TRAFFIC IMPACT STUDY

MITCHELL PROPERTY WAREHOUSE
(F.O. Mitchell & Brothers Property)

Industrial Development
Harford County, Maryland

Revised June, 2022
November, 2021

Prepared For:

Chesapeake Real Estate Group

Prepared By:

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Traffic Impact Studies • Feasibility • Traffic Signal Design • Traffic Counts •Expert Testimony

June 2, 2022

Mr. Alex Rawls
Transportation Planner
Harford County Government
Department of Planning & Zoning
220 S. Main Street
Bel Air, MD 21014

RE: Traffic Impact Study – Point by Point Letter
Mitchell Property
TIA 63502021, version I
T/C 3762

Dear Mr. Rawls:

We are addressing you March 4, 2022 comments with this point-by-point response letter and a revised Mitchell Property Warehouse Traffic Impact Study (TIS).

- ***Existing Traffic: Update all turning movement counts to expand the AM and PM peak hour. AM peak hour counts shall be collected from 6:00 am to 9:00 am and PM peak hour counts shall be collected from 3:00 pm to 6:00 pm.***

  The existing traffic volumes were recounted with the expanded hours, as requested by Harford County. The traffic volume information is included in the revised TIS.

- ***Trip Generation: ITE released the 11th edition of their Trip Generation Manual in September 2021. We believe with the evolution of the e-commerce industry, the ITE trip generation rate should be used to achieve a more realistic future condition scenario. Please update the study with the ITE trip generation rate for High-Cube Fulfillment Center Warehouse (Land Use Code 155).***

  The revised TIS includes ITE trip generation rates for the High-Cube Fulfillment Center Warehouse (LUC 155).

- ***MD 159 @ Chelsea Road (existing and background): The existing northbound lane configuration shown in the study for Chelsea Road is incorrect. The approach should be shown and analyzed as one northbound left tum lane and one northbound through lane.***

  The revised TIS shows the lane-use at MD 159 @ Chelsea Road intersection under the existing, background, and future conditions with one northbound shared left/through lane and a separate through lane.

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June 2, 2022

Ms. Wendy Wolcott, P.L.A.
Metropolitan District Engineer
MDOT State Highway Administration
District 4 – Baltimore and Harford Counties
320 West Warran Road
Hunt Valley, MD 21030

RE: Traffic Impact Study – Point by Point Letter
Mitchell Property Warehouse – MD 159
MDOT SHA Tracking No. 21APHA021XX
T/C 3762

Dear Ms. Wolcott:

We are addressing you March 18, 2022 comments with this point-by-point response letter and a revised Mitchell Property Warehouse Traffic Impact Study (TIS).

MDOT SHA Comments and conclusions:

1. **Both the existing and proposed traffic volumes shown in the study appear significantly low for the proposed development and its capacity**.

   The existing intersection turning movement counts were recounted with expanded hours as required by Harford County DPZ/DPW.

2. **Based on the number of parking lots and parking spaces shown on the Site Plan, (3,773 parking spaces and 2,178 trailer parking spaces for a total of 5,951 spaces), it appears the project is anticipated to bring significant volumes of traffic to the area. The Site Plan indicates "ON-SITE PARKING AS NECESSARY TO ACCOMMODATE TRAFFIC GENERATED BY THE USE AND THE LARGEST EMPLOYEE SHIFT," yet the TIS shows the proposed number of peak hour trips generated for the site as 416 AM peak hour trips and 572 PM peak hour trips. Please provide explanation for the very large quantity of vehicle spaces compared to the trip generation. Please confirm that the pavement and roadway design of the MDOT maintained roadways will be adequate for the passenger vehicle and truck traffic that is anticipated with this project. If roadways require widening, structural improvement of the pavement, or other improvements to accommodate the development-generated traffic, the developer should be required to fund and/or construct any necessary upgrades**.

   A traffic scoping meeting was held for this project, which was attended by MDOT SHA. At this meeting the site plan was shared with all the reviewing government agencies and the trip generation rates for use in the study were discussed by both SHA and the County. At this meeting, the County provided the traffic engineer with the agreed upon trip generation rates that were included in the original TIS. After the initial TIS review by the County and SHA, the County required new trip generation rates that are now provided in the revied TIS. The requested confirmation of adequate roadways and roadway design would be addressed by the site's civil engineer.

3. **Care should be taken to encourage use of new Roadway A and strongly discourage site vehicles from using MD 159. Please provide information as to proposed mitigation and/or calming measures that will be installed to ensure trucks do not use Perryman Road and will instead use Chelsea Road.**

   The revised TIS includes a new site trip generation and assignment pattern that shows all new trips using the Canning House Road (extended) formerly Roadway A to Chelsea Road. This distribution was approved by Harford County.

4. **Exhibit 9A (Site Generated Traffic - Truck Trips) indicates 65% of vehicles headed to/from Riverside Parkway to/from site will take MD 543 to US 40 to Spesutia Road. However, trucks over 3/4 ton are not permitted on Spesutia Road. This appears to be an editing error, since intersection #6 shows no trucks turning onto Spesutia Road.**

   Exhibits 8A and 8B show the new truck trips generated by the project. No trucks are assigned to Spesutia Road.

5. **To determine the background volumes, a 2.2% annual growth rate was applied to the volumes at intersections #1 to #13. No growth rate was applied to the volumes at intersections #14 to #20. Please apply the growth rate to intersections #14 to #20 or provide justification as to why the growth rate should not be applied.**

   The existing traffic generated within the peninsula is generated by the existing residential, service, and industrial land uses. Any additional traffic is generated by background developments. Therefore, there is no through traffic that would be represented with a growth rate on the Perryman Peninsula.

6. **The Turning Movement counts (TMC's) used to determine "Existing Traffic Volumes" were conducted in September and October 2021. We compared historical counts at some of the intersections with the 2021 volumes and determined that the 2021 volumes are significantly lower for certain movements when compared to the historical counts. One example is during the PM peak hour at intersection #12 (MD 715 @ Old Philadelphia Road). The MD 715 NB volume is 1,721 vph in the historical counts, yet the 2021 count volume is only 899 vph. TFAD recommends the higher, pre-Covid-19 volumes be used.**

   The intersection turning movement counts were recounted and the count time were expanded, as required by the County. The revised TIS includes the new existing traffic counts.

7. **Additionally, was research done to determine whether major employers in the area (i.e. Aberdeen Proving Ground) had a large percentage of employees teleworking at the times the 2021 TMC's were conducted? ATR station #12 along US 40 in Harford County indicated the ADT for 2019 as being 24,140 vpd and for 2020 as 20,161 vpd. Please apply a COVID factor to TMC volumes conducted after the onset of COVID to attempt to offset the significant reduction in volumes.**

   The intersection turning movement counts were recounted and the count time were expanded, as required by the County. The revised TIS includes the new existing traffic counts.

8. **Two new figures must be provided for review summing the volumes shown in Exhibits 9A and 10A (Total Site Generated Trips) and Exhibits 9B and 10B (Total Site Generated Trips). The new figures must show the truck and passenger vehicle trips combined.**

   The revised TIS includes separate exhibits for the site generated passenger car trips, truck trips, and exhibits for the combined passenger cars and truck trips.

9. **We note that the trip generation rates for distribution centers used in this study were developed in 1996. Although the county may have provided the trip generation numbers provided in the TIS (416 AM trips and 572 PM trips) in 1996, the number of trips proposed is significantly less than the quantity yielded had they utilized the ITE 10th edition. Additionally, the developer should update their report utilizing trip generation numbers that correlate with the Site Plan submitted and resubmit for review.**

   A traffic scoping meeting was held for this project, which was attended by MDOT SHA. At this meeting, the site plan was shared with all the reviewing government agencies and the trip generation rates were discussed by both SHA and the County. At this meeting, the County provided the traffic engineer with the agreed upon trip generation rates that were used in the original TIS. After a review by the County and SHA, the County required that the ITE rates for Land Use Code 155 must be used in a revised TIS. These trips are included in the attached revised TIS.

10. **The scoping documents provided in the TIS do not clearly show approval of the project site trip distribution percentages. Please provide / highlight the documentation showing Harford County approved the proposed trip distribution as Harford County is responsible for all land use approvals.**

    The revised trip distribution is included in the revised TIS.

11. **We question the percentage of vehicles (especially trucks) the developer assigns to the MD 543 to MD 7 to MD 159 route. There are three roundabouts along MD 7, so it seems unlikely that large trucks would choose that route. Also, two different navigation applications were used and neither recommended using MD 7, but instead, recommended continuing south along MD 543 to US 40. Please provide additional information (i.e. travel time runs) supporting this routing and/or consider revising the trip distribution to have all trucks, and possibly additional passenger cars to/from the northwest, utilize the MD 543 to US 40 to MD 159 route.**

    The revised TIS includes a truck distribution that shows the truck trips using US 40 to MD 543 to MD 159 to and from the site.

12. **Since the percentage of large trucks is high, please include the correct truck percentage in the analysis and update the queuing analysis.**

    The HCS and the Synchro analyses were changed in the revised TIS to include heavy truck percentages, as determined by the County.

13. **The study indicates Intersection #4 (MD 7 at Stepney Road) had LOS D and F for some of the movements in the background and future conditions, and the current development worsened the HCM delay in the future condition. According to the conclusions of the TIS, a traffic signal warrant analysis was recently conducted at the intersection by other developers, but the results indicated signalization is not yet warranted. The TIS also indicated the signal is fully funded and the County or other will install it once the warrants are met. Please indicate whether any other mitigation options were considered. Additionally, we also note that Harford County, in their April 1, 2021 transportation priorities letter, requests acquisition of right-of-way, design, and construction of a roundabout to improve safety and flow of traffic at the MD 7 at Stepney Road intersection**.

    The improvement at this intersection is a traffic signal. The signal is fully funded and is part of another project's required traffic mitigation plan. In the revised TIS, the signal is included in the background and the future conditions analyses. The revised TIS shows the intersection would operate adequately with al traffic signal.

14. **The developer only included intersections 1 through 3 of the study intersections in the synchro files they provided. Please provide the synchro analysis for any study intersections which include MDOT SHA roadways and report 95th percentile queues from SimTraffic**.

    New Synchro models have been prepared that include all study intersections.

15. **Including MD 543 at Church Creek Road in the volume diagrams would be useful. We understand that it is not included in the intersections to be analyzed, but recommend including this intersection with a note indicating that the volumes are included because they are in the Synchro model**.

    The study limits in the revised TIS remain the same as in the original TIS and as required by the County and MDOT SHA.

16. **Background/Future Models – Unless planned improvements will extend the southbound MD 543 right turn lane at the I-95 southbound ramps, please correct the lane configuration to show the correct right turn lane distances.**

    The extension of this lane is expected as part of the James Run development to the north.

17. **MD 543 at I-95 northbound ramps – The geometry does not match the current configuration. The channelized right turn is not included. Due to the redundancy of the movement, we recommend putting in a dummy node with the channelized right into the southbound MD 543 right turn lane downstream and adjusting the link O-D volumes from that right to not allow lefts at MD 543 and MD 7. This would solve the volume balancing issue and prevent vehicles from popping up in the middle of the link in SimTraffic.**

    To fully model the existing geometry at this intersection would require the placement of new nodes very close to the signalized intersection, which would interfere with detection, queue reporting, and modeling of other channelized right turns. The O–D volumes have been duly adjusted to ensure that the traffic generated mid-block (representing the users of the channelized right turn) does not turn left at MD 7. The same compromise has been made to represent the approved improvements to the eastbound leg of MD 7 at MD 543.

18. **At the MD 543 at I-95 northbound and southbound ramp intersections, adjust max splits to be full time of opposing through and left to remove gray block in timing settings display.**

    This change has been made, except when the signal in question runs uncoordinated. Increasing the max split in uncoordinated operation was found to alter the operation of the signal from the actual programmed timing.

21. **Confirm coordination control type from signal sheets. The corridor switches from actuated uncoordinated to actuated coordinated back to actuated uncoordinated.**

    The control type has been confirmed against timing sheets provided by MDOT SHA.

22. **Employee shift changes at similar sites introduce a significant increase to the existing traffic volume which creates an added peak period which was not evaluated as part of this analysis. The Site Plan submitted indicates that shift work is anticipated.**

    The revised TIS now includes ITE trip generation rates for a warehouse distribution project. The ITE rates account for all trips generated during the weekday AM and PM peak hours. We do note the key intersections were recounted with expanded hours. This information is included in the revised TIS.

Sincerely,

TRAFFIC CONCEPTS, INC.

J. Mark Keeley

Mark Keeley, PTP
Project Manager
MKeeley@traffic-concepts.com

Attachments: Revised TIS

- ***MD 159 @ Chelsea Road (future mitigation): Channelize the westbound/southbound Perryman Road (MD 159) right turn (from Spesutia Road) with a stop bar on eastbound Perryman Road (MD 159 - from Stockhams Lane) repositioned further out into the intersection as shown on the attached exhibit (exhibit 1).***

  The developer will construct a channelized southbound MD 159 right turn lane from Spesitia Road approaching MD 159. The developer will also relocate the existing stop bar on MD 159 further into the intersection to improve driver sight lines.

- ***MD 159 @ Chelsea Road (future mitigation): Restripe northbound Chelsea Road as shown on the attached exhibit (exhibit 2)***

  The revised TIS shows adequate queuing along the northbound left turn lane along Chelsea Road to MD 159. The requested lane remarking is not required according to the APFO.

- ***MD 715 @ Woodley Road (Extended): This proposed Harford County Department of Public Works Capital Project is not fully funded in the current fiscal year and must be removed from the traffic study.***

  The revised traffic impact study does not include the MD 715 @ Woodley Road extended project.

- ***Spesutia Road: The Harford County Department of Public Works, Division of Highways Engineering Capital Project for the Spesutia Road Reconstruction (US 40 to MD 159) is designed and fully funded for construction. These improvements need to be identified in the study and included in the analysis of the intersections of MD 159 @ Spesutia Road and US 40 @ Spesutia Road.***

  The Spesutia Road improvements are included in the revised TIS.

- ***US 40 @ Spesutia Road (existing and background): The existing northbound lane configuration shown in the study for Spesutia Road is incorrect. The approach should be shown and analyzed as an exclusive northbound left tum lane with 300-feet of storage and a shared through/right tum lane.***

  The US 40 @ Spesutia Road (existing and background) programmed road improvements are included in the revised TIS.

- ***US 40 @ Spesutia Road (future mitigation): Revise the existing traffic signal to install a split phase with a left and a shared left/through/right for northbound Spesutia Road.***

  The US 40 @ Spesutia Road intersection improvements are provided in the revised TIS. These improvements, as requested by the County, include the background and future analyses of US 40 @ Spesutia Road with split signal phasing and with a left and a shared left/thru/right lane configuration along NB Spesutia Road.

- ***MD 7 @ Stepney Road: The developer needs to mitigate their impact at this failing intersection. The traffic study identifies this as an issue but says that the fully funded signal proposed at the intersection by others will have enough built-in capacity to address the problem. An analysis to prove this hypothesis needs to be provided to ensure that it is no longer failing with the installation of the traffic signal and to ensure that adequate storage is provided for the future queues. If the signal isn't warranted, other mitigation options must be considered and identified.***

  The MD 7 @ Stepney Road intersection was analyzed with a traffic signal under the background and future traffic conditions. As determined with the analysis, the fully funded signal would operate with adequate LOS conditions. Therefore, no additional improvements are warranted at this intersection.

- ***MD 543 @ MD 7: Provide a queuing analysis for the westbound MD 7 right turn lane.***

  The westbound MD 7 right turn lane queue was analyzed and is included in the revised TIS. The right turn storage was determined to be adequate to support the future traffic volumes.

- ***Exhibit LOA - Site Generated Traffic/Passenger Vehicles: The trips to/from US 40 west of MD 543 access the site from Spesutia Road but the triple asterisk indicates that the trips access the site from MD 159. Please correct the triple asterisk to match the distribution.***

  The revised TIS includes revisions to the new site generated peak hour trips, as requested by MDOT SHA and approved by Harford County.

- ***Site Generated Traffic: Provide an exhibit showing passenger vehicles and trucks combined.***

  The revised TIS includes exhibits 10A and 10B that show the combined new site generated passenger car trips and the truck trips.

- ***Heavy Vehicles: In accordance with the Harford County TIA Guidelines, the percent of heavy vehicles should be set to 5% on MD 7/Old Philadelphia Road, MD 543, and MD 159/Chelsea Road. The developer proposes 10% on MD 159 at their site access and at Canning House Road and on Chelsea Road at their proposed access road and at Woodley Road. We agree that 10% should be used at these intersections.***

  The revised TIS includes in the HCS analyses the percent of heavy vehicles requested by Harford County.

- ***Appendix I-B HCM Report: Submit the HCS7 Input Report along with the Summary Report.***

  The HCS input reports are included in the revised TIS.

Sincerely,

TRAFFIC CONCEPTS, INC.

J. Mark Keeley

Mark Keeley, PTP
Project Manager
MKeeley@traffic-concepts.com

Attachments: Revised TIS

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INTRODUCTION

Traffic Concepts, Inc. has revised the traffic impact study for the proposed Mitchell Property warehouse project. The study revision is due to comments received by MDOT SHA and Harford County.

Site Description & Access

The developer proposes to construct a 5,200,000 gsf of warehouse on the F.O. Mitchell & Brothers property. The property address is 1714 Perryman Road. The property is situated on the west side of MD 159 (Perryman RD) and the property boundary begins south of Canning House Road and extends to Ford Lane.

The subject property has direct access to Canning House Road and to MD 159. As shown on the site plan, Canning House would be shifted to intersect MD 159 north of its current location and extended to Chelsea Road. All site trips were assigned to this new road connection.

Scope of Services

The study was developed in accordance with the Harford County Adequate Public Facilities Ordinance and the Harford County Traffic Impact Study Guidelines. A scope of services document was developed by the County, which is included in the Appendix IV. The key intersections are listed below. Exhibit 1 shows the location of the site, the proposed Canning House Road extension and new connection to Chelsea Road, and the key intersections.

US 40 EB Ramps @ MD 22 (Signalized)	US 40 @ MD 132 (Signalized)
US 40 @ MD 7/MD 159 (Signalized)	US 40 @ MD 543 (Signalized)
US 40 @ Spesutia Road (Signalized)	MD 543 @ I-95 NB Ramps (Signalized)
MD 543 @ I-95 SB Ramps (Signalized)	MD 543 @ MD 7 (Signalized)
MD 715 @ US 40 EB Ramps (Signalzied)	MD 715 @ Old Philadelphia RD (Signalized)
MD 7 @ Stepney Road (Unsignalized)	MD 159 (Old Phil. RD) @ MD 159 (Perryman RD) (Roundabout)
MD 159 @ Spesutia Road (Unsignalized)	MD 159 @ Chelsea Road (Unsignalized)
MD 159 @ Fords Lane (Unsignalized)	MD 159 @ Canning House Road (Unsignalized)
Chelsea Road @ Woodley RD (Unsignalized)	Chelsea Road @ Proposed Canning House Road Extended (Unsignalized)

Study Methodology

The key intersections were counted during the weekday morning (6:00 AM - 9:30 AM) and evening (3:00 PM – 6:30 PM) peak hours. The morning and afternoon peak hour traffic volume was analyzed during the existing, background, and the future traffic conditions using the following methodologies.

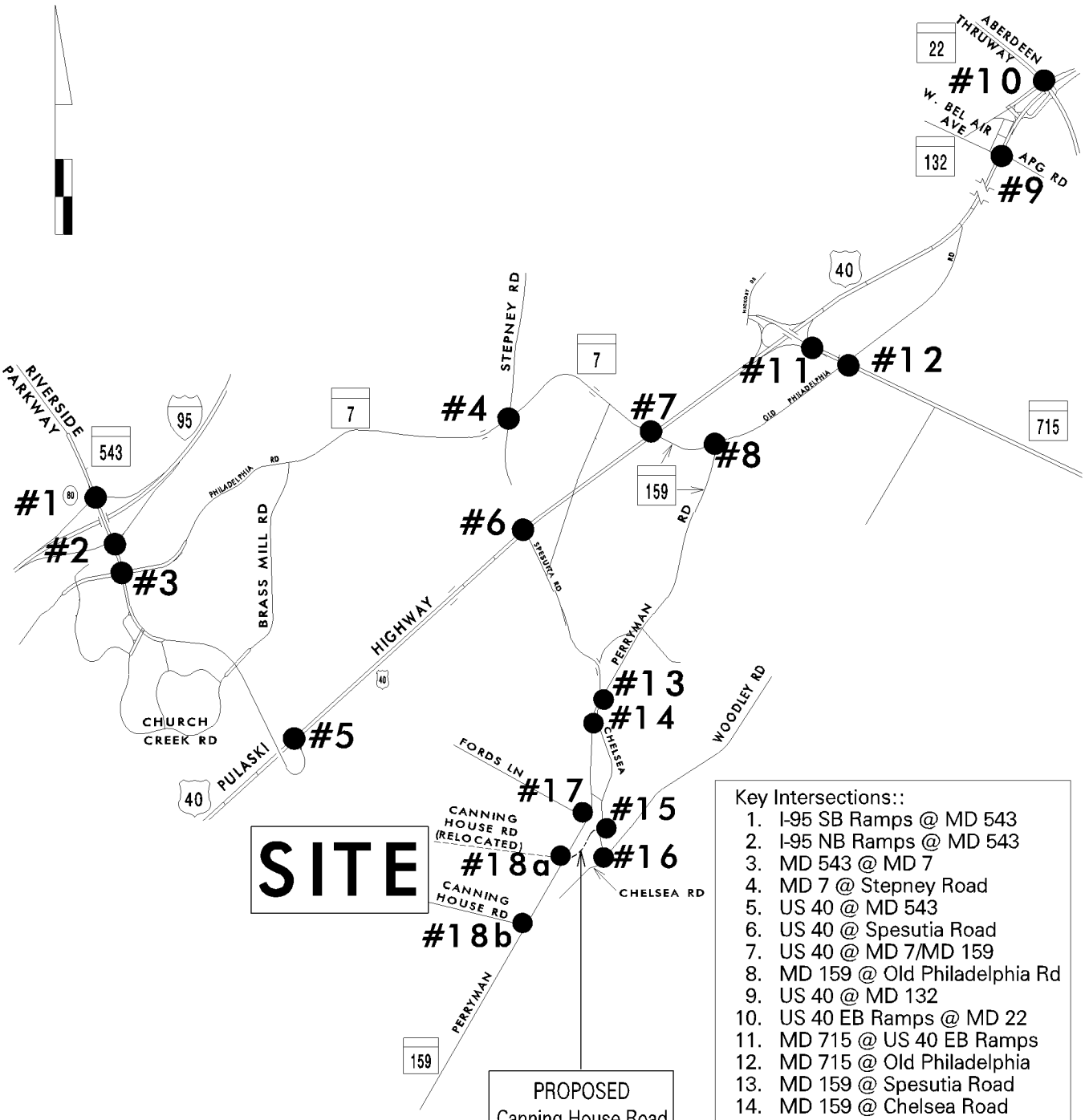
This study meets the County APFO standards by including analyses at all key intersections using the Critical Lane Volume (CLV) and Highway Capacity Manual software (HCS) methodologies. The HCS results are included at all key intersections, unless otherwise approved by Harford County.

Additionally, the signalized key intersections and the non-standard unsignalized intersections that the HCM software cannot analyze were analyzed with Synchro model. The Synchro model results were reported with HCM methodology, which is represented as Version HCM 2000. This methodology was requested by MDOT SHA and is accepted by Harford County. Finally, roundabouts were analyzed using the Sidra Intersection method. The results are listed in the following tables and the detailed calculations are included in Appendix I.

Additionally, vehicle queuing analyses were conducted at signalized intersections, as directed by the County. The SimTraffic queues from the Synchro model were also reported.

The study was conducted in three phases that includes an existing condition, a background condition, and the future traffic condition. The background and the future site generated trips were determined with data contained in the Institute of Transportation Engineers', Trip Generation Manual, 11th Edition (ITE Manual). The total future traffic volumes are described with the following formula:

Total Future Traffic = (Existing Traffic + Growth in Existing Traffic + Approved Development Traffic + Site Generated Traffic)



Key Intersections::

1. I-95 SB Ramps @ MD 543
2. I-95 NB Ramps @ MD 543
3. MD 543 @ MD 7
4. MD 7 @ Stepney Road
5. US 40 @ MD 543
6. US 40 @ Spesutia Road
7. US 40 @ MD 7/MD 159
8. MD 159 @ Old Philadelphia Rd
9. US 40 @ MD 132
10. US 40 EB Ramps @ MD 22
11. MD 715 @ US 40 EB Ramps
12. MD 715 @ Old Philadelphia
13. MD 159 @ Spesutia Road
14. MD 159 @ Chelsea Road
15. Chelsea Road @ Proposed Canning House Rd Extended
16. Chelsea Rd @ Woodley Rd
17. MD 159 @ Fords Lane

18a. MD 159 @ Canning House Rd Relocated/Extended

18b. MD 159 @ Canning House Rd

NOT TO SCALE

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EXHIBIT 1

Site Location Map

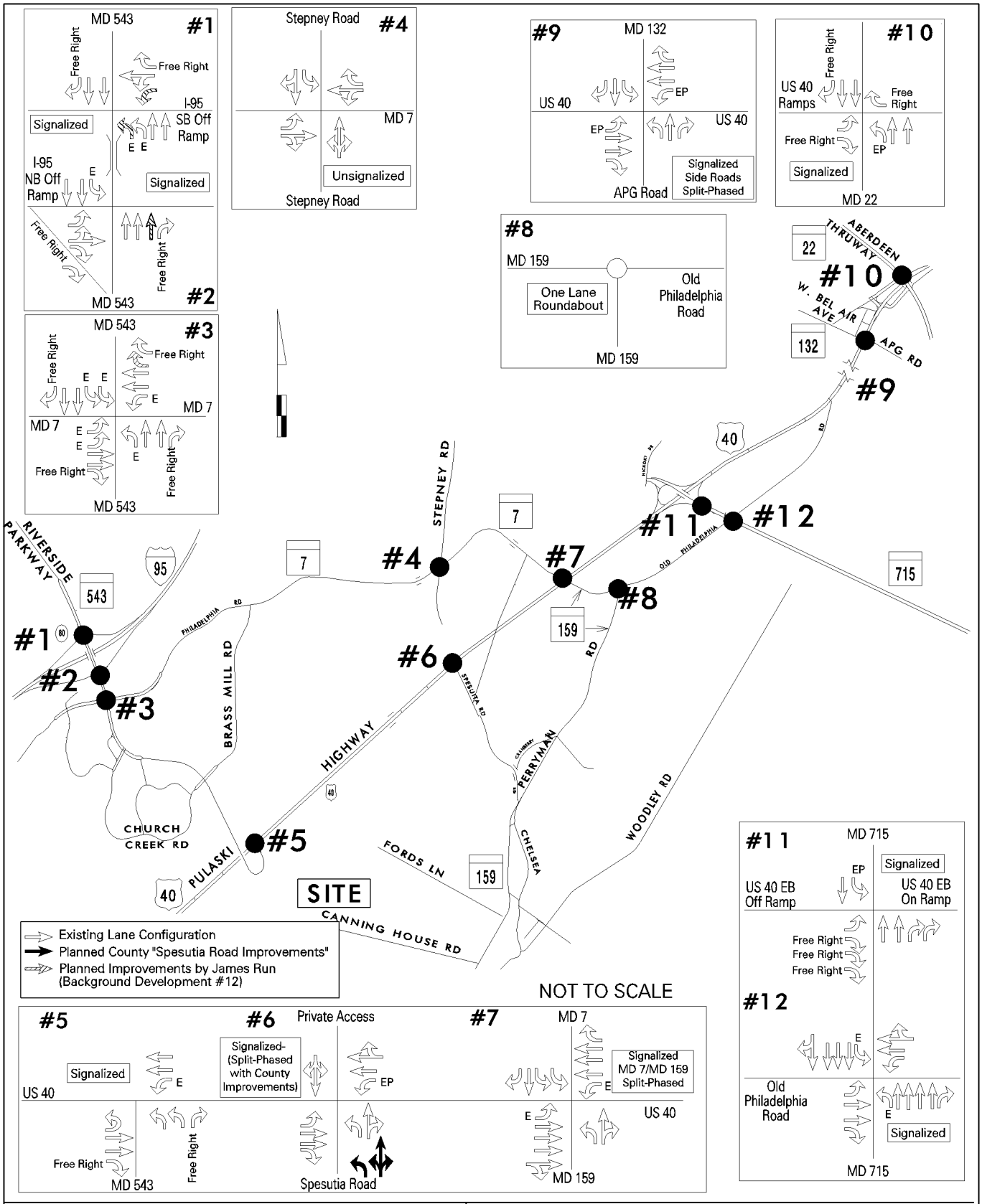

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EXHIBIT 2A

Lane Configuration

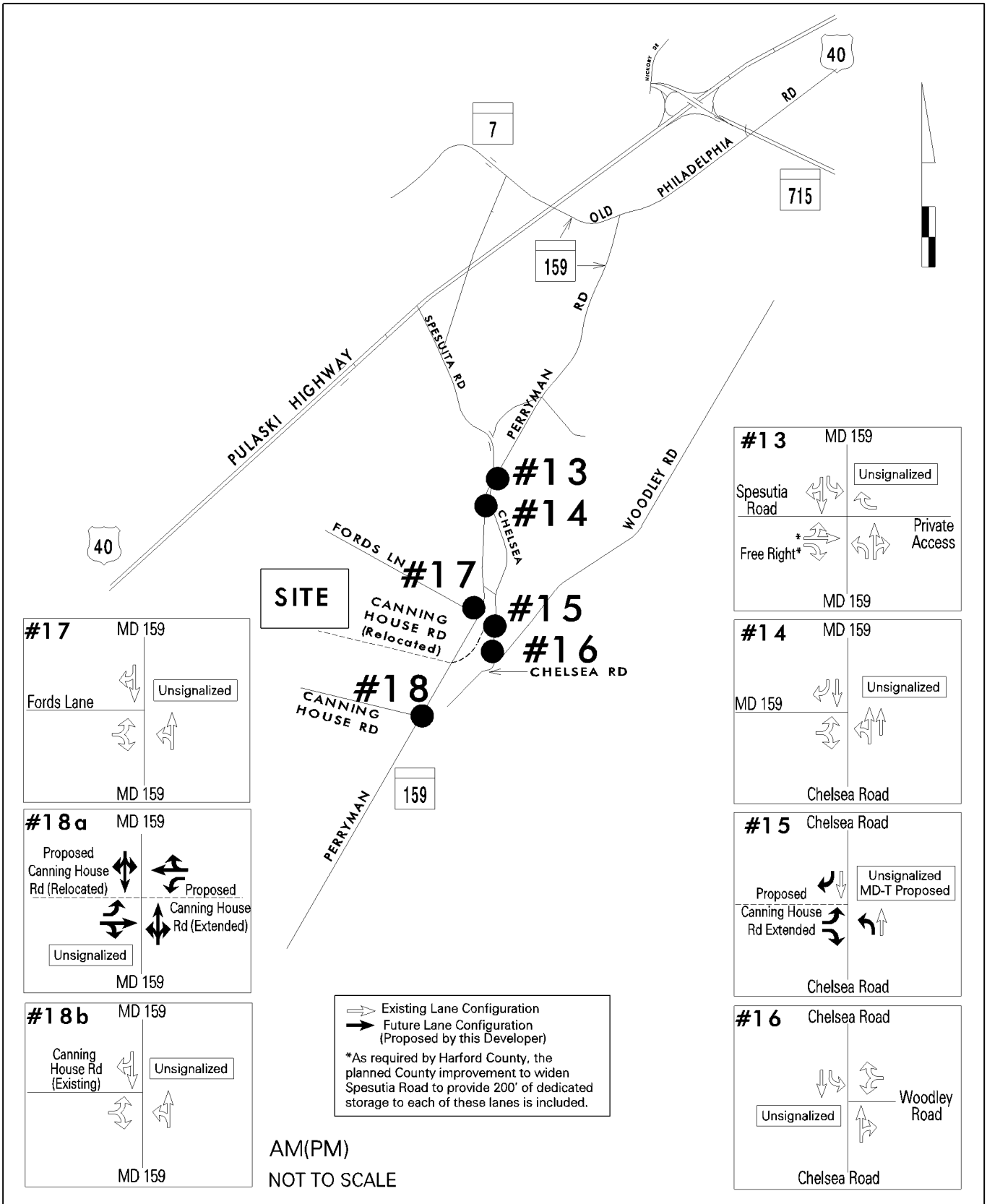

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EXHIBIT 2B

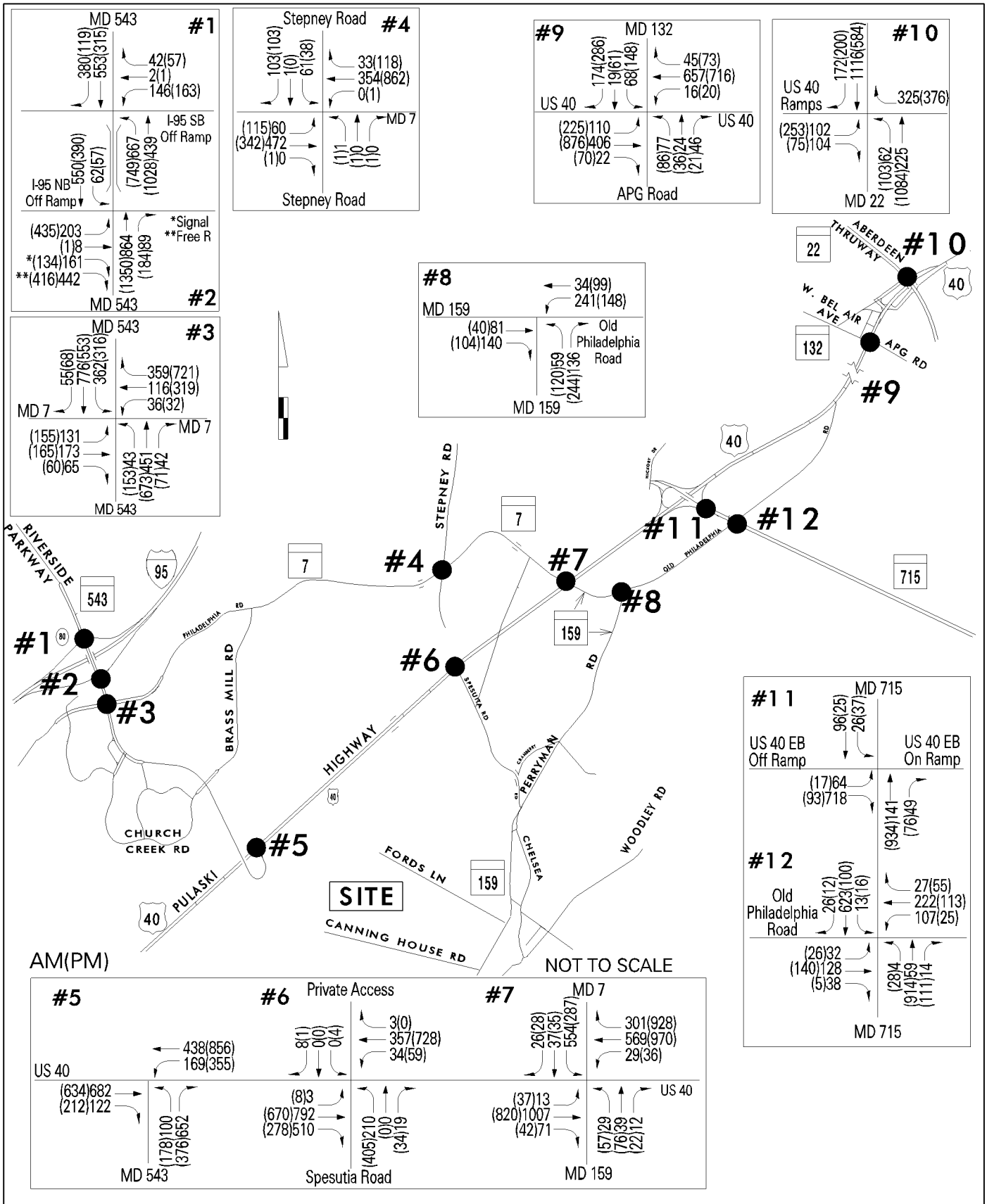
Lane Configuration

EXISTING CONDITION

The existing traffic condition establishes the existing or baseline intersection levels of service at the key intersections. The existing traffic condition was created with intersection turning movement counts that were conducted in March of 2022, with one exception. Woodley Road at Chelsea Road intersection was not updated since site trips do no not impact this intersection.

The existing, planned, and the proposed intersection lane configurations are shown on Exhibit 2A and 2B. The intersection conditions diagrams are included in Appendix III.

The existing intersection counts are provided in Appendix III and the peak hour counts are shown on Exhibits 3A and 3B.



