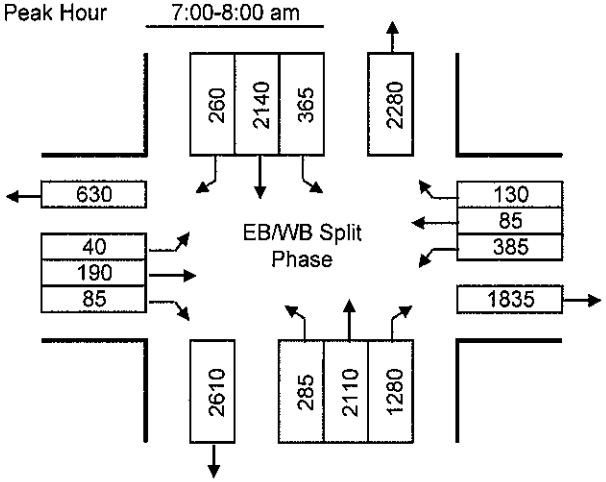
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 2/21/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

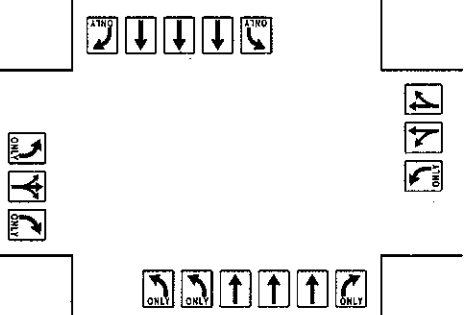
Location: TECH ROAD@US29
Computed By: Y.R.
Date: 7/14/08

Montgomery County Method

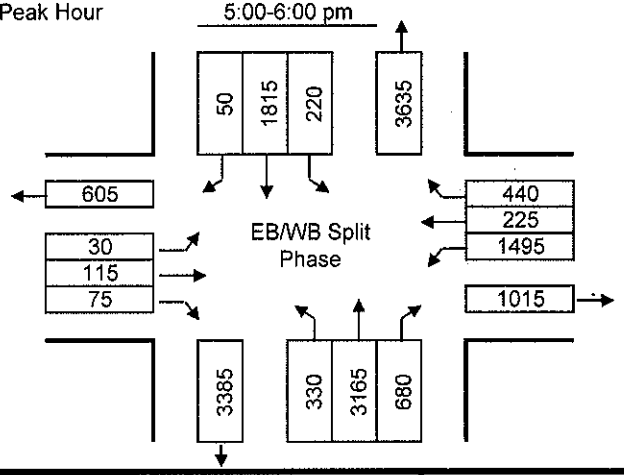
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn
Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	BELTSVILLE	NB 181	NB
SB Approach:	BELTSVILLE	SB	SB
EB Approach:	POWDER MILL RD	EB	EB
WB Approach:	POWDER MILL RD	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Fairland / White Oak Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR + SBL	1099	1.00	1.00	1099	365	1464	*
SBT + NBL	2140	1.00	0.37	792	171	963	
EBLTR	315	1.00	0.60	189	0	189	*
WBL	385	1.00	0.60	231	0	231	*
					Critical Volume	1884	F
					V/C	1.28	

De facto LT lane(s) assumed for WB approach.

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT + SBL	3165	1.00	0.37	1171	220	1391	*
SBT + NBL	1815	1.00	0.37	672	198	870	
EBLTR	220	1.00	0.60	132	0	132	*
WBL	1495	1.00	0.60	897	0	897	*
					Critical Volume	2420	F
					V/C	1.64	

De facto LT lane(s) assumed for WB approach.

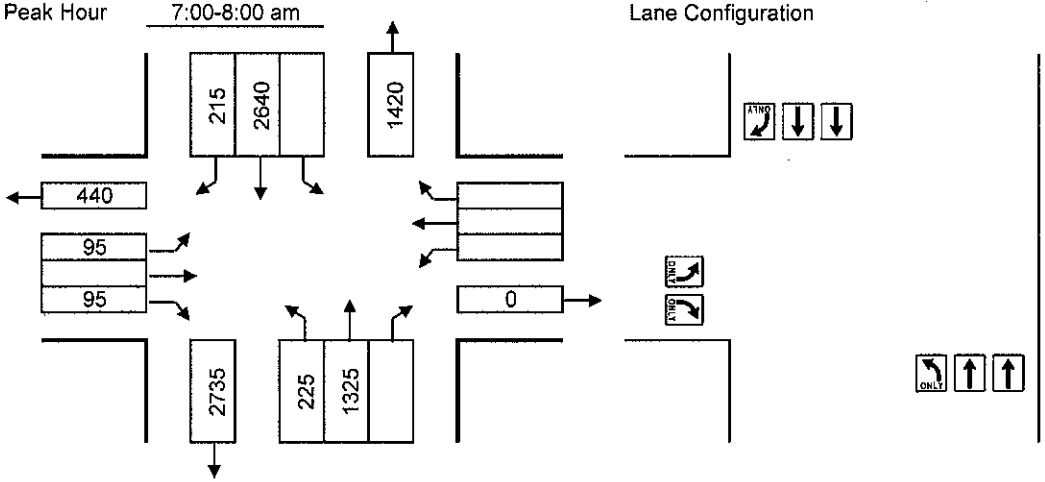
Maryland State Highway Administration
Turning Movement Summary and
Level of Service

