Montgomery County Department of Transportation
Division of Traffic Engineering and Operations

COMMUNITY DISCUSSION PAPER

DETERMINATION OF ACCESS RESTRICTION ELIGIBILITY

Decatur Ave

Prepared in cooperation with Mead & Hunt, Inc.

Executive Summary

- On August 23rd, 2022, residents of Decatur Ave petitioned the County for access restrictions for AM and PM rush hours eastbound and westbound traffic.
- In December of 2022, traffic counts, for both traffic volume and speed, were conducted. These counts were conducted on Lawrence Avenue, as well, but were too low to satisfy the eligibility requirements for Montgomery County's access restrictions standards.
- Based on the Decatur Ave traffic counts, anonymized license plate data was collected in the evening peak hour to determine the degree of cut-through traffic. The license plate data was further processed to determine the block location of the registered vehicles in order to map the origin of the drivers along Decatur Ave.
- In June 2023, a Community Discussion paper was drafted based on the data collection effort and analysis, in conjunction with Executive Regulation 17-94. Per Executive Regulation 17-94, Decatur Avenue meets the County's requirements for access restrictions per in the PM peak hour.
- The recommended access restriction is:

  Installation of a regulatory sign to restrict eastbound right turns from Wexford Drive to Decatur Ave from 4:00 – 6:00 PM Monday through Friday.
- This restriction will prohibit all local and non-local traffic from entering Decatur Ave from Wexford Drive. This restriction will also result in the signalized intersections of MD 547 (Knowles Ave) at Beach Dr and MD 547 (Knowles Ave) at MD 185 (Connecticut Ave) degrading to a Level of Service E and F, respectively.
- Next steps will involve sharing the Discussion Paper with the community and implement signs if the majority approve the restriction.

1. INTRODUCTION

Executive Regulation 17-94 "Through Traffic Volume Access Restrictions in Residential Areas" was authorized to aid in the County's efforts to "enhance neighborhood traffic safety and maintain 'livable' residential environments by providing a procedure for reducing excessive volumes of through traffic." The policy attempts to balance the needs of all impacted parties while maintaining the efficient and appropriate use of County streets and public rights of way.

The Department of Transportation assists communities in developing a Through Traffic Volume Management Plan by designing and evaluating the impacts of access restrictions. The Department then reports its preliminary assessment in a "Community Discussion Paper (CDP)", which will serve as the basis for discussions with residents and other potentially impacted parties. The purpose of this CDP is to determine access restriction eligibility for Decatur Ave in Kensington, as well as to evaluate traffic impacts on any proposed access restrictions.

2. REGULATORY PROCESS

The development of, criteria for, public comment on, and approval process for installation of access restrictions in residential areas follows seven sequential steps:

1. **Application & Eligibility:** The process begins with an initial request for access restrictions and determination of street eligibility for access restrictions.
   - Application - A request for neighborhood through traffic volume restrictions may be made by a local citizens Association which represents a significant number of residents or by a petition from 15 percent of the households in an area being proposed for traffic restrictions.
   - Eligibility - The Department will assess the area described in the application and adjust boundaries as appropriate to delineate the traffic shed. Eligibility of one or more streets in a residential area for volume restrictions must be based on satisfying criteria for:
     - Functional classification of the study roadways
     - Measured traffic volumes.
     - Estimated non-local traffic.

2. **Project Development:** Once eligible, the Department will move forward to develop a detailed plan and assess the potential traffic impacts of that plan.
   - Preliminary Plan – input from the community will be solicited and considered in developing a detailed plan to manage through traffic volumes on eligible streets within a traffic shed or volume management area. The plan may include traffic controls such as signs and pavement markings or other physical barriers that establish turn or entry restrictions, one-way traffic flows, or mandatory turns. Speed reduction measures such as speed humps, chokers, roundabouts, etc. and pedestrian improvements such as sidewalks are addressed under other processes established by the Department. Under no circumstance may a street be fully closed to traffic.
   - Community Discussion Paper – A formal study typically including 1) technical and quantitative analysis of existing traffic conditions such as traffic volumes, travel times, origin-destination

surveys, 2) the development of a plan for implementing one or more access restriction measures, and 3) the assessment of potential consequences of such actions on:

- the surrounding residential streets that may receive diverted traffic.
- the surrounding collector, arterial and highway network that is intended to carry through traffic volumes.
- potential impacts on access to public facilities such as schools, parks and libraries located within the traffic volume management area.
- compatibility with Master and Sector Plans

3. **Community Assessment:** Once a Preliminary Plan and Community Discussion Paper have been completed, disclosure and public dialogue and access to information for a minimum of 30 days. Stakeholders for the Plan may include the following groups:
   - Community Associations
   - Business Associations
   - Local Municipalities (e.g., Town of Chevy Chase)
   - Schools
   - Hospitals
   - Other County Agencies (e.g., Department or Recreation, M-NCPPC)

   Means of communication the Department may undertake with stakeholders may include any or all of the following:
   - Public Notification
   - Working Groups
   - Advisory Committee

4. **Final Plan:** Based on the feedback received during the Community Assessment phase, the preliminary plan may be revised by the Department to address concerns and a Final Plan will be produced.

5. **Public Hearing:** Within 60 days of submitting a Final Plan, a public hearing will be held, with ample (15 days) notice and hearing announcements posted, and a hearing officer will decide on behalf of the Executive whether to support the plan. In deciding whether to create an area and adopt a plan for that area, the Executive must consider:
   - the classification or function of each street in the area and existing street widths;
   - overall traffic volumes and level of use by non-local traffic;
   - pertinent traffic and pedestrian safety factors;
   - the impact of possible traffic flow restrictions on nearby residential areas, businesses, public access and facilities, and the surrounding street network;
   - feasibility of compliance and enforcement;
   - the need of the residents in the proposed area for traffic flow restrictions;
   - approved or pending master or sector plans; and
   - any other factor the Executive finds relevant. The Executive must not reject a proposed plan primarily because it would increase traffic volumes on arterial roads.

In summary, the Executive must decide if the benefits of the Plan outweigh the possible impacts to the surrounding community, higher functioning roadways, or other resources. However, the Executive does have discretion to request specific modification to the Plan to better balance the goals of the plans with the potential consequences of access restrictions.

6. **Adaptation:** Once the plan in recommended by the Executive for implementation, the applicant will be asked to collect a petition from determined eligible properties (one adult signature per property) to move forward. A simple majority (51% or more) will be required to adopt the Plan; a non-response will be considered a no vote.

7. **Implementation and Assessment:** Once adopted, passive measures will be scheduled for installation by Department forces. In cases where physical measures have been recommended, funding for construction may be submitted through the County's Capital Improvement Program.

After a period of a minimum of 90 days, the Department may conduct an 'after' assessment to document actual changes in traffic patterns.

3. GLOSSARY OF TERMS

Definitions for common terminology used in this report are presented below.

Access Restriction – A full or part-time regulatory prohibition or physical barrier preventing full or directional entry into or through a particular street.

Arterial – A roadway that functions primarily to facilitate high volume vehicular traffic connections between, collector streets and major thoroughfares such as expressways and freeways; and secondarily to provide access to abutting land uses.

Average (Weekday) Daily Traffic (AWDT) – The average total number of vehicles in one or more direction of travel in a 24-hour (weekday) period passing a given point on a roadway.

Collector – An intermediary street that funnels vehicular traffic to and from local streets and arterials, providing moderate access to adjacent land uses.

Community Association - Any incorporated or unincorporated common ownership or Civic Association which represents the interests of the subdivision in which the street being considered for access restrictions is located.

Community Discussion Paper – A formal study typically including 1) technical and quantitative analysis of existing traffic conditions such as traffic volumes, 2) the development of a plan for implementing one or more access restriction measures, and 3) the assessment of potential consequences of such actions.

Cut-through or Non-local traffic – Through traffic diverted from arterial and collector streets onto local residential streets to avoid congestion and/or longer trips, with both an origin and destination external to

the neighborhood and/ or traffic shed boundaries as documented in a license tag survey sample or other appropriate measure. Note that vehicles which cross a collector or arterial road from an originating local street and continue to another local street in the same destination direction of the collector/arterial road, without a destination on that local street, may be considered part of the non-local traffic in some cases depending on the exact boundaries of the traffic volume management area.

Functional Classification – Is the process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they are intended to provide. There are four highway functional classifications: highway, arterial, collector, and local roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access that they allow.

Major Highway – A roadway with limited or controlled access that carries high through traffic volumes between freeways, central business districts and other major traffic generators. Major highways provide a high level of traffic service and a low level of direct access to local development.

Management Plan – That group of traffic controls, which may include signs, pavement markings, and physical devices or barriers, designed to reduce, divert, or discourage non-local traffic in a particular neighborhood or on a particular neighborhood street.

Neighborhood Traffic Committee – An ad hoc group of residents formed in the absence of an active Community Association which represents the interests of the subdivision in which the street being considered for speed humps is located.

Residential Street – A neighborhood street providing direct access to abutting residential land uses, not intended to service traffic traveling beyond or through a neighborhood. Residential streets can be sub classified as follows:

- Primary Residential Street: A neighborhood street serving as a collector for local traffic from secondary and tertiary residential roadways, designed to feed traffic to arterial and major highways. Primary roadways provide a moderate level of traffic service and a high level of direct residential property access. Can also be defined as a Master Plan primary street so designated in a Master or Sector plan.
- Secondary residential street – A neighborhood street providing a high level of direct residential access and a limited level of traffic service; not intended to provide for traffic traveling through the neighborhood.
- Tertiary residential roadway – A neighborhood street with similar function to a secondary street but having a narrower right-of-way and typically ending in a cul-de-sac.

Study Intersections/ Study Area – A geographic area which includes all critical intersections along arterials or major highways that connect to each other or local collector and residential streets within the traffic shed or traffic volume management area and which may need to be analyzed to determine potential impacts of access restrictions.

Traffic Shed – A geographic area defined by an interconnected network of local primary, secondary and tertiary streets within a neighborhood or portion of a neighborhood that feed into the same arterials or major

highways.

Traffic Volume Management Area – An area defined by natural or physical/ transportation boundaries, typically encompassing one or a portion of a neighborhood or traffic shed, within which residents, businesses and other visitors may be required to change their travel patterns to reach a local origin or destination within the traffic volume management area with the implementation of access restrictions on one or more streets.

85th-Percentile Speed – The speed at or below which 85% of the vehicles are moving. 85th-persentile speed is a common measure of the speed at which most motorists consider safe and reasonable based on the prevailing geometric and traffic conditions on a particular roadway. Studies have demonstrated that drivers who travel either slower or faster than the 85th-percentile speed of the traffic stream have a higher rate of crash involvement rate than those drivers whose speed is close to the 85th-percentile speed. The measured 85th-percentile speed indicates that only 15% of drivers exceed it.

4. STUDY AREA LOCATION AND PURPOSE

A. Study Area

Kensington Residents in Montgomery County, MD state that non-local drivers are using Decatur Ave via Wexford Dr during commuter rush hours. Residents believe this cut-through traffic is using local neighborhood streets to avoid congestion and delays on MD 185 and Knowles Ave.

Definitions of key areas for this study are as follows:

- The Traffic Shed is bounded by Knowles Ave (MD 547), Connecticut Ave (MD 185), University Ave (MD 193) and Garrett Park Rd.
- The Traffic Volume Management Area is defined as Decatur Ave from Wexford Dr to MD 185.
- Study Intersections will include Beach Dr at Wexford Dr, Beach Dr at Knowles Ave, and Knowles Ave at MD 185.

A map of the traffic shed and traffic volume management area is shown in Figure 1.

FIGURE 1: STUDY AREA MAP

B. History

The neighborhood has noted that the excessive cut-through traffic through the community along Decatur Ave has negatively impacted the quality of life and safety of residents. This is potentially due to increasing regional traffic volumes, as well as recurring congestion along MD 185 and Knowles Ave. Motorists may perceive it is faster to cut through the neighborhood than to remain on the State highways.

C. Location

The study area is situated west of MD 185, east of Beach Dr, and north of Knowles Ave. The neighborhood is comprised of county-maintained roads. An area map is shown in **Figure 2**.

FIGURE 2: LOCATION MAP (NOT TO SCALE)

D. Purpose

The purpose of the study is to document the volume of non-local through traffic utilizing the study roadways to avoid congestion on MD 185 and Knowles Ave, and, if eligible, develop and implement an access restriction plan after evaluating the potential impact of that plan on the roadway network and community. This paper summarizes the results of a technical analysis including existing conditions, traffic volumes, capacity analysis, license plate surveys, travel time, and field observations.

5. EXISTING CONDITIONS ANALYSIS

A. Roadway Network, Land Use, Community Resources and Existing Restrictions

The following section describes the study area roadway network and its characteristics, existing land use mixture, community resources such as public spaces, and vehicular access restrictions that are already in place.

The Montgomery County Master Plan of Highways classifies MD 185 (Connecticut Ave) as a major highway. MD 185 is a six-lane divided roadway between the District of Columbia and mid-Montgomery County. The speed limit along MD 185 within the study area is 30 miles-per-hour (mph); there are three traffic signals along MD 185 within the study traffic shed area. MD 547 (Knowles Ave) is classified as a primary residential roadway. Knowles Ave is a two-lane roadway between Beach Drive and MD 185 with a posted speed limit in the study area of 25-mph. The intersection of Knowles Ave at Beach Dr and MD 185 are signalized.

Decatur Ave is a local roadway with width and on-street parking characteristics that allow for one unobstructed lane for travel in both directions meeting the Executive Regulation 17-94 description for a Tertiary Residential Street.

Land uses along Decatur Ave are exclusively residential except for a driveway for the Kaiser Permanente office building on the SW corner of Decatur Ave at MD 185. Surrounding land uses are composed of primarily of residential, schools, and parks to the east, north, and west with commercial uses to the south along MD 185.

There are no **existing traffic restrictions** and controls for the community.

Existing traffic calming is limited to a mini roundabout at the intersection of Wexford Dr and Decatur Ave.

A detailed map of all access restrictions is shown in **Figure 3** on the next page.