TRAFFIC CONCEPTS, INC. 7525 Connelly Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 3A Existing Traffic Volumes

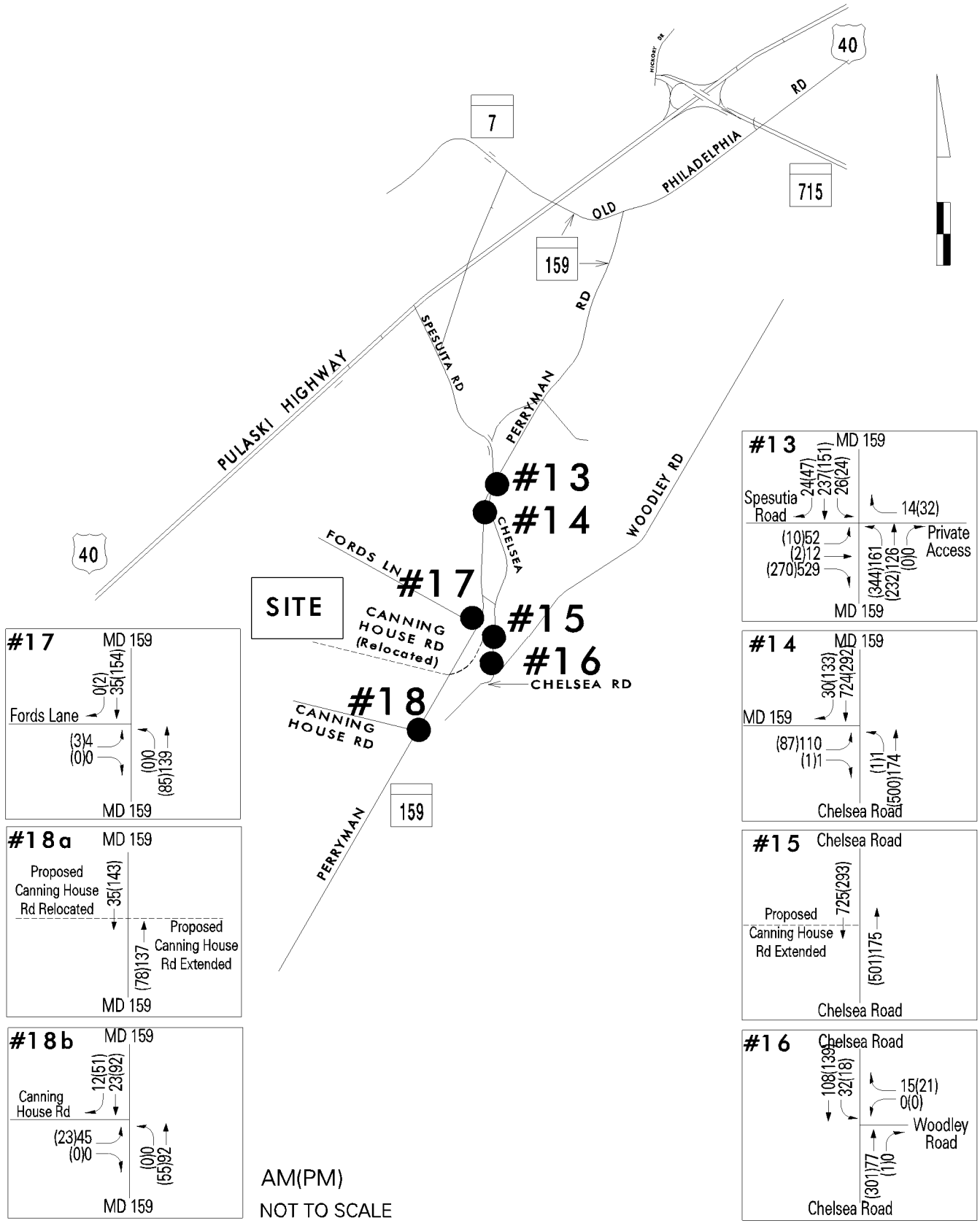


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EXHIBIT 3B
Existing Traffic Volumes

BACKGROUND CONDITION

The background condition evaluates the key intersections with the existing intersection volumes and with background peak hour trips. The background trips consist of trips generated by a traffic growth rate and trips generated by nearby developments that are approved, but are not completed.

Growth Rates

The required Harford County growth rate of 2.2 percent was applied to the key intersection volumes and was compounded over 5-years. Five years represents the project build-out period. The peak hour trips generated by the growth rates are shown on Exhibit 4.

Background Developments

Harford County DPZ identified fourteen (14) nearby developments that could impact the key intersections. The locations of these developments are shown on Exhibit 5. The background developments and the resulting background peak hour trips are shown below. All background trips were generated with the *ITE Manual 10th Edition*.

	AM		PM	
	IN	OUT	IN	OUT
1. Abingdon Addition (ITE LUC 210)				
20 sfu	**5**	**14**	**14**	**8**
2. Beech Creek Estates (ITE LUC 220)				
15 thu	**2**	**6**	**7**	**4**
3. Hollywoods (ITE LUC 220)				
250 condos	26	88	84	49
6. Woodlawn (ITE LUC 210)				
103 sfu	20	58	66	39
TOTAL BACKGROUNDS 3 & 6:	**46**	**146**	**150**	**88**
4. Monarch Glen				
1 sfu (ITE LUC 210)	0	1	1	0
15 thu (ITE LUC 220)	2	6	7	4
5. Redlief Run				
26 sfu (ITE LUC 210)	6	17	18	10
TOTAL BACKGROUNDS 4 & 5:	**8**	**24**	**26**	**14**

	AM		PM	
	IN	OUT	IN	OUT
7. 999-1041 Old Philadelphia Rd (Cranberry Run Ph II)				
Distribution Center – per ksf*	0.06	0.02	0.04	0.07
691.6 ksf	**41**	**14**	**28**	**48**
8. Abingdon Business Park (Lots 1-3)				
Distribution Center – per ksf*	0.06	0.02	0.04	0.07
2,064.8 ksf	**124**	**41**	**83**	**145**
9. Belcamp Commercial – Lots 1 & 2**				
Total New Trips	**85**	**78**	**78**	**66**
10. Capital Exports				
ITE Land Use Code 840				
8.0 ksf	**11**	**4**	**18**	**10**
11. Crossroads Community Church – 13.72 ksf house of worship***				
12. James Run****				
13. LEMS Contrating Company, Inc. – 8.8 ksf retail trade service***				
14. Riverside Business Park – Lot 36				
ITE Land Use Code 150				
242.94 ksf	**41**	**13**	**15**	**42**

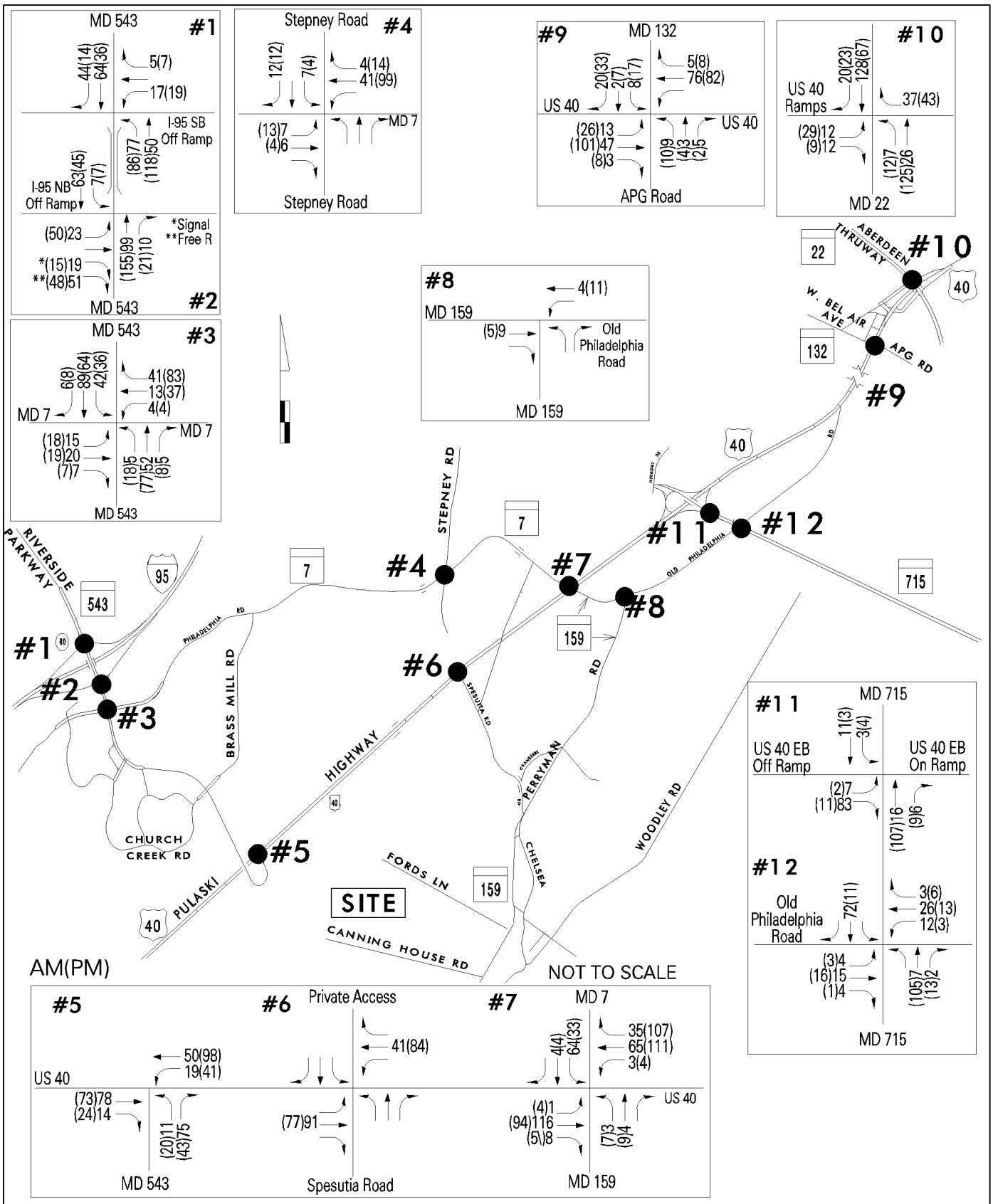
* Harford County peak hour distribution center rates were used.

** Belcamp Commercial trips were copied directly from the approved TIS. The current plan, approved by Harford County, represents a trip reduction of the total site trips analyzed in the TIS. Excerpts of the approved TIS are included in Appendix II.

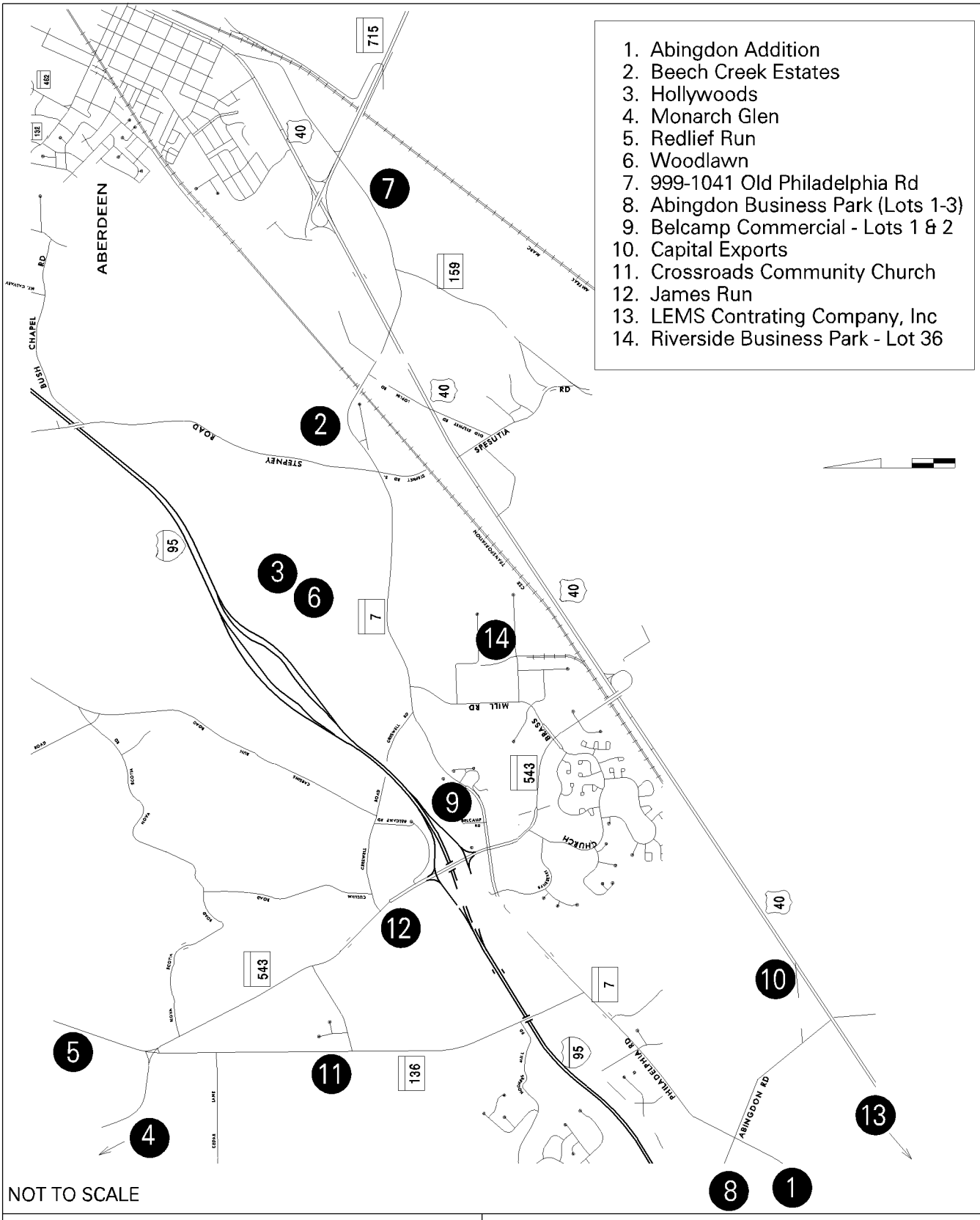
*** The peak hour trips, approved by the County, for these projects are accounted for with the projected growth rates.

**** The James Run site trips approved by the County are included are included in Appendix II.

The background development trips were distributed and assigned to the key intersections using the approved Harford County trip distribution patterns. The combined background peak hour trip assignment is provided on Exhibit 6. The distribution and assignment for each background development are provided in Appendix II.



TRAFFIC CONCEPTS, INC. 7525 Connelly Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 4 Projected Growth Rates (2.2% for Five Years)



NOT TO SCALE

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EXHIBIT 5

Background Development Locations

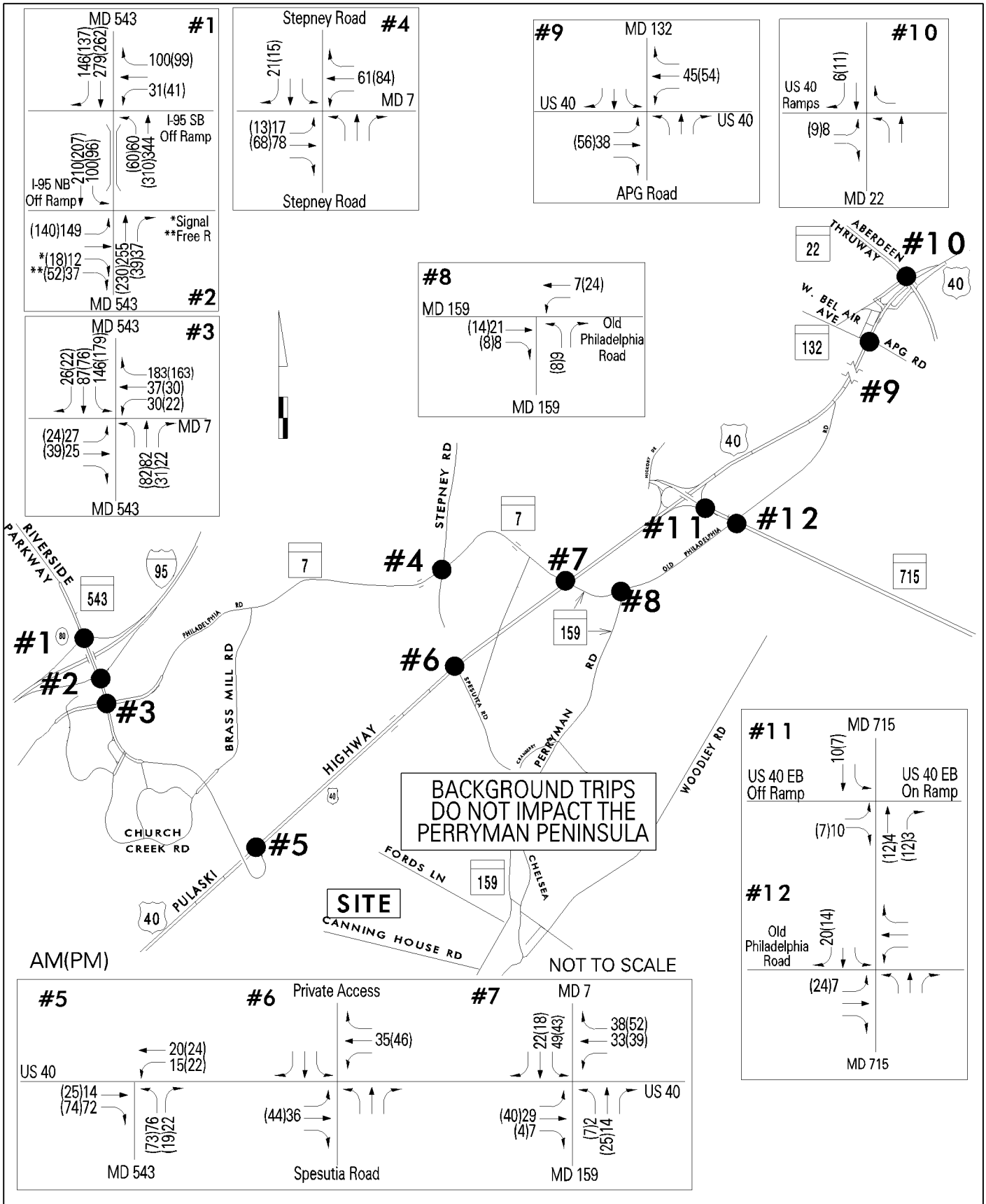

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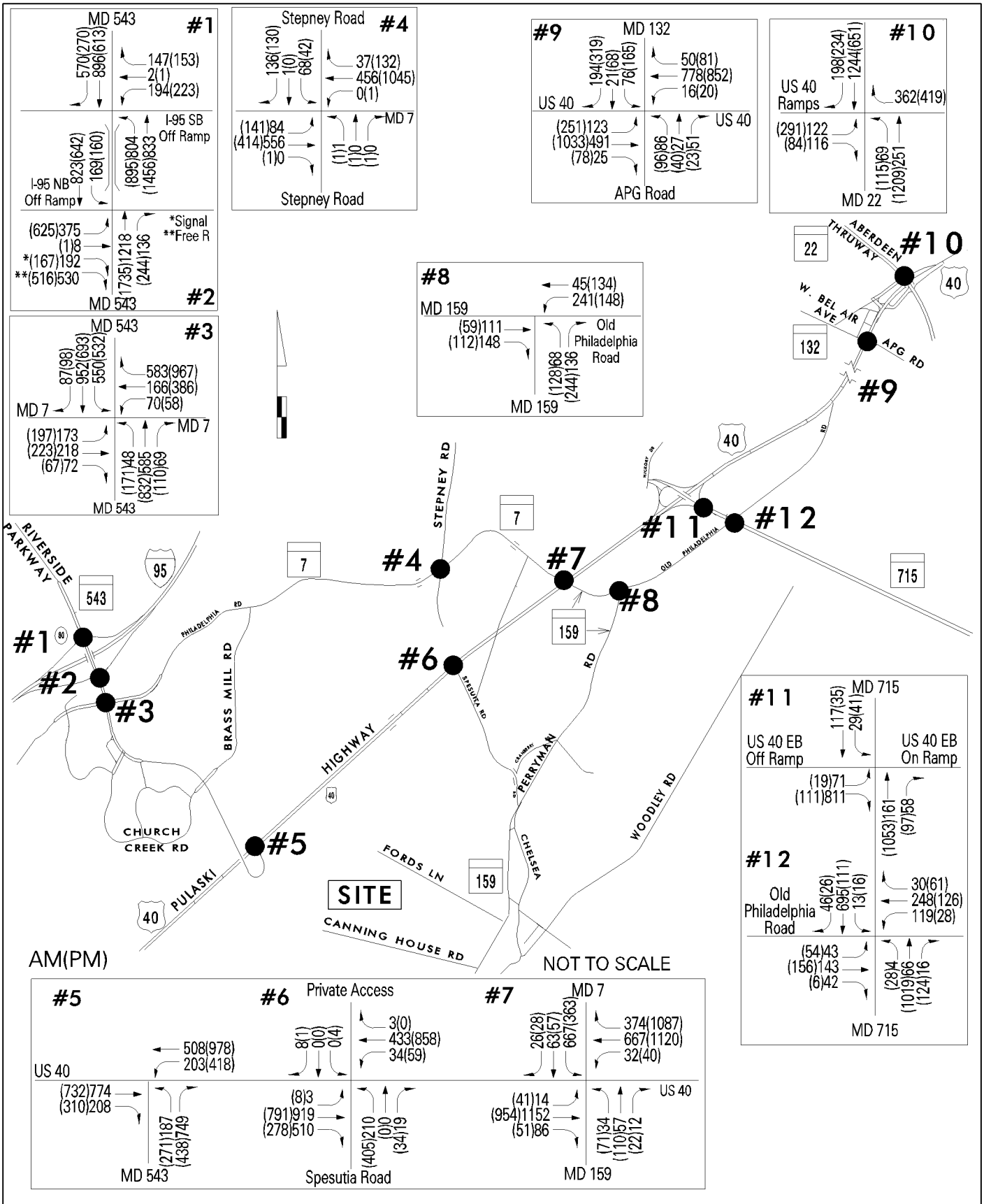
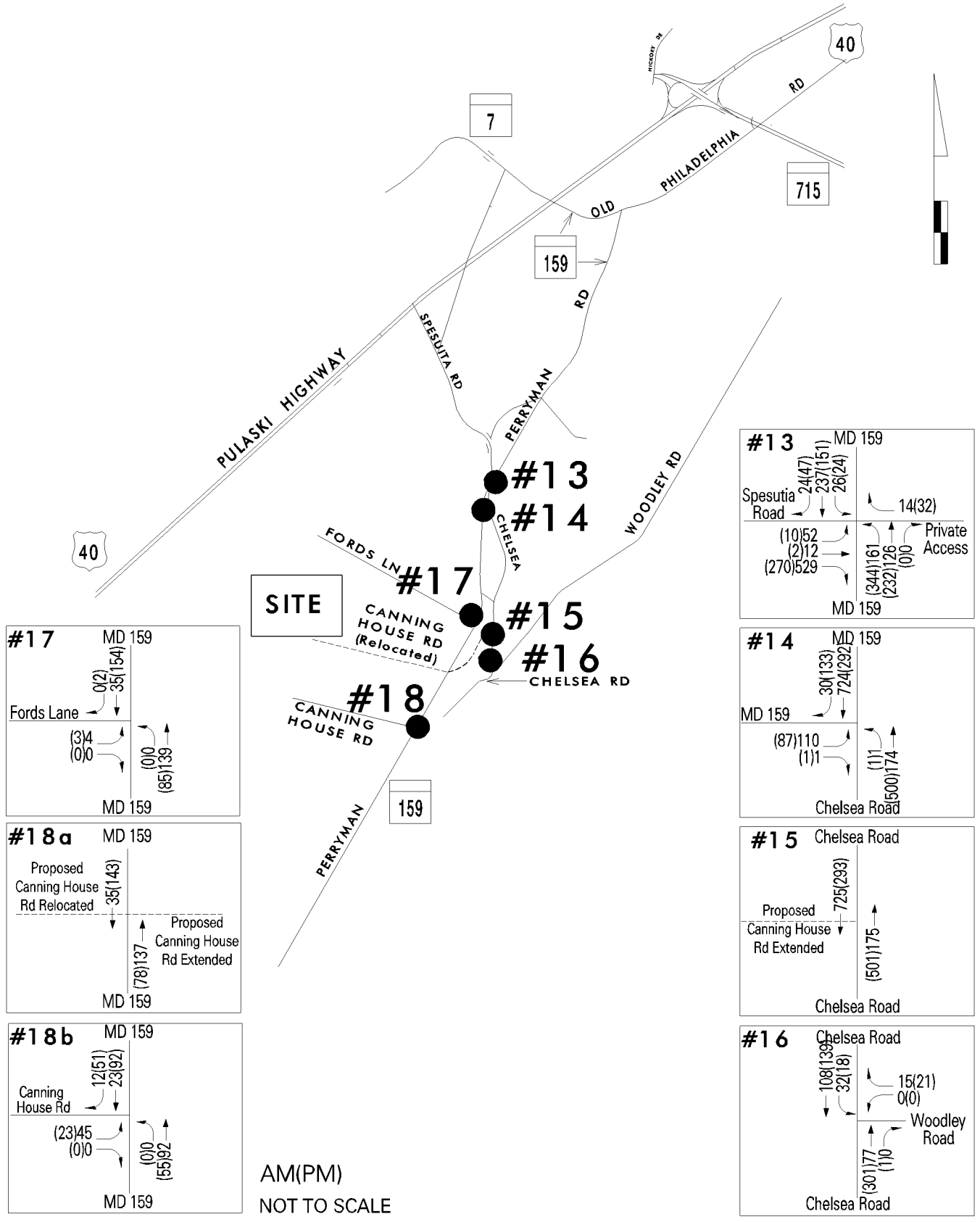
EXHIBIT 6

Background Traffic Volumes



TRAFFIC CONCEPTS, INC. 7525 Connelly Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 7A Total Background Traffic Volumes



TRAFFIC CONCEPTS, INC. 7525 Connelly Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 7B Total Background Traffic Volumes

FUTURE CONDITION

The future condition evaluates the impact that the new site generated peak hour trips have on the existing key intersections and the proposed new road connection labeled Canning House Road (Extended) between MD 159 and Chelsea Road.

Proposed Road Connection

As shown on the current site plan, the existing Canning House Road intersection at MD 159 would be eliminated. The developer would realign Canning House Road through the subject property to create a new intersection at MD 159, north of its current location. Canning House Road (extended) would be constructed by the developer and would span the distance from MD 159 to Chelsea Road. As stated, all new site generated trips were assigned to this new road connection.

This new road provides a third connection to and from MD 159/Chelsea Road. In the northbound direction along MD 159, the new Canning House Road (extended) would reduce left turns from MD 159 to MD 159/Chelsea Road that now experiences peak hour delays. The traffic diversion due to the planned new roadway shows two-thirds of the existing (local) northbound through traffic diverted to Chelsea Road via Canning House Road extended, as shown on Exhibit 7C *(Diverted Total Background Traffic for Canning House Road Extension).*

A portion of the existing (local) southbound MD 159 traffic may use this new connection from Chelsea Road to MD 159. However, the study represents all existing (local) southbound MD 159 traffic using MD 159, which includes a right turn movement in order to continue south along MD 159. Therefore, no local southbound MD 159 trips were diverted to Chelsea Road to Canning House Road (extended).

Site Generated Trips

The developer proposes to construct warehouse buildings with a gross floor area of 5,200,000 s.f. The weekday peak hour trips associated with this project are shown below and were generated with data contained in the *ITE* Trip Generation Manual *11th Edition*.

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
High Cube Fulfillment Center Warehouse ITE LUC 155				
5,200,000 gsf	632	148	324	508
Trucks Trips (30%)	**190**	**44**	**97**	**152**
Passenger Vehicles (70%)	**442**	**104**	**227**	**356**

The site generated truck trips are shown on Exhibits 8A and 8B and Exhibits 9A and 9B show the site generated passenger car trips. The total combined site generated trips are shown on Exhibits 10A and 10B.

The diverted traffic (Exhibit 7C) and combined site trips (Exhibits 10A & 10B) were added to the total background traffic volumes (Exhibits 7A & 7B) to obtain total future traffic volumes as shown on Exhibits 11A and 11B.

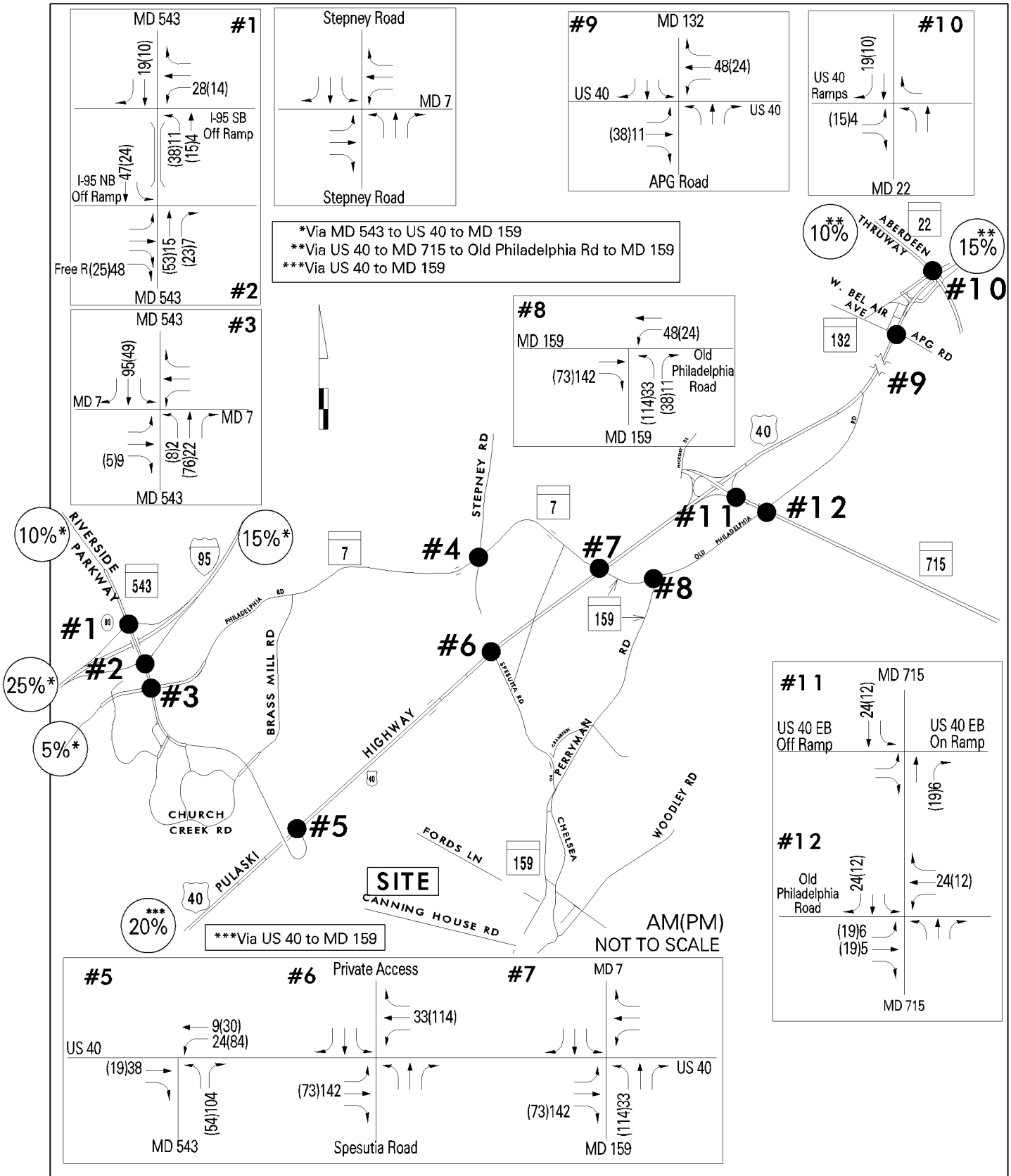


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EXHIBIT 8A

Site Generated Traffic - Truck Trips

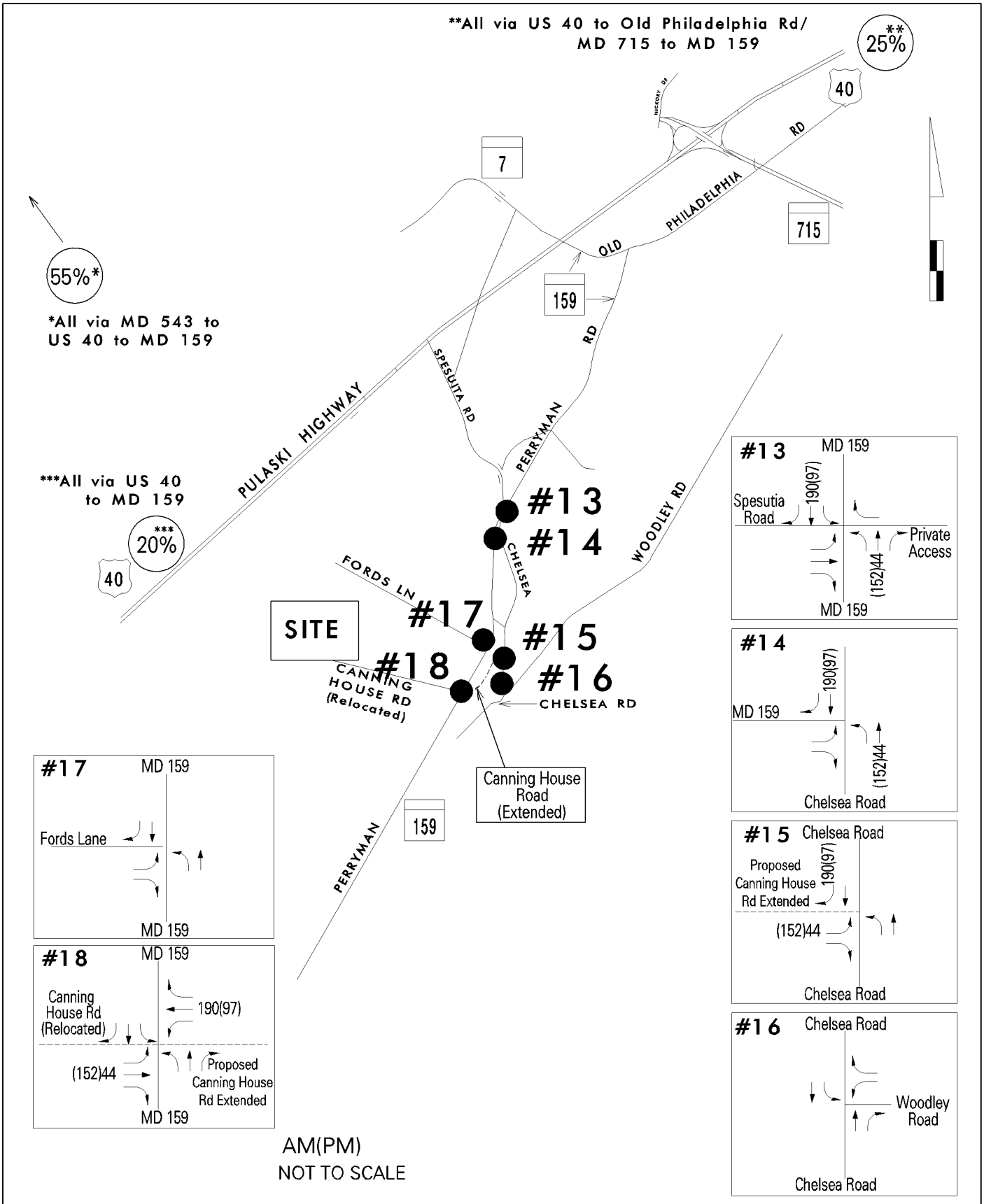

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EXHIBIT 8B

Site Generated Traffic - Truck Trips

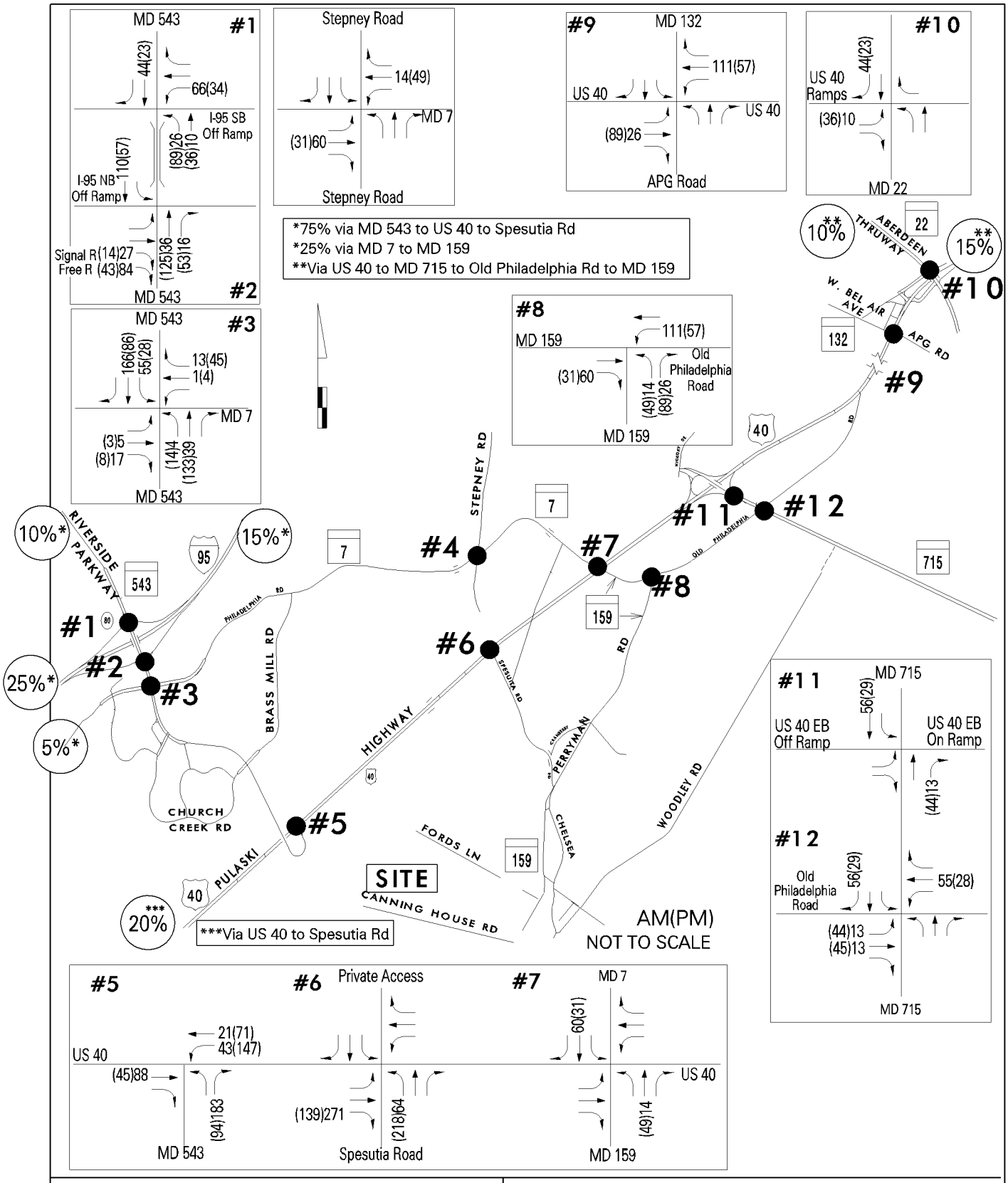

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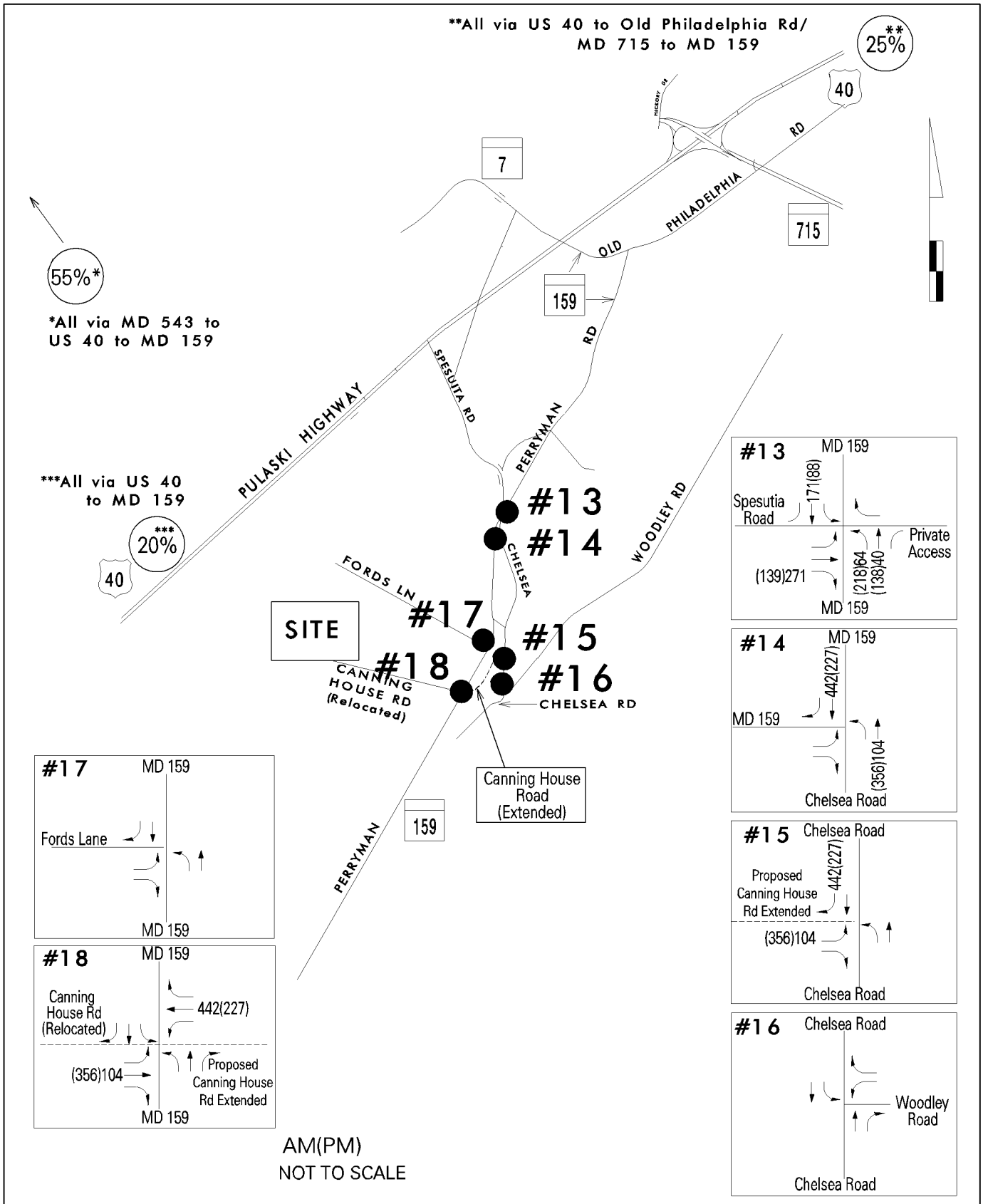
EXHIBIT 9A