Count Date: 10/20/2008
Conditions: PROPOSED WITH ICC
Design Year: 2012

Location: US 29@ PROSPERITY DRIVE
Computed By: Y.R. Date: 7/14/08

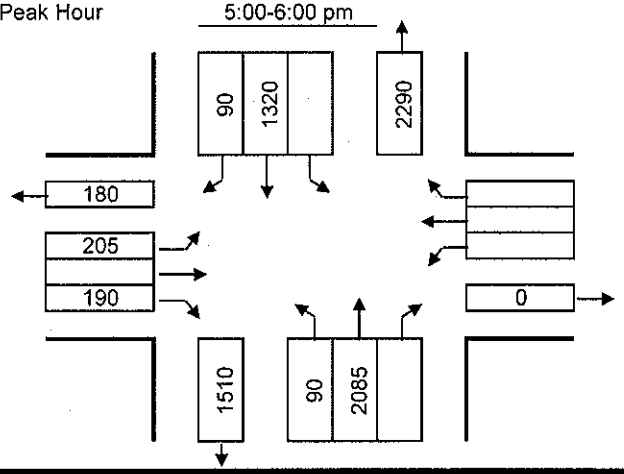
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn
Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29	NB	NB
SB Approach:	US 29	SB	SB
EB Approach:	PROSPERITY DRIVE	EB	EB
WB Approach:	PROSPERITY DRIVE	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.53
3 =	0.37
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	1325	1.00	0.53	702	0	702	
SBT + NBL	2640	1.00	0.53	1399	225	1624	*
EBL	95	1.00	1.00	95	0	95	*
					Critical Volume	1719	F
					V/C	1.17	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBT	2085	1.00	0.53	1105	0	1105	*
SBT + NBL	1320	1.00	0.53	700	90	790	
EBL	205	1.00	1.00	205	0	205	*
					Critical Volume	1310	OK
					V/C	0.89	

Maryland State Highway Administration
Turning Movement Summary and Level of Service

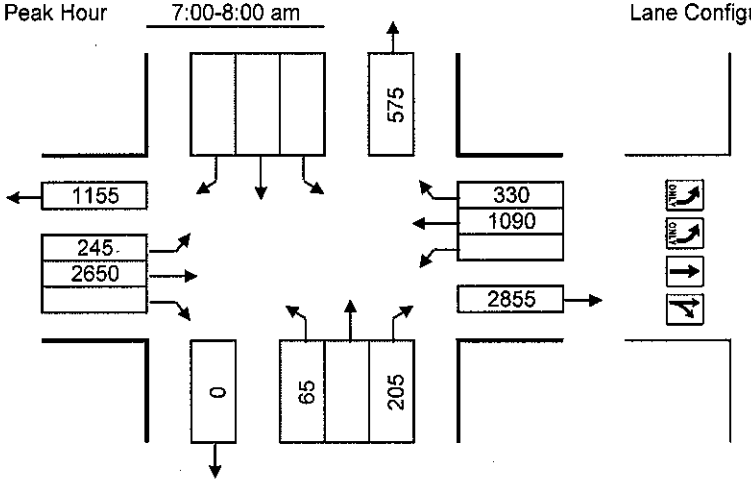
SHA

Count Date: 10/24/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

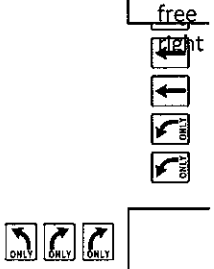
Location: US 29 NB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

Montgomery County Method

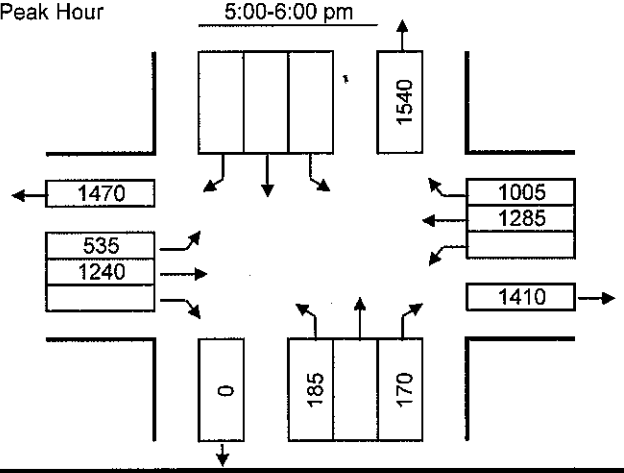
Morning Peak Hour 7:00-8:00 am



Lane Configuration



Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB 1005

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
≥	1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBR	205	1.00	0.53	109	0	109	*
EBT	2650	1.00	0.53	1405	0	1405	*
WBT + EBL	1090	1.00	0.53	578	147	725	
					Critical Volume	1514	F
					V/C	1.03	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
NBL	185	1.00	1.00	185	0	185	*
EBT	1240	1.00	0.53	657	0	657	
WBT + EBL	1285	1.00	0.53	681	321	1002	*
					Critical Volume	1187	OK
					V/C	0.80	