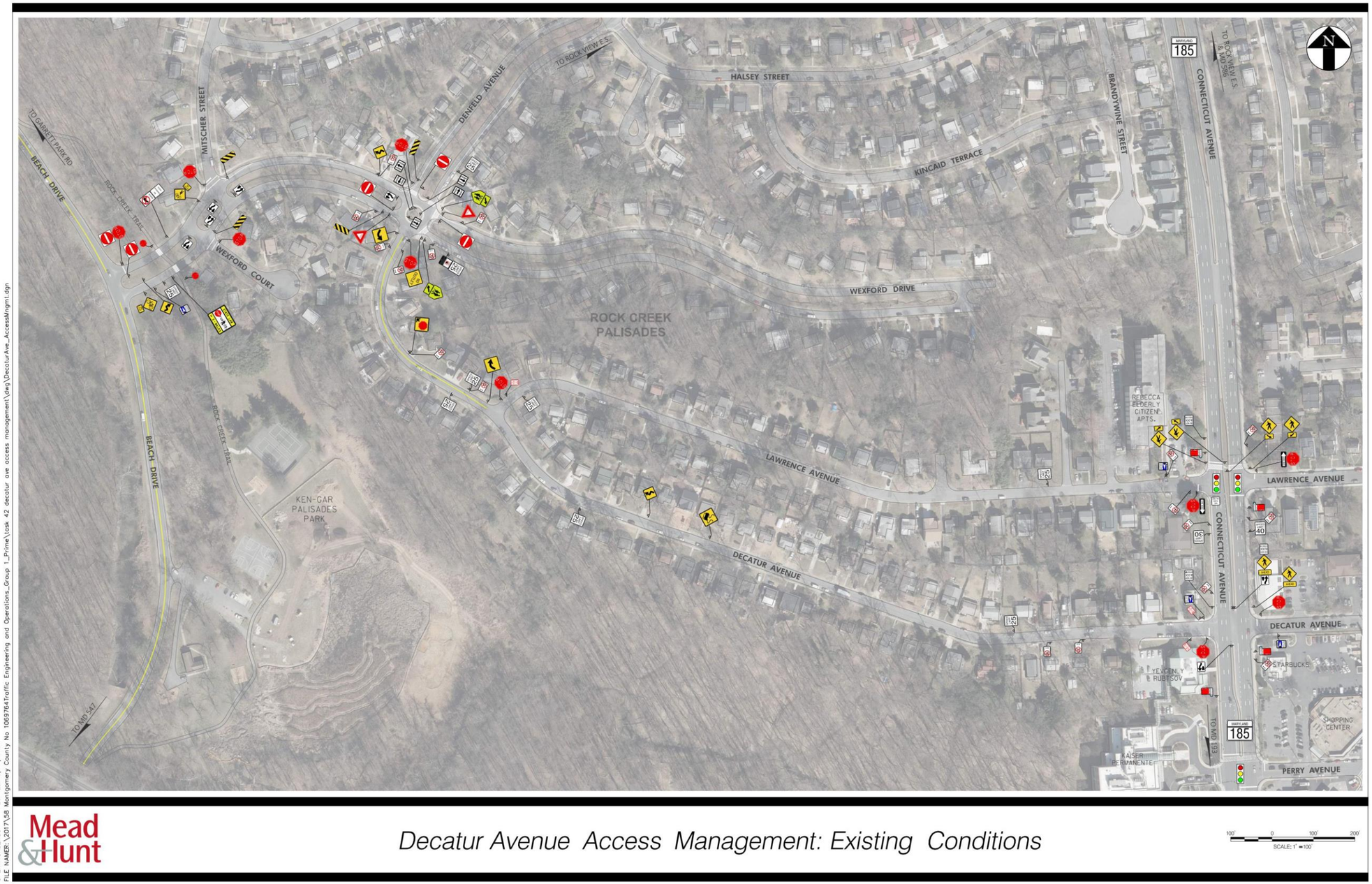


FIGURE 3: EXISTING ACCESS RESTRICTIONS

B. Traffic Volumes

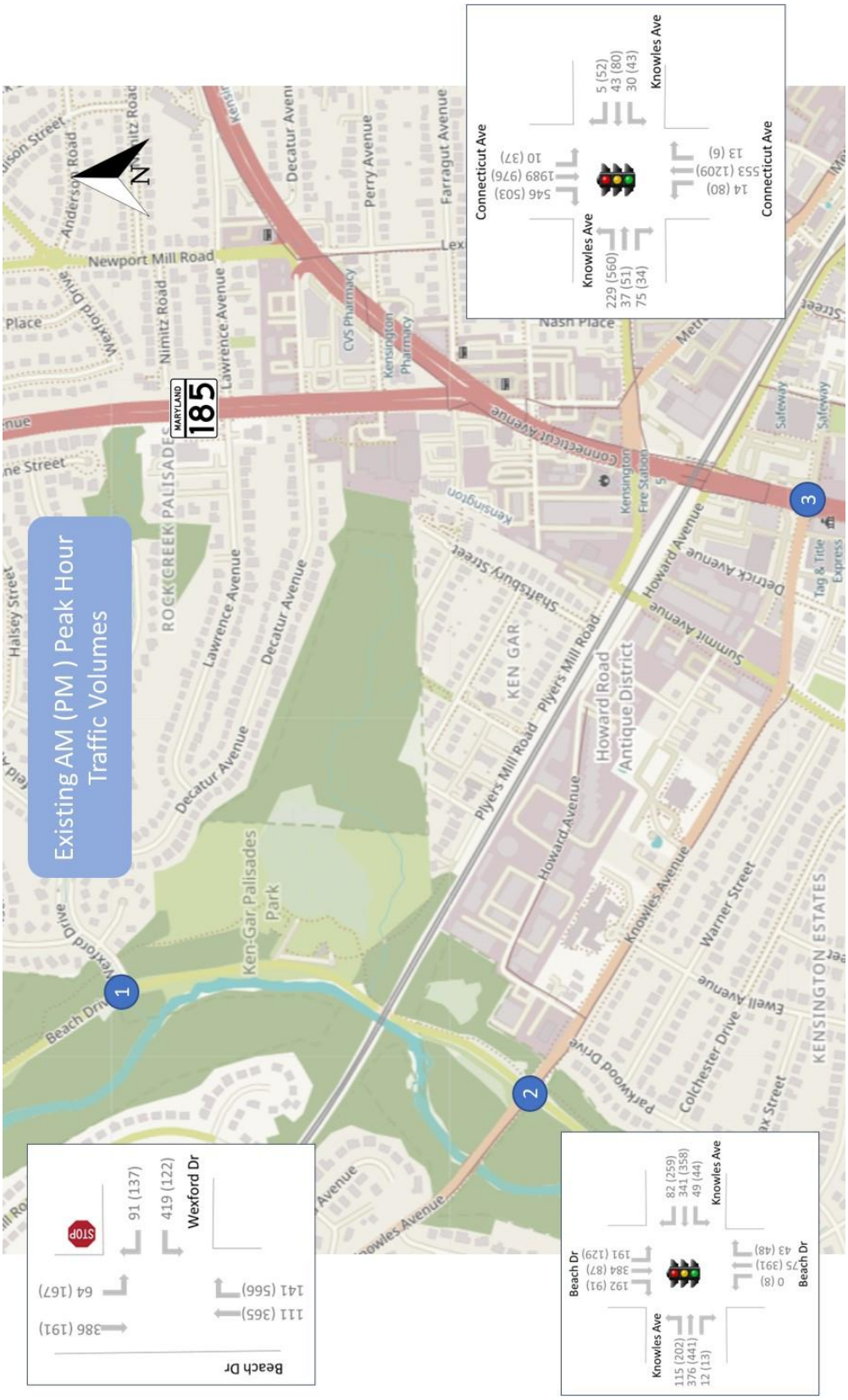
Peak hour intersection traffic data for the study area intersections was gathered from the Maryland State Highway Administration (MDSHA), Maryland-National Capital Park and Planning Commission (MNCPPC) and supplemented with new data collected as a part of this study. The new volume data was collected at Beach Dr at Wexford Dr, Beach Dr at Knowles Ave, and MD 185 at Knowles Ave on February 28, 2023. Figure 4 illustrates peak hour *balanced* volumes at study intersections. Detailed traffic data is included in Appendix A. Table 1 summarizes the most conservative volumes for the weekday AM and PM peak hour bi-directional traffic volumes along the study roadway segments.

TABLE 1: PEAK HOUR BI-DIRECTIONAL TRAFFIC VOLUMES - AM (PM)

Roadway	Westbound/ Northbound	Eastbound/ Southbound	Total Peak Hour Volume	Total Daily Volume
Decatur Avenue: between Wexford Dr and MD 185.	49 (72)	80 (143)	129 (220)	1,679
Lawrence Avenue: between Decatur Ave and MD 185.	13 (12)	19 (20)	32 (32)	248
Knowles Ave: 0.20 -mi W of MD 185	332 (466)	409 (443)	741 (909)	10,235
MD 185: 0.10-mi N of MD 192	1,093 (2,460)	2,828 (1,551)	3,921 (4,001)	50,098
Beach Dr: 0.10-mi N of MD 547	208 (749)	511 (330)	719 (1,079)	9,427

The total volume of traffic on Lawrence Ave is less than 100 vehicles per hour during the AM and PM peak hours and does not meet the minimum threshold for eligibility of access restrictions; therefore, this study will focus on evaluating cut-though and access controls along Decatur Avenue only.

FIGURE 4: EXISTING VOLUMES DIAGRAM



C. Capacity Analysis

The Critical Lane Volume Analysis (CLV) methodology was used to evaluate capacity and level of service for the selected intersections during the AM and PM peak hours. Performance measures of effectiveness include critical lane volume, volume-to-capacity ratio, and level of service.

The critical lane volume for each peak period is found by combining the critical lane volumes for the NB/SB movements and EB/WB movements. The critical lane volumes indicate the highest volume for a given approach lane configuration in each direction. The volume-to-capacity ratio (v/c ratio) is the ratio of current flow rate to the capacity of the facility. This ratio is often used to determine how sufficient capacity is on a given roadway. Generally, a ratio of 1.00 indicates that the roadway is operating at capacity. A ratio of greater than 1.00 indicates that the facility is failing as the demand of vehicles exceed the intersection's available capacity.

The level of service (LOS) is a letter designation that corresponds to a certain range of roadway operating conditions. The levels of service range from A to F, with A indicating the best operating conditions and F indicating the worst, or a failing, operating condition. Level of service thresholds are summarized in Table 2, the results of the capacity analyses are summarized in Table 3. Detailed capacity worksheets for existing conditions are included in Appendix B.

TABLE 2: CRITICAL LANE VOLUME LEVEL OF SERVICE PARAMETERS

LOS	Volume (CLV)	Expected Problems at Intersection
A	≤ 1000	Very low delay
B	> 1000 and ≤ 1150	Short delay
C	> 1150 and ≤ 1300	Number of vehicles stopping is significant
D	> 1300 and ≤ 1450	Influence of congestion becomes noticeable
E	> 1450 and ≤ 1600	Limits of capacity, moderate to excessive delay
F	> 1600	Oversaturated traffic conditions, excessive delay

(Source: MD State Highway Administration.)

TABLE 3: CAPACITY ANALYSIS SUMMARY TABLE

Intersection	Critical Lane Volume	Volume-to-Capacity Ratio	Level of Service
Beach Drive at Wexford Drive	1,024 (1,357)	0.64 (0.85)	B (D)
Beach Drive at Knowles Avenue	1,107 (1,348)	0.69 (0.84)	B (D)
MD 185 at Knowles Avenue	1,126 (1,556)	0.70 (0.97)	B (E)

D. Non-Local Traffic

A license plate survey was performed in February 2023 to determine the percentage of cut-through traffic along Decatur Ave between Beach Dr and MD 185. The purpose of the license plate study is to determine the percentage of non-local traffic currently utilizing the neighborhood streets, i.e., those vehicles without either an origin or destination within the defined traffic shed. The evaluation was conducted by recording license plate data in the field and then entering them into a database to perform a record search of the vehicle's registered address.

In the evening hour of 5:00 PM to 6:00 PM, it was observed that of 140 vehicles entering Decatur Ave from Wexford Drive, 22 were local and 118 were non-local (84%).

Table 4 below illustrates the license plate study vehicles survey and the resultant percentage of traffic determined to be cut-through. A map showing the anonymized address blocks of the vehicles surveyed is provided in Figure 5.

TABLE 4: LICENSE PLATE SURVEY

Location	Date	Time	Within ¾ mile Boundary	Outside 1-mile Boundary	Total Vehicles	Remarks
Decatur Ave between Beach Dr and MD 185	2/28/2023	5-6 PM	22	118	140	= 84% >50% Cut Through Traffic, Meets Criteria

To ensure that the license plates from the above survey did not reflect visitors to Kaiser Permanente, two simultaneously-connected license plate gathering efforts were conducted. At the same time, license plates were video-recorded (with timestamps) for vehicles turning right from Wexford onto Decatur and also from Decatur onto Connecticut – east of the Kaiser Permanente driveway. Timestamped license plates were documented for both locations. If a license plate / vehicle was observed at *both* locations within a five-minute timeframe it was assumed to be a non-local vehicle cut through traffic and analyzed further for anonymous addressing as shown in Table 4.

License Plate Tag Locations

Decatur Avenue

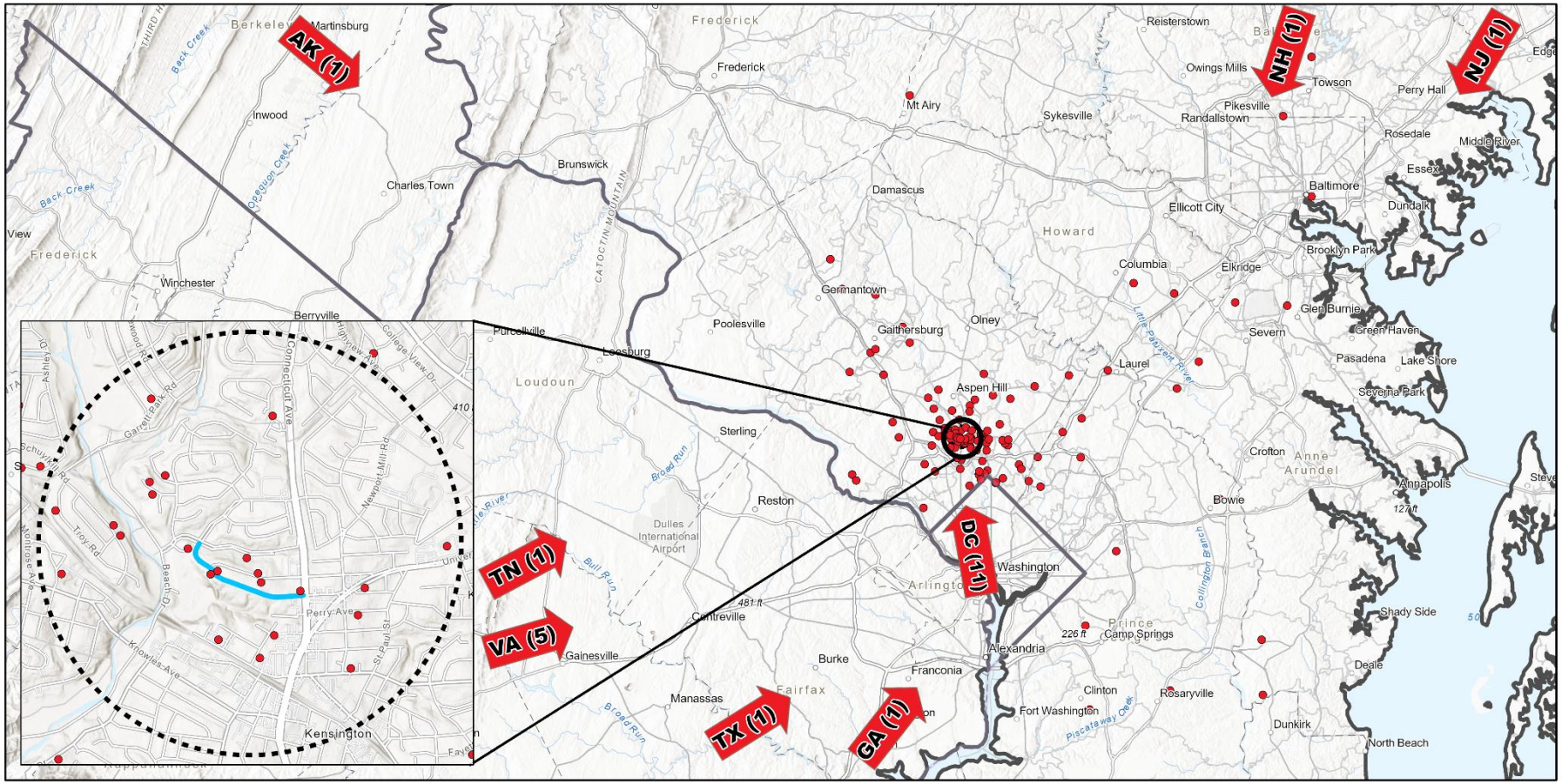


FIGURE 5: LICENSE PLATE SURVEY MAP

E. Travel Time Analysis

Detailed field investigations of travel times along Decatur Ave, and adjacent primary roadways were performed during a typical midweek day (December 8, 2022) during the AM (7:00 – 9:00) and PM (4:00 – 6:00) peak hours, while school was in session. The purpose of this analysis is to document relative travel times, including delay at signalized intersections, over routes that diverted traffic may experience if access restrictions were implemented along Wexford Dr to/from Decatur Ave. Three (3) travel time runs were conducted for Routes 1 and 2 listed below (Figure 6 shows the travel time run paths for routes 1 and 2). The starting and ending points were the same for each route and compare the Decatur Ave cut-through route with the same trip using the primary route of Beach Dr to Knowles Ave. Table 5 shows a summary of the average travel times recorded during the AM peak hours. Detailed travel time information for each route can be found in Appendix C.