Site Generated Traffic - Passenger Vehicles



AM(PM)
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EXHIBIT 9B

Site Generated Traffic - Passenger Vehicles

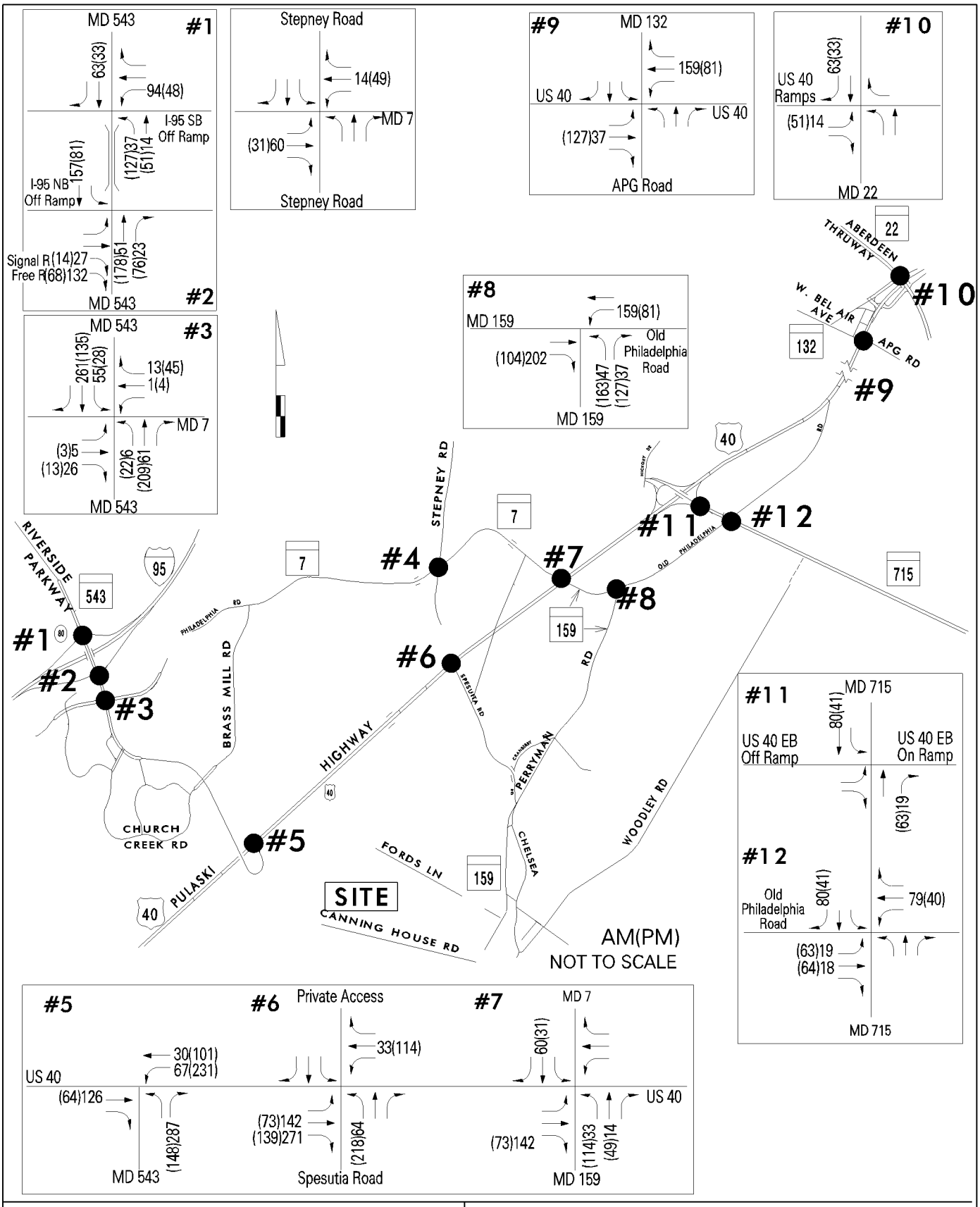

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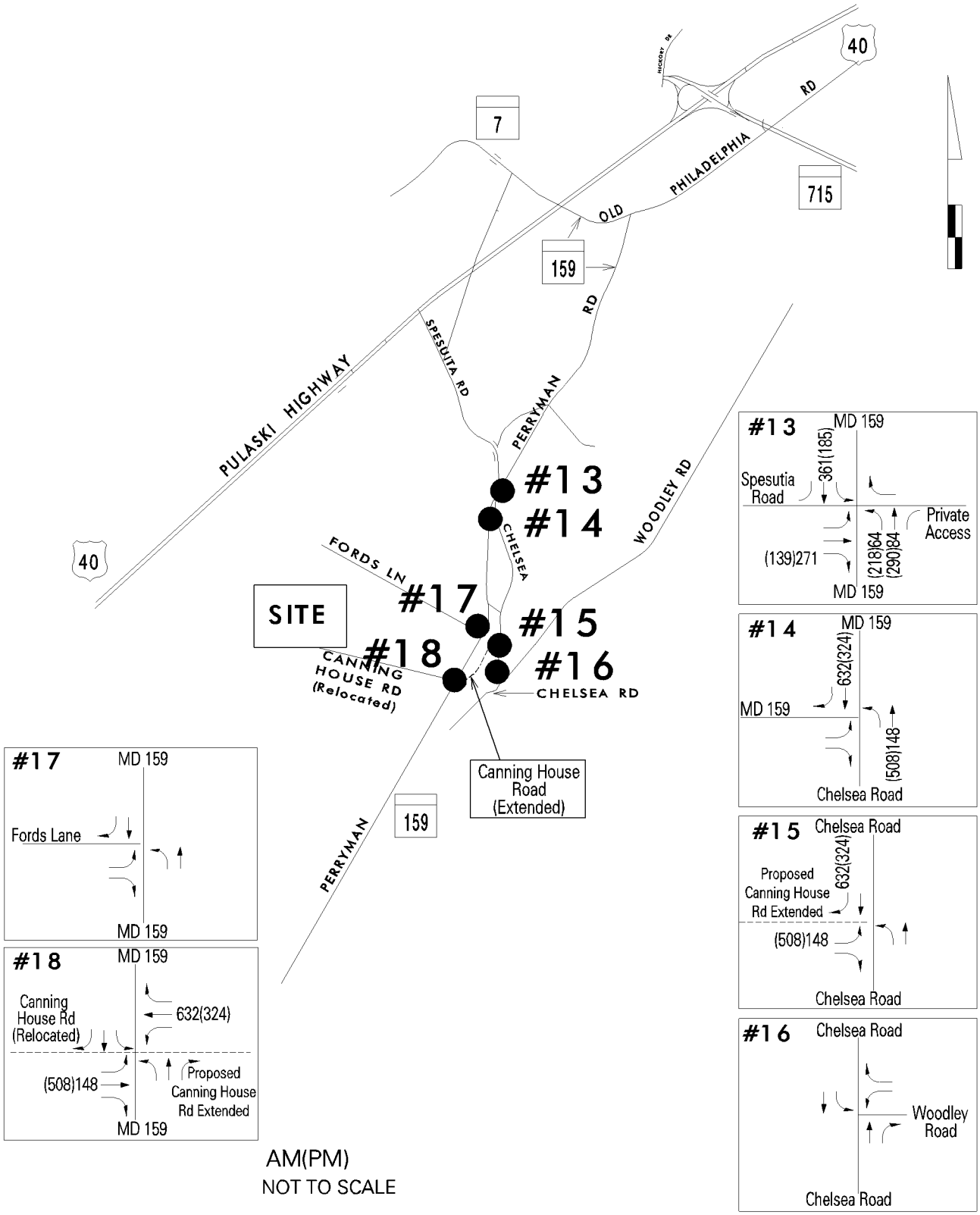
EXHIBIT 10A

Total Site Generated Traffic



AM(PM)

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EXHIBIT 10B

Total Site Generated Traffic

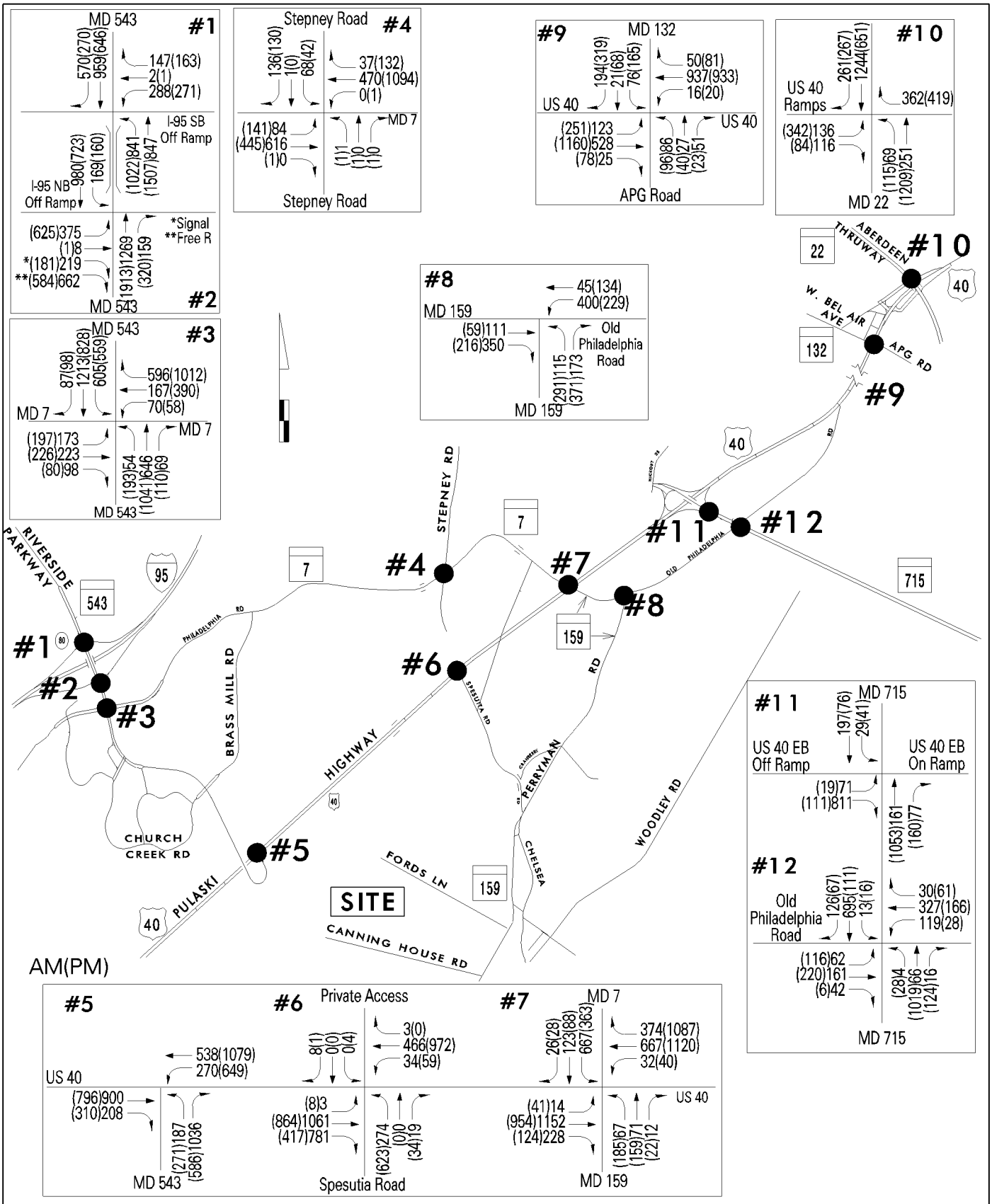

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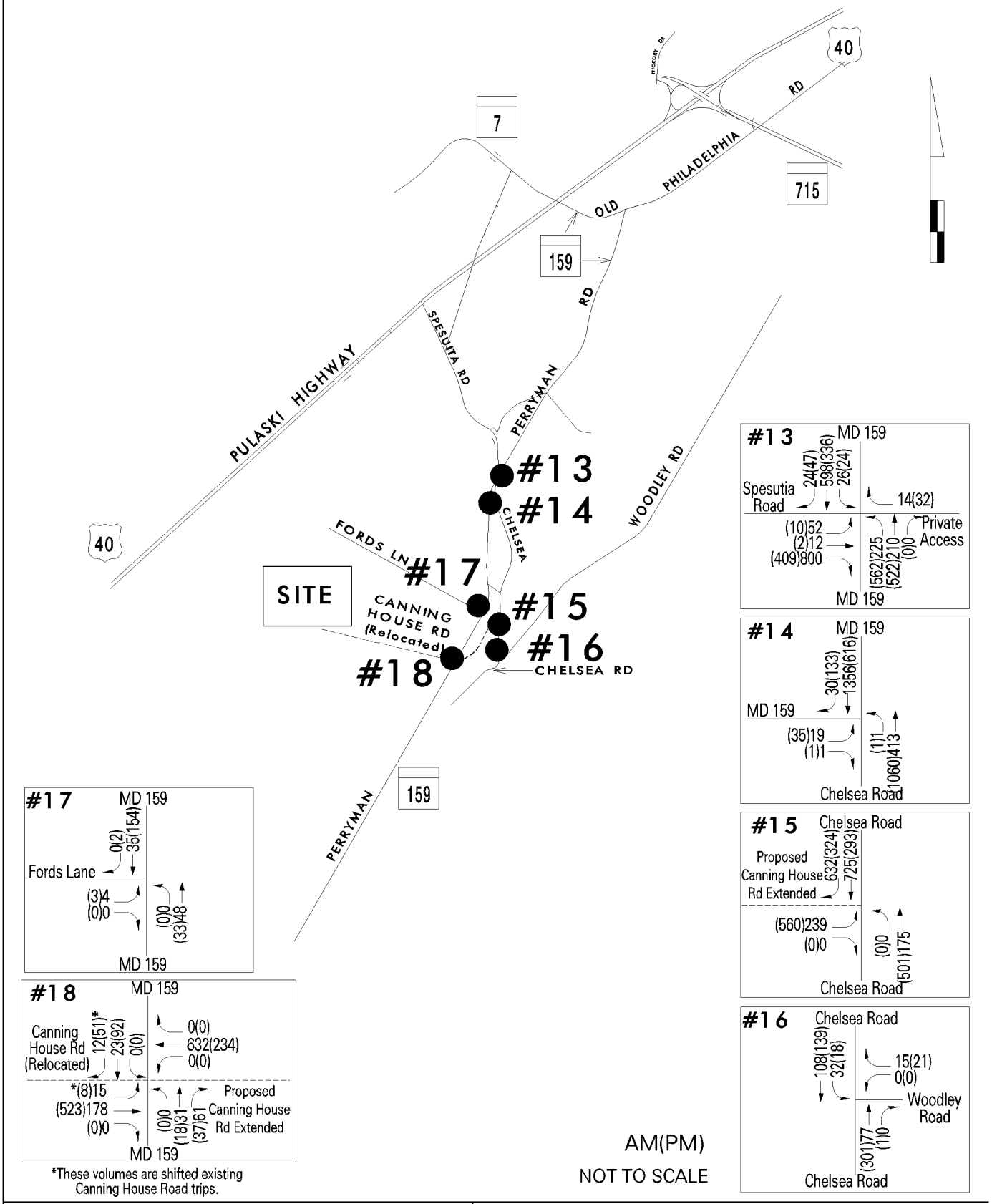
EXHIBIT 11A

Total Future Traffic Volumes



*These volumes are shifted existing Canning House Road trips.

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EXHIBIT 11B

Total Future Traffic Volumes

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed during the existing, background, and future traffic conditions using the following methodologies. This study meets the County APFO standards by analyzing all key intersections using the Critical Lane Volume (CLV) and Highway Capacity Manual software (HCS) methodologies. The HCS software results are listed for all key intersections unless otherwise noted and approved by Harford County.

The Synchro model reports intersection results using the HCM methodology, which is represented as Version HCM 2000. This methodology was requested by MDOT SHA and is accepted by Harford County. The Synchro model was used to analyze the key signalized intersections and non-standard unsignalized intersections that HCS software cannot analyze. Finally, roundabouts were analyzed using the Sidra Intersection method. The results are listed in the following tables, and the detailed calculations are included in Appendix I.

CRITICAL LANE VOLUME ANALYSIS – AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING CLV / LOS	BACKGROUND CLV / LOS	FUTURE CLV / LOS
1: I-95 SB Ramps @ MD 543	1119 / B	1093 / B	1206 / C
2: I-95 NB Ramps @ MD 543	664 / A	886 / A	906 / A
3: MD 543 @ MD 7	612 / A	847 / A	917 / A
4: MD 7 @ Stepney Road	577 / A	694 / A	754 / A
5: US 40 @ MD 543	604 / A	741 / A	877 / A
6: US 40 @ Spesutia Road	688 / A	684 / A*	802 / A*
7: US 40 @ MD 7/MD 159	735 / A	872 / A	929 / A
9: US 40 @ MD 132	616 / A	713 / A	800 / A
10: US 40 EB Ramps @ MD 22	778 / A	875 / A	889 / A
11: MD 715 @ US 40 EB Ramps	168 / A	188 / A	268 / A
12: MD 715 @ Old Philadelphia Rd	376 / A	424 / A	508 / A
13: MD 159 @ Spesutia Road	790 / A	491 / A*	916 / A*
14: MD 159 @ Chelsea Road	836 / A	836 / A	1376 / D
15: Chelsea Rd @ Proposed Canning House Rd (Extended)	-	-	25.0 / D
16: Chelsea Rd @ Woodley Rd	124 / A	124 / A	124 / A
17: MD 159 @ Fords Lane	143 / A	143 / A	52 / A
18: MD 159 @ Canning House Rd	137 / A	137 / A	739 / A (Relocated)
*Includes planned County Spesutia Road improvements, as required by Harford County.			

CRITICAL LANE VOLUME ANALYSIS – PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING CLV / LOS	BACKGROUND CLV / LOS	FUTURE CLV / LOS
1: I-95 SB Ramps @ MD 543	1084 / B	1008 / B	1132 / B
2: I-95 NB Ramps @ MD 543	1062 / B	1230 / C	1301 / D
3: MD 543 @ MD 7	828 / A	1108 / B	1241 / C
4: MD 7 @ Stepney Road	1082 / B	1319 / D	1368 / D
5: US 40 @ MD 543	811 / A	984 / A	1250 / C
6: US 40 @ Spesutia Road	818 / A	762 / A*	942 / A*
7: US 40 @ MD 7/MD 159	695 / A	839 / A	892 / A
9: US 40 @ MD 132	853 / A	981 / A	1025 / B
10: US 40 EB Ramps @ MD 22	849 / A	956 / A	1007 / B
11: MD 715 @ US 40 EB Ramps	568 / A	639 / A	639 / A
12: MD 715 @ Old Philadelphia	408 / A	479 / A	563 / A
13: MD 159 @ Spesutia Road	584 / A	584 / A	987 / A
14: MD 159 @ Chelsea Road	381 / A	381 / A	653 / A
15: Chelsea Rd @ Proposed Canning House Rd (Extended)	-	-	35.6 (E)
16: Chelsea Rd @ Woodley Rd	341 / A	341 / A	341 / A
17: MD 159 @ Fords Lane	159 / A	159 / A	159 / A
18: MD 159 @ Canning House Rd	166 / A	166 / A	666 / A (Relocated)
*Includes planned County Spesutia Road improvements, as required by Harford County.			

SIDRA ROUNDABOUT ANALYSIS - AM PEAK HOUR			
KEY INTERSECTION	EXISTING DELAY / LOS	BACKGROUND DELAY / LOS	FUTURE DELAY / LOS
8: MD 159 @ Old Philadelphia Rd	5.1 / A	5.4 / A	9.2 / A
SIDRA ROUNDABOUT ANALYSIS - PM PEAK HOUR			
KEY INTERSECTION	EXISTING DELAY / LOS	BACKGROUND DELAY / LOS	FUTURE DELAY / LOS
8: MD 159 @ Old Philadelphia Rd	5.2 / A	5.4 / A	8.4 / A

HIGHWAY CAPACITY MANUAL SOFTWARE (HCS): SIGNAL CONTROL - AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE Delay / LOS
1: I-95 SB Ramps @ MD 543*	25.6 / C	22.3 / C	26.2 / C
2: I-95 NB Ramps @ MD 543*	10.0 / A	16.4 / B	16.5 / B
3: MD 543 @ MD 7*	26.4 / C	34.4 / C	33.5 / C
4: MD 7 @ Stepney Road	-	10.3 / B**	10.2 / B**
5: US 40 @ MD 543	11.9 / B	12.9 / B	13.0 / B
6: US 40 @ Spesutia Road	16.8 / B	24.6 / C***	26.5 / C***
7: US 40 @ MD 7/MD 159	29.4 / C	30.7 / C	31.4 / C
9: US 40 @ MD 132	23.4 / C	24.2 / C	25.7 / C
10: US 40 EB Ramps @ MD 22	15.5 / B	16.9 / B	17.0 / B
11: MD 715 @ US 40 EB Ramps	3.7 / A	3.7 / A	3.7 / A
12: MD 715 @ Old Philadelphia	23.7 / C	24.0 / C	24.8 / C
HIGHWAY CAPACITY MANUAL SOFTWARE (HCS): SIGNAL CONTROL - PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE 0elay / LOS
1: I-95 SB Ramps @ MD 543*	31.4 / C	27.0 / C	30.9 / C
2: I-95 NB Ramps @ MD 543*	16.7 / B	21.1 / C	20.6 / C
3: MD 543 @ MD 7*	27.0 / C	40.8 / D	41.2 / D
4: MD 7 @ Stepney Road	-	12.9 / B**	13.9 / B**
5: US 40 @ MD 543	16.4 / B	18.0 / B	19.6 / B
6: US 40 @ Spesutia Road	16.4 / B	29.4 / C***	31.7 / D***
7: US 40 @ MD 7/MD 159	32.7 / C	33.6 / C	34.1 / C
9: US 40 @ MD 132	30.6 / C	32.9 / C	35.0 / C
10: US 40 EB Ramps @ MD 22	15.0 / B	15.9 / B	17.0 / B
11: MD 715 @ US 40 EB Ramps	11.1 / B	11.6 / B	10.9 / B
12: MD 715 @ Old Philadelphia	20.9 / C	21.3 / C	22.7 / C

*These intersections are only analyzed in the Synchro model as required by MDOT SHA for all studies due to the extensive overlapping improvements and coordination of these signalized intersections.
**Includes bonded improvement to install traffic signal control.
***Includes planned County Spesutia Road improvements, as required by Harford County.

HIGHWAY CAPACITY MANUAL SOFTWARE (HCS): STOP CONTROL - AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE Delay / LOS
4: MD 7 @ Stepney Road			
EB Left - MD 7	8.3 / A	-	-
WB L/T - MD 7	8.4 / A	-	-
NB Approach – L/T/R	28.7 / D	-	-
SB Approach – L & T/R	18.4 / C	-	-
13: MD 159 @ Spesutia Road			
EB Approach – L/T & R	23.9 / C	14.0 / B*	38.7 / E*
WB Approach – R	9.1 / A	9.1 / A	9.7 / A
NB Left - MD 159	8.3 / A	8.3 / A	10.5 / B
SB Left - MD 159	7.6 / A	7.6 / A	7.9 / A
14: MD 159 @ Chelsea Road			
EB Approach - L/R	28.0 / D	28.0 / D	66.5 / F
NB L/T - MD 159	9.6 / A	9.6 / A	13.4 / B
15: Chelsea Rd @ Proposed Canning House Rd Extended			
EB Approach – L & R	-	-	25.0 / D
NB Left – Chelsea Rd	-	-	13.0 / B
16: Chelsea Rd @ Woodley Rd			
WB Approach – L & R	8.8 / A	8.8 / A	8.8 / A
SB Left – Chelsea Rd	7.5 / A	7.5 / A	7.5 / A
17: MD 159 @ Fords Lane			
EB Approach - L/R	9.5 / A	9.5 / A	9.0 / A
NB L/T - MD 159	7.3 / A	7.3 / A	7.3 / A
18a: MD 159 @ Canning House Rd			
EB Approach - L/R	9.4 / A	9.4 / A	-
NB L/T - MD 159	7.3 / A	7.3 / A	-
18b: MD 159 @ Canning House Rd (Relocated/Extended)			
EB Approach – Left & Thru/R	-	-	12.1 / B
WB Approach – L/T/R	-	-	16.8 / C
NB Left - MD 159	-	-	7.3 / A
SB Left - MD 159	-	-	7.4 / A
*Includes planned County improvements to widen Spesutia Road with a shared left/thru & dedicated free right turn lane with 200' storage. Right turn headway factor reduced for free right turn movement; however, HCM does not accurately model and calculate the free right turn delay.			

HIGHWAY CAPACITY MANUAL SOFTWARE (HCS): STOP CONTROL - PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE Delay / LOS
4: MD 7 @ Stepney Road			
EB Left - MD 7	11.4 / B	-	-
WB L/T - MD 7	8.0 / A	-	-
NB Approach – L/T/R	46.6 / E	-	-
SB Approach – L & T/R	36.1/ E	-	-
13: MD 159 @ Spesutia Road			
EB Approach – L/T & R	12.9 / B	11.2 / B*	26.8 / D*
WB Approach – R	10.0 / A	10.0 / A	12.8 / B
NB Left - MD 159	8.7 / A	8.7 / A	12.0 / B
SB Left - MD 159	7.9 / A	7.9 / A	8.9 / A
14: MD 159 @ Chelsea Road			
EB Approach - L/R	15.8 / C	15.8 / C	34.6 / D
NB L/T - MD 159	8.3 / A	8.3 / A	9.5 / A
15: Chelsea Rd @ Proposed Canning House Rd Extended			
EB Approach – L & R	-	-	49.9 / E
NB Left – Chelsea Rd	-	-	8.9 / A
16: Chelsea Rd @ Woodley Rd			
WB Approach – L & R	10.3 / B	10.3 / B	10.3 / B
SB Left – Chelsea Rd	8.0 / A	8.0 / A	8.0 / A
17: MD 159 @ Fords Lane			
EB Approach - L/R	10.0 / B	10.0 / B	9.6 / A
NB L/T - MD 159	7.6 / A	7.6 / A	7.6 / A
18a: MD 159 @ Canning House Rd			
EB Approach - L/R	9.7 / A	9.7 / A	-
NB L/T - MD 159	7.5 / A	7.5 / A	-
18b: MD 159 @ Canning House Rd (Relocated/Extended)			
EB Approach – Left & Thru/R	-	-	15.4 / C
WB Approach – L/T/R	-	-	9.8 / A
NB Left - MD 159	-	-	7.5 / A
SB Left - MD 159	-	-	7.3 / A
*Includes planned County improvements to widen Spesutia Road with a shared left/thru & dedicated free right turn lane with 200' storage. Right turn headway factor reduced for free right turn movement; however, HCM does not accurately model and calculate the free right turn delay.			

HIGHWAY CAPACITY MANUAL (HCM 2000): SIGNAL CONTROL - AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE Delay / LOS
1: I-95 SB Ramps @ MD 543	25.6 / C	22.3 / C	26.2 / C
2: I-95 NB Ramps @ MD 543	10.0 / A	16.4 / B	16.5 / B
3: MD 543 @ MD 7	26.4 / C	34.4 / C	33.5 / C
4: MD 7 @ Stepney Road	-	10.9 / B**	11.3 / B**
5: US 40 @ MD 543	10.1 / B	13.4 / B	15.7 / B
6: US 40 @ Spesutia Road	17.5 / B	16.3 / B***	21.7 / C***
7: US 40 @ MD 7/MD 159	26.2 / C	31.6 / C	34.5 / C
9: US 40 @ MD 132	18.9 / B	20.1 / C	21.0 / C
10: US 40 EB Ramps @ MD 22	10.5 / B	10.8 / B	11.1 / B
11: MD 715 @ US 40 EB Ramps	2.8 / A	2.8 / A	2.9 / A
12: MD 715 @ Old Philadelphia	14.6 / B	15.0 / B	15.5 / B
HIGHWAY CAPACITY MANUAL (HCM 2000): SIGNAL CONTROL - PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS	BACKGROUND Delay / LOS	FUTURE 0elay / LOS
1: I-95 SB Ramps @ MD 543	31.4 / C	27.0 / C	30.9 / C
2: I-95 NB Ramps @ MD 543	16.7 / B	21.1 / C	20.6 / C
3: MD 543 @ MD 7	27.0 / C	40.8 / D	41.2 / D
4: MD 7 @ Stepney Road	-	20.2 / C*	20.8 / C*
5: US 40 @ MD 543	16.0 / B	20.7 / C	34.4 / C
6: US 40 @ Spesutia Road	42.2 / D	19.5 / B**	25.9 / C**
7: US 40 @ MD 7/MD 159	26.7 / C	40.4 / D	49.3 / D
9: US 40 @ MD 132	24.4 / C	30.5 / C	32.3 / C
10: US 40 EB Ramps @ MD 22	10.8 / B	12.4 / B	14.5 / B
11: MD 715 @ US 40 EB Ramps	7.4 / A	8.1 / A	7.9 / A
12: MD 715 @ Old Philadelphia	14.4 / B	15.2 / B	17.9 / B
*Includes bonded improvement to install traffic signal control. **Includes planned County Spesutia Road improvements, as required by Harford County.			

QUEUING ANALYSIS – SIGNALIZED INTERSECTIONS - HCM

As required by Harford County, a queuing analysis was conducted at the signalized key intersections, with exclusive left turn lanes. Unless noted, the Highway Capacity Manual software (HCS) back-of-queues are listed for the background future traffic conditions. Detailed calculations are included in Appendix I.

	BACKGROUND 95TH Percentile HCS Queue (ft) AM(PM)	FUTURE 95TH Percentile HCS Queue (ft) AM(PM)	Storage (ft)	SITE ADDS (ft)
1: I-95 SB Ramps @ MD 543**				
WB Left/Thru	111(168)	158(192)	Continuous	*
NB Left	320(354)	349(328)	800	*
2: I-95 NB Ramps @ MD 543**				
EB Left/Thru	250(363)	242(397)	Continuous	*
SB Left	233(362)	272(288)	575	*
3: MD 543 @ MD 7**				
EB Left	187(194)	184(179)	200	*
WB Left	139(114)	145(106)	430	*
WB Right	111(251)	132(338)	865	
NB Left	100(267)	119(313)	280	*
SB Left	317(313)	329(327)	575	*
4: MD 7 @ Stepney Road				
EB Left	33(148)	33(168)	175	*
SB Left	70(55)	70(55)	150	*
5: US 40 @ MD 543				
WB Left – US 40	190(317)	251(565)	450	115
NB Left – MD 543	93(195)	93(195)	Continuous	*
6: US 40 @ Spesutia Road***				
EB Left – US 40	3(9)	3(9)	350	*
WB Left – US 40	25(47)	25(47)	400	*
NB Left & L/T/R - Spesutia	214(406)	260(586)	Continuous	*

* This lane has adequate storage.

** SimTraffic queues reported since these intersections are only analyzed with the Synchro model, as approved by the County & MDOT SHA for all studies due to the extensive overlapping improvements and coordination of these signalized intersections.

*** Includes planned approved County (Spesutia Road) improvements.

	BACKGROUND 95TH Percentile HCS Queue (ft) AM(PM)	FUTURE 95TH Percentile HCS Queue (ft) AM(PM)	Storage Bay (ft)	SITE ADDS (ft)
7: US 40 @ MD 7/MD 159				
EB Left – US 40	17(53)	17(53)	350	*
WB Left – US 40	40(51)	40(51)	300	*
NB Left – MD 159	44(81)	88(219)	400	*
SB Left – MD 7	372(223)	372(223)	775**	*
9: US 40 @ MD 132				
EB Left – US 40	56(181)	56(186)	200	*
WB Left – US 40	8(15)	8(15)	185	*
NB Left – APG Rd	80(111)	80(111)	100	0
SB Left – MD 132	71(198)	71(198)	150	0
10: US 40 EB Ramps @ MD 22				
EB Left – N. Rogers St	129(270)	145(333)	Continuous	*
NB Left – MD 22	22(38)	22(38)	215	*
11: MD 715 @ US 40 EB Ramps				
EB Left – US 40 EB Ramps	69(18)	69(18)	300	*
SB Left – MD 715	7(10)	7(10)	150	*
12: MD 715 @ Old Philadelphia				
EB Left – Old Phila	48(59)	73(138)	200	*
WB Left – Old Phila	133(29)	133(30)	300	*
NB Left – MD 715	4(29)	4(29)	275	*
SB Left – MD 715	13(16)	13(16)	60	*

*This lane has adequate storage.
**Storage is the average of two turn lanes.

QUEUING ANALYSIS – SIGNALIZED INTERSECTIONS - SimTraffic

The MDOT SHA required that all of the signalized key intersections must be included in the Synchro model. Therefore, the SimTraffic 95th Percentile Back-of-Queue results for the background and future traffic conditions are listed below. The detailed calculations are included in Appendix I.

	BACKGROUND 95TH Percentile SimTraffic Queue (ft) AM(PM)	FUTURE 95TH Percentile SimTraffic Queue (ft) AM(PM)	Storage (ft)	SITE ADDS (ft)
1: I-95 SB Ramps @ MD 543				
WB Left/Thru	111(168)	158(192)	Continuous	*
NB Left	320(354)	349(328)	800	*
2: I-95 NB Ramps @ MD 543				
EB Left/Thru	250(363)	242(397)	Continuous	*
SB Left	233(362)	272(288)	575	*
3: MD 543 @ MD 7				
EB Left	187(194)	184(179)	200	*
WB Left	139(114)	145(106)	430	*
WB Right	111(251)	132(338)	865	
NB Left	100(267)	119(313)	280	*
SB Left	317(313)	329(327)	575	*
4: MD 7 @ Stepney Road				
EB Left	64(145)	65(161)	175	*
SB Left	76(90)	75(78)	150	*
5: US 40 @ MD 543				
WB Left – US 40	190(367)	217(562)	450	112
NB Left – MD 543	98(146)	96(142)	Continuous	*
6: US 40 @ Spesutia Road**				
EB Left – US 40	10(21)	7(26)	400	*
WB Left – US 40	52(66)	60(69)	360	*
NB Left & L/T/R - Spesutia	102(179)	113(246)	Continuous	*

*This lane has adequate storage.
**Includes planned County Spesutia Road improvements (detailed on Exhibits 2A & 2B), as required by Harford County.

	BACKGROUND 95TH Percentile SimTraffic Queue (ft) AM(PM)	FUTURE 95TH Percentile SimTraffic Queue (ft) AM(PM)	Storage Bay (ft)	SITE ADDS (ft)
7: US 40 @ MD 7/MD 159				
EB Left – US 40	40(78)	42(80)	340	*
WB Left – US 40	68(81)	79(88)	300	*
NB Left – MD 159	68(109)	110(194)	400	*
SB Left – MD 7	312(188)	319(197)	775	*
9: US 40 @ MD 132				
NB Left – US 40	99(229)	101(295)	200	**66**
SB Left – US 40	35(43)	37(42)	185	*
WB Left – APG Rd	91(95)	85(109)	110	*
EB Left – MD 132	90(231)	93(282)	Continuous	*
10: US 40 EB Ramps @ MD 22				
EB Left – N. Rogers St	129(203)	139(269)	Continuous	*
NB Left – MD 22	67(120)	59(136)	215	*
11: MD 715 @ US 40 EB Ramps				
NB Left – US 40 EB Ramps	71(36)	70(38)	300	*
EB Left – MD 715	34(43)	32(48)	150	*
12: MD 715 @ Old Philadelphia				
NB Left – Old Phila	42(58)	60(97)	200	*
SB Left – Old Phila	100(48)	102(52)	305	*
EB Left – MD 715	32(44)	38(41)	275	*
WB Left – MD 715	15(57)	23(56)	260	*
*This lane has adequate storage.				