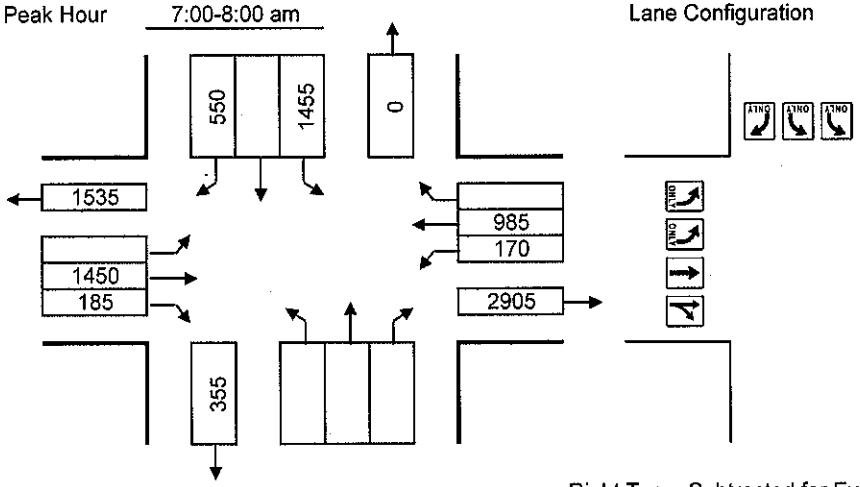
Maryland State Highway Administration
Turning Movement Summary and Level of Service

Count Date: 10/24/2007
Conditions: PROPOSED WITH ICC
Design Year: 2012

Location: US 29 SB RAMP@ CHERRY HILL
Computed By: Y.R. Date: 7/14/08

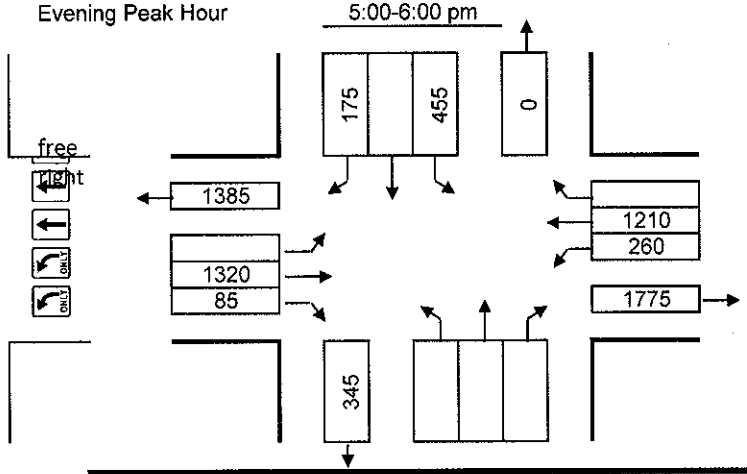
Montgomery County Method

Morning Peak Hour 7:00-8:00 am



Lane Configuration

Evening Peak Hour 5:00-6:00 pm



Right Turns Subtracted for Exclusive Right Turn Overlap Phasing or Right Turn on Red:

		AM	PM
NB Approach:	US 29 NB RAMP	NB	NB
SB Approach:		SB	SB
EB Approach:	CHERRY HILL	EB	EB
WB Approach:	CHERRY HILL	WB	WB

Number of Lanes	Lane Use Factor
1 =	1.00
2 =	0.55
3 =	0.40
4 =	0.30
Dbl-left	0.60

Congestion Standard = 1475 for Aspen Hill Policy Area

Opposing Volume (vph)	PCE
≤ 199	1.1
≤ 599	2.0
≤ 799	3.0
≤ 999	4.0
≥ 1000	5.0

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	1455	1.00	0.60	873	0	873	*
EBTR + WBL	1635	1.00	0.53	867	102	969	*
WBT	985	1.00	0.53	522	0	522	
					Critical Volume	1842	F
					V/C	1.25	

Movement	Volume	PCE	Lane Use Factor	Lane Volume	Opposing Lefts	Critical Lane Volume	*
SBL	455	1.00	0.60	273	0	273	*
EBTR + WBL	1405	1.00	0.53	745	156	901	*
WBT	1210	1.00	0.53	641	0	641	
					Critical Volume	1174	OK
					V/C	0.80	