- Route 1 (Southeast-bound Baseline): From Beach Dr at Wexford Dr southbound along Beach Dr to the intersection of Beach Dr and Knowles Ave; left to eastbound Knowles Ave to Knowles Ave at MD 185. The average duration of the Baseline route in the AM and PM peak hours is 5 minutes and 59 seconds and 6 minutes and 40 seconds, respectively.
- Route 2 (Southeast-bound Decatur Avenue): From Beach Dr at Wexford Dr eastbound along Wexford Dr to the intersection of Wexford Dr and Decatur Ave; right to eastbound Decatur Ave to Decatur Ave at MD 185; right to MD 185 southbound to MD 185 at Knowles Ave. The average duration of the Decatur route in the AM and PM peak hours is 6 minutes and 1 second and 5 minutes and 42 seconds, respectively.

TABLE 5: SUMMARY OF TRAVEL TIME ROUTES AND RESULTS

Route Number	Direction	Route Description	AM	PM
1	Southeastbound	Knowles Ave	5:59	6:40
2	Southeastbound	Decatur Ave	6:01	5:42

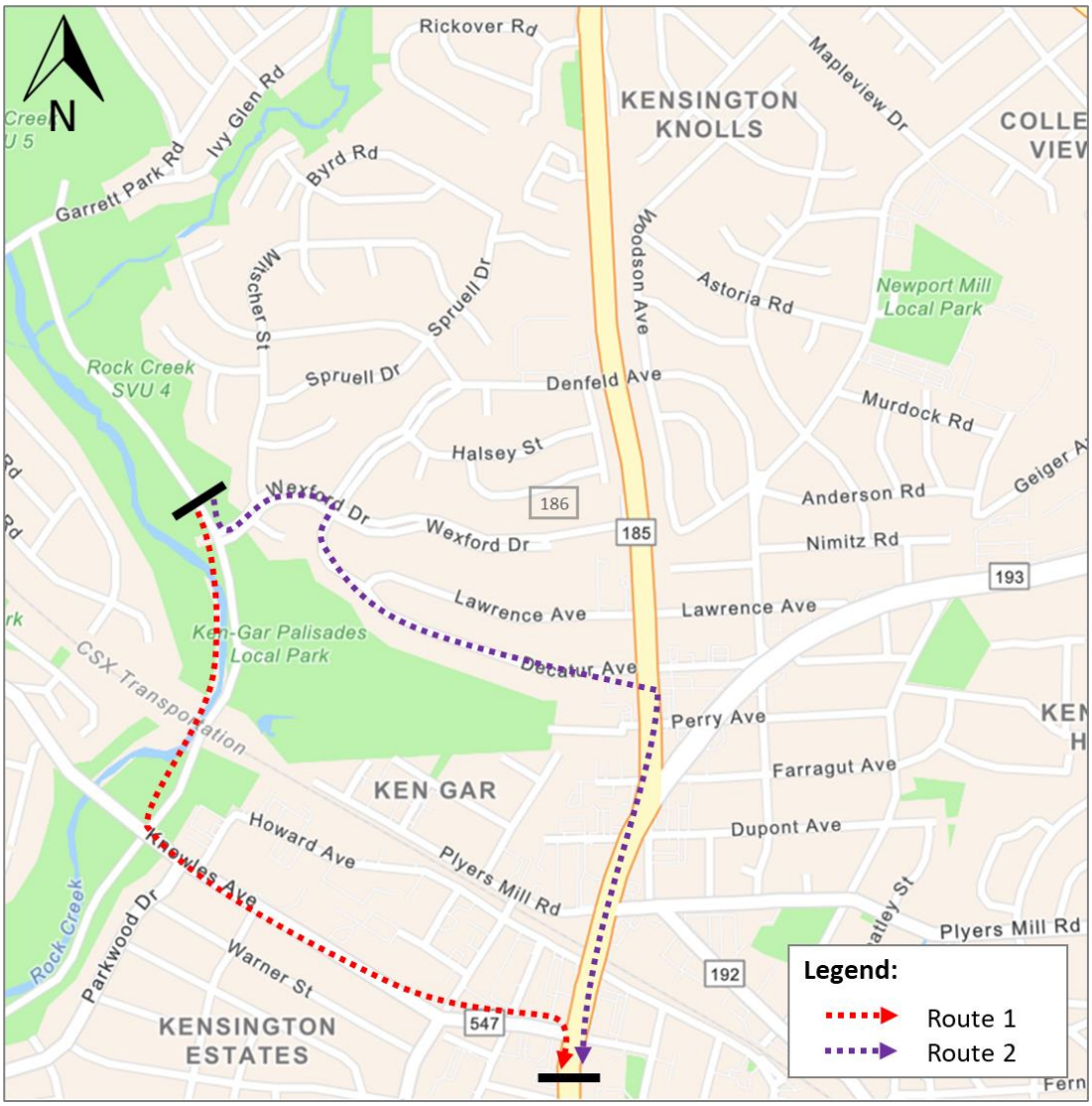


FIGURE 6: AM TRAVEL TIME ROUTES

Findings indicate that typically the baseline route, Beach Dr to Knowles Ave, has the higher or similar travel times to that of the Decatur Route in both the AM and PM peak hours thus affirming the desire to cut-through using Decatur Ave.

F. Field Observations

A Professional Traffic Engineer observed the study area in December 2022 on a weekday during the morning and evening peak hours, specifically focusing on driver behavior, traffic patterns and queues, geometry, and overall traffic operations. The following summarizes the observations:

- Moderate southbound congestion along MD 185 from Plyers Mill Rd through the MD 193 intersection to Decatur Ave with minimal congestion along Beach Dr and Knowles Ave.
- Moderate to heavy congestion in both direction of MD 185 between Knowles Ave and MD 193 and along Knowles Ave between Beach Dr and MD 185.

6. ACCESS RESTRICTION ELIGIBILITY ANALYSIS

According to Executive Regulation 17-94AM, the eligibility requirements and satisfaction thereof are summarized below in Table 6. The evaluation focuses on Decatur Ave.

TABLE 6: SUMMARY OF DECATUR AVENUE ACCESS RESTRICTION ELIGIBILITY ANALYSIS

Criteria	Description	Existing Condition	Satisfied?
Street Classification	Access volume restrictions limited to tertiary, secondary, and primary residential streets.	All of the study streets in the community are classified as tertiary residential streets.	**Yes**
Measured Traffic Volumes	A minimum two-directional volume: > 400 vehicles per hour for at least one hour of a weekday peak or off-peak time period on a **primary street** with one unobstructed travel lane in each direction. > 250 vehicles per hour on a **non-primary residential street** with one unobstructed travel lane in each direction. > 100 vehicles per hour on any **residential street** with one unobstructed travel lane serving both directions.	Based on the tertiary residential roadway classification, the measured traffic volumes exceed the 100 total two-way volume per hour on Decatur Avenue.	**Yes**
Estimated Non-Local Traffic	Non-local traffic must exceed 50 percent of the highest hourly volume, as documented by a license plate survey.	Non-local traffic is above 50% for the highest hourly volume.	**Yes**

Findings

The community along Decatur Avenue in Montgomery County petitioned for a determination of access restriction eligibility to address a perceived cut-through traffic problem. The results of a technical analysis confirm the following findings:

- The land use is primarily single family residential with one office building and serves internal local traffic.
- Based on the capacity analysis results under the existing conditions, the Beach Drive at Wexford Drive unsignalized intersection and the Beach Drive at Knowles Avenue signalized intersection operates at an acceptable Level of Service during the AM and PM peak hours. The signalized intersection of Knowles Avenue at MD 185 operates at unacceptable level of service during the PM only.
- The traffic volumes on Lawrence Avenue do not satisfy the minimum requirements of 100 vehicles per hour during the AM and PM peak hours and therefore do not satisfy the eligibility requirements for access restrictions.
- The two-way traffic volumes on Decatur Avenue satisfy the minimum requirements of 100 vehicles per hour during the AM and PM peak hours.
- A license tag survey documented 86% (120 vehicles) during the evening peak hour were non-local traffic on Decatur Avenue.
- Based on the above findings, Decatur Avenue is eligible for access restrictions.

7. ACCESS RESTRICTION PLAN IMPACT ANALYSIS

An access restriction plan must balance the needs of both the neighborhood and the prevailing traffic conditions. An access restriction plan may not include traffic calming measures such as speed humps or small traffic circles, nor does it permit a complete roadway closure. The plan may include signs and/ or physical barriers that "establish turn or entry restrictions, one-way residential streets, or mandatory turns".

The evaluation of access plans should include the consideration of impact of diverted traffic on other roadways such as residential and arterial streets, impact on access to public facilities and community resources such as schools, parks, libraries, religious institutions, or shopping centers, and lastly compatibility with area Master Plans. Regulation 17-94AM specifically states that any access restriction imposed affects residents as well as cut-thru traffic and makes no provision to allow use by residents.

Proposal

Based on the origin of cut-through traffic from the license plate survey and findings from the travel time analysis, Decatur Ave is being used as a cut-through to bypass signal delays along Knowles Ave eastbound and MD 185 southbound. To discourage the use of Decatur Ave as a cut-through, a no right turn restriction is recommended eastbound on Wexford Dr at the approach to Decatur Ave during the PM peak period from 4:00 – 6:00 PM. While cut-through traffic may occur during the AM peak hour, and other times of day, the volume of traffic does not meet the eligibility requirements outlined in Executive Regulation 17-94AM.

The restriction will require the installation of a regulatory sign to communicate the restriction and targeted police enforcement may be necessary for compliance.

A. Preliminary Restriction Plan Impacts

The proposed plans ultimately aim to provide access restrictions without further limiting through access for commuter and non-local cut-through traffic on roadways in the study area that serve local residences and businesses in the community. The proposed recommendations were weighted for advantages and disadvantages prior to traffic analysis.

B. Impact to Other Roadways

It is assumed that all traffic making the southbound left turn movement from Beach Dr to Wexford Dr will utilize the arterial streets and access MD 185 southbound via Beach Dr and Knowles Ave to the eastbound right turn movement onto MD 185 southbound.

This additional diverted volume was added to the existing CLV volume for each affected intersection during the PM peak hour when the restriction is in place and the results are summarized below in Table 7. The results indicate that the additional diverted traffic volumes would result in moderate increases in Critical Lane Volumes with each intersection degrading by one (1) letter grade during the PM peak hour. This includes the signalized intersection of Beach Dr at Knowles Ave degrading from LOS D to E and the signalized intersection of Knowles Ave at MD 185 degrading from LOS E to F. CLV worksheets with the diverted traffic volumes can be found in Appendix D.

TABLE 7: FUTURE INTERSECTION CAPACITY ANALYSIS - PM PEAK

Intersection	Critical Lane Volume	Volume-to-Capacity Ratio	Level of Service
Beach Drive at Wexford Drive	1190	0.74	C
Beach Drive at Knowles Avenue	1515	0.95	E
MD 185 at Knowles Avenue	1618	1.01	F

C. Impact to Public and Community Facilities

The proposed access and turn restrictions are only limited to the evening peak hours, 4:00 – 6:00 PM to discourage through commuter traffic along eastbound Decatur Ave. The restriction may impact some local residents of the communities along Wexford Dr and the Kaiser Permanente office building who will need to alter their trip patterns from Beach Dr by using Randolph Rd and Veirs Mill Rd (MD 586) to access the community from the north via MD 185 while the restriction is active. It should be noted that the restriction will begin after school dismissal times and should not impact school bus operations or trips associated with the Rock View Elementary School.

8. SUMMARY AND RECOMMENDATION

The community along Decatur Avenue in Montgomery County petitioned for a determination of access restriction eligibility to address a perceived cut-through traffic problem. The results of a technical analysis confirm the following findings:

- The traffic volumes on Lawrence Avenue do not satisfy the minimum requirements of 100 vehicles per hour during the AM or PM peak hours and therefore do not satisfy the eligibility requirements for access restrictions.
- Eastbound PM peak-hour traffic exceeds 100 vehicles on Decatur Avenue west of Connecticut Ave, while PM peak-hour westbound traffic and *both* AM/PM eastbound traffic did not; accordingly, only PM eastbound cut-through conditions were evaluated further.
- A comparison of field-measured travel times in the study area during evening peak hours indicate a about one minute in travel time savings for non-local traffic by using Decatur Avenue in lieu of Beach Drive and Knowles Avenue.
- A license plate survey of eastbound traffic documented non-local traffic volumes on Decatur Avenue, of 86% which were found to be more than 50% requirement of evening peak hour traffic.
- Based on the overall PM peak hour volumes in the eastbound direction, the percentage of non-local traffic, Decatur Avenue meets the County's requirements for access restrictions per Executive Regulation 17-94.
- The majority of traffic entering Decatur Ave is assumed to originate from southbound left turns from Beach Drive.
- The recommended access restriction is:

  Installation of a regulatory sign to restrict eastbound right turns from Wexford Drive to Decatur Avenue from 4:00 – 6:00 PM Monday through Friday.
- Based on CLV analysis of study area intersections that would see modified traffic patterns, this regulation was found to result in moderate degradation of one (1) letter grade at each study intersection during the PM peak hour. Of note, the signalized intersections of Knowles Ave at Beach Dr and Knowles Ave at MD 185 will degrade to Level of Service E and F, respectively.

APPENDIX A – TRAFFIC COUNTS

MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather:
Counted By:
Town:
Country

File Name : beach dr at knowles ave
Site Code : 00000000
Start Date : 12/8/2022
Page No : 1