CONCLUSIONS AND RECOMMENDATIONS

The Harford County Adequate Public Facilities Ordinance (APFO) states: signalized intersections located within the development envelope must operate at a level of service "D" or better and all unsignalized intersections located within the development envelope must operate with a side road minor approach level of service of "D" or better. If the traffic study determines an intersection is rated "E" or lower, than the developer needs to mitigate only the new site generated trips.

Intersection Capacity Results

- The Critical Lane Volume (CLV) analysis shows acceptable levels of service at all key intersections.
- The future HCS analyses conducted at the following intersections show an approach level of service below "D" during at least one of the studied peak hours. The level of service results and mitigation measures for these intersections provided on the following pages.
  - MD 159 at Spesutia Road
  - MD 159 at Chelsea Road
  - Chelsea Road at Canning House Road Extended

Queuing Analysis Results

The results of the queuing analyses, as required by Harford County, shows the site would not create queue storage deficiencies at the tested turn bays but with one exception. At future traffic conditions, the westbound left turn bay from US 40 to MD 543 is projected to extend 115 feet outside of the marked storage area.

Mitigation: The developer will increase the left turn storage area by remarking the area to provide an additional 115 feet of storage.

MD 159 at Spesutia Road

This intersection is analyzed with the County roadway improvements, which includes the widening of Spesutia Road that creates a shared left/thru and free right turn lane with 200 feet of dedicated storage.

The HCS results show acceptable levels of service and delays during the future PM peak hour. However, during the future AM peak hour, the analysis shows a level of service "E" approach (38.7 sec/veh) along Spesutia Road. It is important to restate that the HCS software does not accurately calculate free right turn delay into the approach delay. Therefore, this analysis method is not appropriate analyze this intersection with the planned intersection configuration.

The intersection was then analyzed with the SimTraffic model. With this analysis, the Spesutia Road approach delay during the future AM peak hour is 9.3 seconds/vehicle ("A" LOS). The average overall intersection delay is 6.3 seconds/vehicle. Based on the projected future AM SimTraffic delays, this intersection is projected to operate with an acceptable level of service and delays at the future build-out condition.

Future AM
SimTraffic Performance Report 06/01/2022

13: MD 159 & Spesutia Rd Performance by approach

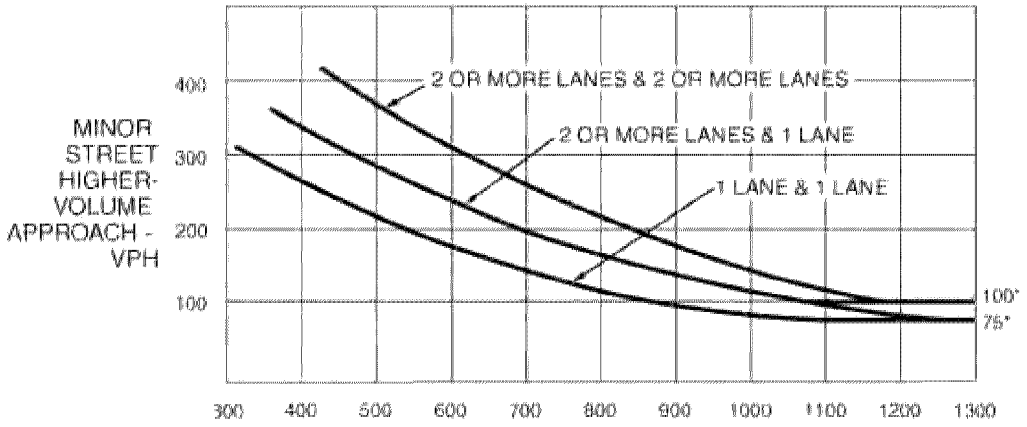
Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.1
Total Del/Veh (s)	9.3	2.1	4.3	4.1	6.3

An additional analysis at this intersection was conducted to include a Peak Hour (Warrant 3) to determine if this it could be considered for traffic signal control. Based on this test, the peak hour warrants are met due to the projected northbound MD 159 left turn volume.

MD 159 at Spesutia Road
Future AM Peak (SB Thru/R mainline 622, NB left 225)
Future PM Peak (SB Thru/R mainline 383, NB left 562)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

MD 159 at Spesutia Road Mitigation: As stated, this intersection operates with adequate levels of service during the future AM and PM peak hours. However, the intersection volume meets peak hour warrants with the future volumes. Therefore, the developer would monitor the intersection during the project build-out and the developer would construct a traffic signal if warranted and approved by the MDOT SHA.

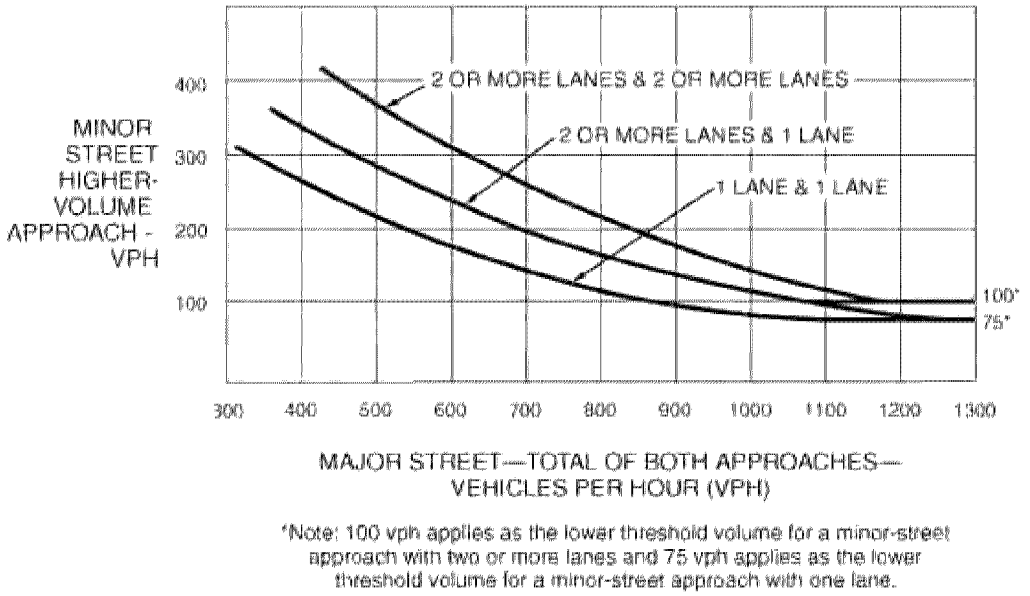
MD 159 at Chelsea Road

The results of the HCM analysis show acceptable levels of service and delays during the future PM peak hour. However, during the future AM peak hour, the analysis shows an "F" minor approach LOS. Therefore, the Peak Hour (Warrant 3) was tested:

MD 159 at Chelsea Road
Existing AM Peak (mainline 929, left 110)
Existing PM Peak (mainline 926, Left 87)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

MD 159 at Chelsea Road Mitigation: The developer will install the improvements recommended by the County to channelize the SB MD 159 right turn lane and also move the EB MD 159 stop bar closer to MD 159. This project would improve driver sight lines from the stop-controlled approach onto MD 159.

Additionally, the proposed Canning House Road (extended) project would connect MD 159 at the site entrance to Chelsea Road. This new route would be constructed by the developer and would provide an alternative travel route for traffic traveling along MD 159. This new road connection is expected to reduce the minor approach left turning traffic at this intersection. However, the intersection volume meets peak hour warrants with the existing volumes. Therefore, the developer will monitor the intersection during the project build-out and the developer would construct a traffic signal if warranted and approved by the MDOT SHA.

Chelsea Road at Canning House (Extended)

The planned Canning House (Extended) intersection with Chelsea Road would fail as a standard stop-controlled intersection. Therefore, the planned intersection configuration analyzed in this report is a MD T. The HCS does not accurately analyze a MD T design. However, in order to maintain the consistency with the County APFO, the MD T configuration was analyzed using the HCS methodology. This analysis shows a minor approach level of service "D" during the future AM peak and a level of service "E" during the future PM.

This intersection was then analyzed with the SimTraffic model to determine level of service and delay. During the future AM peak hour, the minor approach delay from stop-controlled Canning House Road extended is 21.5 seconds per vehicle ("C" LOS), with an overall intersection delay of 4.6 seconds per vehicle ("A" LOS). During the future PM peak hour, the minor approach delay from stop-controlled Canning House Road extended is 19.3 seconds per vehicle ("C" LOS), with an overall intersection delay of 7.3 seconds per vehicle ("A" LOS).

Future AM
SimTraffic Performance Report 05/27/2022

15: Chelsea Rd & Canning House Rd Performance by movement

Movement	EBL	EBT	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.0
Total Del/Veh (s)	21.5	0.1	0.4	1.5	3.0	4.6

Future PM
SimTraffic Performance Report 05/27/2022

15: Chelsea Rd & Canning House Rd Performance by movement

Movement	EBL	EBT	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.1
Total Del/Veh (s)	19.3	0.2	1.1	0.9	1.6	7.3

Mitigation: The developer will construct a MD T intersection. Intersection design plans will be submitted to the County and to MDOT SHA for review and approval.

Based on results of this study and the proposed traffic mitigation, the developer meets the APFO standards. Therefore, we respectfully recommend approval of the proposed warehouse project from a traffic impact standpoint.

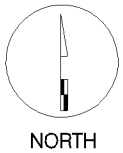
APPENDIX I-A

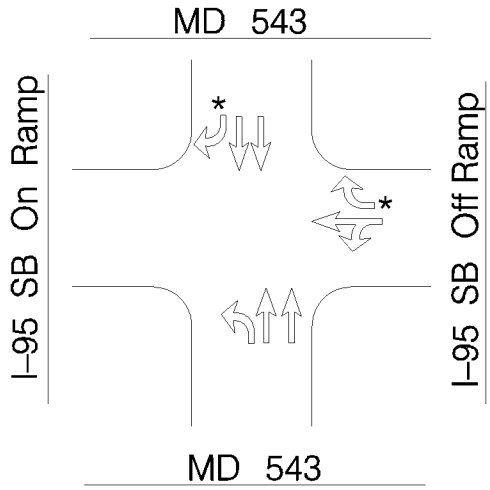
CRITICAL LANE VOLUME ANALYSIS

TRAFFIC CONCEPTS, Inc.

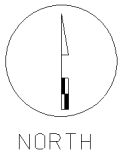
LANE CONFIGURATION

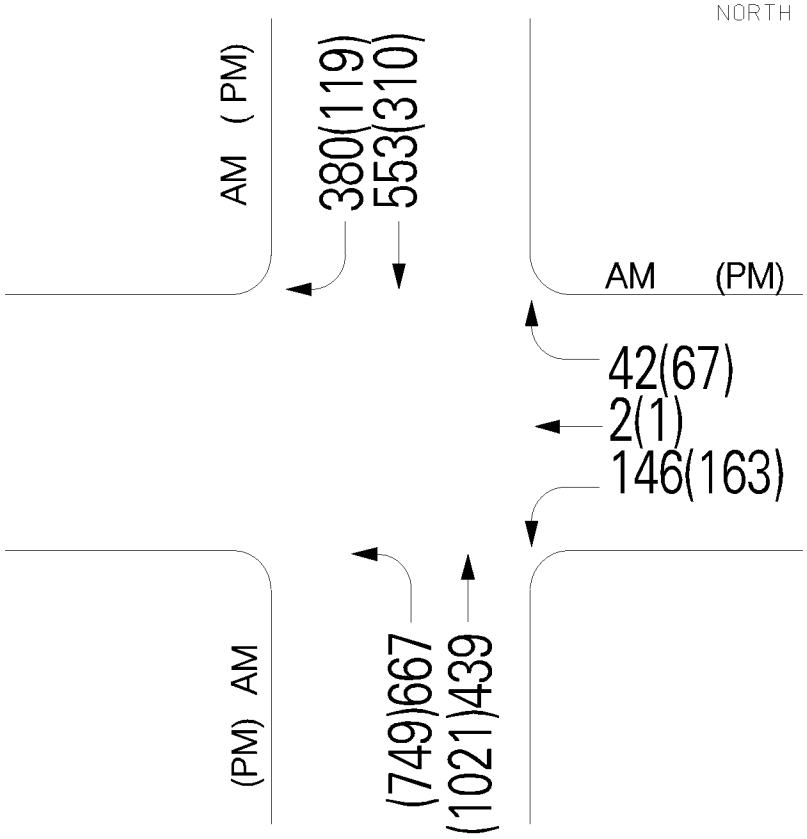
* FREE RIGHT





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	439 * 0.55 =	241	
	SB	553 * 0.55 + 667 * 1 =	971*	
	EB	—	—	B
	WB	(146 + 2) * 1.0 =	148*	1119
PM	NB	1021 * 0.55 =	562	
	SB	310 * 0.55 + 749 * 1 =	920*	
	EB	—	—	B
	WB	(163 + 1) * 1.0 =	164*	1084

CRITICAL LANE ANALYSIS

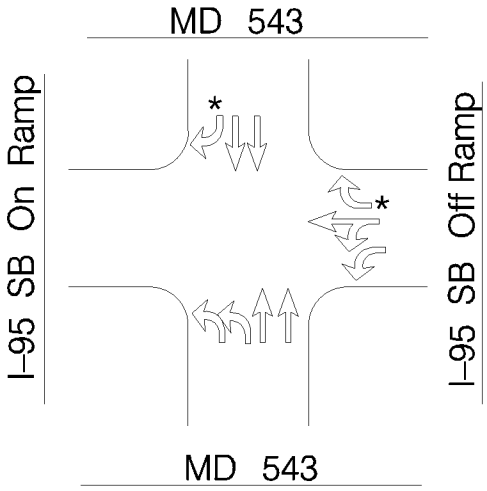
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

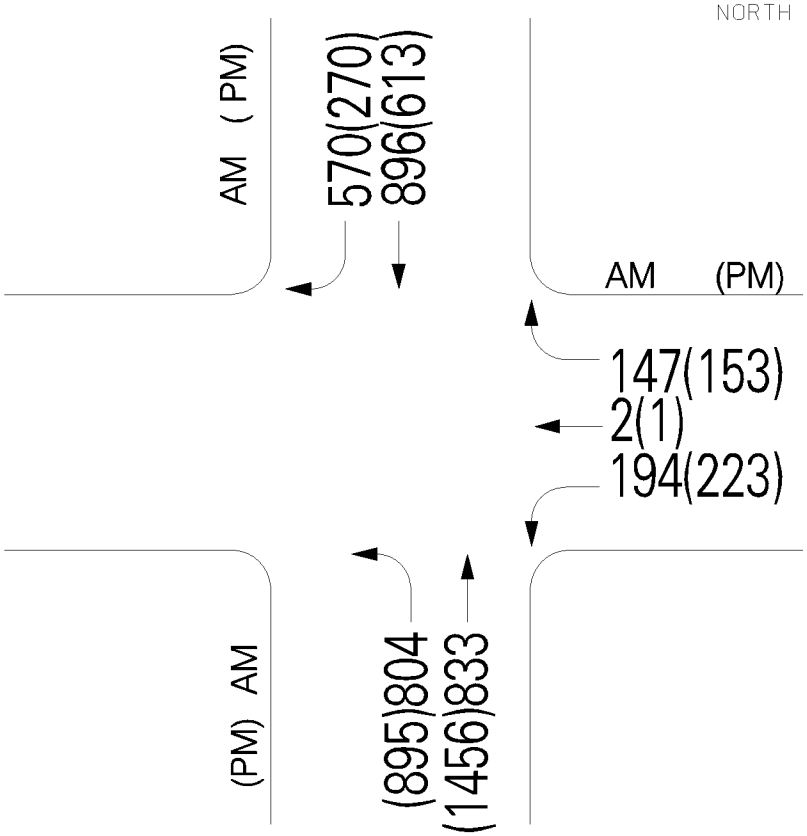
* FREE RIGHT





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	833 * 0.55 =	458	
	SB	896 * 0.55 + 804 * 0.6 =	975*	
	EB	—	—	B
	WB	(194 + 2) * 1.0 =	118*	1093
PM	NB	1456 * 0.55 =	801	
	SB	613 * 0.55 + 895 * 0.6 =	874*	
	EB	—	—	B
	WB	(223 + 1) * 1.0 =	134*	1008

CRITICAL LANE ANALYSIS

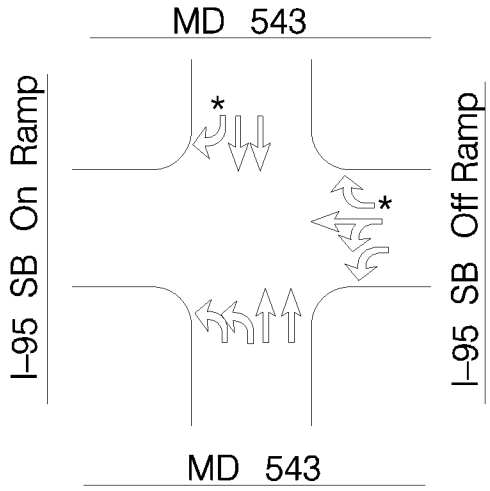
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

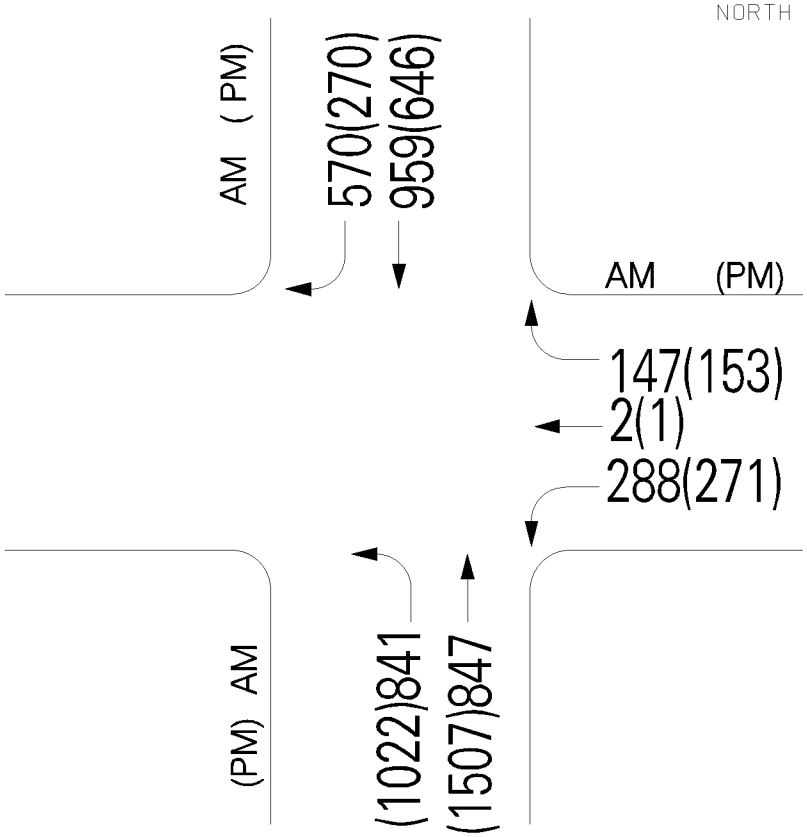
* FREE RIGHT





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	847 * 0.55 =	466	
	SB	959 * 0.55 + 841 * 0.6 =	1032*	
	EB	—	—	C
	WB	(288+2) * 1.0 =	174*	1206
PM	NB	1507 * 0.55 =	829	
	SB	646 * 0.55 + 1022 * 0.6 =	969*	
	EB	—	—	B
	WB	(271+1) * 1.0 =	163*	1132

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

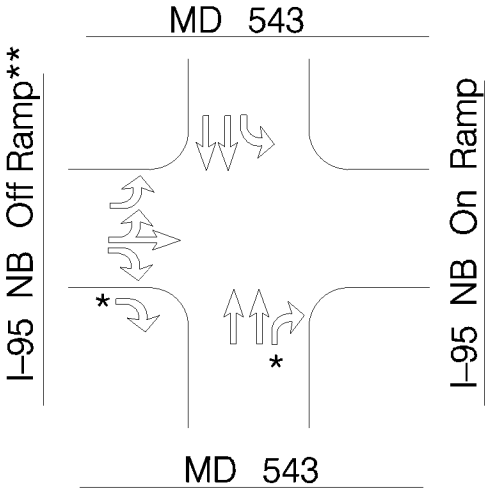
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

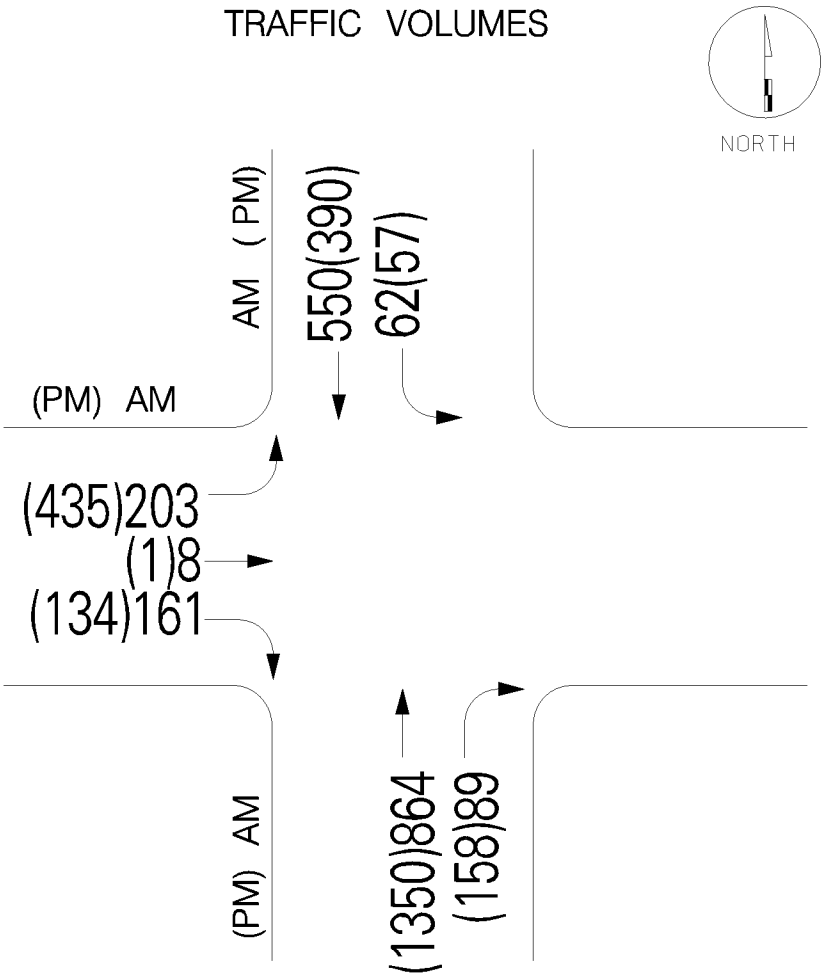
* FREE RIGHT

NORTH

NOTE: The off ramp has a second (free) right turn movement that is channelized and NOT controlled by the signal.



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	864	*	0.55	+	62	*	1	=	537*	
	SB	550	*	0.55					=	303	
	EB	(203+8)	*	0.6					=	127*	A
											664
PM	NB	1350	*	0.55	+	57	*	1	=	800*	
	SB	390	*	0.55					=	215	
	EB	(435+1)	*	0.6					=	262*	B
											1062

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY

Condition: EXISTING – RECOUNT 2022

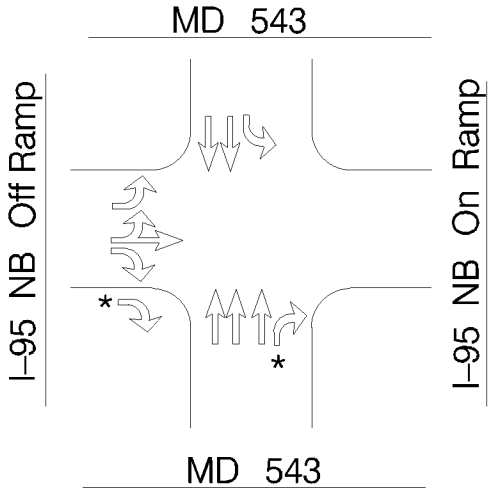
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

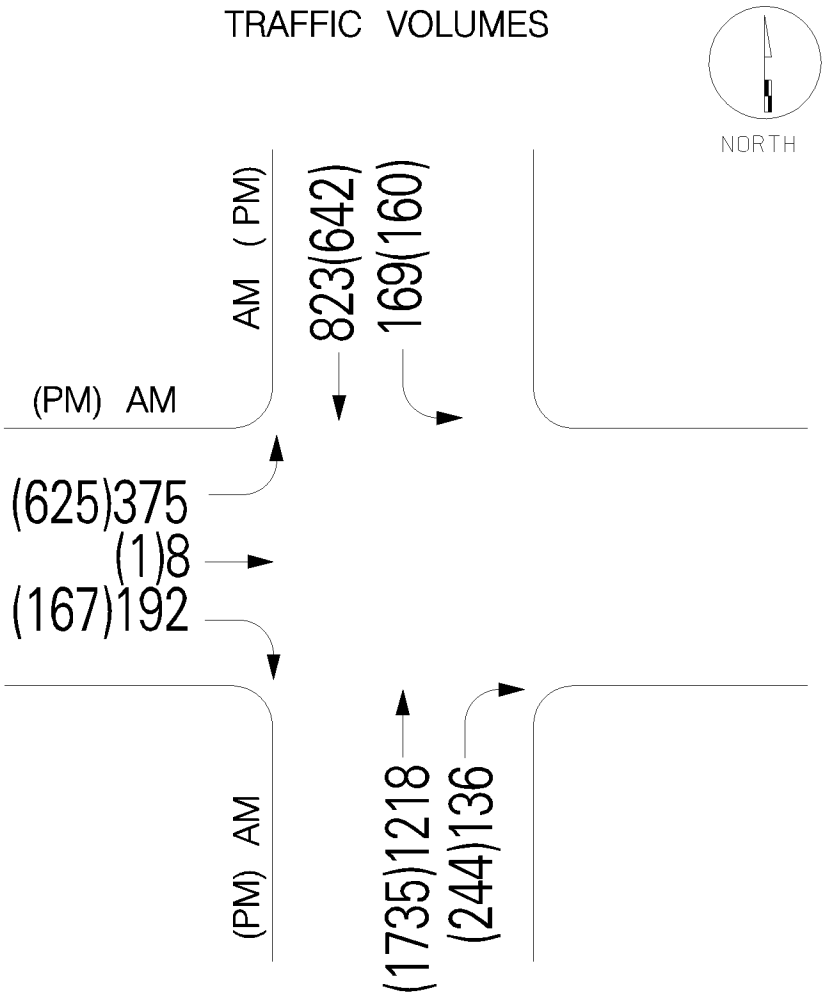
* FREE RIGHT

NORTH

NOTE: The off ramp has a second (free) right turn movement that is channelized and NOT controlled by the signal.



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	1218 * 0.40 + 169 * 1 =	656*	
	SB	823 * 0.55 =	453	
	EB	(375 + 8) * 0.6 =	230*	A
		—	—	886
PM	NB	1735 * 0.40 + 160 * 1 =	854*	
	SB	642 * 0.55 =	353	
	EB	(625 + 1) * 0.6 =	376*	C
		—	—	1230

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

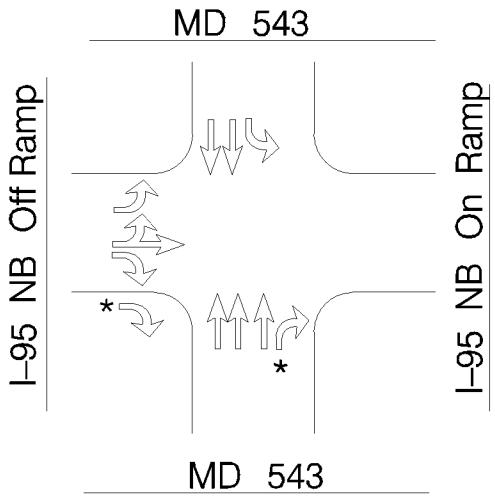
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

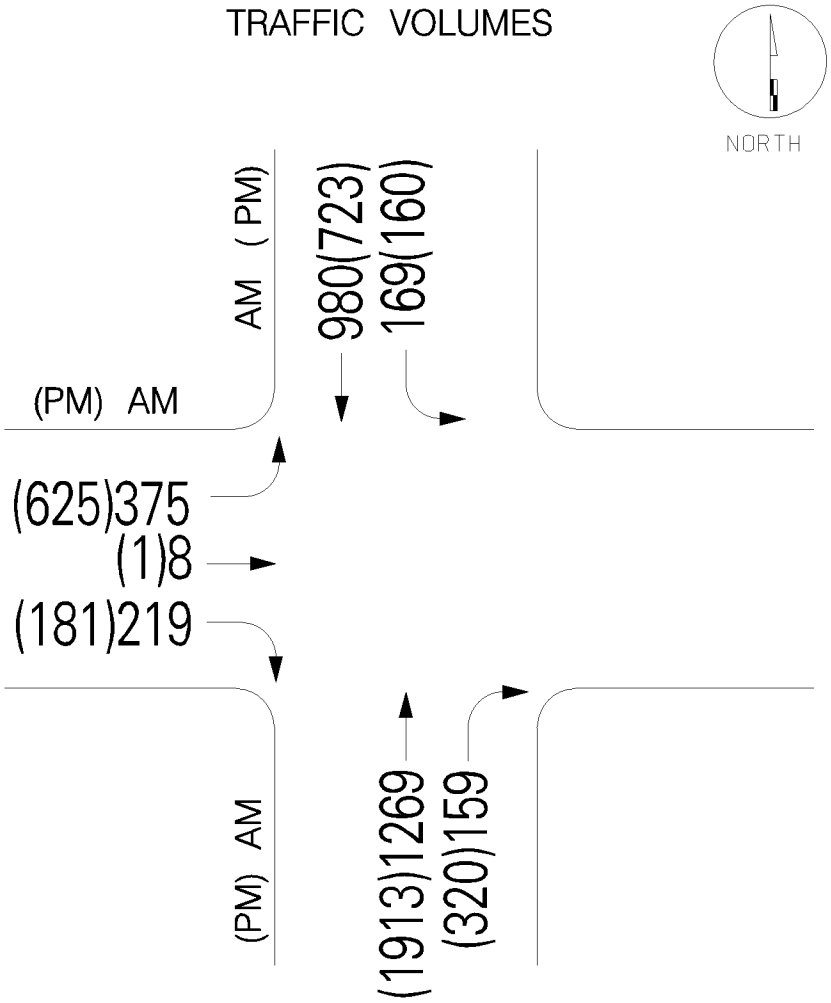
* FREE RIGHT

NORTH

NOTE: The off ramp has a second (free) right turn movement that is channelized and NOT controlled by the signal.



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	1269	*	0.40	+	169	*	1	=	676*	
	SB	980	*	0.55					=	539	
	EB	(375+8)	*	0.6					=	230*	A
					—					—	906
PM	NB	1913	*	0.40	+	160	*	1	=	925*	
	SB	723	*	0.55					=	398	
	EB	(625+1)	*	0.6					=	376*	D
					—					—	1301

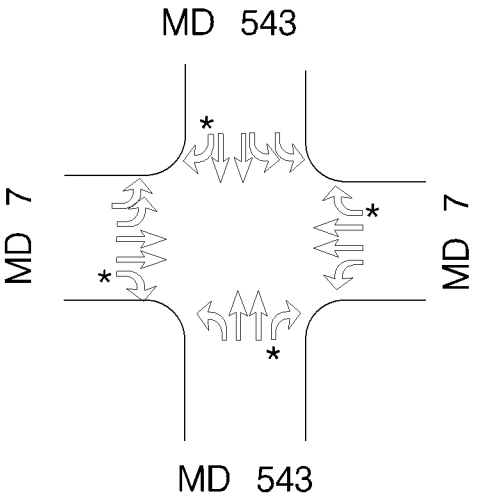
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

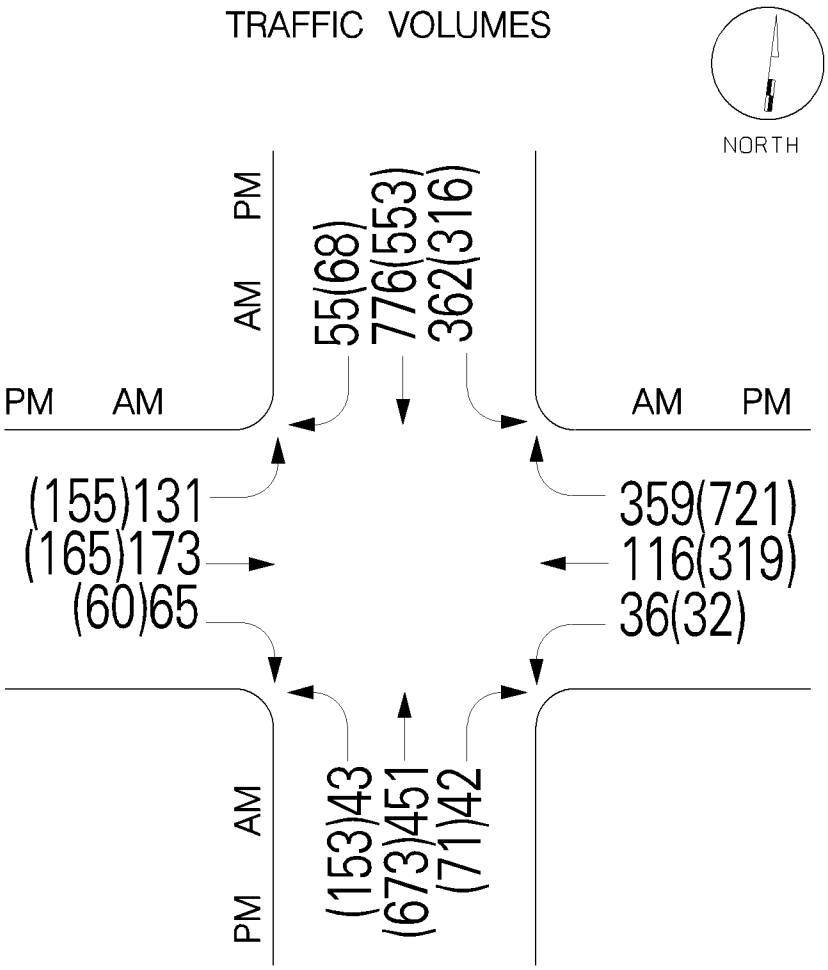
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* FREE RIGHT



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	451	*	0.55	+	362	*	0.6	=	465	
	SB	776	*	0.55	+	43	*	1	=	470*	
	EB	173	*	0.55	+	36	*	1	=	131	A
	WB	116	*	0.55	+	131	*	0.6	=	142*	612
PM	NB	673	*	0.55	+	316	*	0.6	=	560*	
	SB	553	*	0.55	+	153	*	1	=	457	
	EB	165	*	0.55	+	38	*	1	=	123	A
	WB	339	*	0.55	+	165	*	0.6	=	268*	828

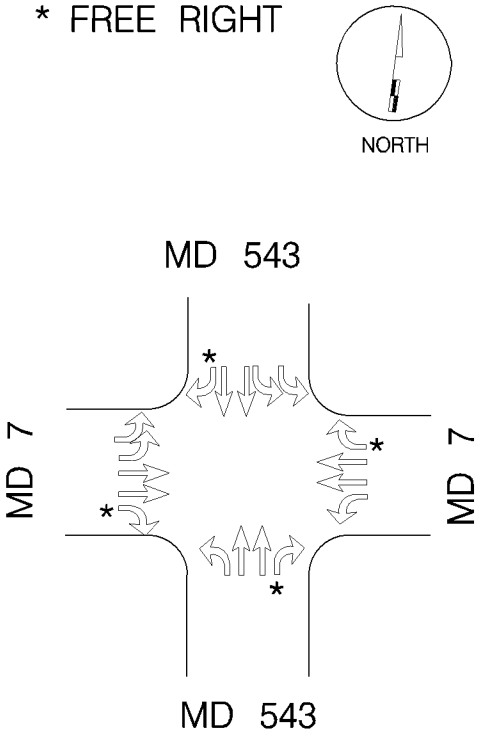
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

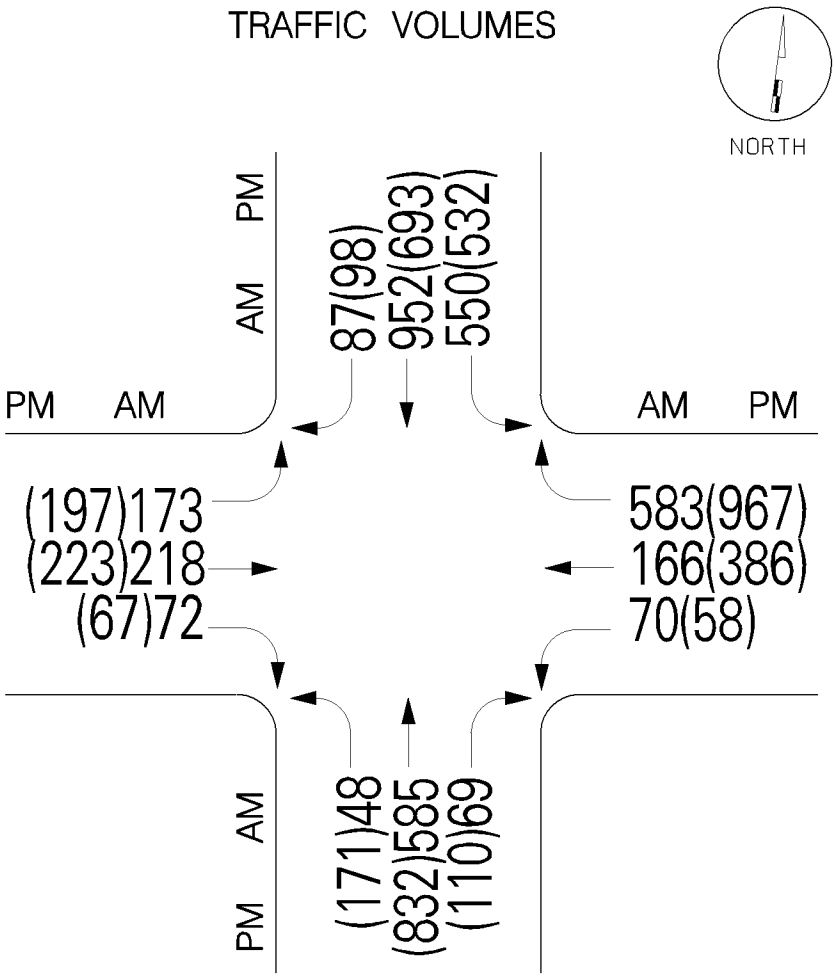
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* FREE RIGHT



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	585	*	0.55	+	550	*	0.6	=	652*	
	SB	952	*	0.55	+	48	*	1	=	572	
	EB	218	*	0.55	+	70	*	1	=	190	A
	WB	166	*	0.55	+	173	*	0.6	=	195*	847
PM	NB	832	*	0.55	+	532	*	0.6	=	777*	
	SB	693	*	0.55	+	171	*	1	=	552	
	EB	223	*	0.55	+	58	*	1	=	181	B
	WB	386	*	0.55	+	197	*	0.6	=	331*	1108

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

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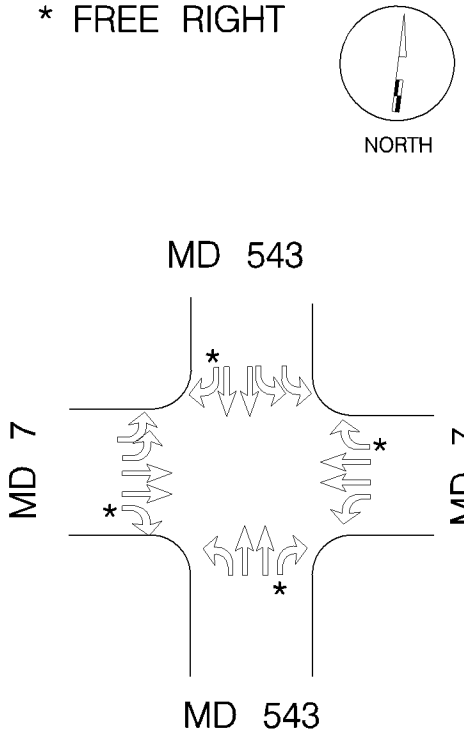
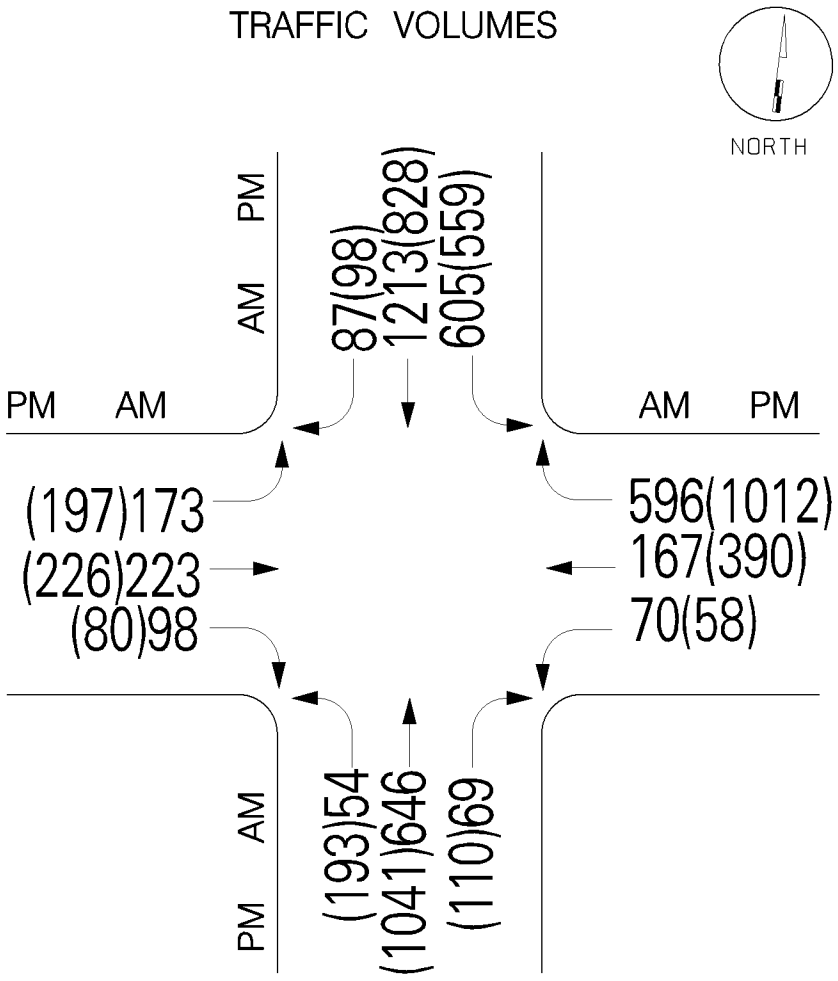


TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	646	*	0.55	+	605	*	0.6	=	718	
	SB	1213	*	0.55	+	54	*	1	=	721*	
	EB	223	*	0.55	+	70	*	1	=	193	A
	WB	167	*	0.55	+	173	*	0.6	=	196*	917
PM	NB	1041	*	0.55	+	559	*	0.6	=	908*	
	SB	828	*	0.55	+	193	*	1	=	648	
	EB	226	*	0.55	+	58	*	1	=	182	B
	WB	390	*	0.55	+	197	*	0.6	=	333*	1241

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

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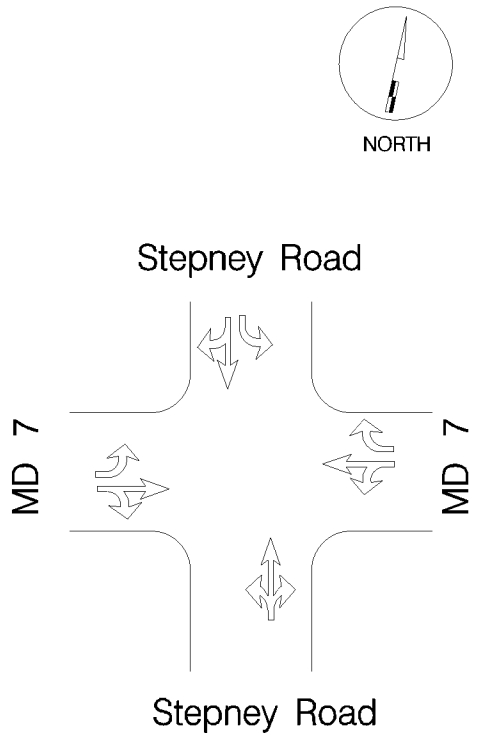
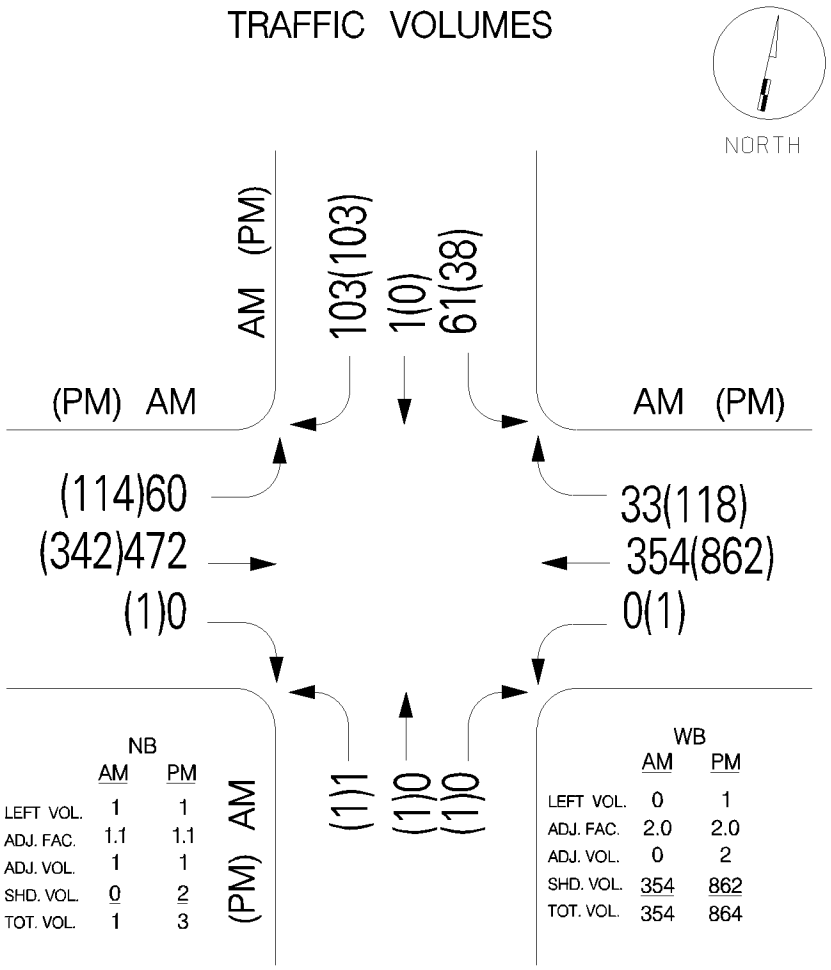
LANE CONFIGURATION



TRAFFIC VOLUMES



NB

	AM	PM
LEFT VOL.	1	1
ADJ. FAC.	1.1	1.1
ADJ. VOL.	1	1
SHD. VOL.	0	2
TOT. VOL.	1	3

WB

	AM	PM
LEFT VOL.	0	1
ADJ. FAC.	2.0	2.0
ADJ. VOL.	0	2
SHD. VOL.	354	862
TOT. VOL.	354	864

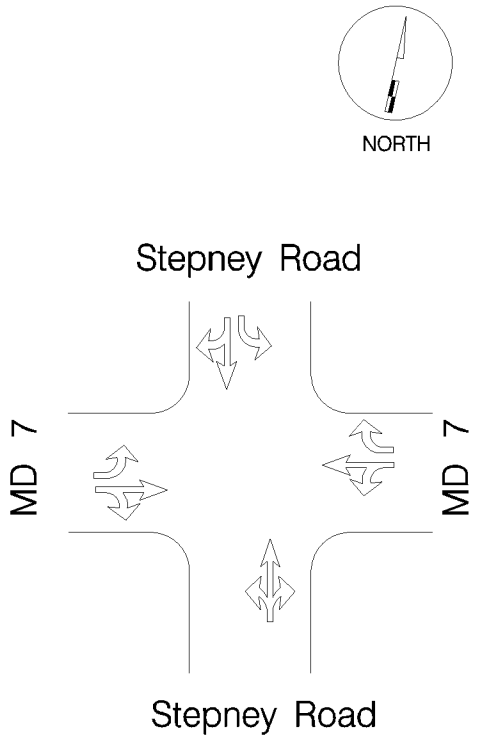
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	1	*	1	+	61	*	1	=	62	
	SB	(1+103)	*	1	+	1	*	1	=	105*	
	EB	(472+0)	*	1	+	0	*	1	=	472*	A
	WB	354	*	1	+	60	*	1	=	414	577
PM	NB	3	*	1	+	38	*	1	=	41	
	SB	(103+0)	*	1	+	1	*	1	=	104*	
	EB	(342+1)	*	1	+	1	*	1	=	344	B
	WB	864	*	1	+	114	*	1	=	978*	1082

CRITICAL LANE ANALYSIS

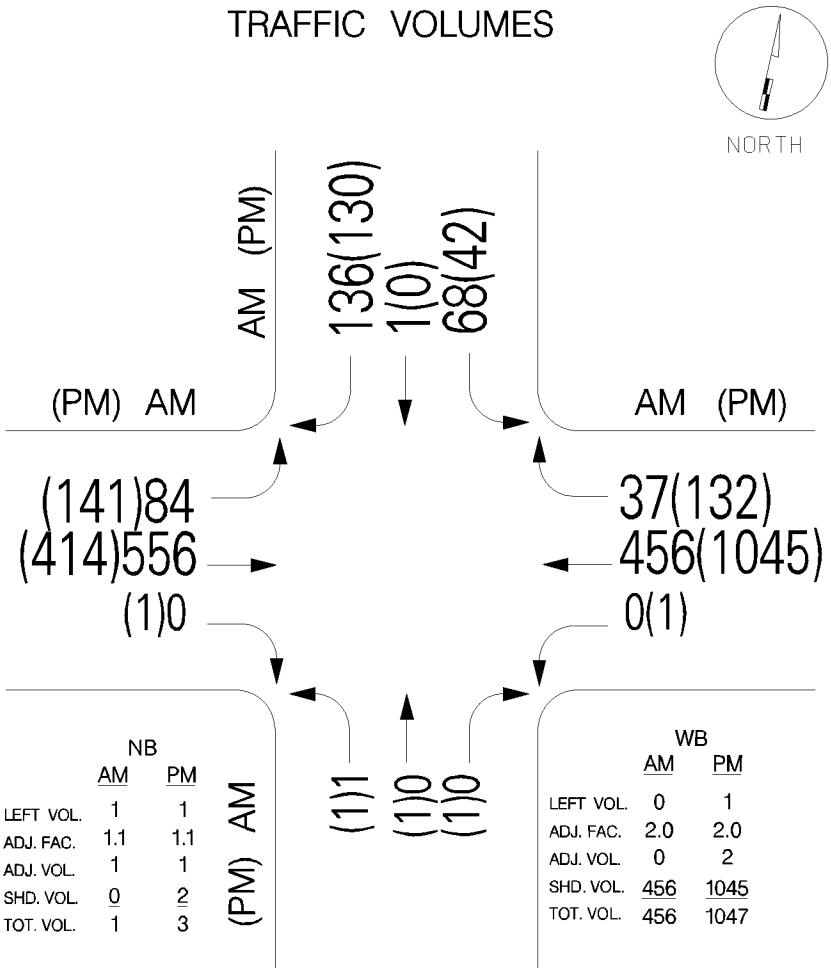
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



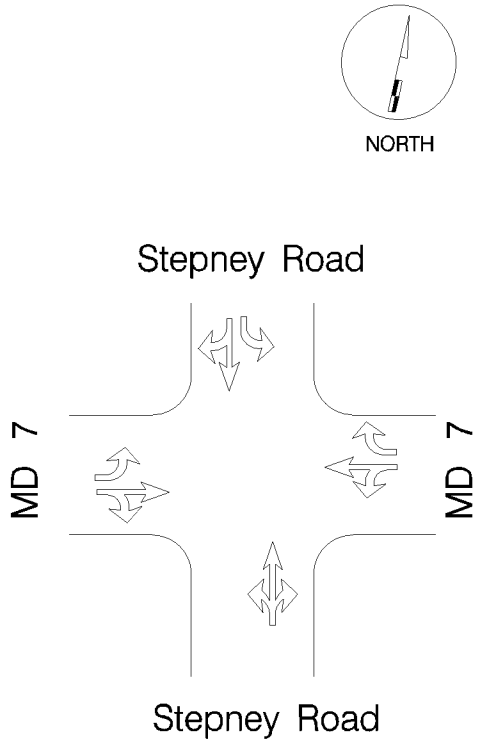
		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	1	*	1	+	68	*	1	=	69	
	SB	(1+136)	*	1	+	1	*	1	=	138*	
	EB	(556+0)	*	1	+	0	*	0	=	556*	A
	WB	456	*	1	+	84	*	1	=	540	694
PM	NB	3	*	1	+	42	*	1	=	45	
	SB	(130+0)	*	1	+	1	*	1	=	131*	
	EB	(414+1)	*	1	+	1	*	1	=	416	B
	WB	1047	*	1	+	141	*	1	=	1188*	1319

CRITICAL LANE ANALYSIS

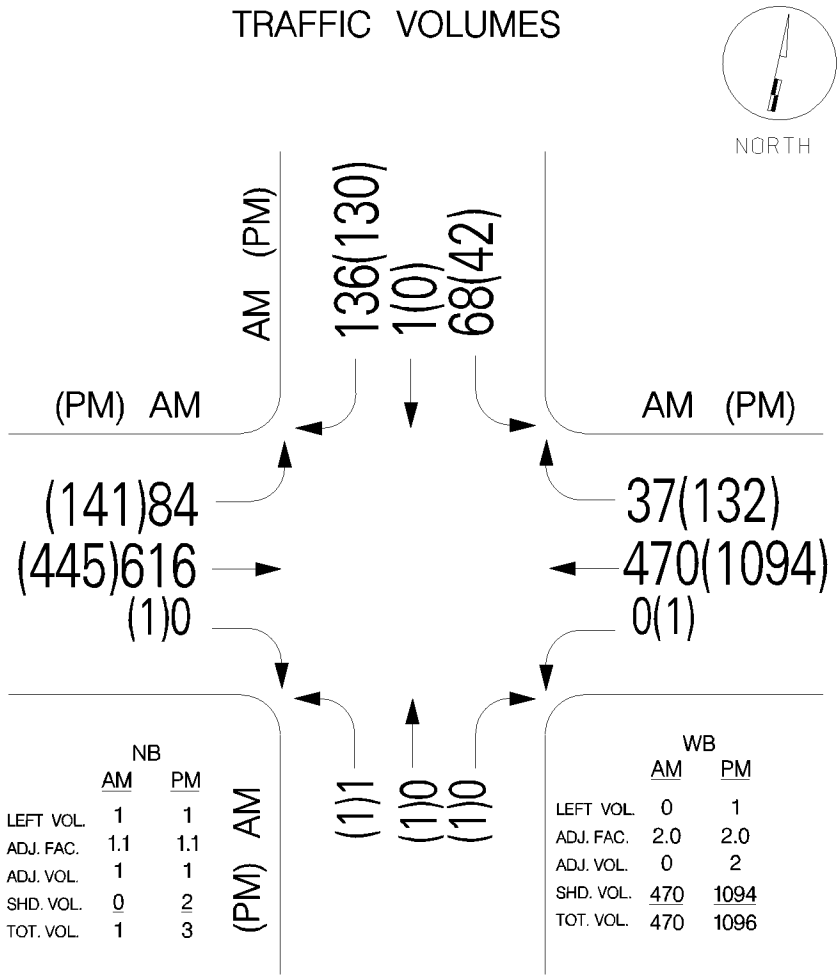
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



NB	AM	PM
LEFT VOL.	1	1
ADJ. FAC.	1.1	1.1
ADJ. VOL.	1	1
SHD. VOL.	0	2
TOT. VOL.	1	3

WB	AM	PM
LEFT VOL.	0	1
ADJ. FAC.	2.0	2.0
ADJ. VOL.	0	2
SHD. VOL.	470	1094
TOT. VOL.	470	1096

		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	1	*	1	+	68	*	1	=	69	
	SB	(1+136)	*	1	+	1	*	1	=	138*	
	EB	(616+0)	*	1	+	0	*	0	=	616*	A
	WB	470	*	1	+	84	*	1	=	554	754
PM	NB	3	*	1	+	42	*	1	=	45	
	SB	(130+0)	*	1	+	1	*	1	=	131*	
	EB	(445+1)	*	1	+	1	*	1	=	447	D
	WB	1096	*	1	+	141	*	1	=	1237*	1368

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

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LANE CONFIGURATION

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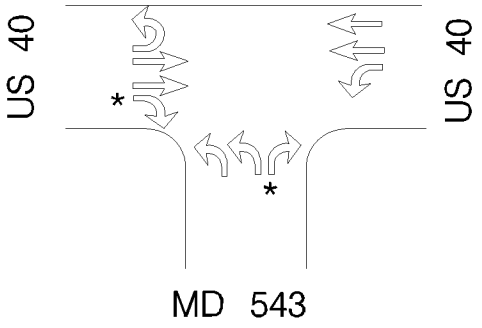
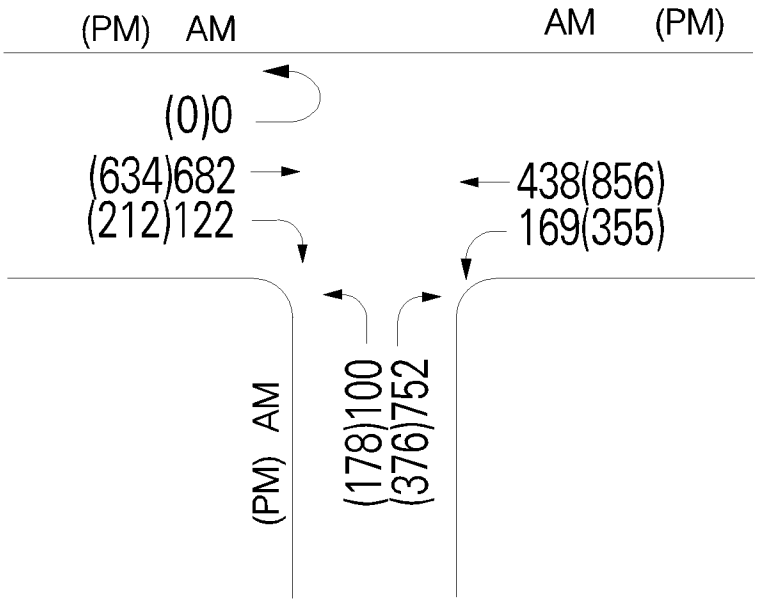


TRAFFIC VOLUMES





		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	100	*	0.6					=	60*	
	SB				—					—	
	EB	682	*	0.55	+	169	*	1	=	544*	A
	WB	438	*	0.55					=	241	604
PM	NB	178	*	0.6					=	107*	
	SB				—					—	
	EB	634	*	0.55	+	355	*	1	=	704*	A
	WB	856	*	0.55					=	471	811

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

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LANE CONFIGURATION

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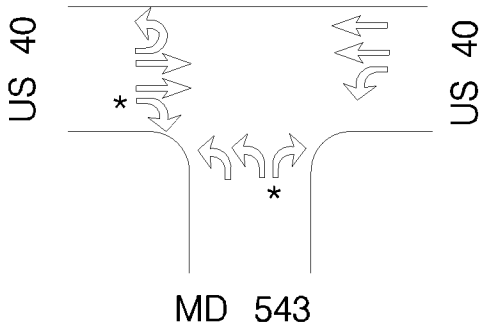
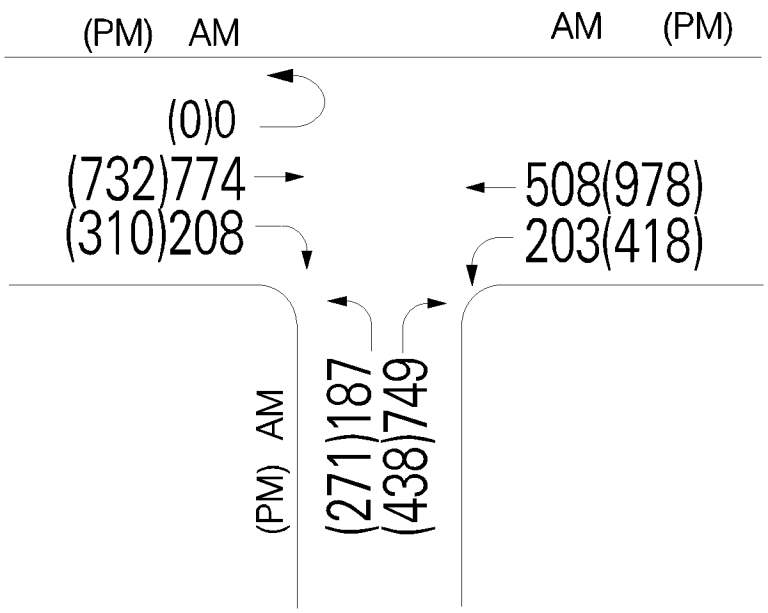


TRAFFIC VOLUMES





		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	187	*	0.6					=	112*	
	SB				—					—	
	EB	774	*	0.55	+	203	*	1	=	629*	A
	WB	508	*	0.55					=	279	741
PM	NB	271	*	0.6					=	163*	
	SB				—					—	
	EB	732	*	0.55	+	418	*	1	=	821*	A
	WB	978	*	0.55					=	538	984

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

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LANE CONFIGURATION

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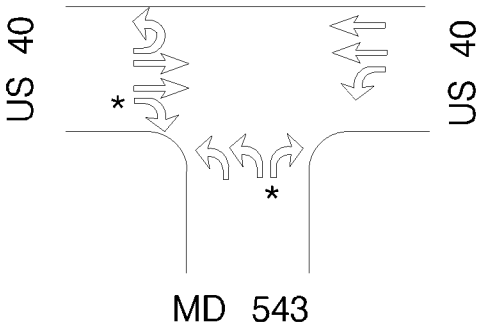
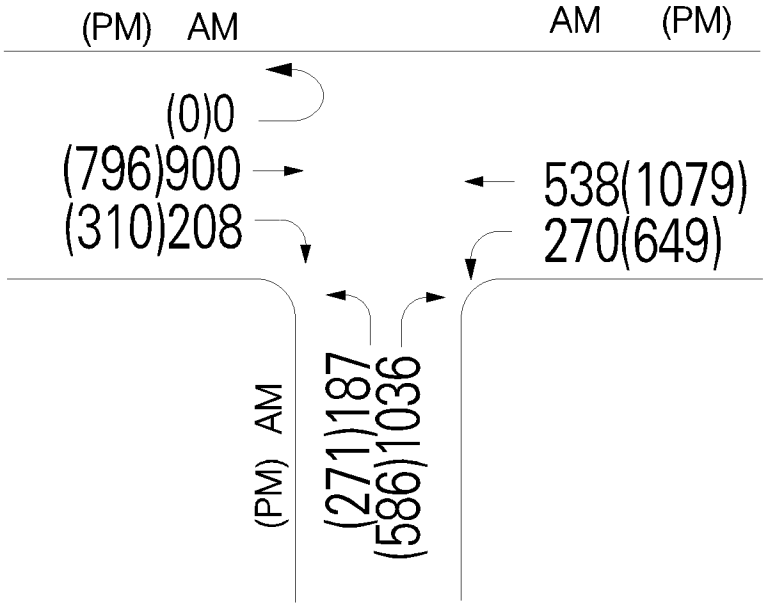


TRAFFIC VOLUMES





		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	187	*	0.6					=	112*	
	SB				—					—	
	EB	900	*	0.55	+	270	*	1	=	765*	A
	WB	538	*	0.55					=	279	877
PM	NB	271	*	0.6					=	163*	
	SB				—					—	
	EB	796	*	0.55	+	649	*	1	=	1087*	C
	WB	1079	*	0.55					=	593	1250

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

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LANE CONFIGURATION

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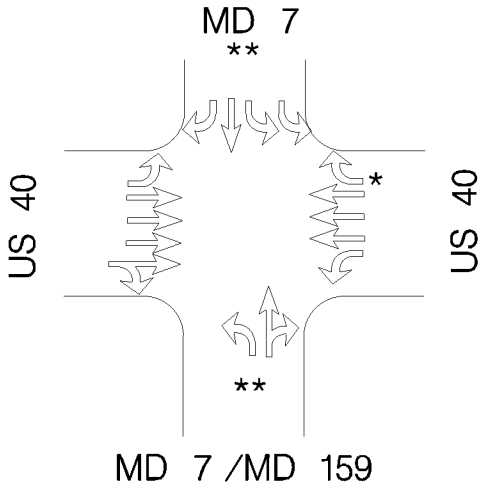
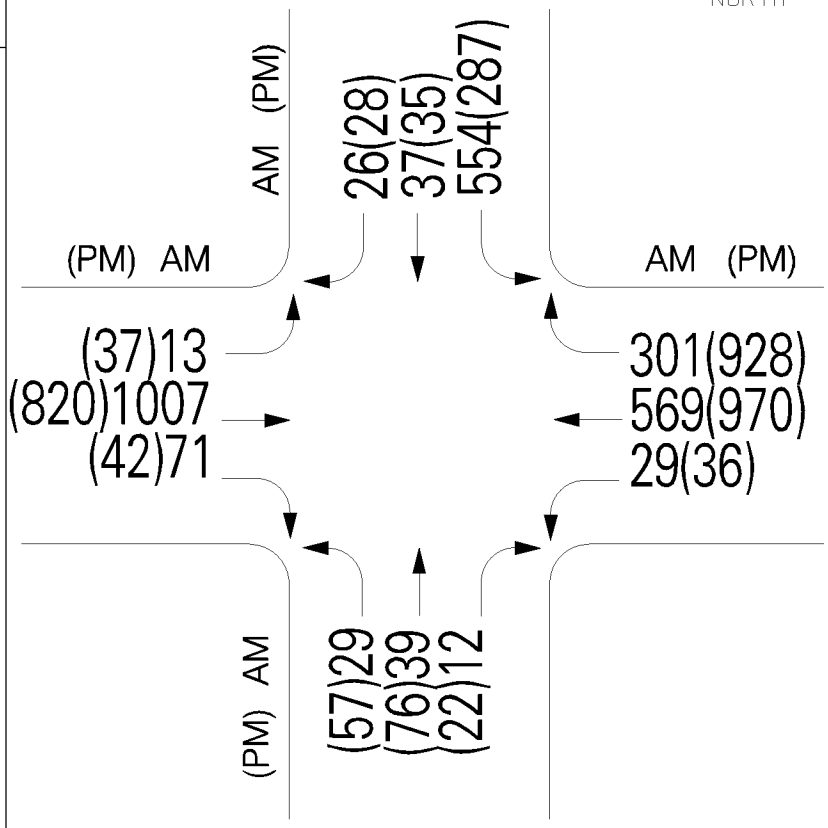
NORTH



TRAFFIC VOLUMES

NORTH



		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(39 + 12)	*	1					=	51*	
	SB	554	*	0.6					=	332*	
	EB	(1007 + 71)	*	0.3	+	29	*	1	=	352*	A
	WB	569	*	0.4	+	13	*	1	=	241	735
PM	NB	(76 + 22)	*	1					=	98*	
	SB	287	*	0.6					=	172*	
	EB	(820 + 42)	*	0.3	+	36	*	1	=	295	A
	WB	970	*	0.4	+	37	*	1	=	425*	695

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

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LANE CONFIGURATION

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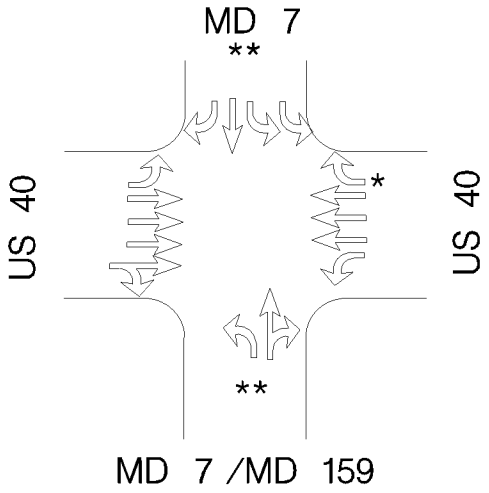
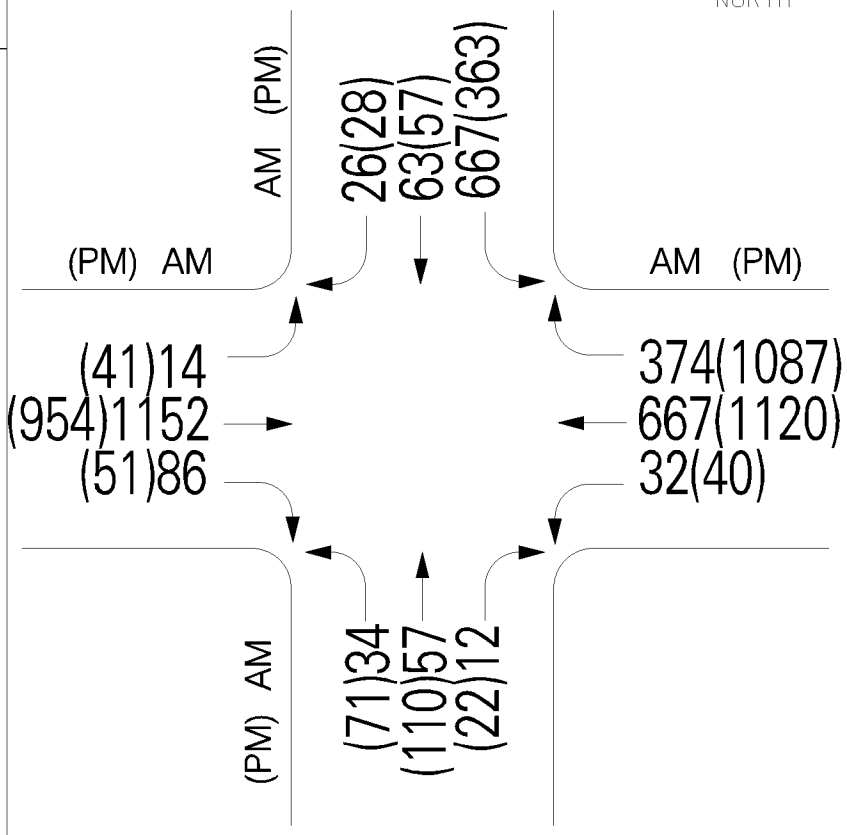
NORTH



TRAFFIC VOLUMES

NORTH



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(57 + 12)	*	1					=	69*	
	SB	667	*	0.6					=	400*	
	EB	(1152 + 86)	*	0.3	+	32	*	1	=	403*	A
	WB	667	*	0.4	+	14	*	1	=	281	872
PM	NB	(110 + 22)	*	1					=	132*	
	SB	363	*	0.6					=	218*	
	EB	(954 + 51)	*	0.3	+	40	*	1	=	342	A
	WB	1120	*	0.4	+	41	*	1	=	489*	839

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

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LANE CONFIGURATION

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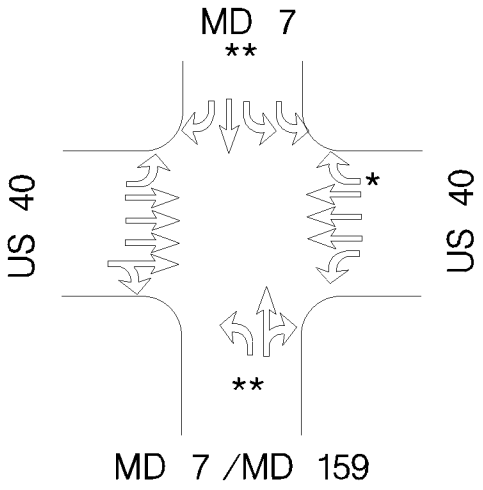
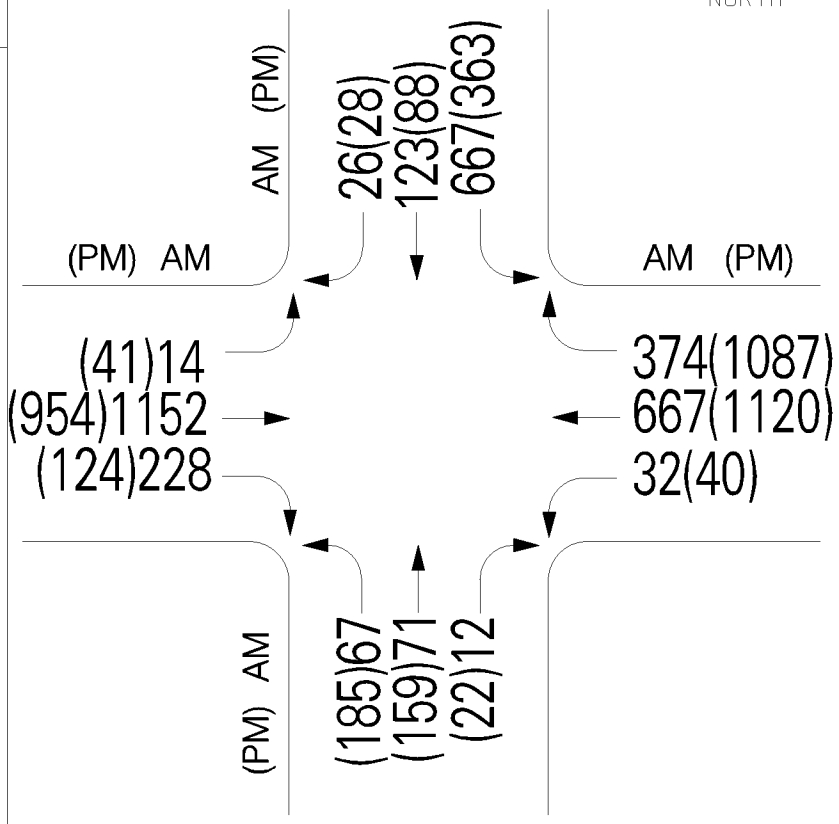
NORTH



TRAFFIC VOLUMES

NORTH



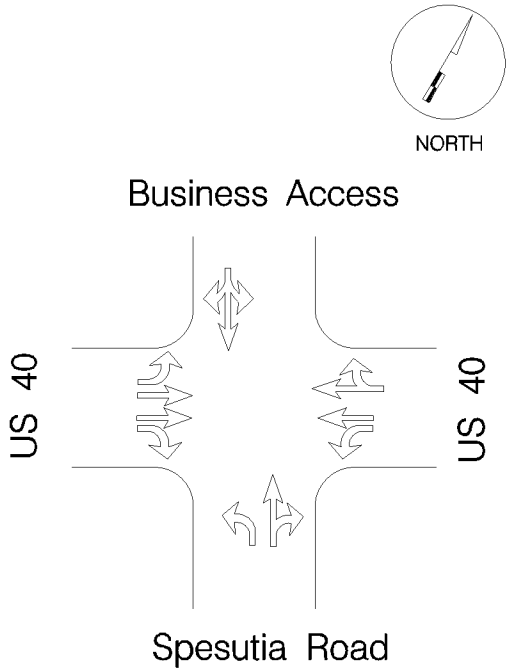
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(71+12)	*	1					=	83*	
	SB	667	*	0.6					=	400*	
	EB	(1152+228)	*	0.3	+	32	*	1	=	446*	A
	WB	667	*	0.4	+	14	*	1	=	281	929
PM	NB	185	*	1					=	185*	
	SB	363	*	0.6					=	218*	
	EB	(954+124)	*	0.3	+	40	*	1	=	363	A
	WB	1120	*	0.4	+	41	*	1	=	489*	892