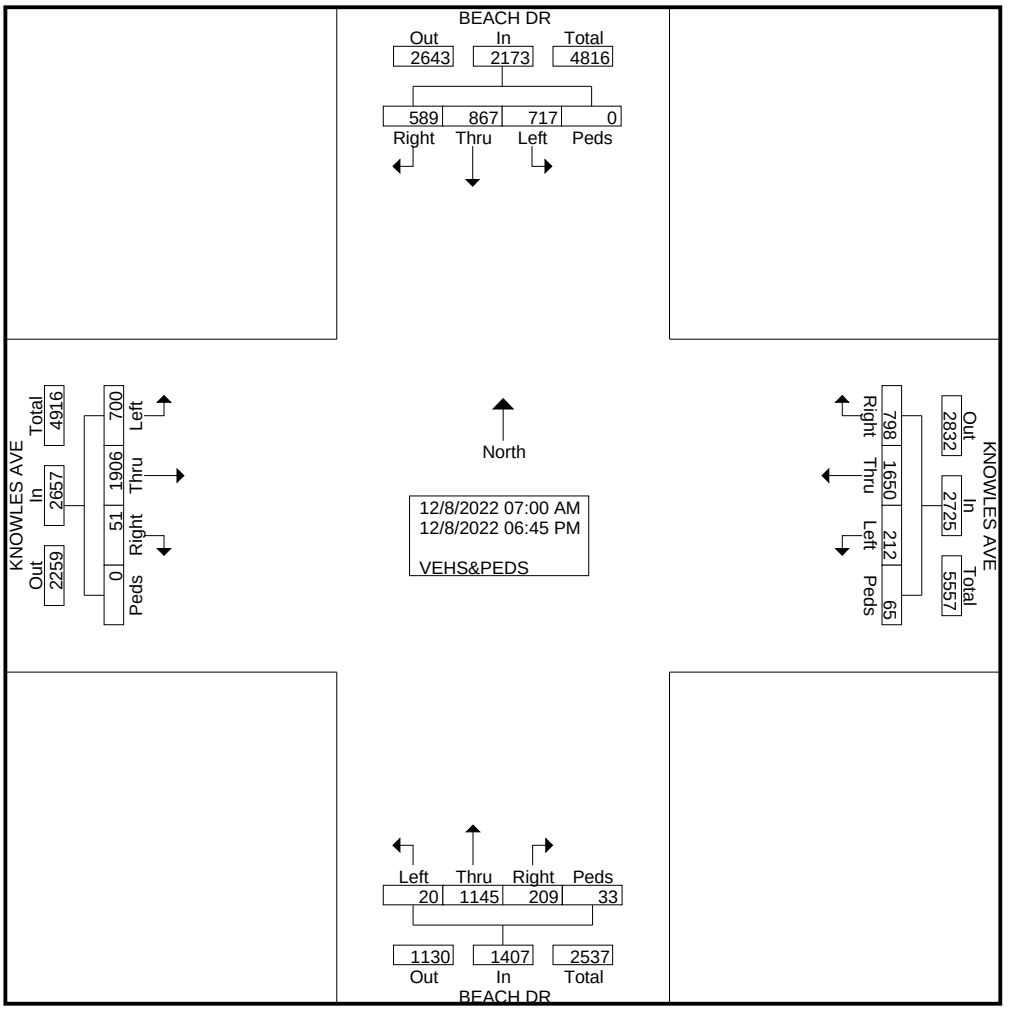
Groups Printed- VEHS&PEDS

	BEACH DR From North					KNOWLES AVE From East					BEACH DR From South					KNOWLES AVE 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
07:00 AM	36	45	18	0	99	6	44	5	2	57	0	3	5	0	8	13	35	3	0	51	215
07:15 AM	35	63	39	0	137	13	54	11	0	78	0	6	5	0	11	16	41	2	0	59	285
07:30 AM	39	69	61	0	169	16	81	15	2	114	0	4	7	3	14	19	54	1	0	74	371
07:45 AM	53	105	79	0	237	10	105	27	3	145	0	22	5	4	31	28	88	3	0	119	532
Total	163	282	197	0	642	45	284	58	7	394	0	35	22	7	64	76	218	9	0	303	1403
08:00 AM	61	104	43	0	208	8	93	16	4	121	0	9	19	0	28	41	114	3	0	158	515
08:15 AM	44	98	45	0	187	12	69	20	13	114	0	22	10	4	36	22	88	0	0	110	447
08:30 AM	33	77	25	0	135	19	74	19	3	115	0	22	9	3	34	24	86	6	0	116	400
08:45 AM	48	70	43	0	161	15	86	21	3	125	0	23	9	0	32	10	83	2	0	95	413
Total	186	349	156	0	691	54	322	76	23	475	0	76	47	7	130	97	371	11	0	479	1775
*** BREAK ***																					
04:00 PM	41	20	25	0	86	6	80	74	6	166	1	100	18	2	121	44	118	3	0	165	538
04:15 PM	26	13	19	0	58	9	103	71	6	189	1	99	9	4	113	39	94	1	0	134	494
04:30 PM	27	15	13	0	55	12	81	48	6	147	1	84	13	0	98	58	120	4	0	182	482
04:45 PM	25	9	24	0	58	15	93	68	12	188	1	102	10	2	115	47	113	4	0	164	525
Total	119	57	81	0	257	42	357	261	30	690	4	385	50	8	447	188	445	12	0	645	2039
05:00 PM	33	36	18	0	87	10	72	56	4	142	2	99	11	0	112	54	117	2	0	173	514
05:15 PM	36	17	21	0	74	14	96	69	0	179	0	102	14	2	118	49	105	2	0	156	527
05:30 PM	35	25	28	0	88	5	97	66	0	168	5	88	13	2	108	52	106	5	0	163	527
05:45 PM	33	23	18	0	74	8	82	64	1	155	3	116	11	1	131	47	101	3	0	151	511
Total	137	101	85	0	323	37	347	255	5	644	10	405	49	5	469	202	429	12	0	643	2079
06:00 PM	38	25	12	0	75	8	85	44	0	137	0	100	13	0	113	43	114	1	0	158	483
06:15 PM	19	15	17	0	51	9	94	44	0	147	4	63	7	3	77	41	119	1	0	161	436
06:30 PM	29	19	22	0	70	5	73	41	0	119	2	57	16	3	78	28	99	3	0	130	397
06:45 PM	26	19	19	0	64	12	88	19	0	119	0	24	5	0	29	25	111	2	0	138	350
Total	112	78	70	0	260	34	340	148	0	522	6	244	41	6	297	137	443	7	0	587	1666
Grand Total	717	867	589	0	2173	212	1650	798	65	2725	20	1145	209	33	1407	700	1906	51	0	2657	8962
Apprch %	33	39.9	27.1	0		7.8	60.6	29.3	2.4		1.4	81.4	14.9	2.3		26.3	71.7	1.9	0		
Total %	8	9.7	6.6	0	24.2	2.4	18.4	8.9	0.7	30.4	0.2	12.8	2.3	0.4	15.7	7.8	21.3	0.6	0	29.6	

MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at knowles ave
Site Code : 00000000
Start Date : 12/8/2022
Page No : 2

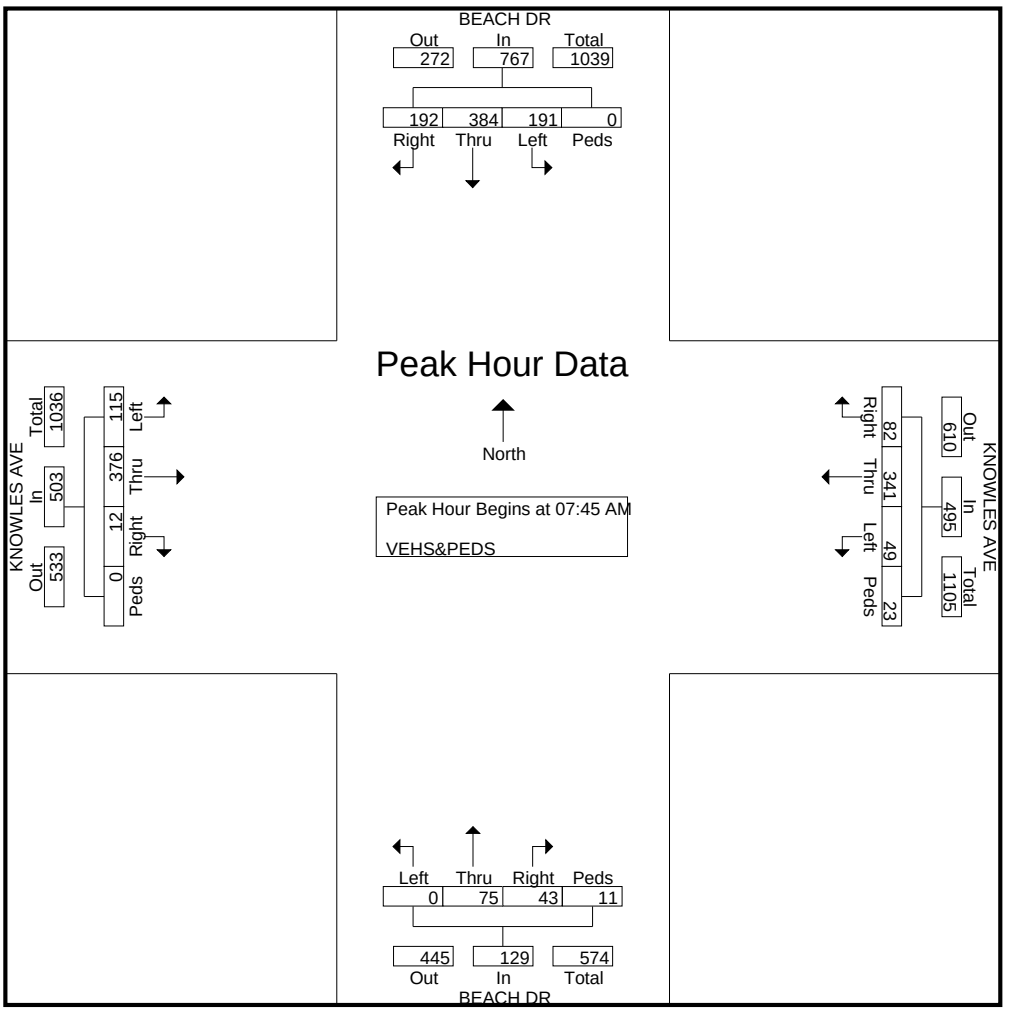


MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at knowles ave
Site Code : 00000000
Start Date : 12/8/2022
Page No : 3

	BEACH DR From North					KNOWLES AVE From East					BEACH DR From South					KNOWLES AVE 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 Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	53	**105**	**79**	0	**237**	10	**105**	**27**	3	**145**	0	**22**	5	**4**	31	28	88	3	0	119	**532**
08:00 AM	**61**	104	43	0	208	8	93	16	4	121	0	9	**19**	0	28	**41**	**114**	3	0	**158**	515
08:15 AM	44	98	45	0	187	12	69	20	**13**	114	0	22	10	4	**36**	22	88	0	0	110	447
08:30 AM	33	77	25	0	135	**19**	74	19	3	115	0	22	9	3	34	24	86	**6**	0	116	400
Total Volume	191	384	192	0	767	49	341	82	23	495	0	75	43	11	129	115	376	12	0	503	1894
% App. Total	24.9	50.1	25	0		9.9	68.9	16.6	4.6		0	58.1	33.3	8.5		22.9	74.8	2.4	0		
PHF	.783	.914	.608	.000	.809	.645	.812	.759	.442	.853	.000	.852	.566	.688	.896	.701	.825	.500	.000	.796	.890

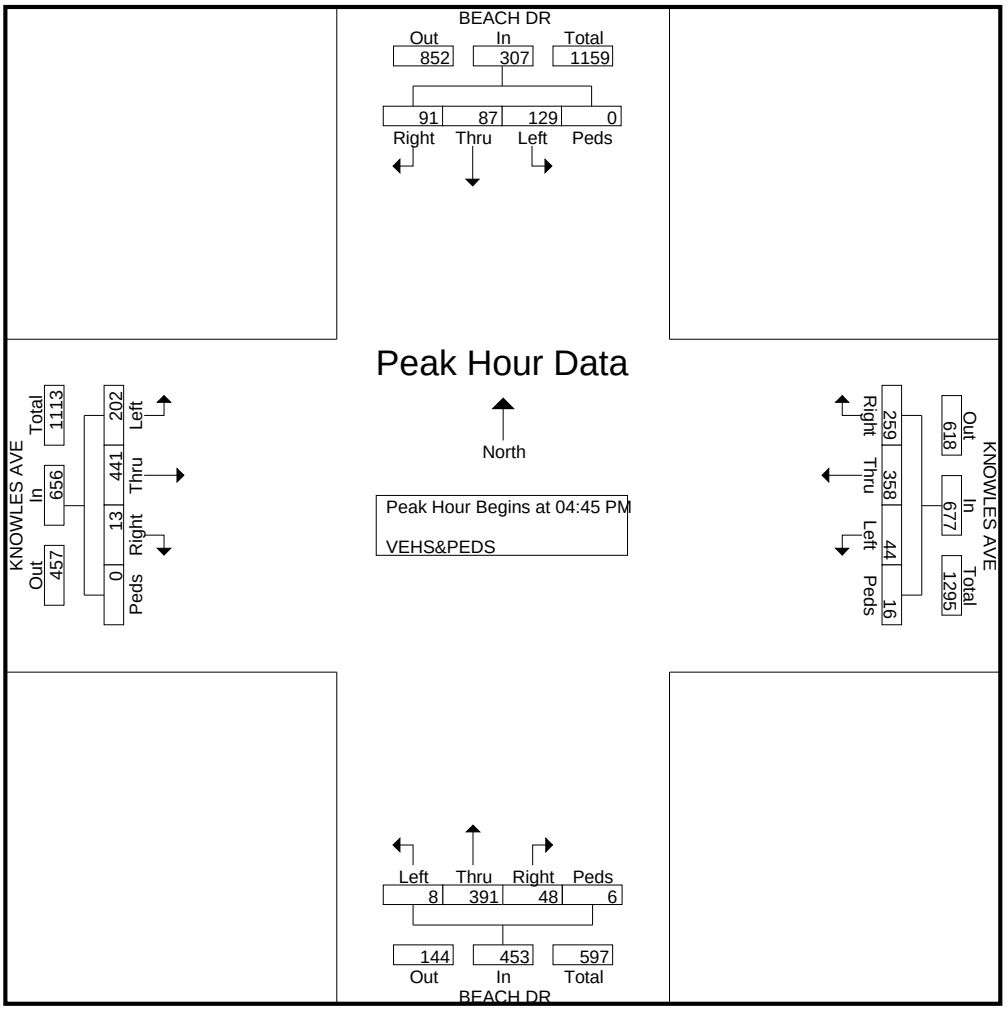


MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at knowles ave
Site Code : 00000000
Start Date : 12/8/2022
Page No : 4

	BEACH DR From North					KNOWLES AVE From East					BEACH DR From South					KNOWLES AVE 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 Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	25	9	24	0	58	**15**	93	68	**12**	**188**	1	**102**	10	**2**	115	47	113	4	0	164	525
05:00 PM	33	**36**	18	0	87	10	72	56	4	142	2	99	11	0	112	**54**	**117**	2	0	**173**	514
05:15 PM	**36**	17	21	0	74	14	96	**69**	0	179	0	102	**14**	2	**118**	49	105	2	0	156	**527**
05:30 PM	35	25	**28**	0	**88**	5	**97**	66	0	168	**5**	88	13	2	108	52	106	**5**	0	163	527
Total Volume	129	87	91	0	307	44	358	259	16	677	8	391	48	6	453	202	441	13	0	656	2093
% App. Total	42	28.3	29.6	0		6.5	52.9	38.3	2.4		1.8	86.3	10.6	1.3		30.8	67.2	2	0		
PHF	.896	.604	.813	.000	.872	.733	.923	.938	.333	.900	.400	.958	.857	.750	.960	.935	.942	.650	.000	.948	.993



MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather:
Counted By:
Town:
Country

File Name : beach dr at wexford dr
Site Code : 00000000
Start Date : 12/8/2022
Page No : 1