CRITICAL LANE ANALYSIS

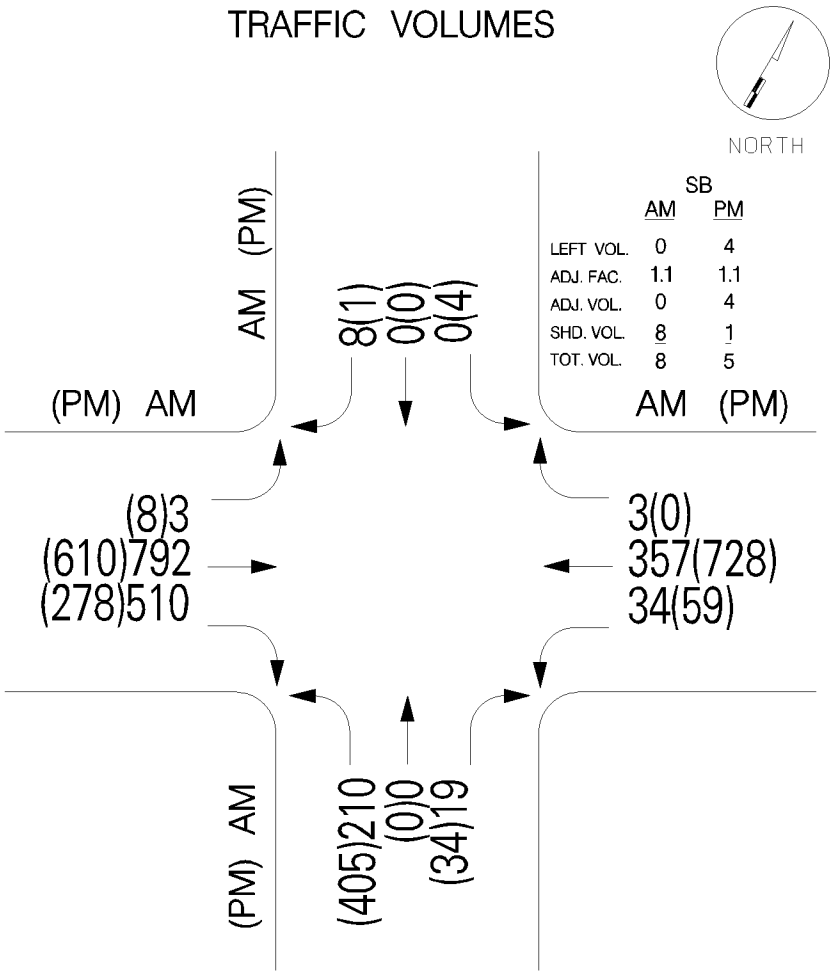
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(19 + 0)	*	1	+	0	*	1	=	19	
	SB	8	*	1	+	210	*	1	=	218*	
	EB	792	*	0.55	+	34	*	1	=	470*	A
	WB	(357 + 3)	*	0.55	+	3	*	1	=	201	688
PM	NB	(0 + 34)	*	1	+	4	*	1	=	38	
	SB	5	*	1	+	405	*	1	=	410*	
	EB	610	*	0.55	+	59	*	1	=	395	A
	WB	(728 + 0)	*	0.55	+	8	*	1	=	408*	818

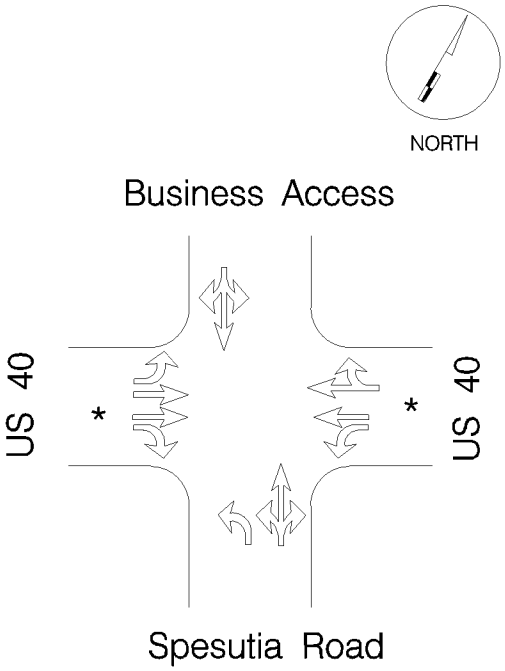
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

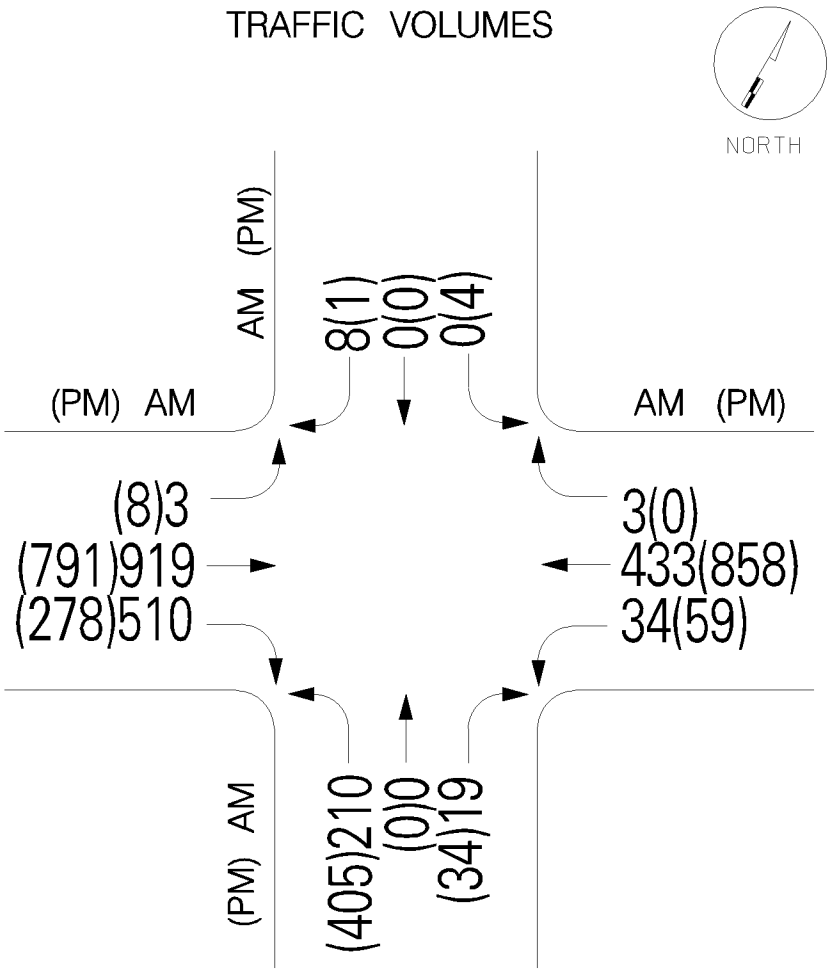
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* SPLIT PHASED



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(210+19)	*	0.6					=	137*	
	SB	8	*	1					=	8*	
	EB	919	*	0.55	+	34	*	1	=	539*	A
	WB	(433+3)	*	0.55	+	3	*	1	=	243	684
PM	NB	(405+34)	*	0.6					=	263*	
	SB	(4+1)	*	1					=	5*	
	EB	791	*	0.55	+	59	*	1	=	494*	A
	WB	(858+0)	*	0.55	+	8	*	1	=	480	762

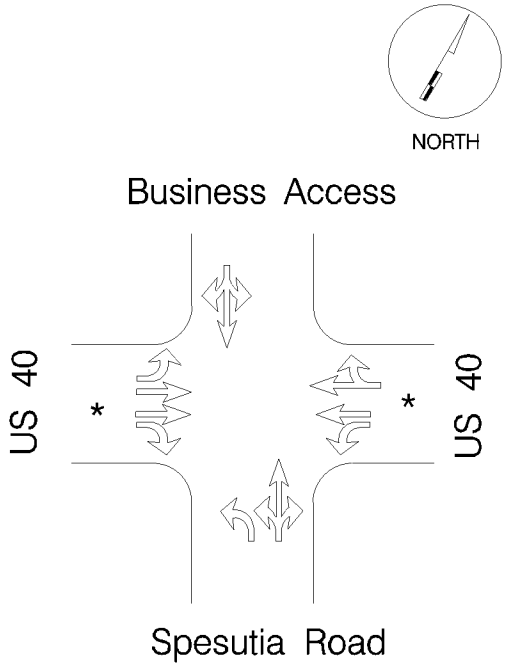
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

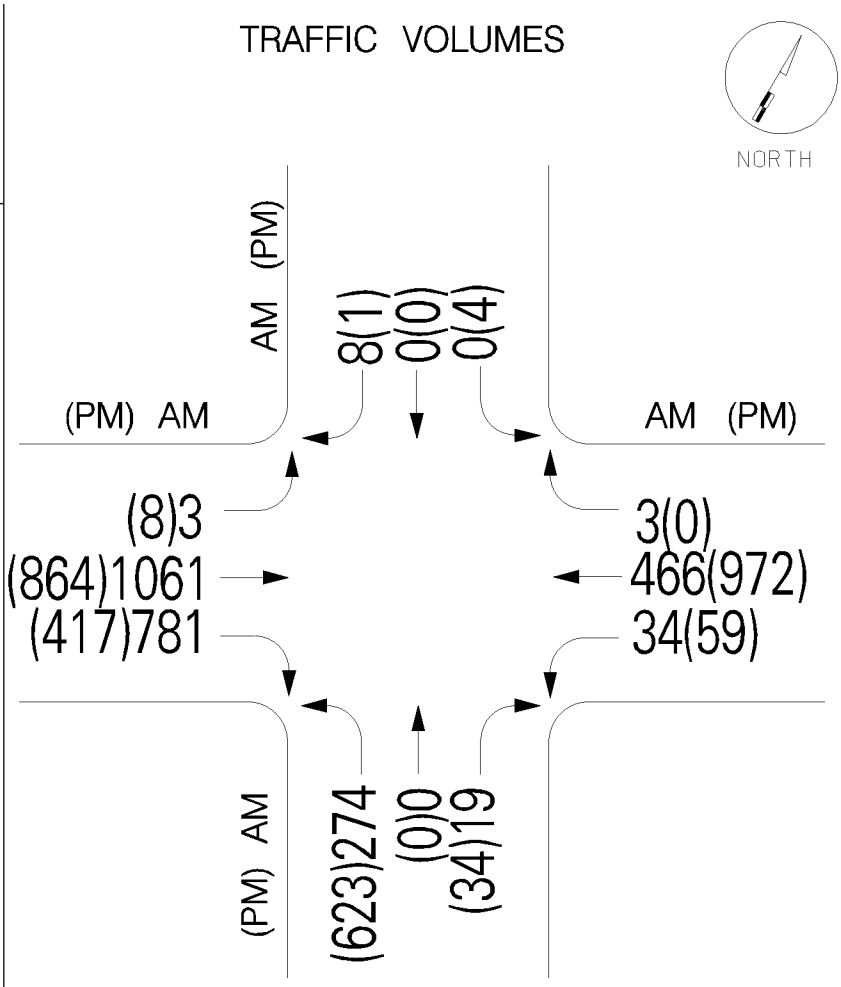
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* SPLIT PHASED



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(274+19)	*	0.6					=	176*	
	SB	8	*	1					=	8*	
	EB	1061	*	0.55	+	34	*	1	=	618*	A
	WB	(466+3)	*	0.55	+	3	*	1	=	261	802
PM	NB	(623+34)	*	0.6					=	394*	
	SB	(4+1)	*	1					=	5*	
	EB	864	*	0.55	+	59	*	1	=	534	A
	WB	(972+0)	*	0.55	+	8	*	1	=	543*	942

CRITICAL LANE ANALYSIS

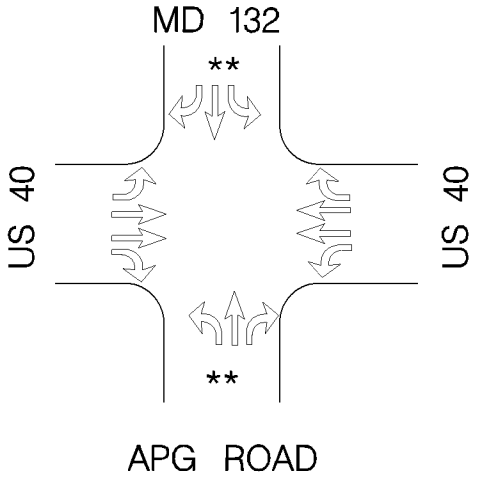
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

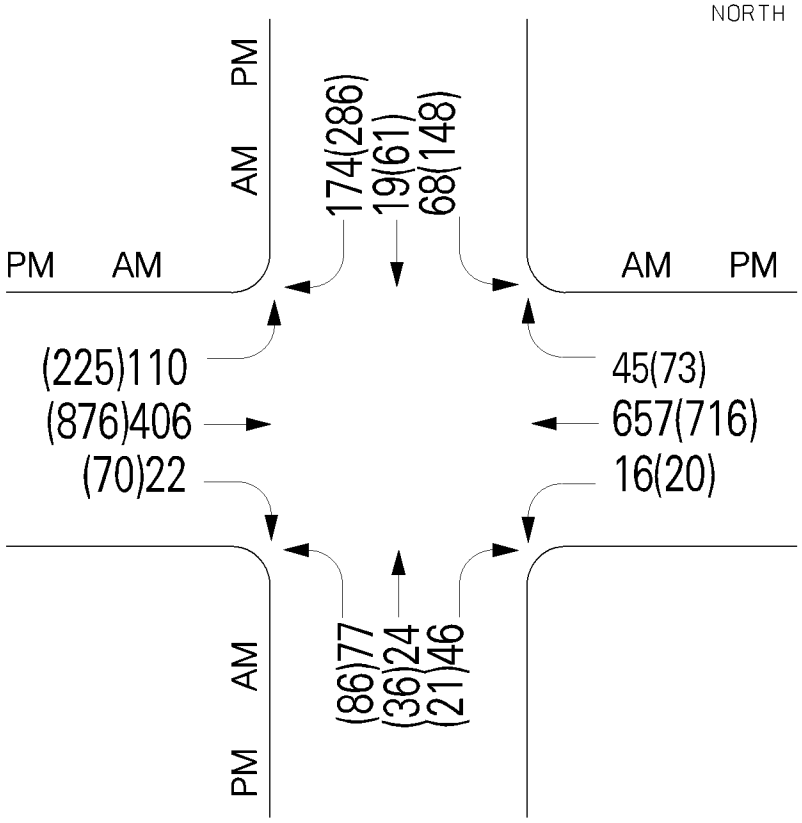
** SPLIT PHASED

NORTH



TRAFFIC VOLUMES

NORTH



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	77	*	1					=	77*	
	SB	68	*	1					=	68*	
	EB	406	*	0.55	+	16	*	1	=	239	A
	WB	657	*	0.55	+	110	*	1	=	471*	616
PM	NB	86	*	1					=	86*	
	SB	148	*	1					=	148*	
	EB	876	*	0.55	+	20	*	1	=	502	A
	WB	716	*	0.55	+	225	*	1	=	619*	853

CRITICAL LANE ANALYSIS

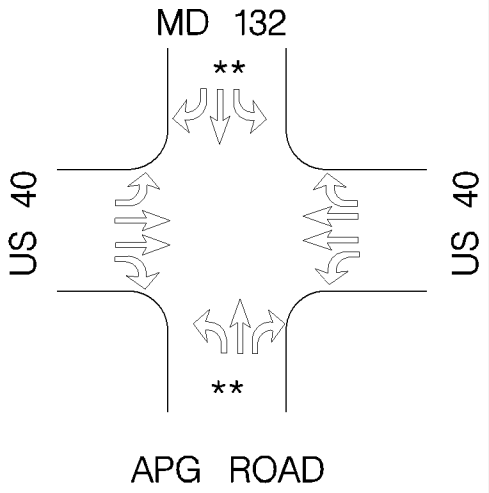
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

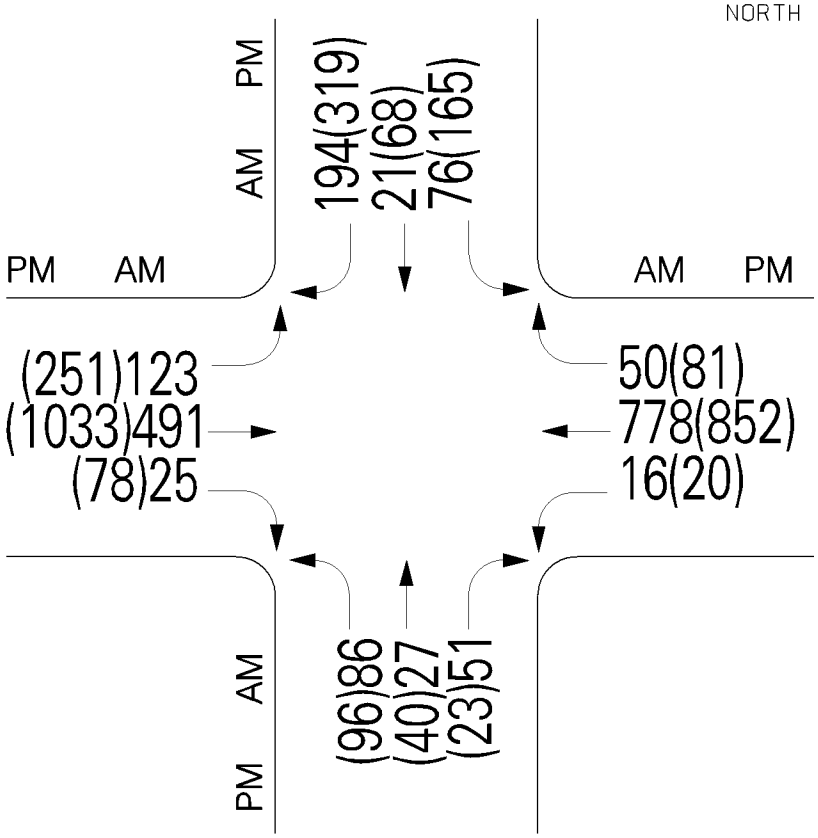
** SPLIT PHASED

NORTH



TRAFFIC VOLUMES

NORTH



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	86	*	1					=	86*	
	SB	76	*	1					=	76*	
	EB	491	*	0.55	+	16	*	1	=	286	A
	WB	778	*	0.55	+	123	*	1	=	551*	713
PM	NB	86	*	1					=	96*	
	SB	165	*	1					=	165*	
	EB	1033	*	0.55	+	20	*	1	=	588	A
	WB	852	*	0.55	+	251	*	1	=	720*	981

CRITICAL LANE ANALYSIS

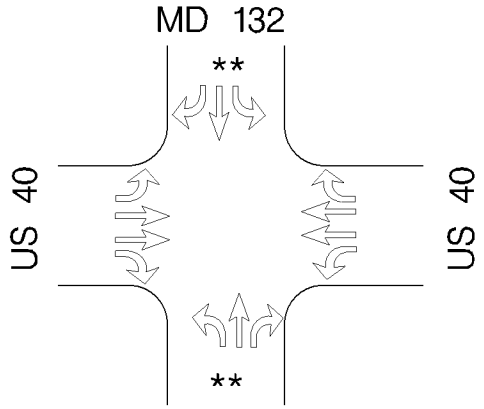
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

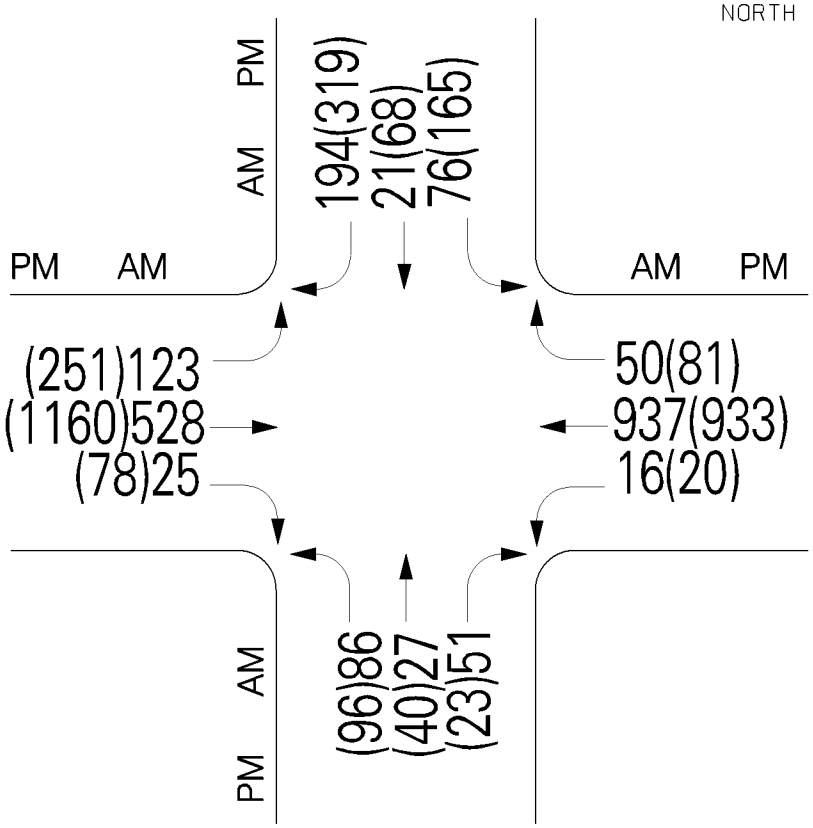
** SPLIT PHASED

NORTH



TRAFFIC VOLUMES

NORTH



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	86	*	1					=	86*	
	SB	76	*	1					=	76*	
	EB	528	*	0.55	+	16	*	1	=	306	A
	WB	937	*	0.55	+	123	*	1	=	638*	800
PM	NB	86	*	1					=	96*	
	SB	165	*	1					=	165*	
	EB	1160	*	0.55	+	20	*	1	=	658	B
	WB	933	*	0.55	+	251	*	1	=	764*	1025

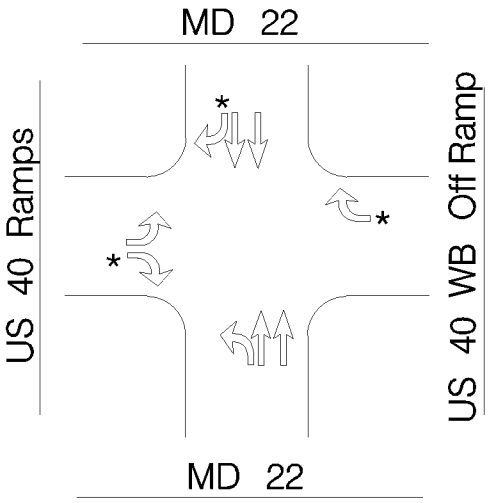
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

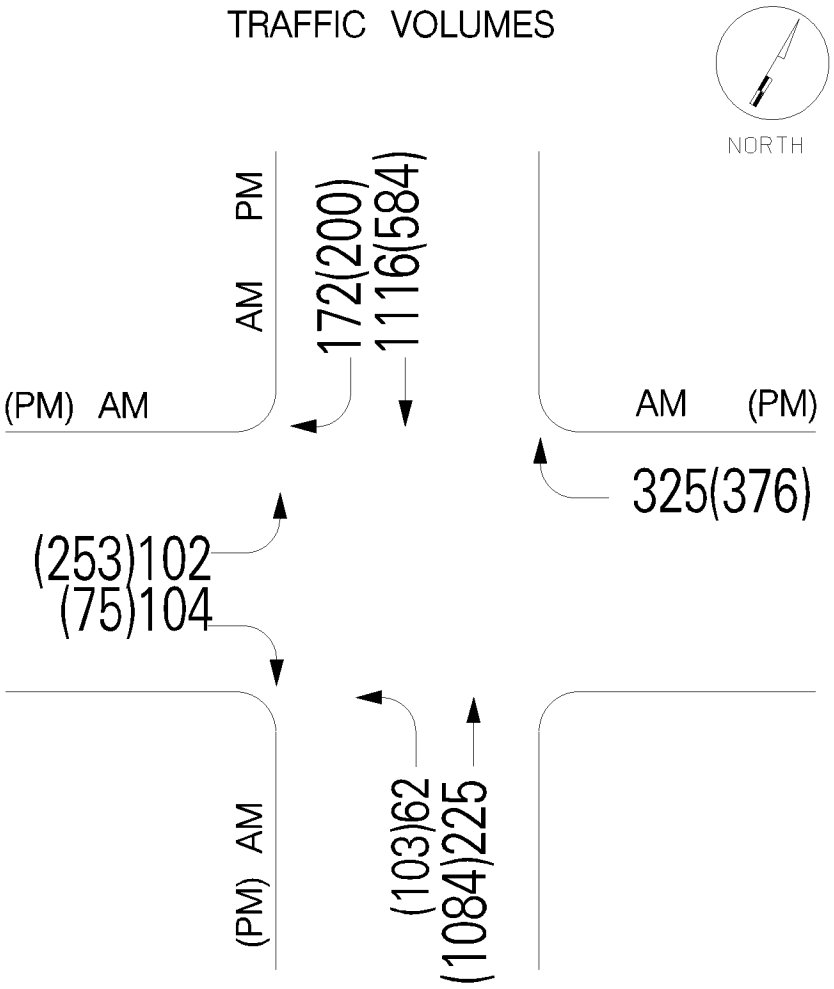
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* FREE RIGHT



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =							CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	225	*	0.55				=	124	
	SB	1116	*	0.55	+	62	* 1	=	676*	
	EB	102	*	1				=	102*	A
	WB									778
PM	NB	1084	*	0.55				=	596*	
	SB	584	*	0.55	+	103	* 1	=	424	
	EB	253	*	1				=	253*	A
										849

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

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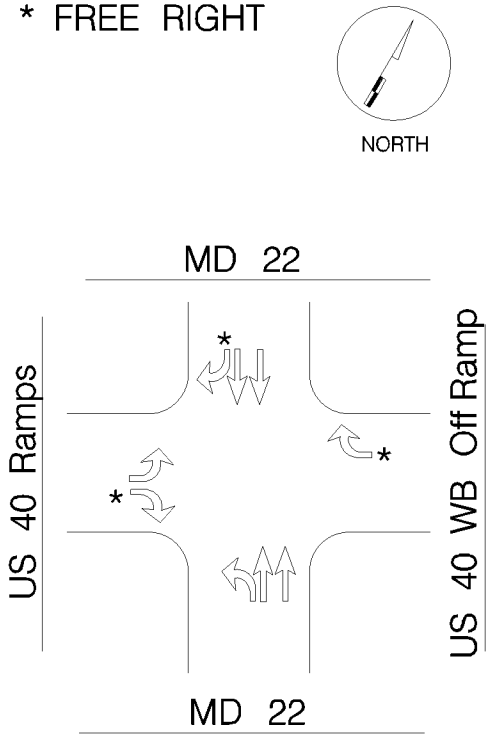
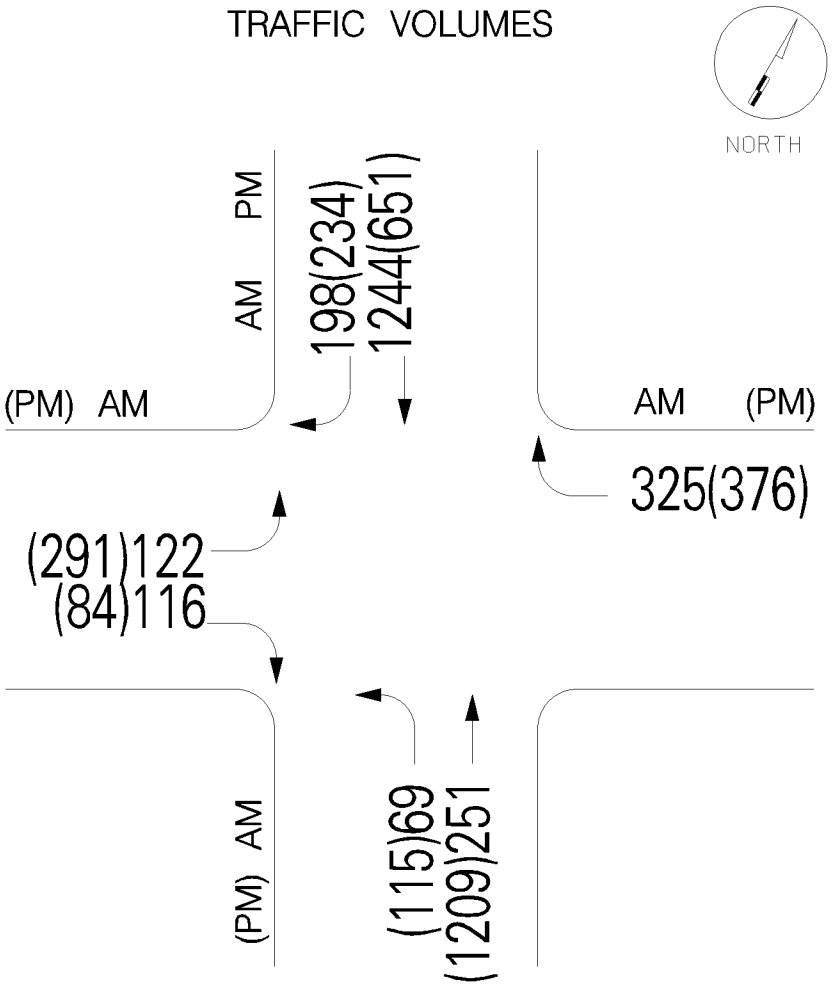


TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	251 * 0.55 =	138	
	SB	1244 * 0.55 + 69 * 1 =	753*	
	EB	122 * 1 =	122*	A
	WB			875
PM	NB	1209 * 0.55 =	665*	
	SB	651 * 0.55 + 115 * 1 =	473	
	EB	291 * 1 =	291*	A
				956

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

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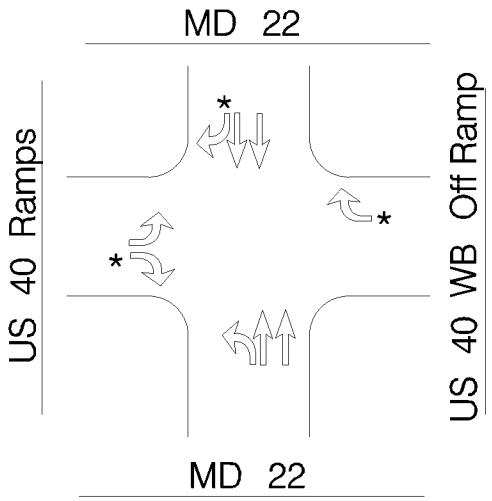
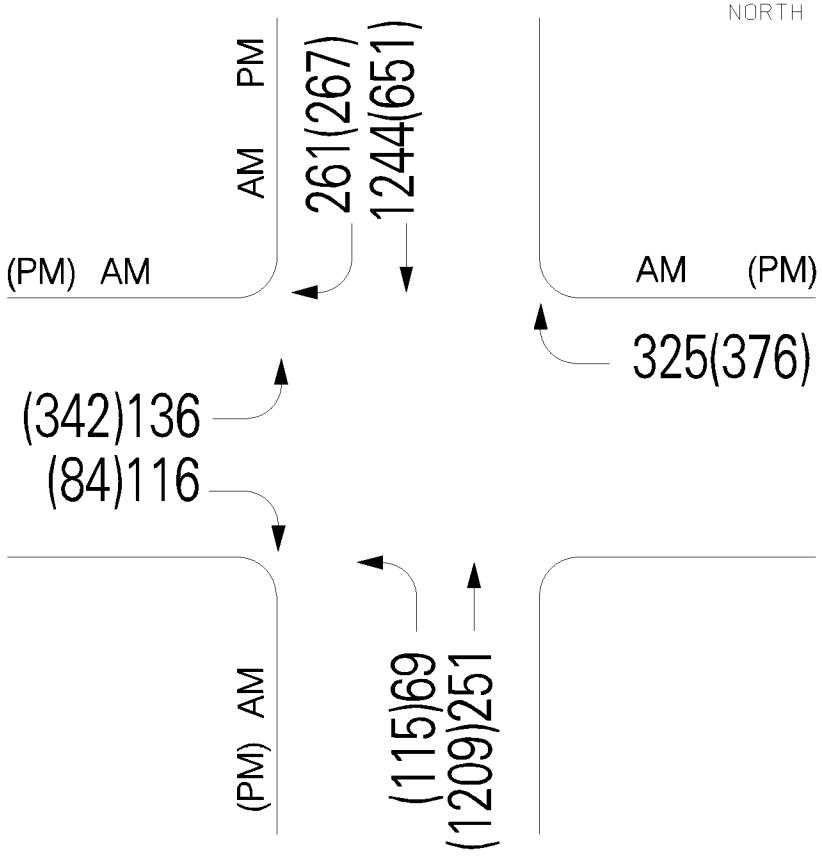


TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	251 * 0.55 =	138	
	SB	1244 * 0.55 + 69 * 1 =	753*	
	EB	136 * 1 =	136*	A
	WB			889
PM	NB	1209 * 0.55 =	665*	
	SB	651 * 0.55 + 115 * 1 =	473	
	EB	342 * 1 =	342*	B
				1007

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

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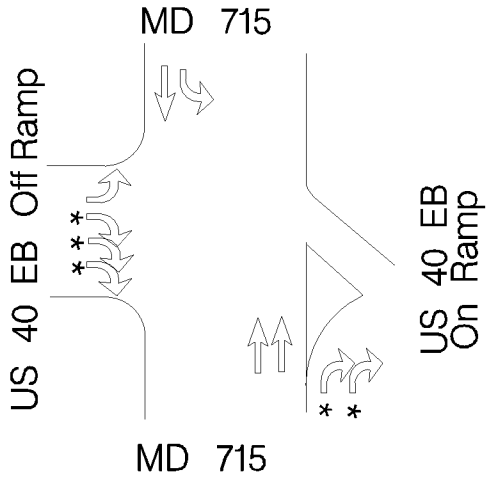
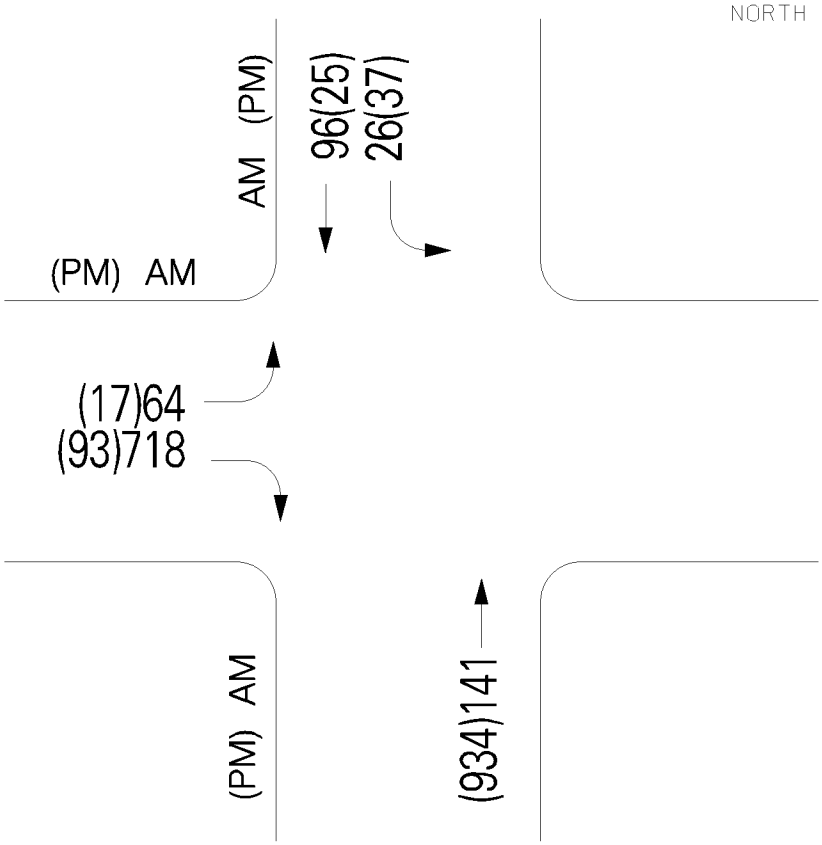


TRAFFIC VOLUMES





		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	141	*	0.55	+	26	*	1	=	104*	
	SB	91	*	1					=	96	
	EB	64	*	1					=	64*	A
	WB				—					—	168
PM	NB	934	*	0.55	+	37	*	1	=	551*	
	SB	25	*	1					=	25	
	EB	17	*	1					=	17*	A
	WB				—					—	568

CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

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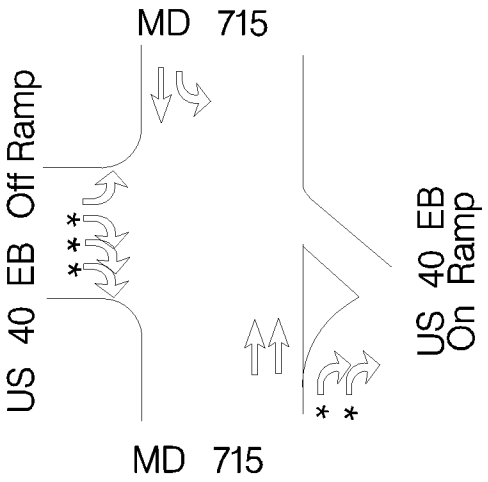
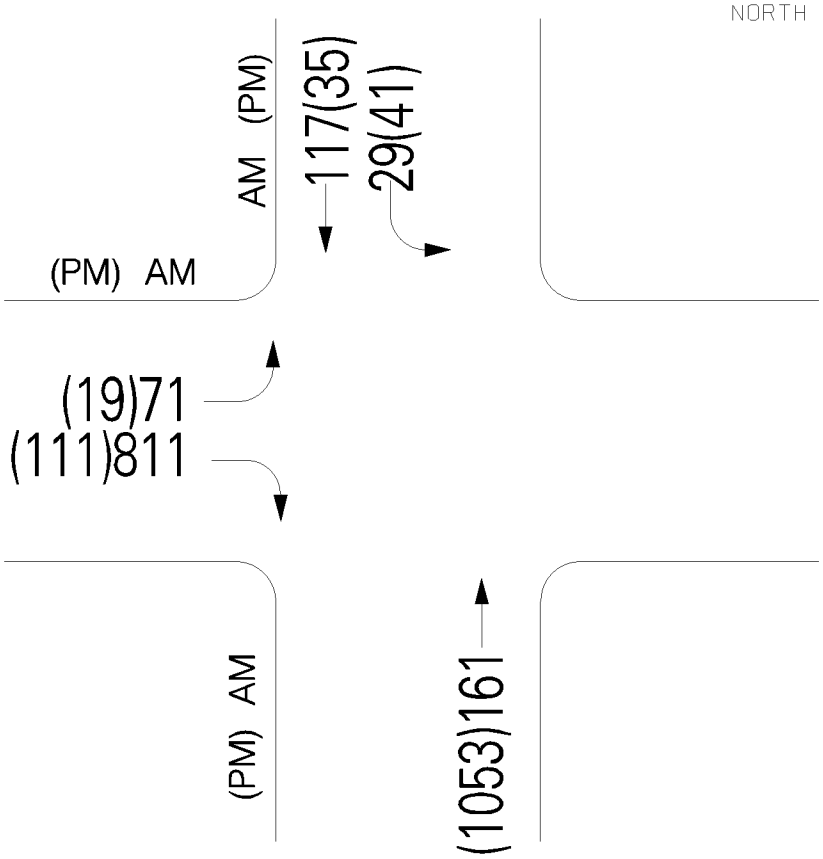


TRAFFIC VOLUMES





		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	161	*	0.55	+	29	*	1	=	118	
	SB	117	*	1					=	117*	
	EB	71	*	1					=	71*	A
	WB				—					—	188
PM	NB	1053	*	0.55	+	41	*	1	=	620*	
	SB	35	*	1					=	35	
	EB	19	*	1					=	19*	A
	WB				—					—	639

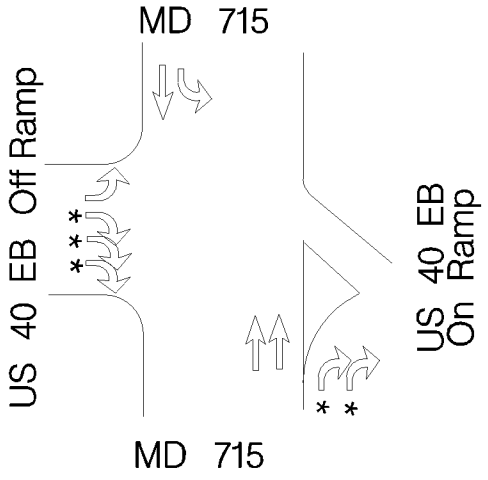
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

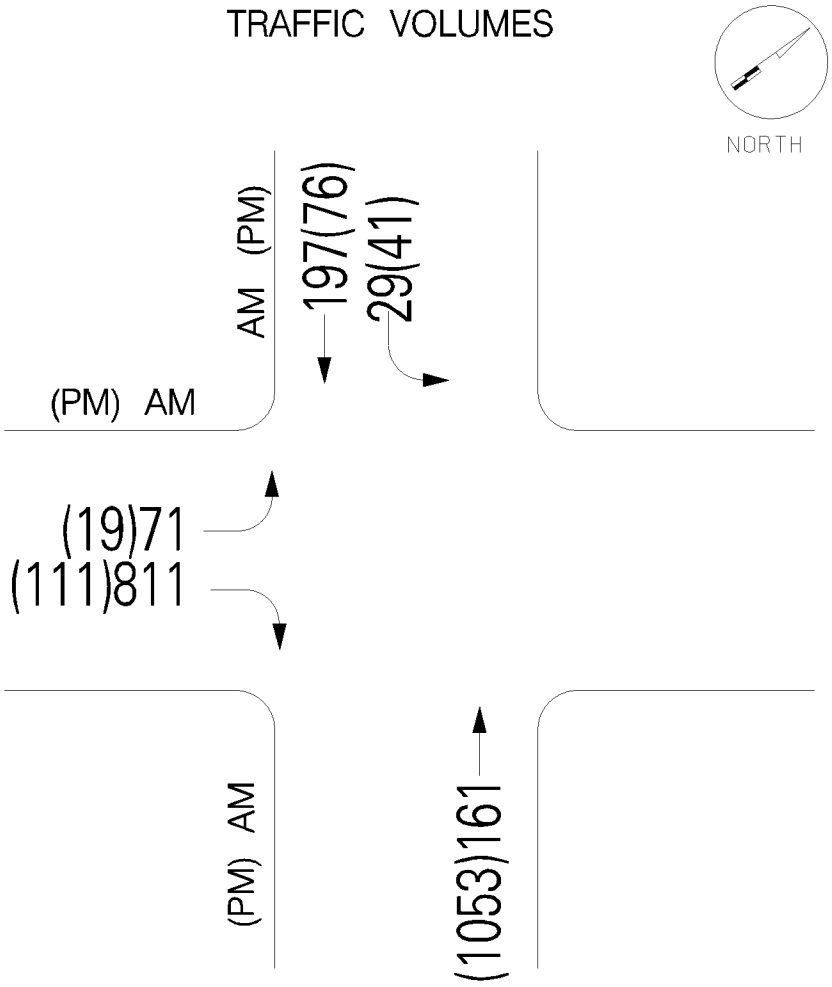
TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

* FREE RIGHT



TRAFFIC VOLUMES



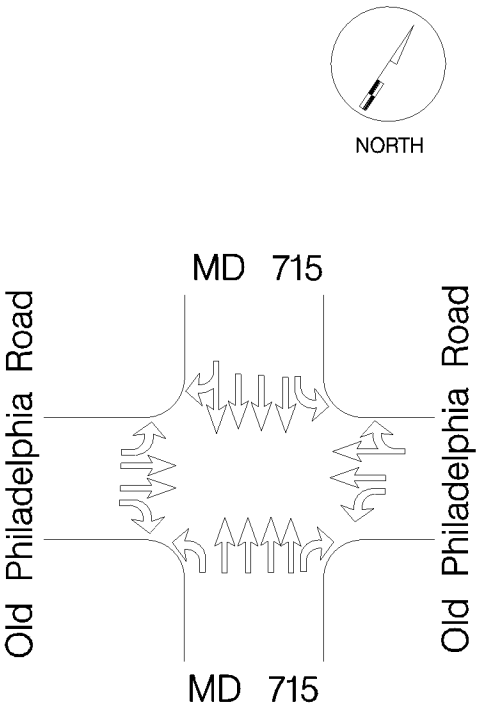
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	161	*	0.55	+	29	*	1	=	118	
	SB	197	*	1					=	197*	
	EB	71	*	1					=	71*	A
	WB				—					—	268
PM	NB	1053	*	0.55	+	41	*	1	=	620*	
	SB	76	*	1					=	76	
	EB	19	*	1					=	19*	A
	WB				—					—	639

CRITICAL LANE ANALYSIS

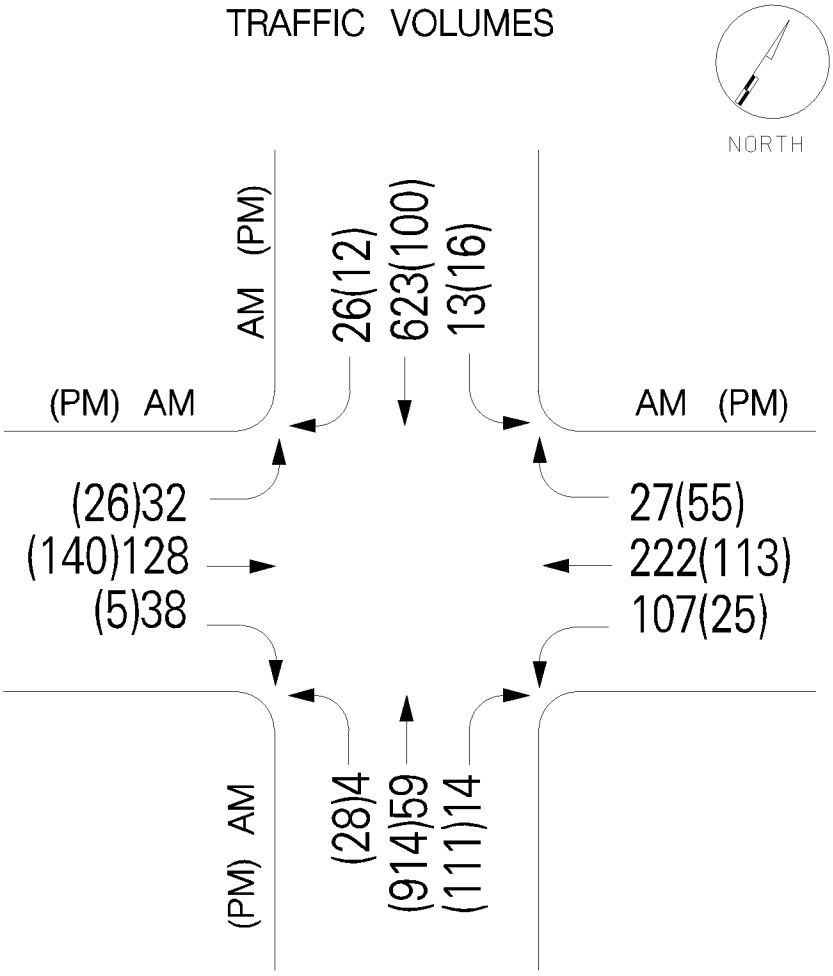
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



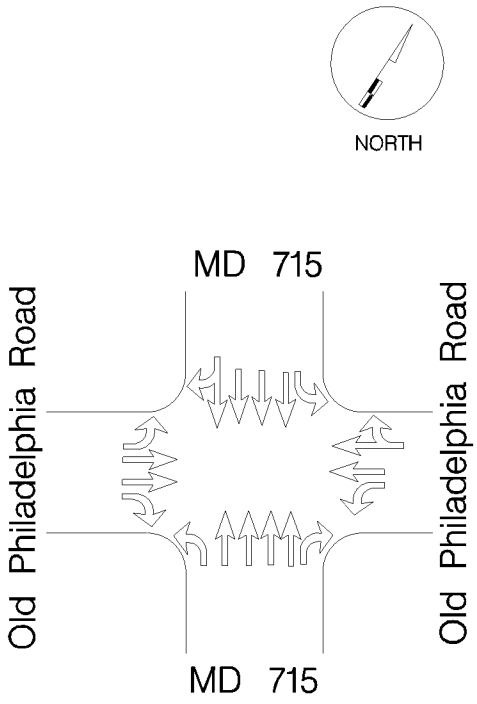
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	59	*	0.3	+	13	*	1	=	31	
	SB	(623+26)	*	0.3	+	4	*	1	=	199*	
	EB	128	*	0.55	+	107	*	1	=	177*	A
	WB	(222+27)	*	0.55	+	32	*	1	=	169	376
PM	NB	914	*	0.3	+	16	*	1	=	290*	
	SB	(100+12)	*	0.3	+	28	*	1	=	62	
	EB	140	*	0.55	+	25	*	1	=	102	A
	WB	(113+55)	*	0.55	+	26	*	1	=	118*	408

CRITICAL LANE ANALYSIS

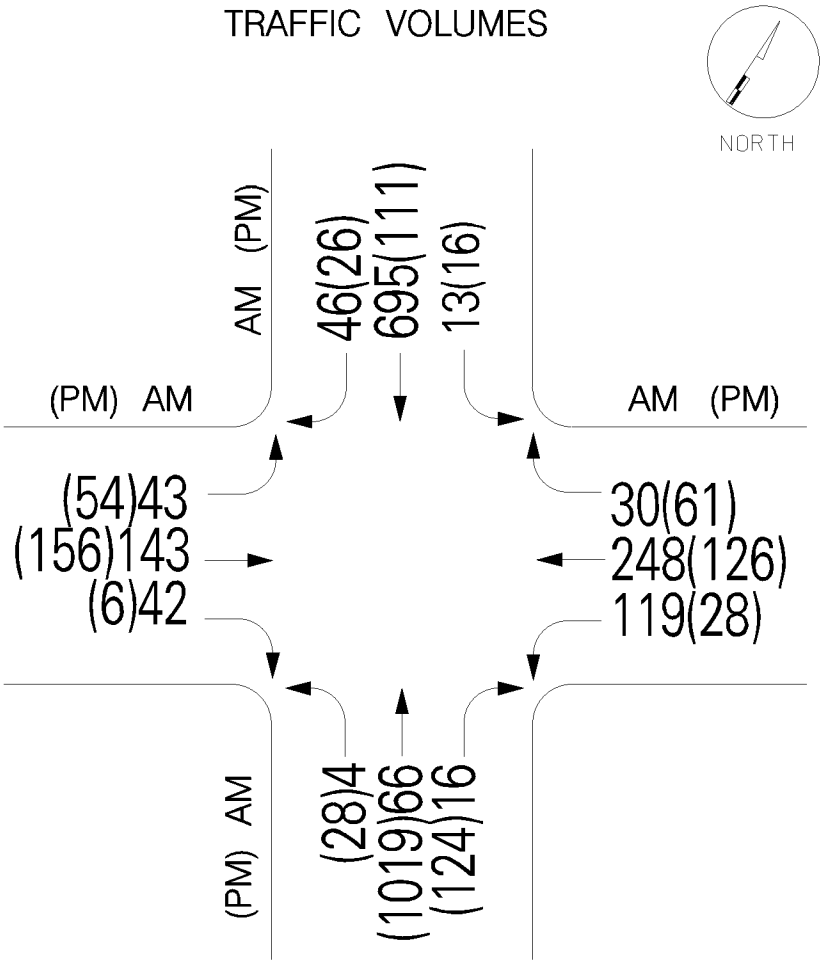
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



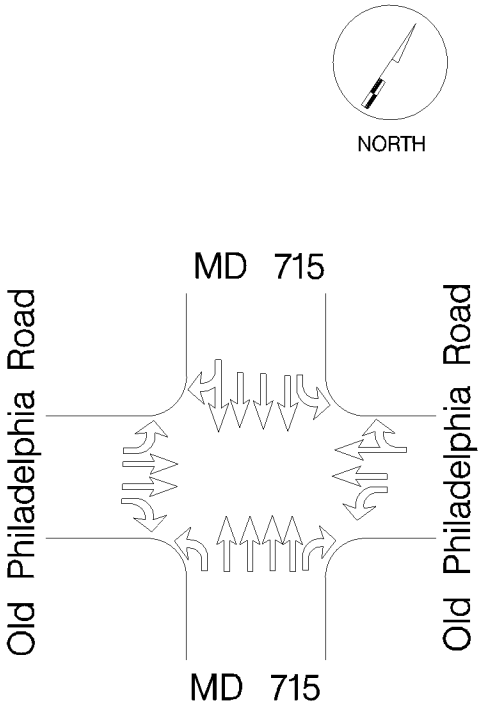
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	66	*	0.3	+	13	*	1	=	33	
	SB	(695 + 46)	*	0.3	+	4	*	1	=	226*	
	EB	143	*	0.55	+	119	*	1	=	198*	A
	WB	(248 + 30)	*	0.55	+	43	*	1	=	196	424
PM	NB	1019	*	0.3	+	16	*	1	=	322*	
	SB	(111 + 26)	*	0.3	+	28	*	1	=	69	
	EB	156	*	0.55	+	28	*	1	=	114	A
	WB	(126 + 61)	*	0.55	+	54	*	1	=	157*	479

CRITICAL LANE ANALYSIS

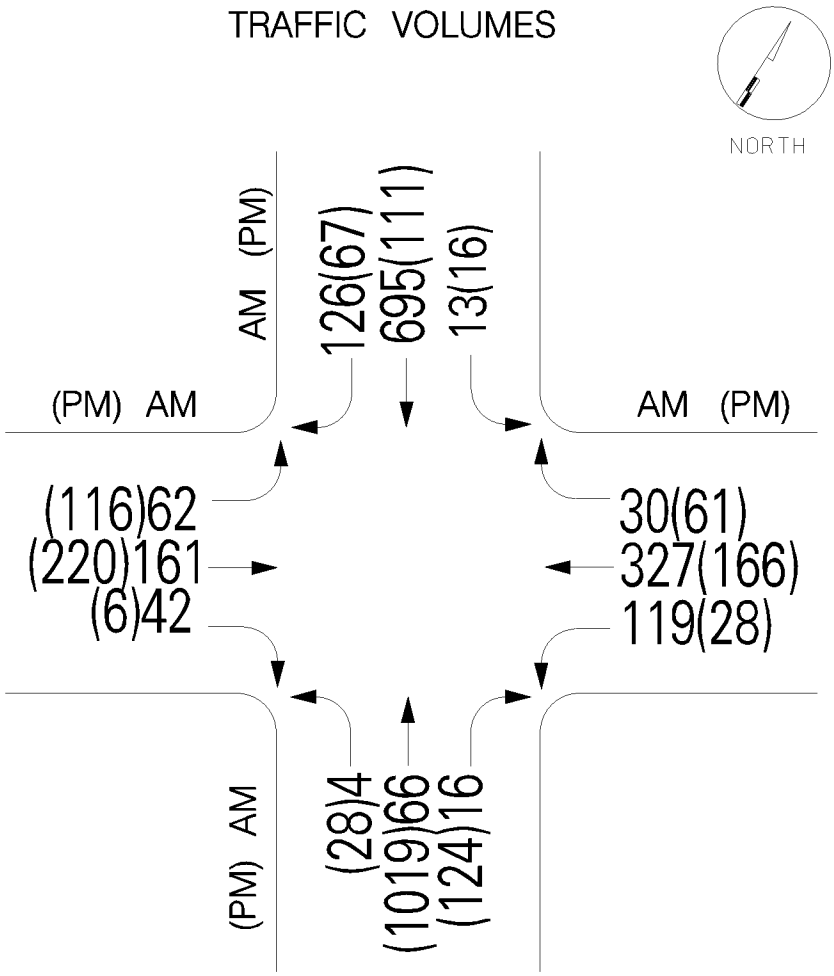
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



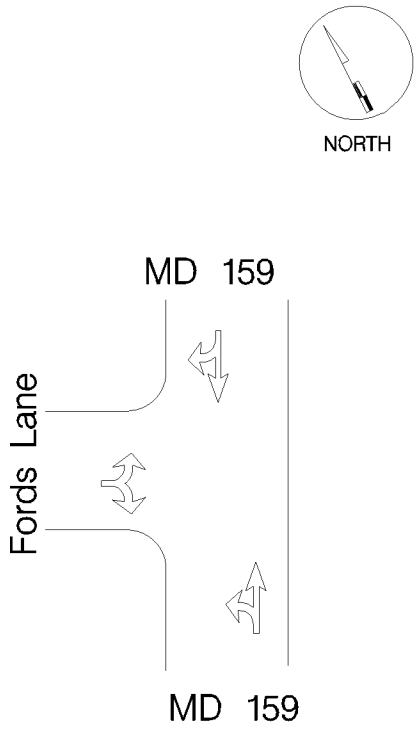
		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	66	*	0.3	+	13	*	1	=	33	
	SB	(695+126)	*	0.3	+	4	*	1	=	250*	
	EB	161	*	0.55	+	119	*	1	=	208	A
	WB	(327+30)	*	0.55	+	62	*	1	=	258*	508
PM	NB	1019	*	0.3	+	16	*	1	=	322*	
	SB	(111+67)	*	0.3	+	28	*	1	=	81	
	EB	220	*	0.55	+	28	*	1	=	149	A
	WB	(166+61)	*	0.55	+	116	*	1	=	241*	563

CRITICAL LANE ANALYSIS

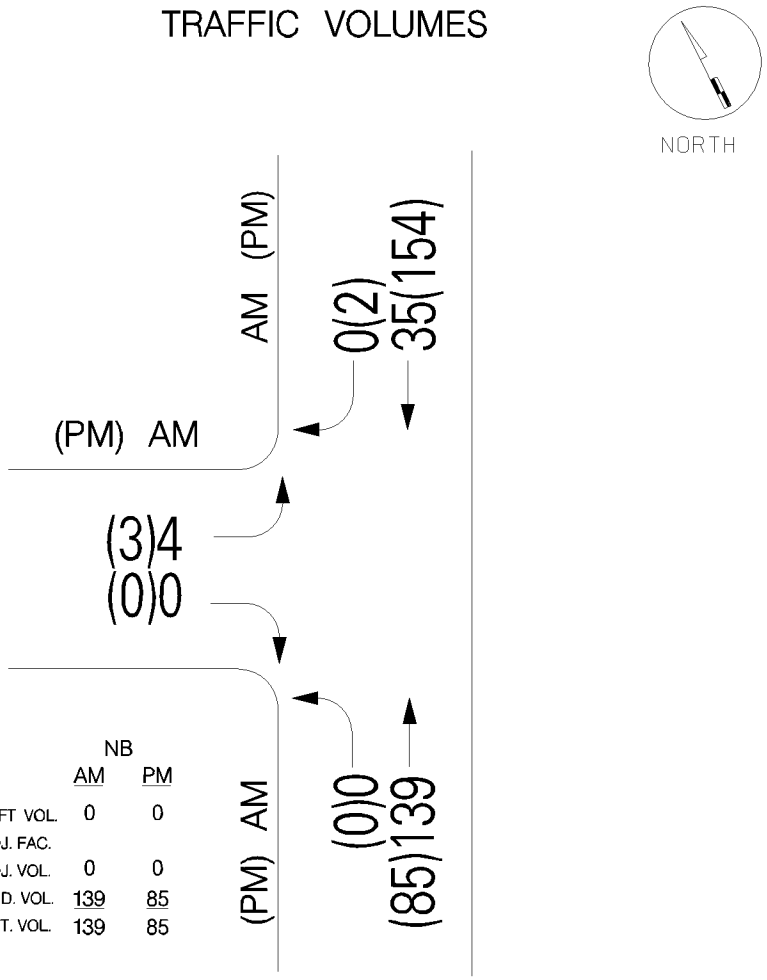
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



NB	AM	PM
LEFT VOL.	0	0
ADJ. FAC.		
ADJ. VOL.	0	0
SHD. VOL.	139	85
TOT. VOL.	139	85

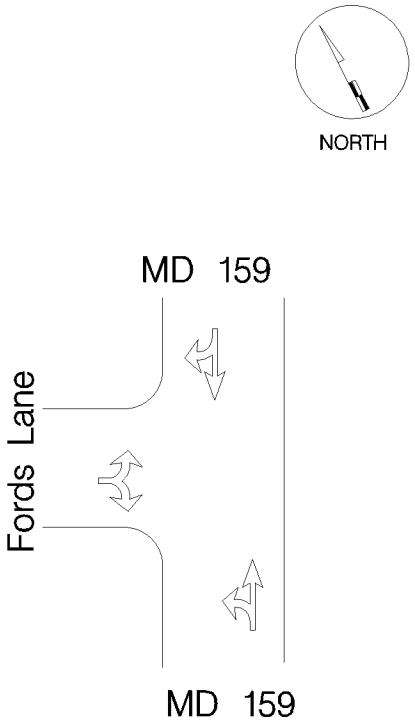
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	139	*	1					=	139*	
	SB	(35+0)	*	1	+	0	*	1	=	35	
	EB	(4+0)	*	1					=	4*	A
	WB				—					—	143
PM	NB	85	*	1					=	85	
	SB	(154+2)	*	1	+	0	*	1	=	156*	
	EB	(3+0)	*	1					=	3*	A
	WB				—					—	159

CRITICAL LANE ANALYSIS

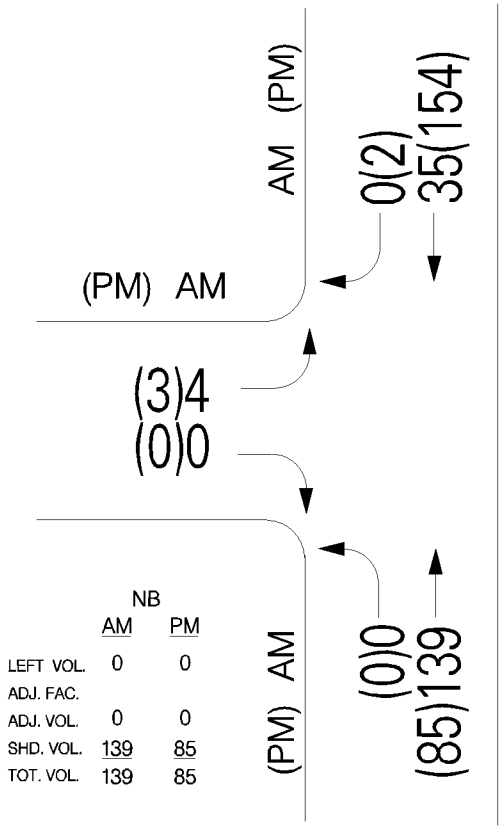
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



	NB AM	NB PM
LEFT VOL.	0	0
ADJ. FAC.		
ADJ. VOL.	0	0
SHD. VOL.	139	85
TOT. VOL.	139	85

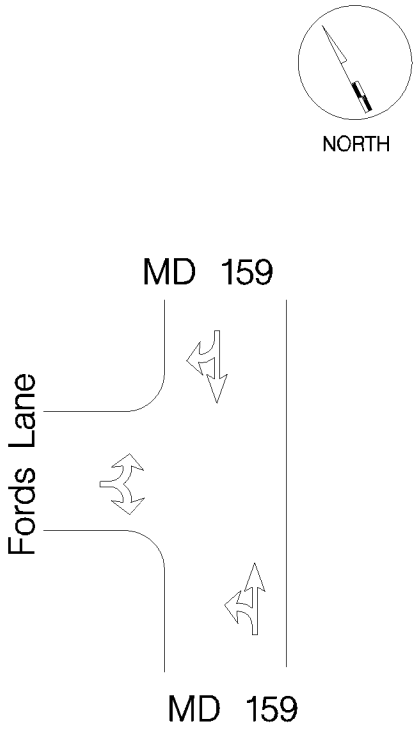
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	139	*	1					=	139*	
	SB	(35+0)	*	1	+	0	*	1	=	35	
	EB	(4+0)	*	1					=	4*	A
	WB				—					—	143
PM	NB	85	*	1					=	85	
	SB	(154+2)	*	1	+	0	*	1	=	156*	
	EB	(3+0)	*	1					=	3*	A
	WB				—					—	159

CRITICAL LANE ANALYSIS

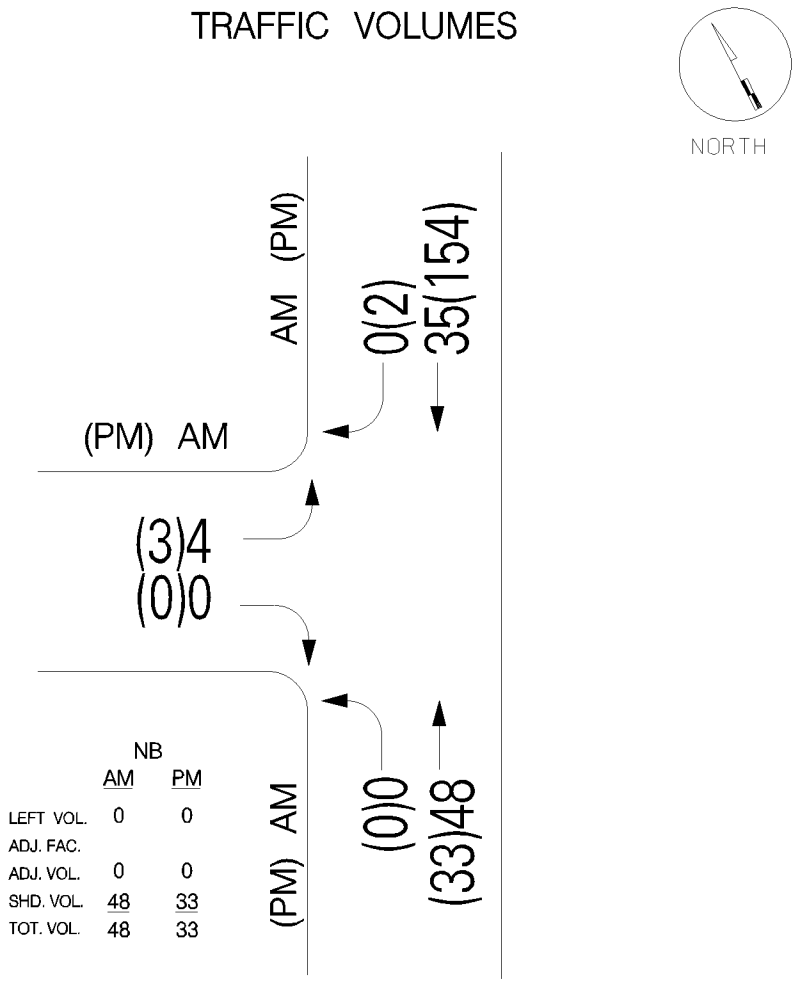
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



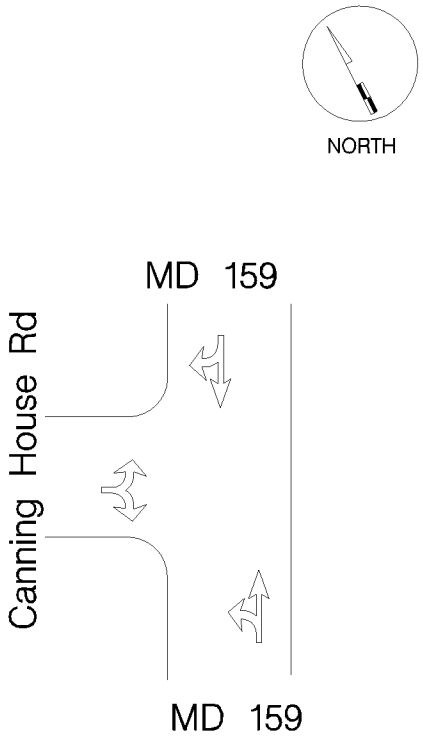
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	48	*	1					=	48*	
	SB	(35+0)	*	1	+	0	*	1	=	35	
	EB	(4+0)	*	1					=	4*	A
	WB				—					—	52
PM	NB	33	*	1					=	33	
	SB	(154+2)	*	1	+	0	*	1	=	156*	
	EB	(3+0)	*	1					=	3*	A
	WB				—					—	159

CRITICAL LANE ANALYSIS

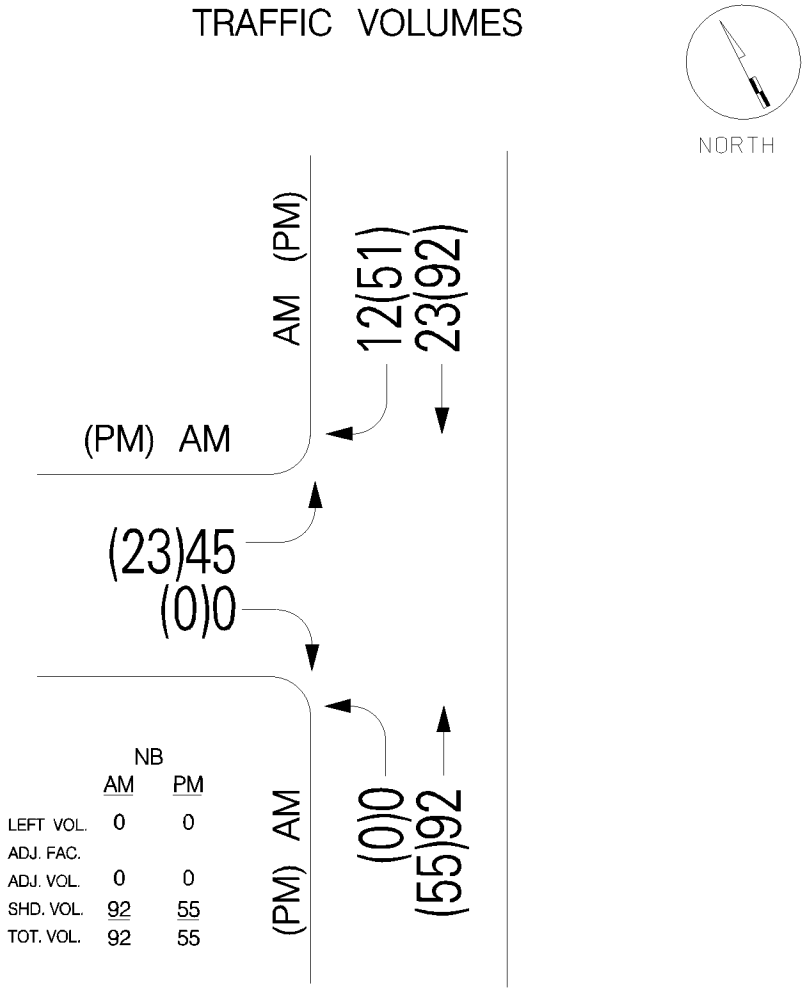
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	92	*	1					=	92*	
	SB	(23+12)	*	1	+	0	*	1	=	35	
	EB	(45+0)	*	1					=	45*	A
	WB				—					—	137
PM	NB	55	*	1					=	55	
	SB	(51+92)	*	1	+	0	*	1	=	143*	
	EB	(23+0)	*	1					=	23*	A
	WB				—					—	166

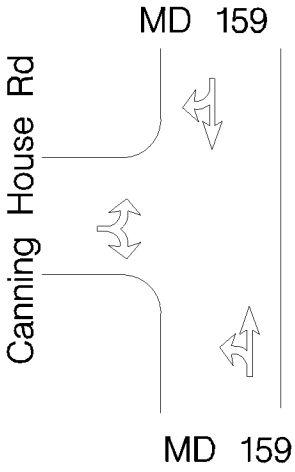
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

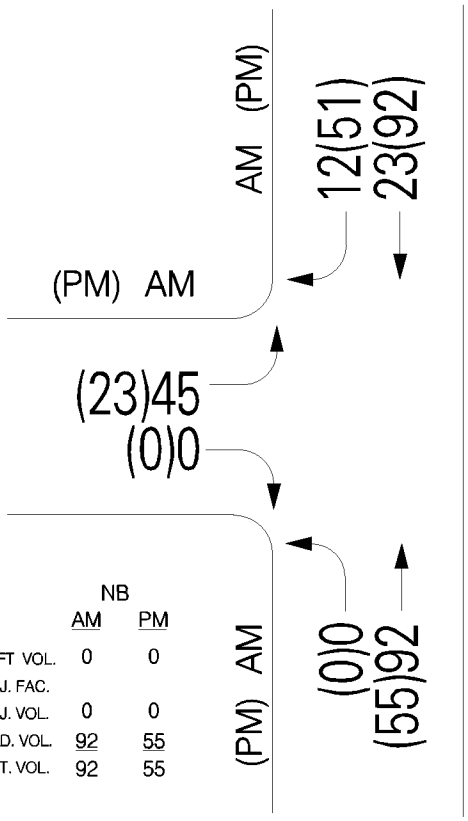
LANE CONFIGURATION





TRAFFIC VOLUMES





	NB AM	NB PM
LEFT VOL.	0	0
ADJ. FAC.		
ADJ. VOL.	0	0
SHD. VOL.	92	55
TOT. VOL.	92	55

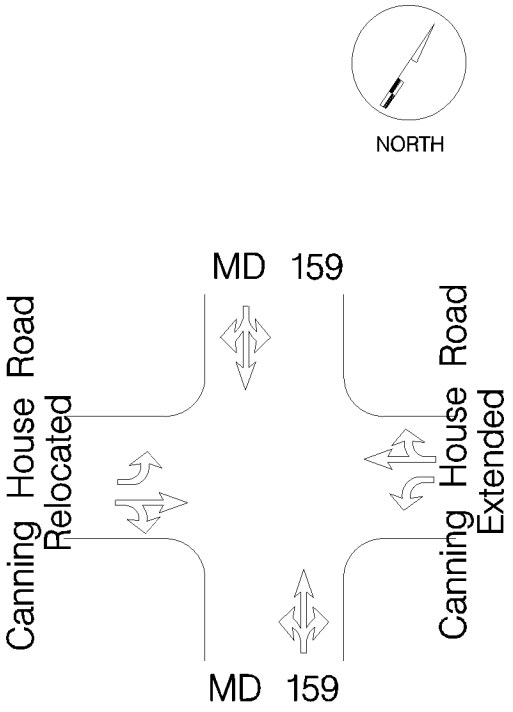
		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	92	*	1					=	92*	
	SB	(23+12)	*	1	+	0	*	1	=	35	
	EB	(45+0)	*	1					=	45*	A
	WB				—					—	137
PM	NB	55	*	1					=	55	
	SB	(51+92)	*	1	+	0	*	1	=	143*	
	EB	(23+0)	*	1					=	23*	A
	WB				—					—	166

CRITICAL LANE ANALYSIS

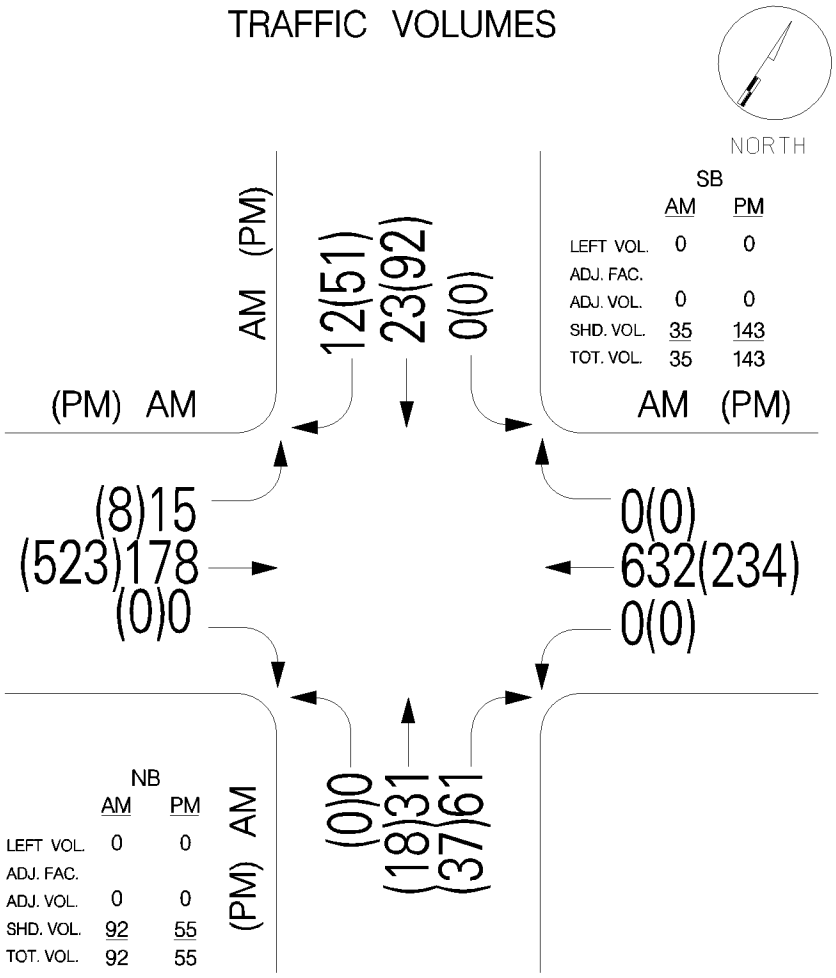
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	92	*	1	+	0	*	1	=	92*	
	SB	35	*	1	+	0	*	1	=	35	
	EB	(178 + 0)	*	1	+	0	*	1	=	178	A
	WB	(632 + 0)	*	1	+	15	*	1	=	647*	739
PM	NB	55	*	1	+	0	*	1	=	55	
	SB	143	*	1	+	0	*	1	=	143*	
	EB	(523 + 0)	*	1	+	0	*	1	=	523*	A
	WB	(234 + 0)	*	1	+	8	*	1	=	242	666