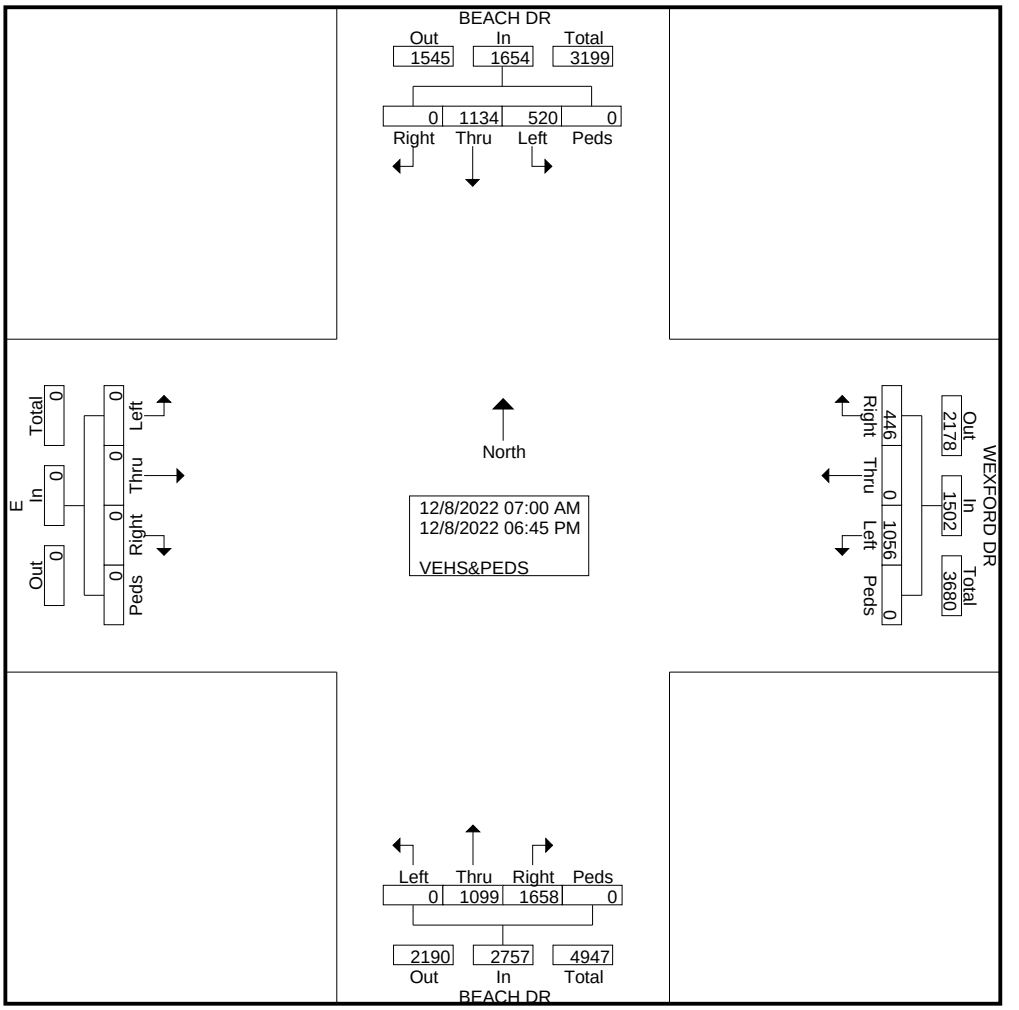
Groups Printed- VEHS&PEDS

	BEACH DR From North					WEXFORD DR From East					BEACH DR From South					E 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
07:00 AM	12	59	0	0	71	45	0	6	0	51	0	6	15	0	21	0	0	0	0	0	143
07:15 AM	15	66	0	0	81	68	0	14	0	82	0	13	17	0	30	0	0	0	0	0	193
07:30 AM	14	94	0	0	108	96	0	23	0	119	0	16	19	0	35	0	0	0	0	0	262
07:45 AM	18	103	0	0	121	117	0	18	0	135	0	37	40	0	77	0	0	0	0	0	333
Total	59	322	0	0	381	326	0	61	0	387	0	72	91	0	163	0	0	0	0	0	931
08:00 AM	18	107	0	0	125	103	0	25	0	128	0	33	39	0	72	0	0	0	0	0	325
08:15 AM	14	82	0	0	96	103	0	25	0	128	0	25	43	0	68	0	0	0	0	0	292
08:30 AM	18	64	0	0	82	94	0	16	0	110	0	32	36	0	68	0	0	0	0	0	260
08:45 AM	20	65	0	0	85	82	0	23	0	105	0	32	21	0	53	0	0	0	0	0	243
Total	70	318	0	0	388	382	0	89	0	471	0	122	139	0	261	0	0	0	0	0	1120
*** BREAK ***																					
04:00 PM	27	49	0	0	76	36	0	27	0	63	0	90	127	0	217	0	0	0	0	0	356
04:15 PM	40	33	0	0	73	27	0	21	0	48	0	78	137	0	215	0	0	0	0	0	336
04:30 PM	31	38	0	0	69	24	0	17	0	41	0	65	128	0	193	0	0	0	0	0	303
04:45 PM	31	43	0	0	74	28	0	21	0	49	0	89	130	0	219	0	0	0	0	0	342
Total	129	163	0	0	292	115	0	86	0	201	0	322	522	0	844	0	0	0	0	0	1337
05:00 PM	30	50	0	0	80	29	0	43	0	72	0	93	136	0	229	0	0	0	0	0	381
05:15 PM	54	44	0	0	98	27	0	30	0	57	0	90	156	0	246	0	0	0	0	0	401
05:30 PM	39	53	0	0	92	36	0	33	0	69	0	89	128	0	217	0	0	0	0	0	378
05:45 PM	44	44	0	0	88	30	0	31	0	61	0	93	146	0	239	0	0	0	0	0	388
Total	167	191	0	0	358	122	0	137	0	259	0	365	566	0	931	0	0	0	0	0	1548
06:00 PM	28	52	0	0	80	19	0	30	0	49	0	80	123	0	203	0	0	0	0	0	332
06:15 PM	26	30	0	0	56	24	0	15	0	39	0	60	88	0	148	0	0	0	0	0	243
06:30 PM	20	33	0	0	53	32	0	16	0	48	0	55	80	0	135	0	0	0	0	0	236
06:45 PM	21	25	0	0	46	36	0	12	0	48	0	23	49	0	72	0	0	0	0	0	166
Total	95	140	0	0	235	111	0	73	0	184	0	218	340	0	558	0	0	0	0	0	977
Grand Total	520	1134	0	0	1654	1056	0	446	0	1502	0	1099	1658	0	2757	0	0	0	0	0	5913
Apprch %	31.4	68.6	0	0		70.3	0	29.7	0		0	39.9	60.1	0		0	0	0	0		
Total %	8.8	19.2	0	0	28	17.9	0	7.5	0	25.4	0	18.6	28	0	46.6	0	0	0	0	0	

MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at wexford dr
Site Code : 00000000
Start Date : 12/8/2022
Page No : 2

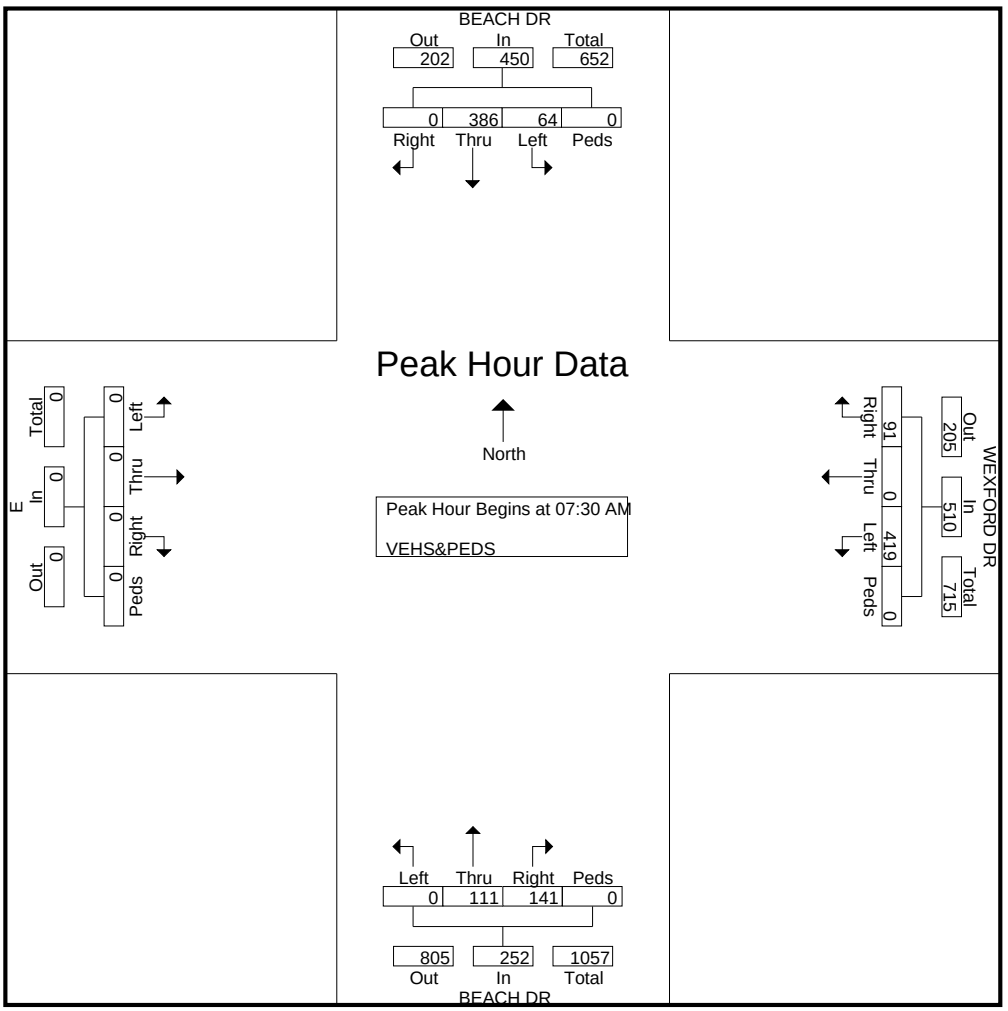


MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at wexford dr
Site Code : 00000000
Start Date : 12/8/2022
Page No : 3

	BEACH DR From North					WEXFORD DR From East					BEACH DR From South					E 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 Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	14	94	0	0	108	96	0	23	0	119	0	16	19	0	35	0	0	0	0	0	262
07:45 AM	**18**	103	0	0	121	**117**	0	18	0	**135**	0	**37**	40	0	**77**	0	0	0	0	0	**333**
08:00 AM	18	**107**	0	0	**125**	103	0	**25**	0	128	0	33	39	0	72	0	0	0	0	0	325
08:15 AM	14	82	0	0	96	103	0	25	0	128	0	25	**43**	0	68	0	0	0	0	0	292
Total Volume	64	386	0	0	450	419	0	91	0	510	0	111	141	0	252	0	0	0	0	0	1212
% App. Total	14.2	85.8	0	0		82.2	0	17.8	0		0	44	56	0		0	0	0	0		
PHF	.889	.902	.000	.000	.900	.895	.000	.910	.000	.944	.000	.750	.820	.000	.818	.000	.000	.000	.000	.000	.910

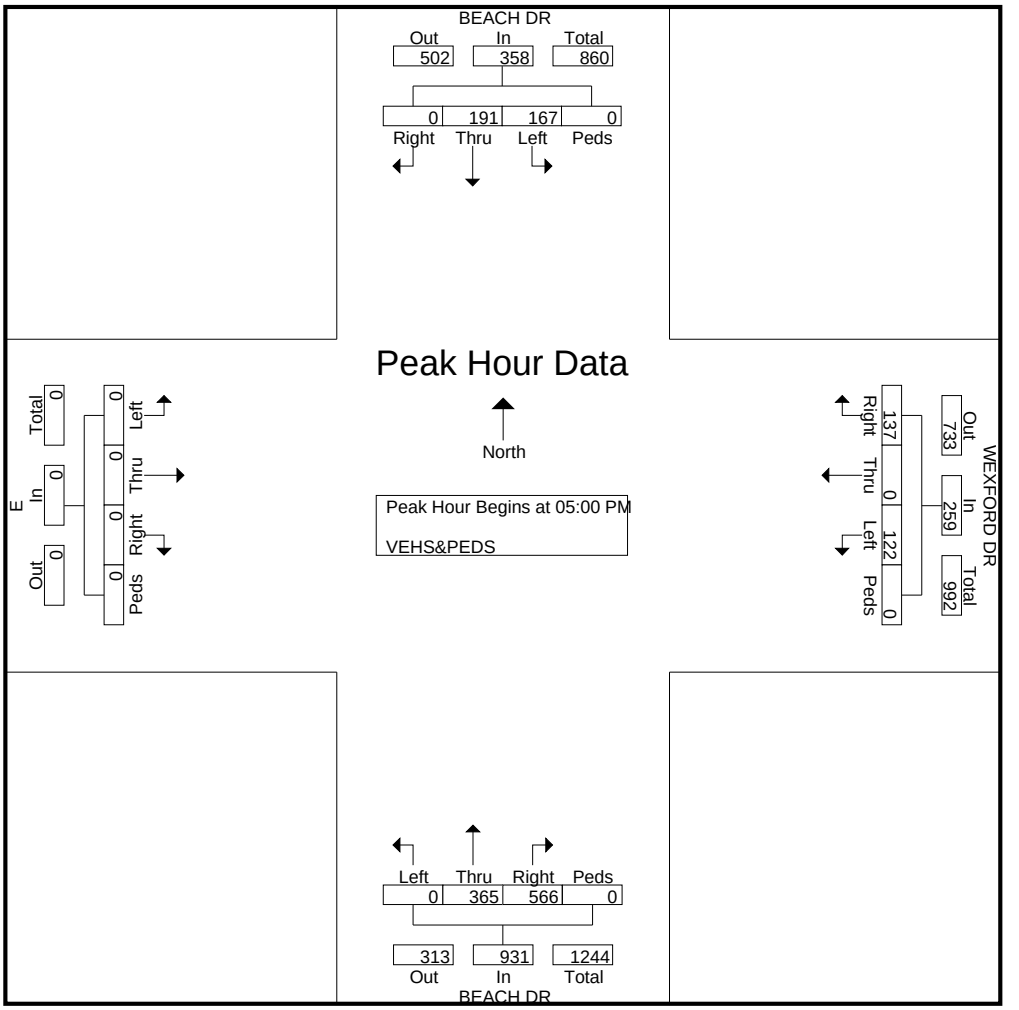


MEAD & HUNT

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : beach dr at wexford dr
Site Code : 00000000
Start Date : 12/8/2022
Page No : 4

	BEACH DR From North					WEXFORD DR From East					BEACH DR From South					E 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 Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	30	50	0	0	80	29	0	**43**	0	**72**	0	**93**	136	0	229	0	0	0	0	0	381
05:15 PM	**54**	44	0	0	**98**	27	0	30	0	57	0	90	**156**	0	**246**	0	0	0	0	0	**401**
05:30 PM	39	**53**	0	0	92	**36**	0	33	0	69	0	89	128	0	217	0	0	0	0	0	378
05:45 PM	44	44	0	0	88	30	0	31	0	61	0	93	146	0	239	0	0	0	0	0	388
Total Volume	167	191	0	0	358	122	0	137	0	259	0	365	566	0	931	0	0	0	0	0	1548
% App. Total	46.6	53.4	0	0		47.1	0	52.9	0		0	39.2	60.8	0		0	0	0	0		
PHF	.773	.901	.000	.000	.913	.847	.000	.797	.000	.899	.000	.981	.907	.000	.946	.000	.000	.000	.000	.000	.965



Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

Weather: CLEAR
Counted By: DON
Town:
Country: MONTGOMERY

File Name : MD 185 AT KNOWLES AVE
Site Code : 00000000
Start Date : 10/20/2021
Page No : 1

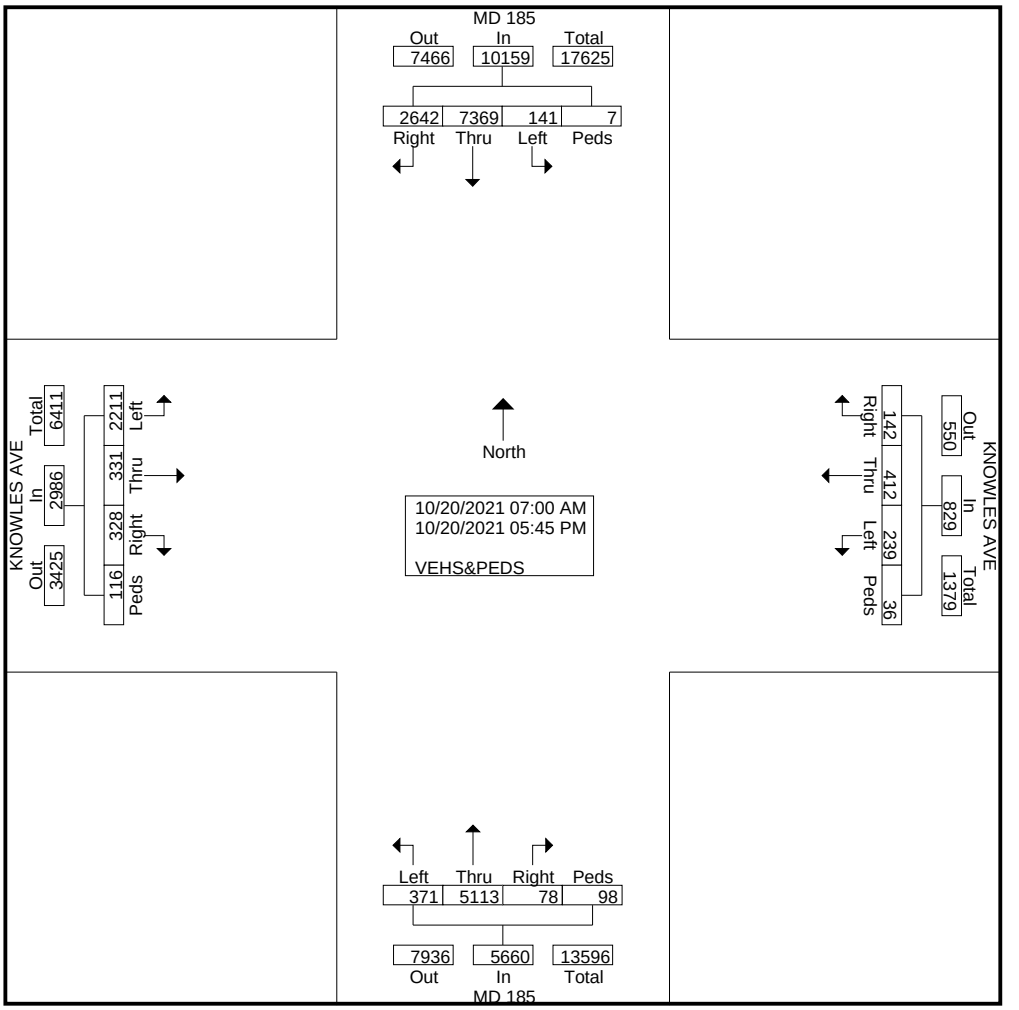
Groups Printed- VEHS&PEDS

	MD 185 From North					KNOWLES AVE From East					MD 185 From South					KNOWLES AVE 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
07:00 AM	3	477	115	0	595	8	5	1	1	15	8	90	5	1	104	37	4	18	2	61	775
07:15 AM	2	528	134	0	664	5	7	0	0	12	3	116	3	4	126	51	5	18	2	76	878
07:30 AM	2	484	165	0	651	9	13	0	2	24	2	137	5	4	148	56	3	26	0	85	908
07:45 AM	3	495	121	0	619	4	12	2	3	21	4	133	3	7	147	62	12	16	7	97	884
Total	10	1984	535	0	2529	26	37	3	6	72	17	476	16	16	525	206	24	78	11	319	3445
08:00 AM	3	482	126	0	611	12	11	3	2	28	5	167	2	4	178	60	17	15	2	94	911
08:15 AM	7	401	112	0	520	18	20	4	0	42	9	163	6	2	180	64	15	16	2	97	839
08:30 AM	6	422	133	0	561	9	25	2	1	37	4	155	1	1	161	59	13	8	4	84	843
08:45 AM	6	387	124	0	517	9	12	1	0	22	9	163	3	0	175	58	6	17	0	81	795
Total	22	1692	495	0	2209	48	68	10	3	129	27	648	12	7	694	241	51	56	8	356	3388
*** BREAK ***																					
11:00 AM	7	216	78	0	301	6	18	3	1	28	18	173	4	1	196	78	16	15	3	112	637
11:15 AM	1	218	67	1	287	11	17	8	0	36	26	183	8	7	224	61	13	15	6	95	642
11:30 AM	3	253	77	0	333	8	21	7	1	37	22	200	4	2	228	82	12	17	5	116	714
11:45 AM	13	221	71	0	305	6	11	3	1	21	27	197	6	2	232	69	13	15	2	99	657
Total	24	908	293	1	1226	31	67	21	3	122	93	753	22	12	880	290	54	62	16	422	2650
12:00 PM	7	228	78	3	316	8	24	3	4	39	24	206	4	7	241	75	15	14	6	110	706
12:15 PM	7	234	87	1	329	8	16	5	1	30	24	242	3	5	274	84	19	15	8	126	759
12:30 PM	5	216	75	0	296	14	19	2	2	37	22	238	8	4	272	74	23	17	8	122	727
12:45 PM	3	223	80	0	306	11	14	3	4	32	17	212	4	11	244	84	17	8	11	120	702
Total	22	901	320	4	1247	41	73	13	11	138	87	898	19	27	1031	317	74	54	33	478	2894
*** BREAK ***																					
04:00 PM	3	208	125	1	337	17	17	11	2	47	26	312	0	3	341	148	20	12	6	186	911
04:15 PM	12	225	142	0	379	14	24	11	0	49	10	244	0	10	264	143	24	11	12	190	882
04:30 PM	6	242	118	0	366	11	20	10	3	44	13	277	2	5	297	147	20	8	5	180	887
04:45 PM	5	257	122	1	385	10	12	15	1	38	17	310	2	5	334	143	8	6	4	161	918
Total	26	932	507	2	1467	52	73	47	6	178	66	1143	4	23	1236	581	72	37	27	717	3598
05:00 PM	15	228	121	0	364	12	25	12	4	53	21	304	1	7	333	137	15	11	10	173	923
05:15 PM	10	248	147	0	405	9	20	17	0	46	18	293	0	0	311	127	9	11	0	147	909
05:30 PM	7	243	113	0	363	12	23	8	3	46	24	302	3	4	333	153	19	6	1	179	921
05:45 PM	5	233	111	0	349	8	26	11	0	45	18	296	1	2	317	159	13	13	10	195	906
Total	37	952	492	0	1481	41	94	48	7	190	81	1195	5	13	1294	576	56	41	21	694	3659
Grand Total	141	7369	2642	7	10159	239	412	142	36	829	371	5113	78	98	5660	2211	331	328	116	2986	19634
Apprch %	1.4	72.5	26	0.1		28.8	49.7	17.1	4.3		6.6	90.3	1.4	1.7		74	11.1	11	3.9		
Total %	0.7	37.5	13.5	0	51.7	1.2	2.1	0.7	0.2	4.2	1.9	26	0.4	0.5	28.8	11.3	1.7	1.7	0.6	15.2	

Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 185 AT KNOWLES AVE
Site Code : 00000000
Start Date : 10/20/2021
Page No : 2

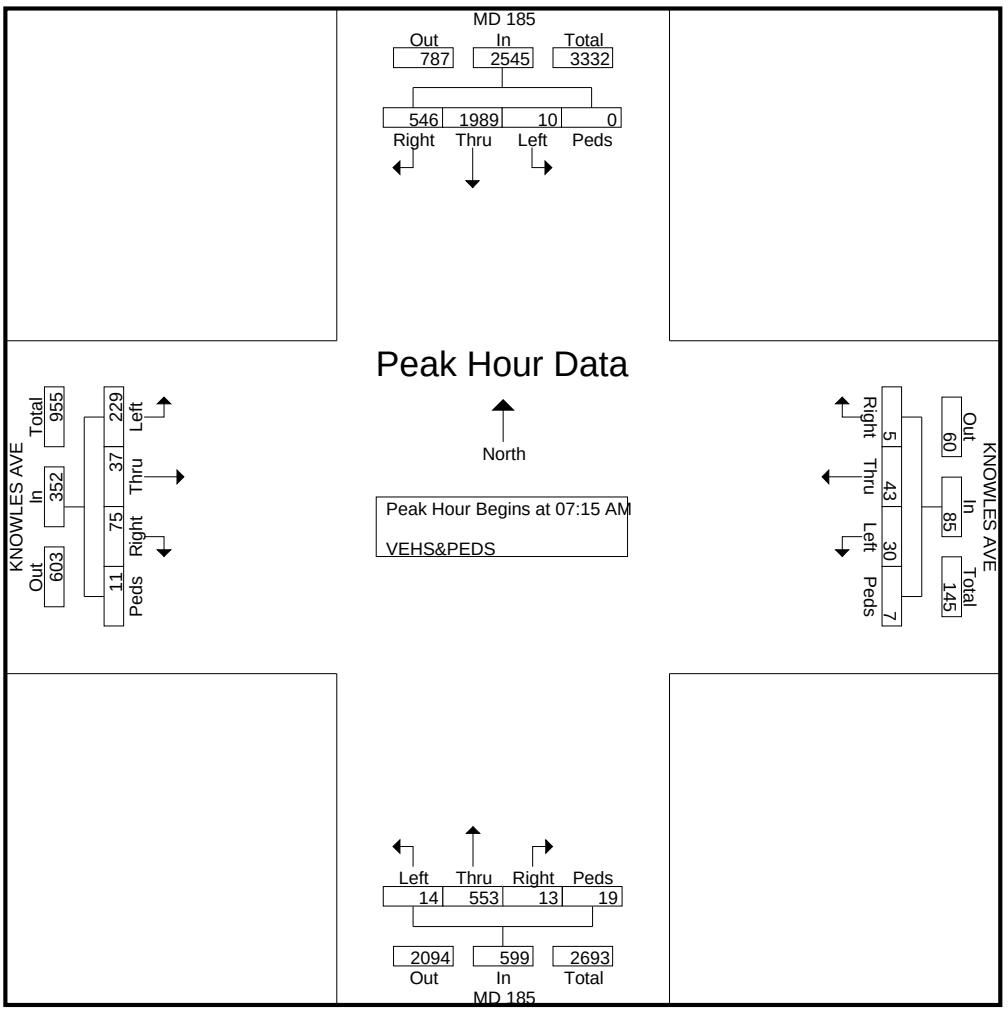


Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 185 AT KNOWLES AVE
Site Code : 00000000
Start Date : 10/20/2021
Page No : 3

	MD 185 From North					KNOWLES AVE From East					MD 185 From South					KNOWLES AVE 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 Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	2	**528**	134	0	**664**	5	7	0	0	12	3	116	3	4	126	51	5	18	2	76	878
07:30 AM	2	484	**165**	0	651	9	**13**	0	2	24	2	137	**5**	4	148	56	3	**26**	0	85	908
07:45 AM	**3**	495	121	0	619	4	12	2	**3**	21	4	133	3	**7**	147	**62**	12	16	**7**	**97**	884
08:00 AM	3	482	126	0	611	**12**	11	**3**	2	**28**	**5**	**167**	2	4	**178**	60	**17**	15	2	94	**911**
Total Volume	10	1989	546	0	2545	30	43	5	7	85	14	553	13	19	599	229	37	75	11	352	3581
% App. Total	0.4	78.2	21.5	0		35.3	50.6	5.9	8.2		2.3	92.3	2.2	3.2		65.1	10.5	21.3	3.1		
PHF	.833	.942	.827	.000	.958	.625	.827	.417	.583	.759	.700	.828	.650	.679	.841	.923	.544	.721	.393	.907	.983

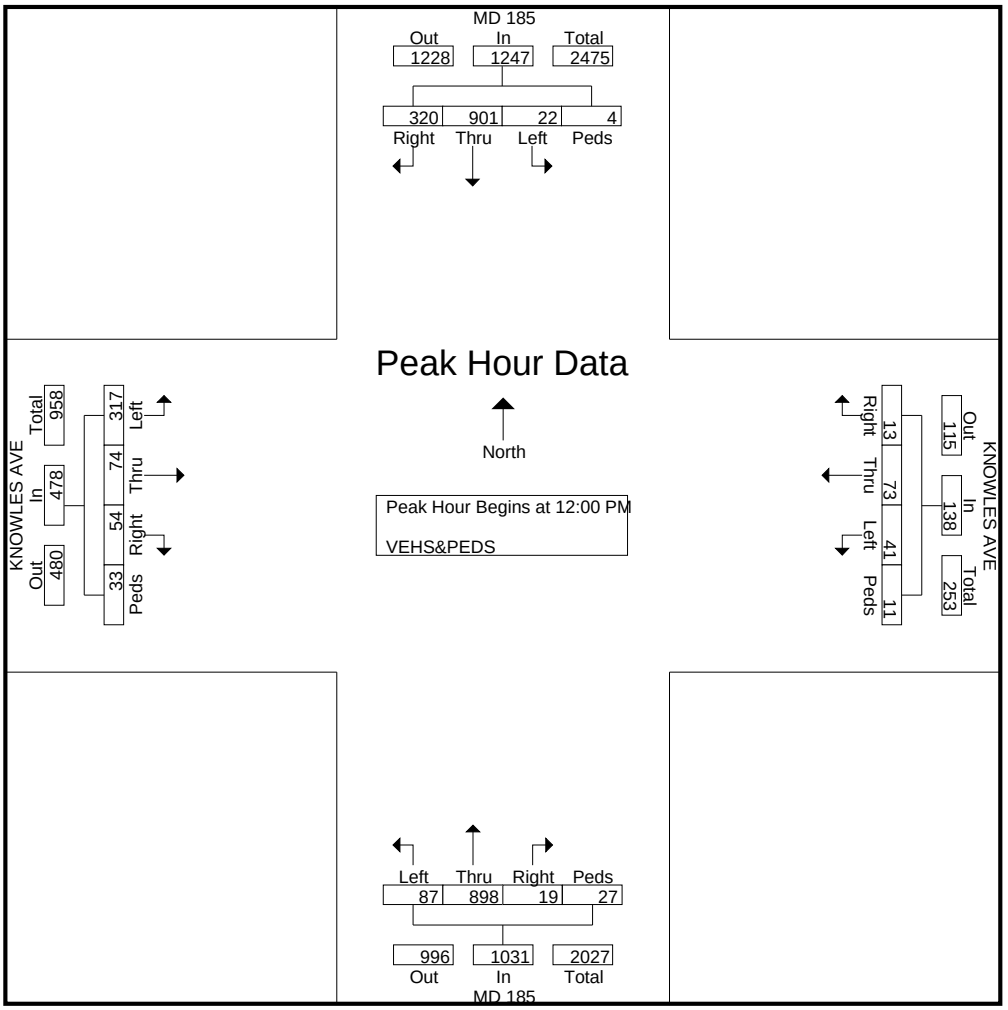


Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 185 AT KNOWLES AVE
Site Code : 00000000
Start Date : 10/20/2021
Page No : 4

	MD 185 From North					KNOWLES AVE From East					MD 185 From South					KNOWLES AVE 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 Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**7**	228	78	**3**	316	8	**24**	3	**4**	**39**	**24**	206	4	7	241	75	15	14	6	110	706
12:15 PM	7	**234**	**87**	1	**329**	8	16	**5**	1	30	24	**242**	3	5	**274**	**84**	19	15	8	**126**	**759**
12:30 PM	5	216	75	0	296	**14**	19	2	2	37	22	238	**8**	4	272	74	**23**	**17**	8	122	727
12:45 PM	3	223	80	0	306	11	14	3	4	32	17	212	4	**11**	244	84	17	8	**11**	120	702
Total Volume	22	901	320	4	1247	41	73	13	11	138	87	898	19	27	1031	317	74	54	33	478	2894
% App. Total	1.8	72.3	25.7	0.3		29.7	52.9	9.4	8		8.4	87.1	1.8	2.6		66.3	15.5	11.3	6.9		
PHF	.786	.963	.920	.333	.948	.732	.760	.650	.688	.885	.906	.928	.594	.614	.941	.943	.804	.794	.750	.948	.953

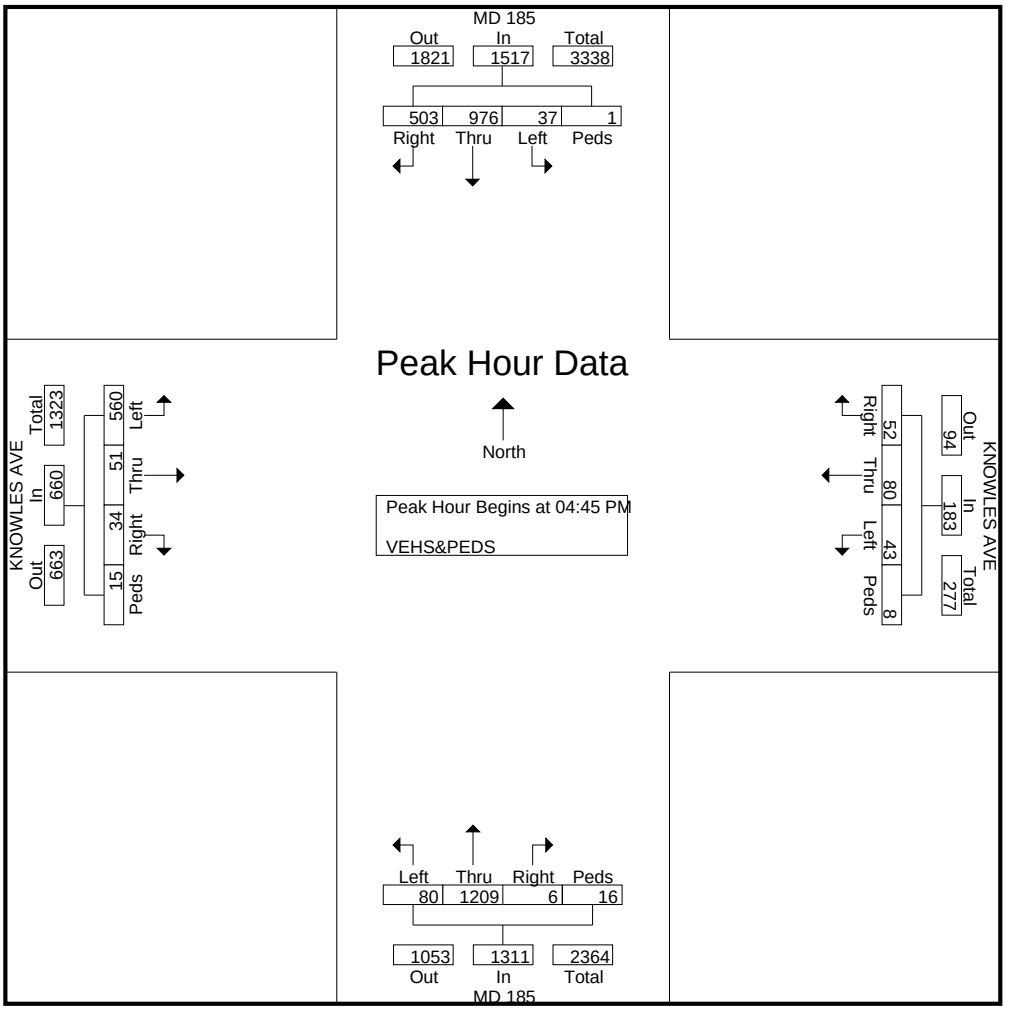


Sabra & Associates

7055 Samuel Morse Dr. Ste. 100
Columbia, Maryland 21045
443-741-3500

File Name : MD 185 AT KNOWLES AVE
Site Code : 00000000
Start Date : 10/20/2021
Page No : 5

	MD 185 From North					KNOWLES AVE From East					MD 185 From South					KNOWLES AVE 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 Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	5	**257**	122	**1**	385	10	12	15	1	38	17	**310**	2	5	**334**	143	8	6	4	161	918
05:00 PM	**15**	228	121	0	364	**12**	**25**	12	**4**	**53**	21	304	1	**7**	333	137	15	**11**	**10**	173	**923**
05:15 PM	10	248	**147**	0	**405**	9	20	**17**	0	46	18	293	0	0	311	127	9	11	0	147	909
05:30 PM	7	243	113	0	363	12	23	8	3	46	**24**	302	**3**	4	333	**153**	**19**	6	1	**179**	921
Total Volume	37	976	503	1	1517	43	80	52	8	183	80	1209	6	16	1311	560	51	34	15	660	3671
% App. Total	2.4	64.3	33.2	0.1		23.5	43.7	28.4	4.4		6.1	92.2	0.5	1.2		84.8	7.7	5.2	2.3		
PHF	.617	.949	.855	.250	.936	.896	.800	.765	.500	.863	.833	.975	.500	.571	.981	.915	.671	.773	.375	.922	.994



Mead & Hunt
7055 Samuel Morse Drive Suite 100
Columbia, MD 21046
1 443 741 3500

Site Code:
Station ID:
Lawrence Ave west of Connecticut Ave

Latitude: 0' 0.0000 Undefined

Start	05-Dec-22		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
03:00	*	*	1	0	0	0	*	*	*	*	*	*	*	*	0	0
04:00	*	*	0	1	0	2	*	*	*	*	*	*	*	*	0	2
05:00	*	*	1	1	3	2	*	*	*	*	*	*	*	*	2	2
06:00	*	*	3	2	2	0	*	*	*	*	*	*	*	*	2	1
07:00	*	*	6	7	**11**	5	*	*	*	*	*	*	*	*	8	6
08:00	*	*	10	9	11	12	*	*	*	*	*	*	*	*	10	10
09:00	*	*	13	**10**	11	**13**	*	*	*	*	*	*	*	*	12	**12**
10:00	*	*	**19**	8	8	8	*	*	*	*	*	*	*	*	**14**	8
11:00	*	*	9	5	9	3	*	*	*	*	*	*	*	*	9	4
12:00 PM	*	*	11	6	10	**8**	*	*	*	*	*	*	*	*	10	7
01:00	*	*	9	6	4	5	*	*	*	*	*	*	*	*	6	6
02:00	*	*	13	4	**14**	2	*	*	*	*	*	*	*	*	**14**	3
03:00	*	*	**20**	3	7	8	*	*	*	*	*	*	*	*	14	6
04:00	*	*	9	**12**	13	7	*	*	*	*	*	*	*	*	11	**10**
05:00	*	*	8	2	10	4	*	*	*	*	*	*	*	*	9	3
06:00	*	*	10	5	8	7	*	*	*	*	*	*	*	*	9	6
07:00	*	*	6	7	10	2	*	*	*	*	*	*	*	*	8	4
08:00	*	*	2	1	1	4	*	*	*	*	*	*	*	*	2	2
09:00	*	*	3	1	5	2	*	*	*	*	*	*	*	*	4	2
10:00	*	*	4	0	1	2	*	*	*	*	*	*	*	*	2	1
11:00	*	*	1	0	4	2	*	*	*	*	*	*	*	*	2	1
Lane	0	0	158	90	142	98	0	0	0	0	0	0	0	0	148	96
Day	0		248		240		0		0		0		0		244	
AM Peak	-	-	10:00	09:00	07:00	09:00	-	-	-	-	-	-	-	-	10:00	09:00
Vol.	-	-	19	10	11	13	-	-	-	-	-	-	-	-	14	12
PM Peak	-	-	15:00	16:00	14:00	12:00	-	-	-	-	-	-	-	-	14:00	16:00
Vol.	-	-	20	12	14	8	-	-	-	-	-	-	-	-	14	10

Comb. Total	0	248	240	0	0	0	0	244

ADT ADT 244 AADT 244

Mead & Hunt
7055 Samuel Morse Drive Suite 100
Columbia, MD 21046
1 443 741 3500

Site Code:
Station ID:
Decatur Ave west of Connecticut Ave

Latitude: 0' 0.0000 Undefined

Start	05-Dec-22		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	2	0	2	3	*	*	*	*	*	*	*	*	2	2
01:00	*	*	0	2	0	1	*	*	*	*	*	*	*	*	0	2
02:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
03:00	*	*	1	1	1	1	*	*	*	*	*	*	*	*	1	1
04:00	*	*	1	0	3	0	*	*	*	*	*	*	*	*	2	0
05:00	*	*	7	4	7	5	*	*	*	*	*	*	*	*	7	4
06:00	*	*	23	15	27	15	*	*	*	*	*	*	*	*	25	15
07:00	*	*	41	19	36	32	*	*	*	*	*	*	*	*	38	26
08:00	*	*	**80**	**49**	**74**	**39**	*	*	*	*	*	*	*	*	**77**	**44**
09:00	*	*	68	35	60	33	*	*	*	*	*	*	*	*	64	34
10:00	*	*	46	31	41	34	*	*	*	*	*	*	*	*	44	32
11:00	*	*	50	46	47	38	*	*	*	*	*	*	*	*	48	42
12:00 PM	*	*	47	44	50	43	*	*	*	*	*	*	*	*	48	44
01:00	*	*	59	29	65	39	*	*	*	*	*	*	*	*	62	34
02:00	*	*	41	43	53	40	*	*	*	*	*	*	*	*	47	42
03:00	*	*	107	63	91	46	*	*	*	*	*	*	*	*	99	54
04:00	*	*	111	60	114	65	*	*	*	*	*	*	*	*	112	62
05:00	*	*	**141**	**71**	**143**	**72**	*	*	*	*	*	*	*	*	**142**	**72**
06:00	*	*	101	59	85	38	*	*	*	*	*	*	*	*	93	48
07:00	*	*	50	39	41	27	*	*	*	*	*	*	*	*	46	33
08:00	*	*	21	14	29	18	*	*	*	*	*	*	*	*	25	16
09:00	*	*	22	12	10	7	*	*	*	*	*	*	*	*	16	10
10:00	*	*	6	13	8	10	*	*	*	*	*	*	*	*	7	12
11:00	*	*	1	4	8	9	*	*	*	*	*	*	*	*	4	6
Lane	0	0	1026	653	995	615	0	0	0	0	0	0	0	0	1009	635
Day	0		1679		1610		0		0		0		0		1644	
AM Peak	-	-	08:00	08:00	08:00	08:00	-	-	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	80	49	74	39	-	-	-	-	-	-	-	-	77	44
PM Peak	-	-	17:00	17:00	17:00	17:00	-	-	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	141	71	143	72	-	-	-	-	-	-	-	-	142	72

Comb. Total	0	1679	1610	0	0	0	0	1644

ADT ADT 1,644 AADT 1,644

APPENDIX B – Existing CLV

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: Beach Dr at Wexford Dr

Conditions: Existing

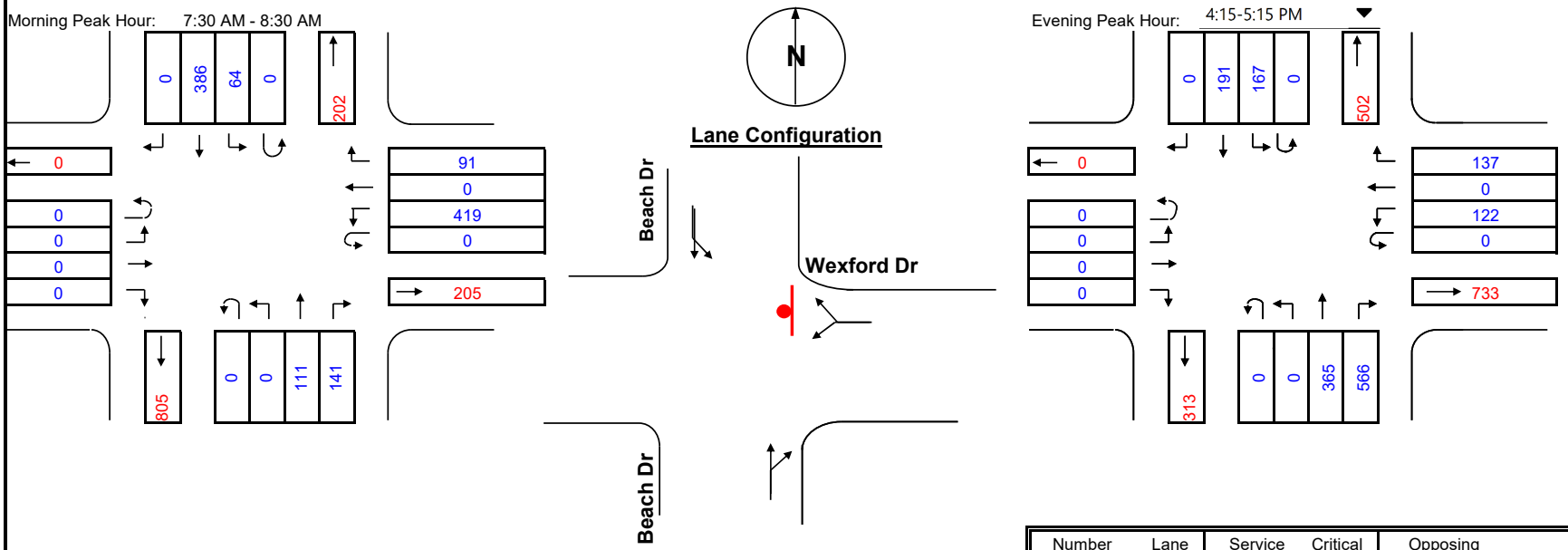
Design Year:

Computed by: MH

Date 5/3/2023

Morning Peak Hour: 7:30 AM - 8:30 AM

Evening Peak Hour: 4:15-5:15 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.53	B	<= 1150	<= 599	2.0
3	= 0.37	C	<= 1300	<= 799	3.0
4	= 0.25	D	<= 1450	<= 999	4.0
Dbl-Lt	= 0.60	E	<= 1600	> 1000	5.0
		F	> 1600		

Phasing			

RTOR/Overlap
- ☐ Northbound
- ☐ Southbound
- ☐ Eastbound
- ☐ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ○ Signal
- ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	252	1.00	252	64	316	
	SB	514	1.00	514	0	514	*
	EB	0	1.00	0	0	0	
	WB	510	1.00	510	0	510	*

Remarks:

* Critical volume Total **1024**

Level of service (V/C) **0.64** **B**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	931	1.00	931	167	1098	*
	SB	859	1.00	859	0	859	
	EB	0	1.00	0	0	0	
	WB	259	1.00	259	0	259	*

Remarks:

* Critical volume Total **1357**

Level of service (V/C) **0.85** **D**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: Beach Dr at Knowles Ave

Conditions: Existing

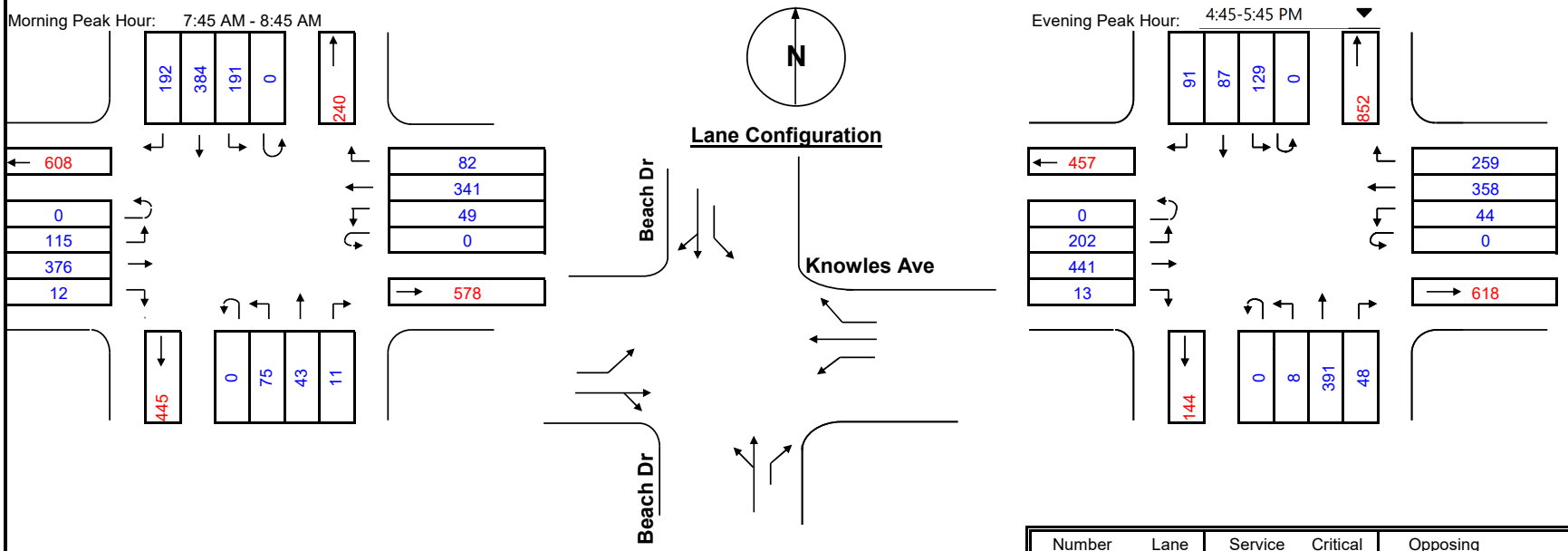
Design Year:

Computed by: MH

Date 5/3/2023

Morning Peak Hour: 7:45 AM - 8:45 AM

Evening Peak Hour: 4:45-5:45 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A	<= 1000	<= 199	1.1
2 =	0.53	B	<= 1150	<= 599	2.0
3 =	0.37	C	<= 1300	<= 799	3.0
4 =	0.25	D	<= 1450	<= 999	4.0
Dbl-Lt =	0.60	E	<= 1600	> 1000	5.0
		F	> 1600		

Phasing

RTOR/Overlap: ☐ Northbound ☑ Southbound ☑ Eastbound ☑ Westbound

Split Phasing: ○ East/West ○ North/South ◉ None

Inx. Control: ◉ Signal ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	193	1.00	193	191	384	
	SB	576	1.00	576	75	651	*
	EB	388	1.00	388	49	437	
	WB	341	1.00	341	115	456	*

Remarks:

* Critical volume Total **1107**

Level of service (V/C) **0.69** **B**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	400	1.00	400	129	529	*
	SB	178	1.00	178	8	186	
	EB	454	1.00	454	44	498	
	WB	617	1.00	617	202	819	*

Remarks:

* Critical volume Total **1348**

Level of service (V/C) **0.84** **D**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: MD 185 at Knowles Ave

Conditions: Existing

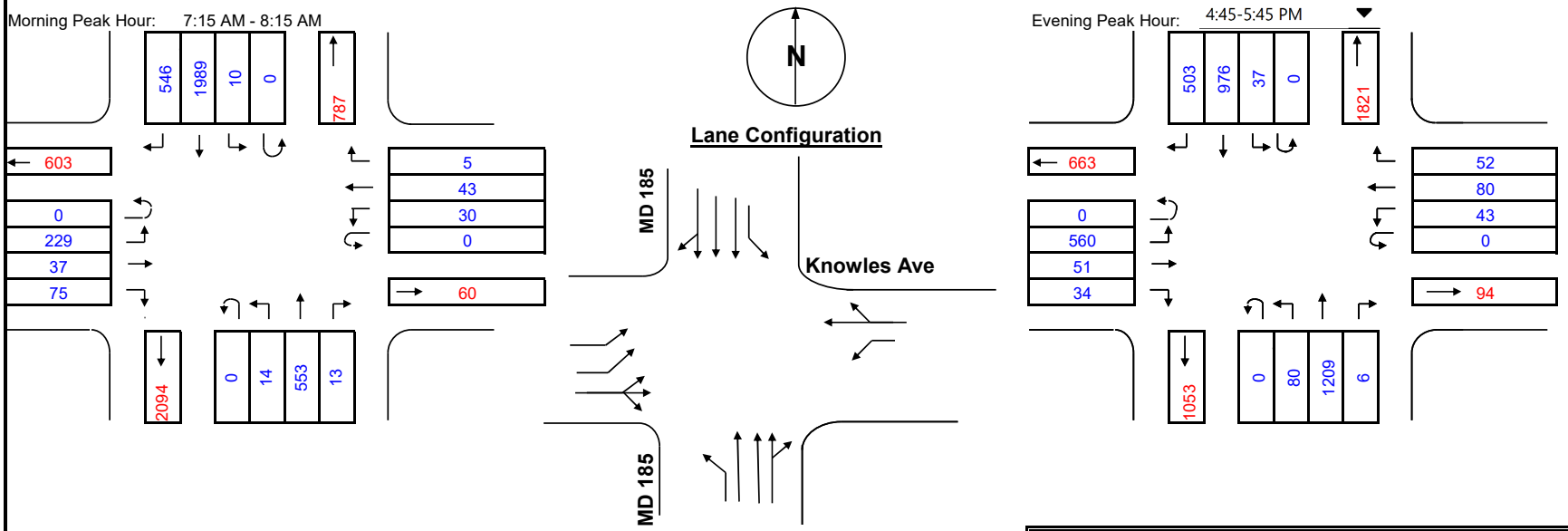
Design Year:

Computed by: MH

Date 5/3/2023

Morning Peak Hour: 7:15 AM - 8:15 AM

Evening Peak Hour: 4:45-5:45 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.53	B <=	1150	<= 599	2.0
3 =	0.37	C <=	1300	<= 799	3.0
4 =	0.25	D <=	1450	<= 999	4.0
Dbl-Lt =	0.60	E <=	1600	> 1000	5.0
		F >	1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	566	0.37	209	10	219			NB	1215	0.37	450	37	487	
	SB	2535	0.37	938	14	952	*		SB	2988	0.37	1106	80	1186	*
	EB	341	0.37	126	0	126	*		EB	645	0.37	239	0	239	*
	WB	48	1.00	48	0	48	*		WB	132	1.00	132	0	132	*

Remarks:

* Critical volume Total **1126**

Level of service (V/C) **0.70** **B**

Remarks:

* Critical volume Total **1556**

Level of service (V/C) **0.97** **E**

APPENDIX C – Travel Times

Field Measured Travel Time (sec)			
Peak	**Runs**	**Knowles Ave**	**Decatur Ave**
AM	Run 1	282	463
	Run 2	466	366
	Run 3	330	370
	Average	**359**	**400**
PM	Run 1	410	399
	Run 2	368	274
	Run 3	306	354
	Average	**361**	**342**

APPENDIX D – Diverted Traffic CLV

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: Beach Dr at Wexford Dr

Conditions: Proposed

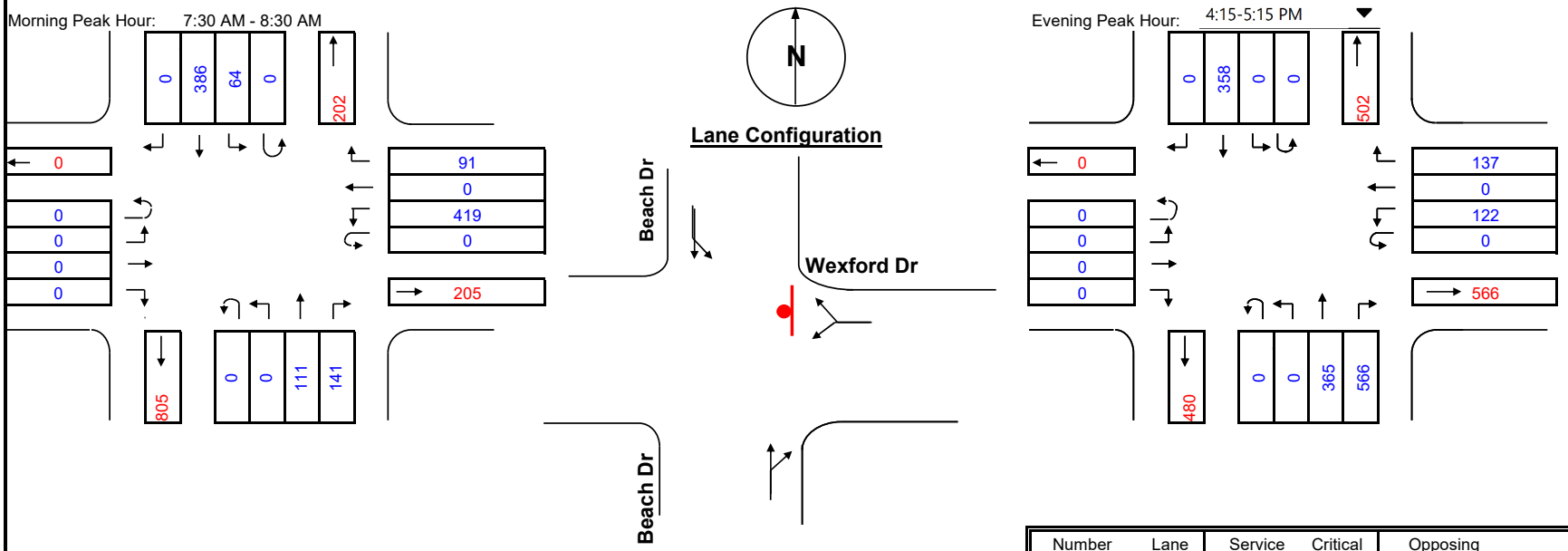
Design Year:

Computed by: MH

Date 5/3/2023

Morning Peak Hour: 7:30 AM - 8:30 AM

Evening Peak Hour: 4:15-5:15 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A	<= 1000	<= 199	1.1
2 =	0.53	B	<= 1150	<= 599	2.0
3 =	0.37	C	<= 1300	<= 799	3.0
4 =	0.25	D	<= 1450	<= 999	4.0
Dbl-Lt =	0.60	E	<= 1600	> 1000	5.0
		F	> 1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☐ Southbound
- ☐ Eastbound
- ☐ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ○ Signal
- ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	252	1.00	252	64	316	
	SB	514	1.00	514	0	514	*
	EB	0	1.00	0	0	0	
	WB	510	1.00	510	0	510	*

Remarks:

* Critical volume Total **1024**

Level of service (V/C) **0.64** **B**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	931	1.00	931	0	931	*
	SB	358	1.00	358	0	358	
	EB	0	1.00	0	0	0	
	WB	259	1.00	259	0	259	*

Remarks:

* Critical volume Total **1190**

Level of service (V/C) **0.74** **C**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: Beach Dr at Knowles Ave

Conditions: Proposed

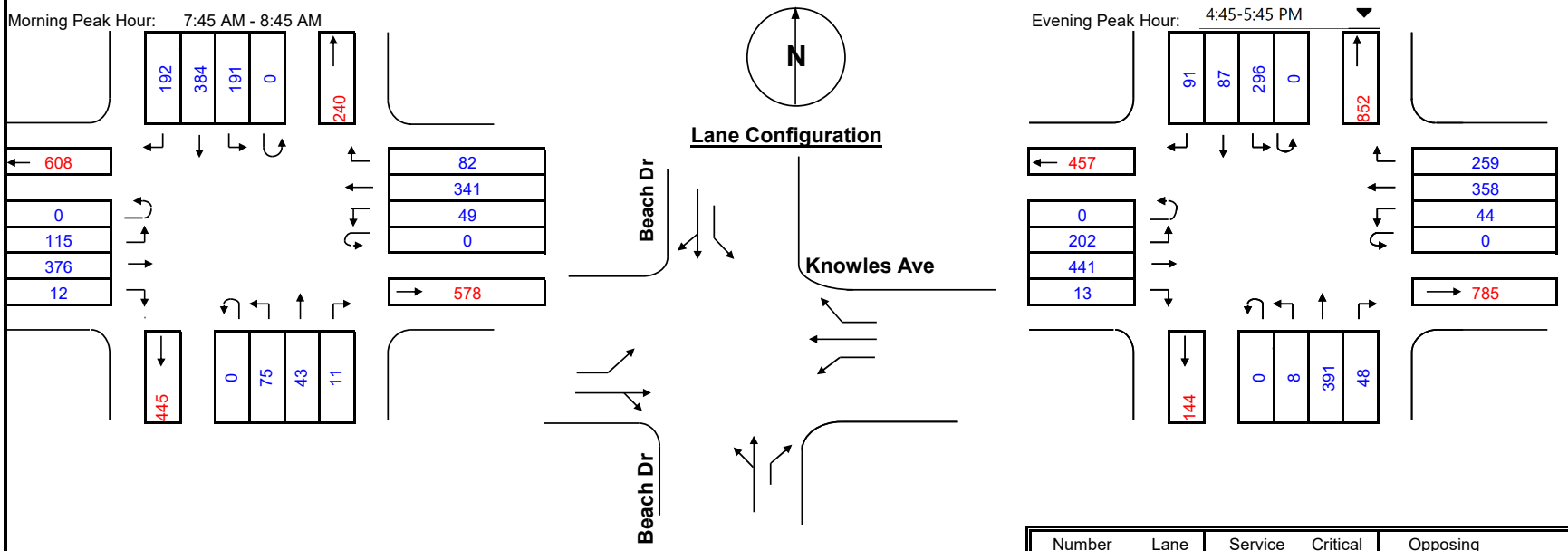
Design Year:

Computed by: MH

Date 5/3/2023

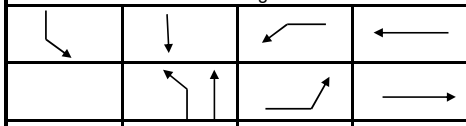
Morning Peak Hour: 7:45 AM - 8:45 AM

Evening Peak Hour: 4:45-5:45 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.53	B <=	1150	<= 599	2.0
3 =	0.37	C <=	1300	<= 799	3.0
4 =	0.25	D <=	1450	<= 999	4.0
Dbl-Lt =	0.60	E <=	1600	> 1000	5.0
		F >	1600		

Phasing



RTOR/Overlap
- ☐ Northbound
- ☑ Southbound
- ☑ Eastbound
- ☑ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ◉ Signal
- ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	193	1.00	193	191	384	
	SB	576	1.00	576	75	651	*
	EB	388	1.00	388	49	437	
	WB	341	1.00	341	115	456	*

Remarks:

* Critical volume Total **1107**

Level of service (V/C) **0.69** **B**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	400	1.00	400	296	696	*
	SB	178	1.00	178	8	186	
	EB	454	1.00	454	44	498	
	WB	617	1.00	617	202	819	*

Remarks:

* Critical volume Total **1515**

Level of service (V/C) **0.95** **E**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Mead & Hunt**

Count Date:

Location: MD 185 at Knowles Ave

Conditions: Proposed

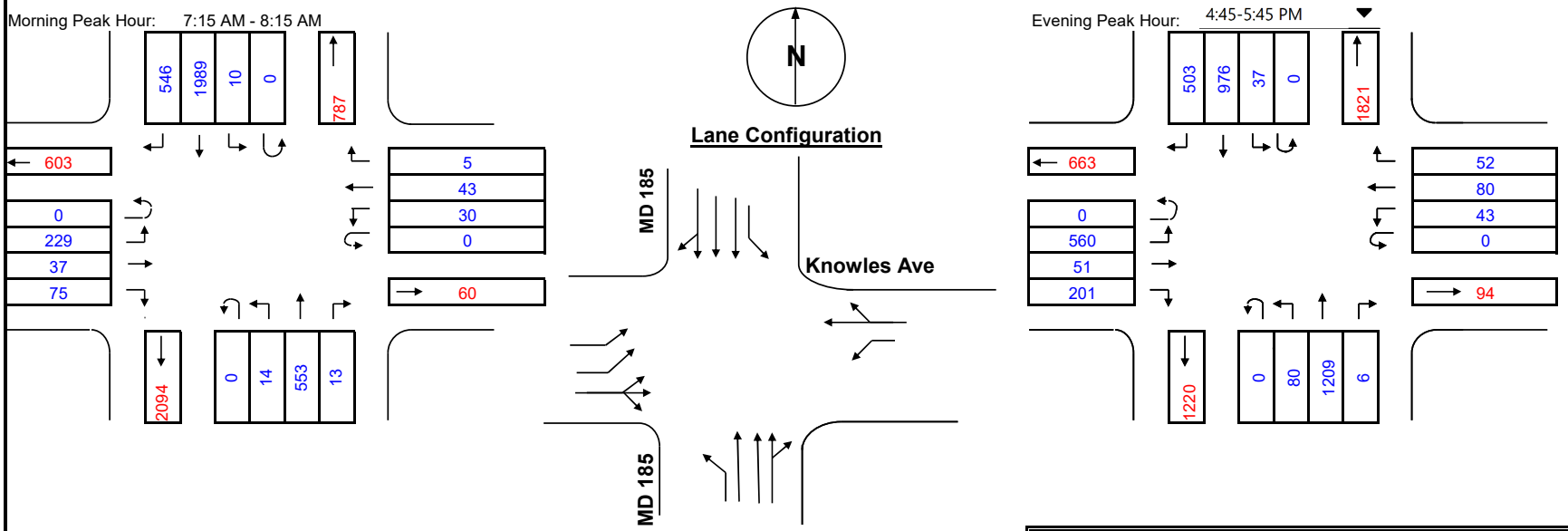
Design Year:

Computed by: MH

Date 5/3/2023

Morning Peak Hour: 7:15 AM - 8:15 AM

Evening Peak Hour: 4:45-5:45 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.53	B <=	1150	<= 599	2.0
3 =	0.37	C <=	1300	<= 799	3.0
4 =	0.25	D <=	1450	<= 999	4.0
Dbl-Lt =	0.60	E <=	1600	> 1000	5.0
		F >	1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	566	0.37	209	10	219			NB	1215	0.37	450	37	487	
	SB	2535	0.37	938	14	952	*		SB	2988	0.37	1106	80	1186	*
	EB	341	0.37	126	0	126	*		EB	812	0.37	300	0	300	*
	WB	48	1.00	48	0	48	*		WB	132	1.00	132	0	132	*

Remarks:

* Critical volume Total **1126**

Level of service (V/C) **0.70** **B**

Remarks:

* Critical volume Total **1618**

Level of service (V/C) **1.01** **F**