CRITICAL LANE ANALYSIS

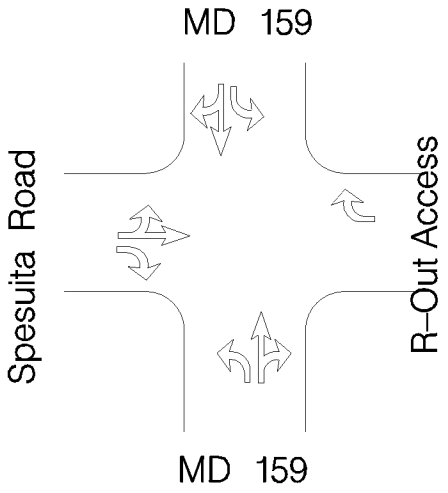
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

*illegal movement

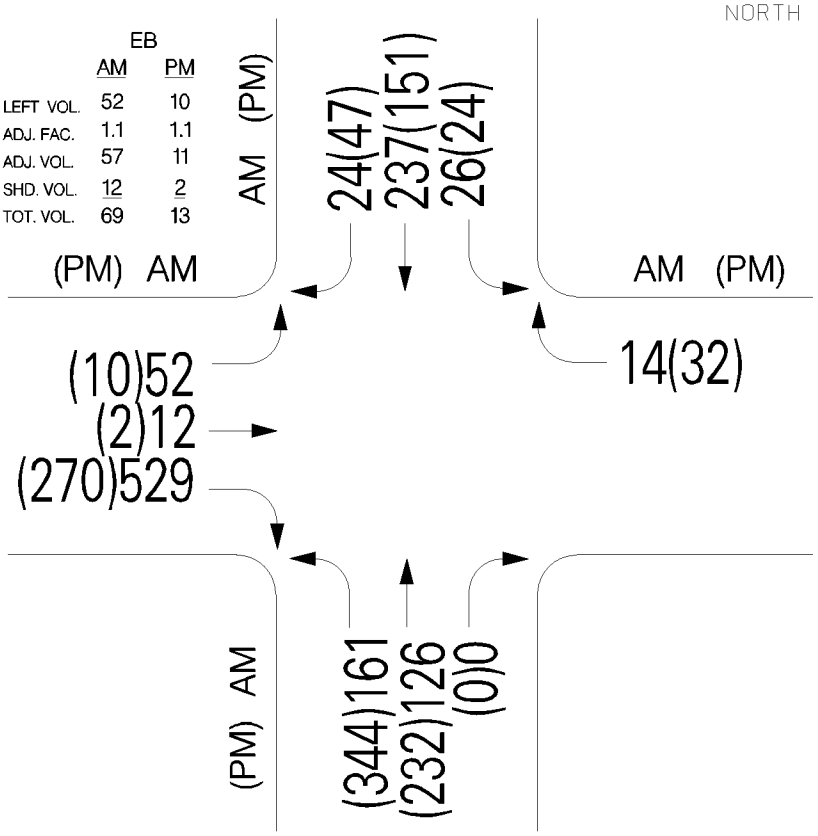




TRAFFIC VOLUMES



EB	AM	PM
LEFT VOL.	52	10
ADJ. FAC.	1.1	1.1
ADJ. VOL.	57	11
SHD. VOL.	12	2
TOT. VOL.	69	13



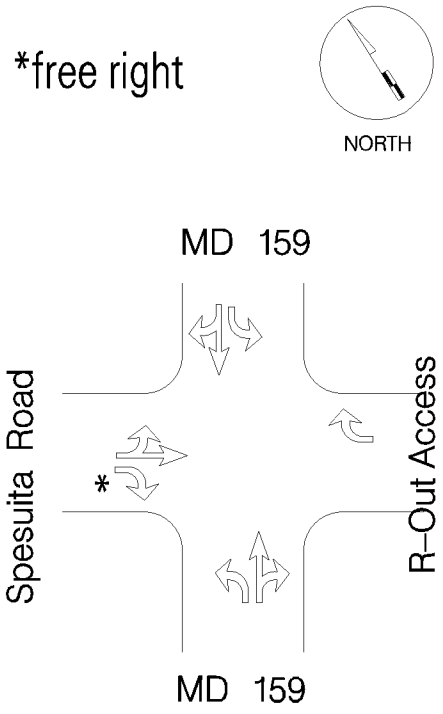
		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(126 + 0)	*	1	+	26	*	1	=	152	
	SB	(237 + 24)	*	1	+	161	*	1	=	422*	
	EB	(529–161)	*	1					=	368*	A
	WB	14	*	1	+	52	*	1	=	66	790
PM	NB	(232 + 0)	*	1	+	24	*	1	=	242	
	SB	(151 + 47)	*	1	+	344	*	1	=	542*	
	EB	13	*	1					=	13	A
	WB	32	*	1	+	10	*	1	=	42*	584

CRITICAL LANE ANALYSIS

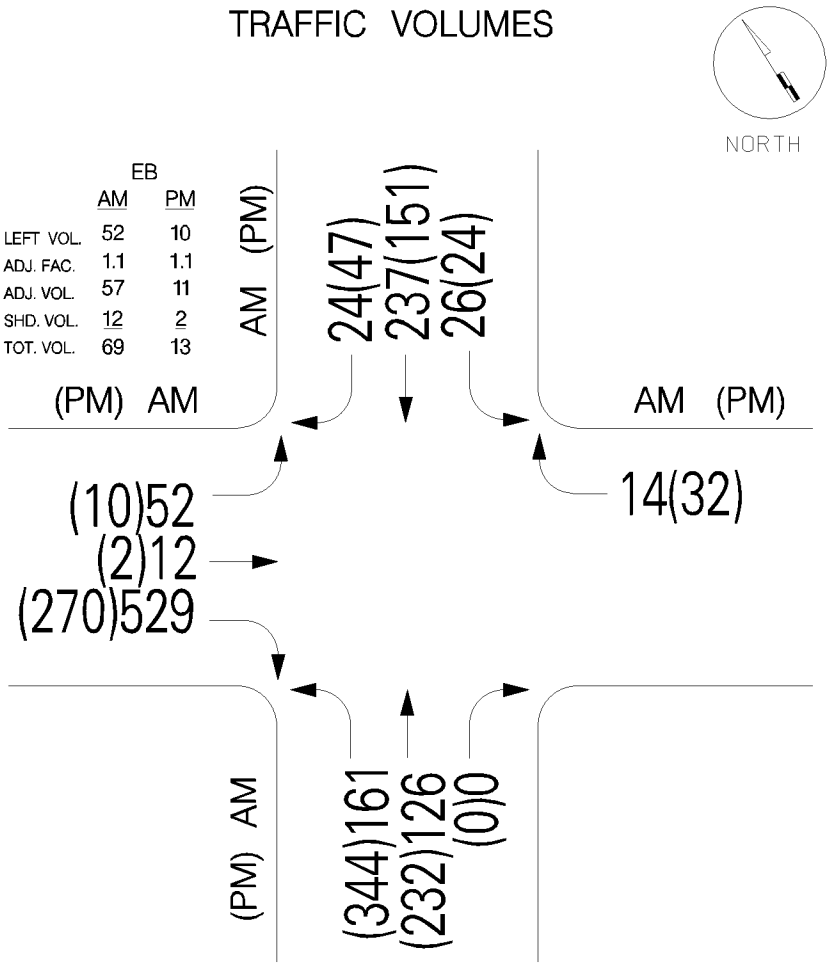
Prepared By: J. CAREY Condition: EXISTING – RECOUNT

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME	*	LUF	+	OPPOSING LEFTS	*	LUF	=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(126+0)	*	1	+	26	*	1	=	152	
	SB	(237+24)	*	1	+	161	*	1	=	422*	
	EB	69	*	1					=	69*	A
	WB	14	*	1	+	52	*	1	=	66	491
PM	NB	(232+0)	*	1	+	24	*	1	=	242	
	SB	(151+47)	*	1	+	344	*	1	=	542*	
	EB	13	*	1					=	13	A
	WB	32	*	1	+	10	*	1	=	42*	584

CRITICAL LANE ANALYSIS

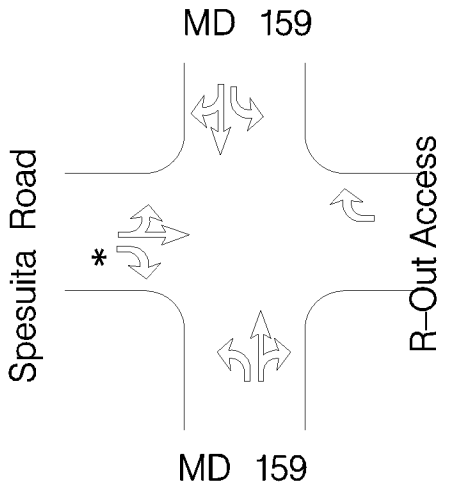
Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION

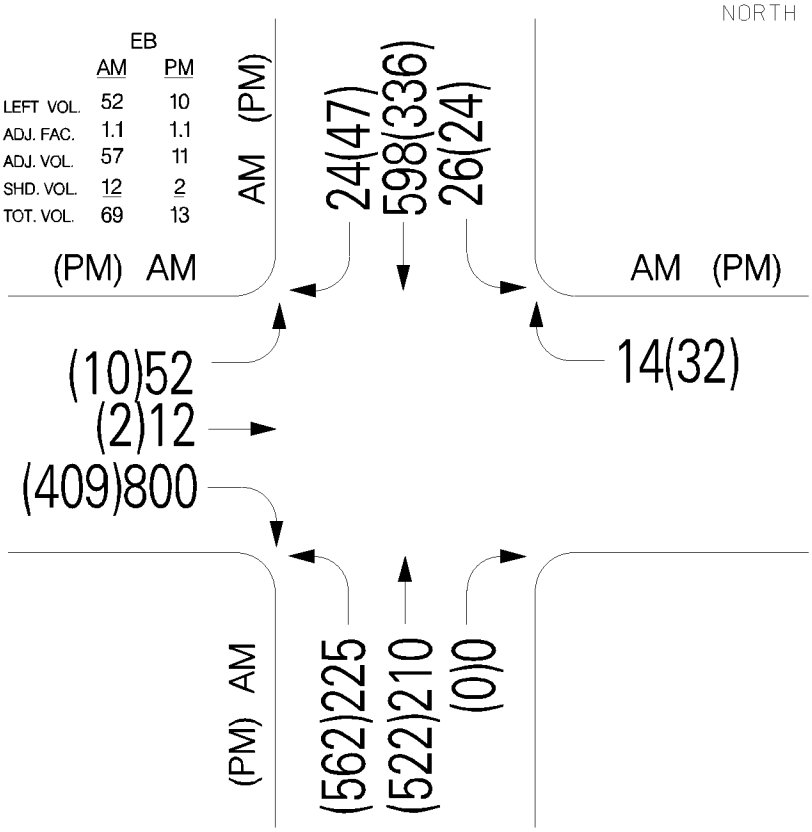
*free right





TRAFFIC VOLUMES





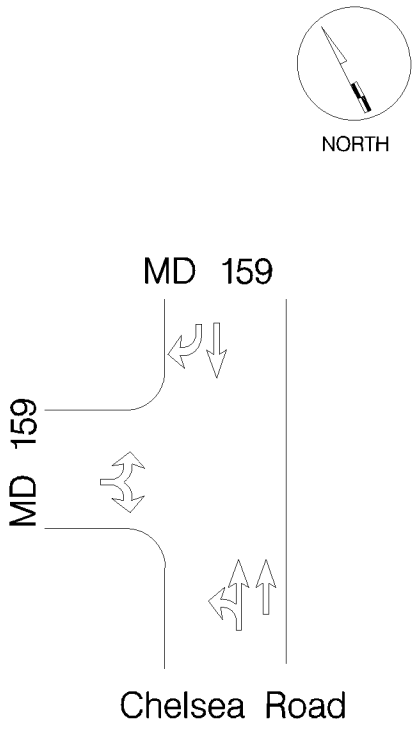
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(210 + 0)	*	1	+	26	*	1	=	236	
	SB	(598 + 24)	*	1	+	225	*	1	=	847*	
	EB	69	*	1					=	69*	A
	WB	14	*	1	+	52	*	1	=	66	916
PM	NB	(522 + 0)	*	1	+	24	*	1	=	546	
	SB	(336 + 47)	*	1	+	562	*	1	=	945*	
	EB	13	*	1					=	13	A
	WB	32	*	1	+	10	*	1	=	42*	987

CRITICAL LANE ANALYSIS

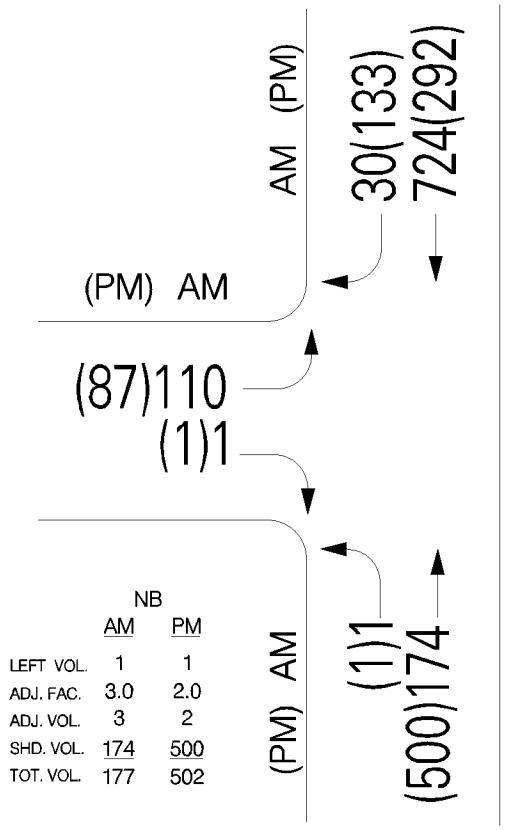
Prepared By: J. CAREY Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



	NB AM	NB PM
LEFT VOL.	1	1
ADJ. FAC.	3.0	2.0
ADJ. VOL.	3	2
SHD. VOL.	174	500
TOT. VOL.	177	502

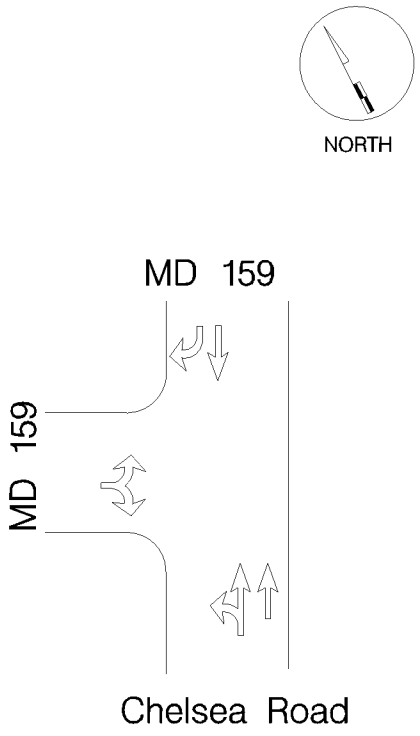
		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	177	*	0.55					=	97	
	SB	724	*	1	+	1	*	1	=	725*	
	EB	(110+1)	*	1					=	111*	A
	WB				—					—	836
PM	NB	502	*	0.55					=	276	
	SB	292	*	1	+	1	*	1	=	293*	
	EB	(87+1)	*	1					=	88*	A
	WB				—					—	381

CRITICAL LANE ANALYSIS

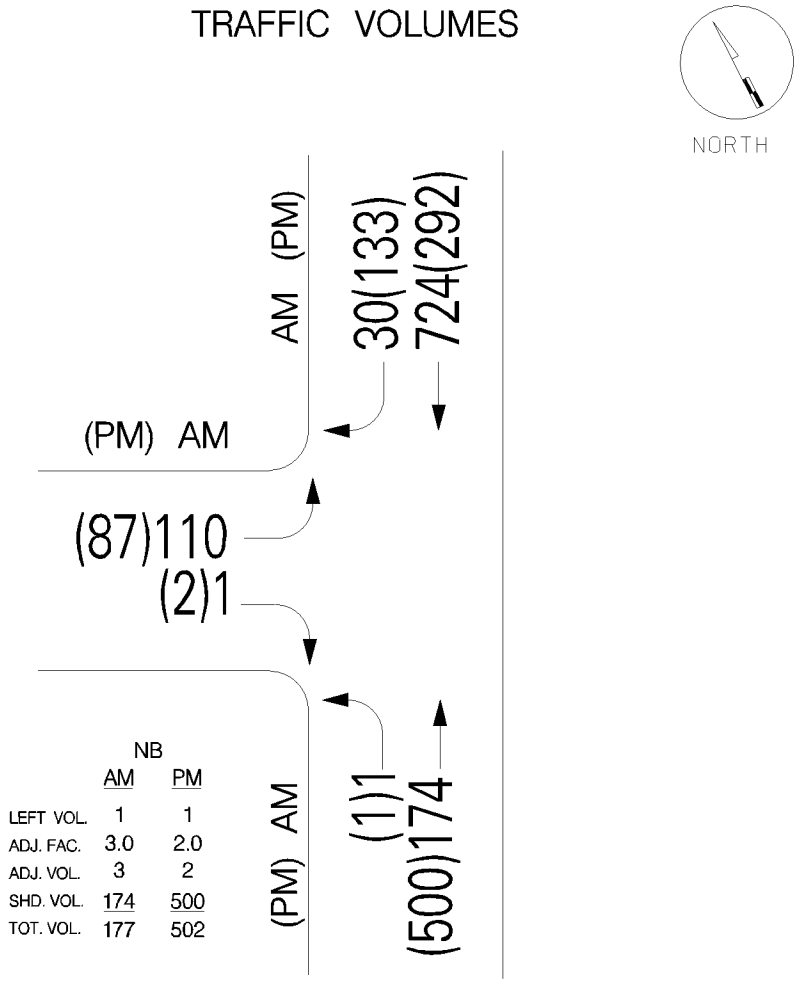
Prepared By: J. CAREY Condition: EXISTING – RECOUNT 2022

TRAFFIC CONCEPTS, Inc.

LANE CONFIGURATION



TRAFFIC VOLUMES



NB	AM	PM
LEFT VOL.	1	1
ADJ. FAC.	3.0	2.0
ADJ. VOL.	3	2
SHD. VOL.	174	500
TOT. VOL.	177	502

		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	177	*	0.55					=	97	
	SB	724	*	1	+	1	*	1	=	725*	
	EB	(110+1)	*	1					=	111*	A
	WB				—					—	836
PM	NB	502	*	0.55					=	276	
	SB	292	*	1	+	1	*	1	=	293*	
	EB	(87+2)	*	1					=	89*	A
	WB				—					—	382

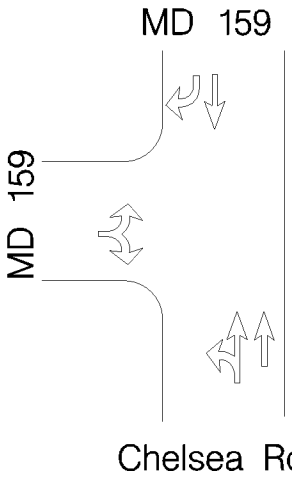
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

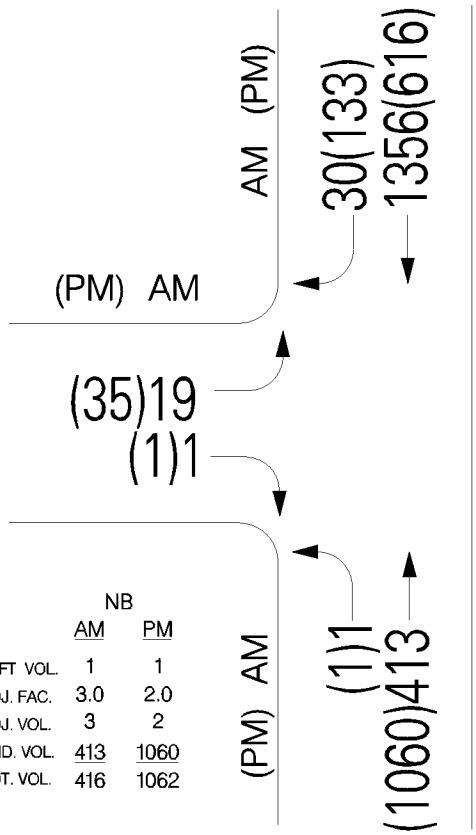
LANE CONFIGURATION





TRAFFIC VOLUMES





	NB AM	NB PM
LEFT VOL.	1	1
ADJ. FAC.	3.0	2.0
ADJ. VOL.	3	2
SHD. VOL.	413	1060
TOT. VOL.	416	1062

		TOTAL VOLUME * LUF			+	OPPOSING LEFTS * LUF			=	CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	416	*	0.55					=	229	
	SB	1356	*	1	+	1	*	1	=	1356*	
	EB	(19+1)	*	1					=	20*	D
	WB				—					—	1376
PM	NB	1062	*	0.55					=	584	
	SB	616	*	1	+	1	*	1	=	617*	
	EB	(35+1)	*	1					=	36*	A
	WB				—					—	653

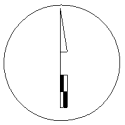
CRITICAL LANE ANALYSIS

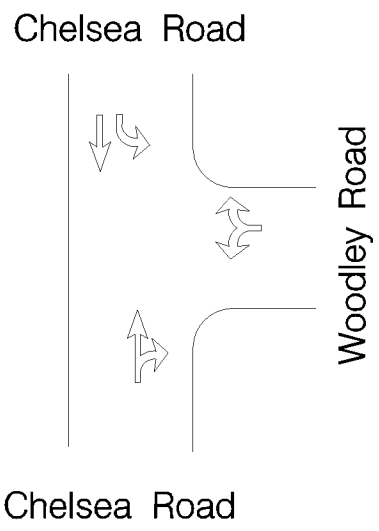
Prepared By: J. CAREY

Condition: FUTURE

TRAFFIC CONCEPTS, Inc.

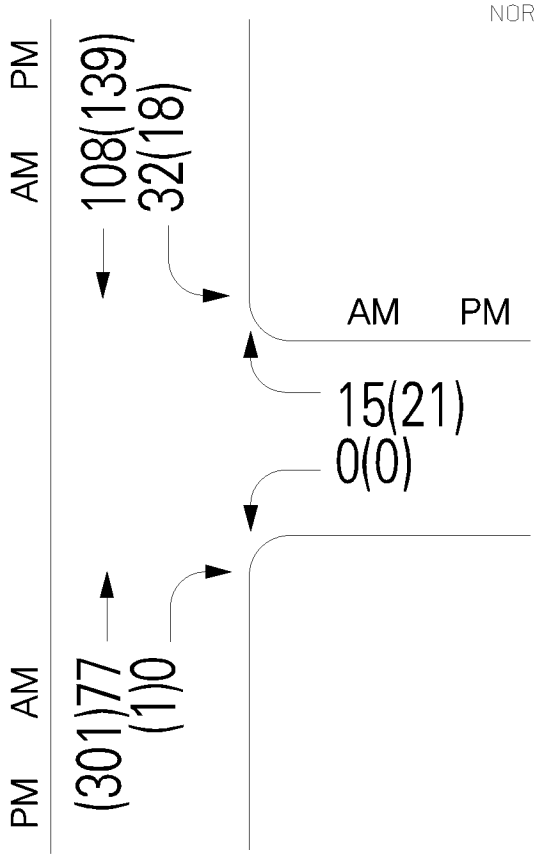
LANE CONFIGURATION





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(77+0)	*	1	+	32	*	1	=	109*	
	SB	108	*	1					=	108	
	EB				—				=	—	A
	WB	(0+15)	*	1						15*	124
PM	NB	(301+1)	*	1	+	18	*	1	=	320*	
	SB	139	*	1					=	139	
	EB				—				=	—	A
	WB	(0+21)	*	1						21*	341

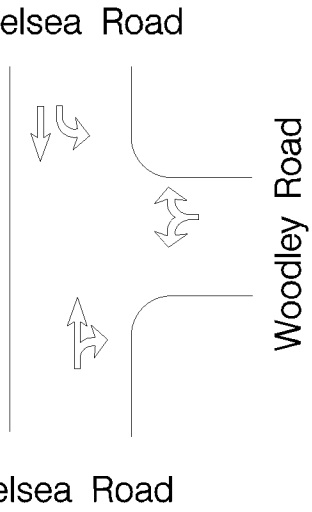
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: EXISTING

TRAFFIC CONCEPTS, Inc.

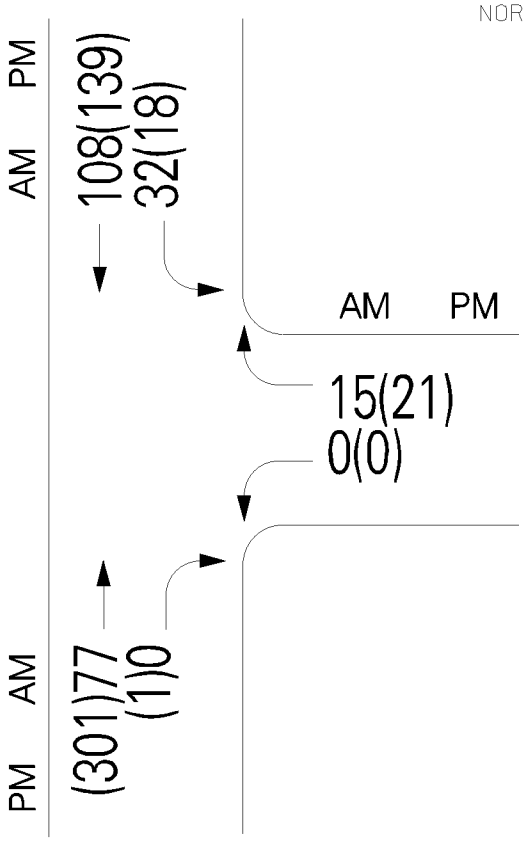
LANE CONFIGURATION





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(77+0)	*	1	+	32	*	1	=	109*	
	SB	108	*	1					=	108	
	EB				—				=	—	A
	WB	(0+15)	*	1						15*	124
PM	NB	(301+1)	*	1	+	18	*	1	=	320*	
	SB	139	*	1					=	139	
	EB				—				=	—	A
	WB	(0+21)	*	1						21*	341

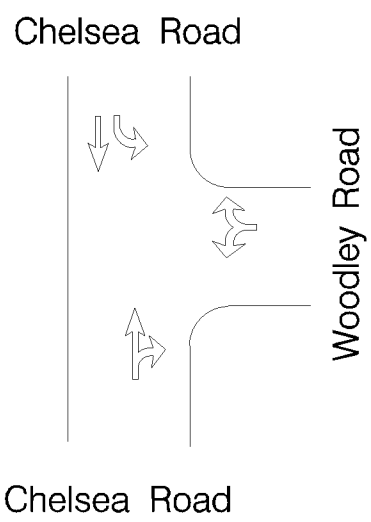
CRITICAL LANE ANALYSIS

Prepared By: J. CAREY Condition: BACKGROUND

TRAFFIC CONCEPTS, Inc.

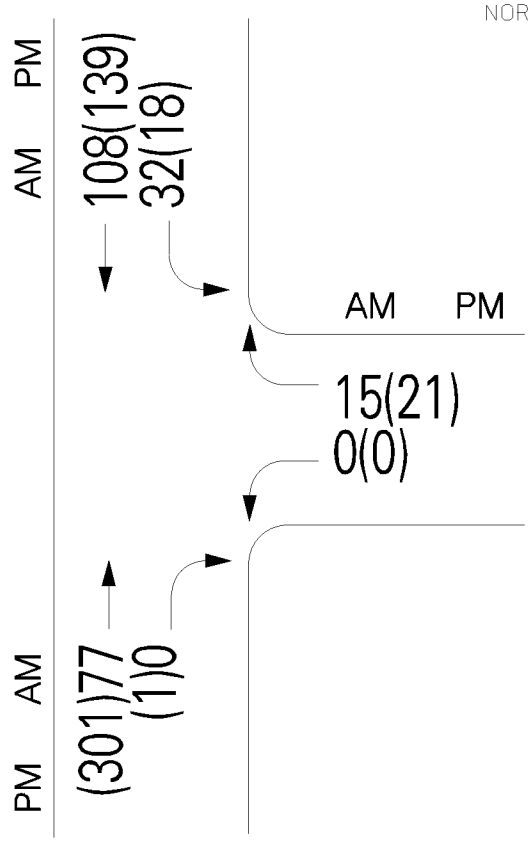
LANE CONFIGURATION





TRAFFIC VOLUMES





		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =								CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(77+0)	*	1	+	32	*	1	=	109*	
	SB	108	*	1					=	108	
	EB				—				=	—	A
	WB	(0+15)	*	1						15*	124
PM	NB	(301+1)	*	1	+	18	*	1	=	320*	
	SB	139	*	1					=	139	
	EB				—				=	—	A
	WB	(0+21)	*	1						21*	341

CRITICAL LANE ANALYSIS

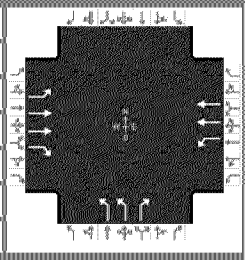
Prepared By: J. CAREY Condition: FUTURE

APPENDIX I-B

HCS REPORTS

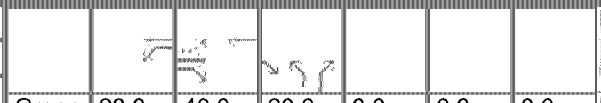
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Ex AM.xus		
Project Description	3762				

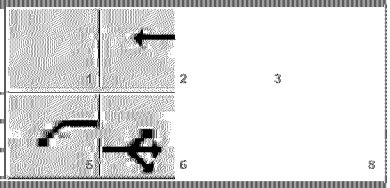


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	682	122	169	438		100		652			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	28.0	40.0	20.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	682	122	169	438		100		652			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	5	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		40.0	28.0	68.0	20.0	20.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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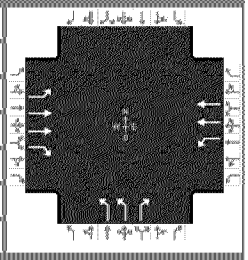
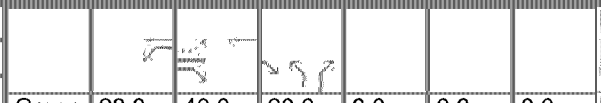
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Ex AM.xus		
Project Description	3762				

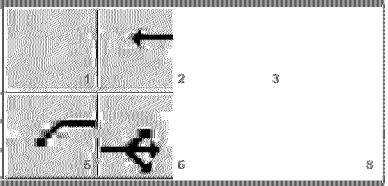


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	682	122	169	438		100		652			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	28.0	40.0	20.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		47.0	28.0	75.0		25.0		
Change Period, ($Y+R_c$), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (g_s), s		17.9	10.0	6.8		24.0		
Green Extension Time (g_e), s		3.1	0.3	3.2		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.00	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	749	134	186	481		110		716			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	928	1738	1609	1809	1738		1689					
Queue Service Time (g_s), s	0.0	15.9	3.3	8.0	4.8		2.6					
Cycle Queue Clearance Time (g_c), s	0.0	15.9	3.3	8.0	4.8		2.6					
Green Ratio (*g/C*)	0.42	0.42	0.64	0.30	0.70		0.22					
Capacity (*c*), veh/h	72	1460	1030	543	2434		743					
Volume-to-Capacity Ratio (*X*)	0.000	0.513	0.130	0.342	0.198		0.148					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	261.3	44.4	154.8	62.5		48.2					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	10.0	1.7	6.0	2.4		1.9					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.04	0.34	0.00		0.00					
Uniform Delay (d_1), s/veh	0.0	21.4	7.1	27.3	5.5		31.4					
Incremental Delay (d_2), s/veh	0.0	0.1	0.0	0.1	0.0		0.0					
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	21.6	7.1	27.4	5.5		31.5		0.0			
Level of Service (LOS)		C	A	C	A		C		A			
Approach Delay, s/veh / LOS	19.4	B		11.6	B		4.2	A		0.0		
Intersection Delay, s/veh / LOS	11.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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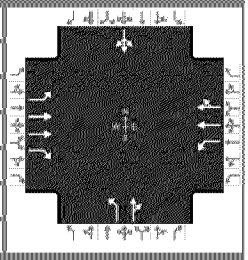
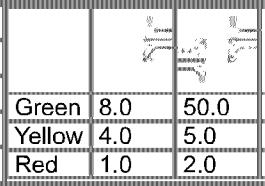
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Ex AM.xus		
Project Description	3762				

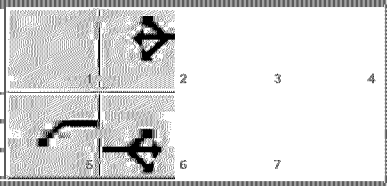


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	792	510	34	357	3	210	0	19	0	0	8

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	50.0	24.0	0.0	0.0	0.0
Yellow	4.0	5.0	4.0	0.0	0.0	0.0
Red	1.0	2.0	2.0	0.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	792	510	34	357	3	210	0	19	0	0	8
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	0	0	5		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	300	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		50.0	8.0	58.0		24.0		24.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0		4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0		2.0		2.0
Minimum Green (G_{min}), s		25	5	25		5		5
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0		2.0		2.0
Recall Mode		Min	Off	Min		Off		Off
Dual Entry		Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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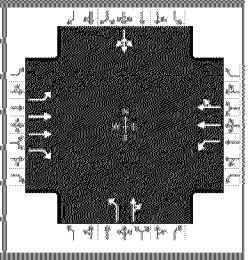
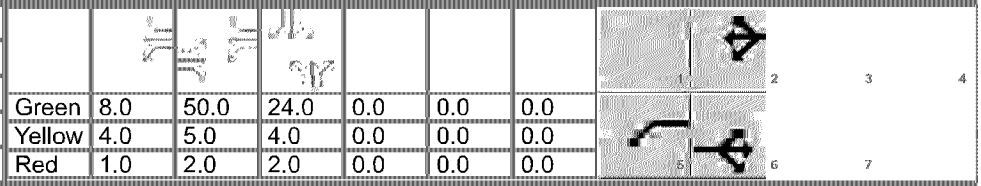
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	792	510	34	357	3	210	0	19	0	0	8

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	50.0	24.0	0.0	0.0	0.0
Yellow	4.0	5.0	4.0	0.0	0.0	0.0
Red	1.0	2.0	2.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		6.0		8.0
Phase Duration, s		57.0	13.0	70.0		30.0		30.0
Change Period, (*Y+R c*), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		3.0	2.9	3.0		3.1		3.1
Queue Clearance Time (*g s*), s		26.6	2.8	6.3		16.9		2.4
Green Extension Time (*g e*), s		4.2	0.0	4.3		0.3		0.5
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.02	0.01	0.00		0.03		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	3	880	567	38	200	200	233	21			0	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	985	1738	1675	1810	1826	1820	1428	1610			0	
Queue Service Time (*g s*), s	0.2	16.3	24.6	0.8	4.3	4.3	14.5	1.0			0.0	
Cycle Queue Clearance Time (*g c*), s	0.2	16.3	24.6	0.8	4.3	4.3	14.9	1.0			0.0	
Green Ratio (*g/C*)	0.52	0.52	0.52	0.64	0.65	0.65	0.26	0.26				
Capacity (*c*), veh/h	584	1808	871	482	1187	1183	438	419				
Volume-to-Capacity Ratio (*X*)	0.006	0.487	0.651	0.078	0.169	0.169	0.533	0.050			0.000	
Back of Queue (*Q*), ft/ln (95 th percentile)	1.4	243.2	326	10.5	60.5	59.2	218.2	17.1			0	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.1	9.4	13.0	0.4	2.3	2.3	8.7	0.7			0.0	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	1.09	0.03	0.00	0.00	0.73	0.00			0.00	
Uniform Delay (*d 1*), s/veh	11.6	15.4	17.4	8.4	7.2	6.9	33.1	27.7				
Incremental Delay (*d 2*), s/veh	0.0	0.1	1.4	0.0	0.0	0.0	0.7	0.0			0.0	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	11.6	15.5	18.8	8.4	7.3	6.9	33.8	27.8				
Level of Service (LOS)	B	B	B	A	A	A	C	C				
Approach Delay, s/veh / LOS	16.8	B		7.2	A		33.3	C		27.5	C	
Intersection Delay, s/veh / LOS	16.8						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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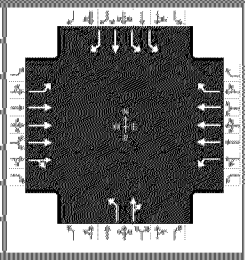
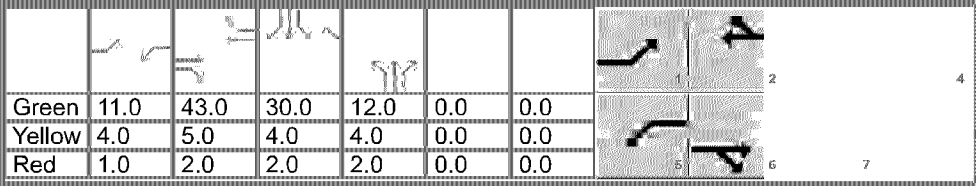
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	13	1007	71	29	568	301	29	39	12	553	37	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	11.0	43.0	30.0	12.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	13	1007	71	29	568	301	29	39	12	553	37	26
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	11.0	43.0	11.0	43.0	12.0	12.0	30.0	30.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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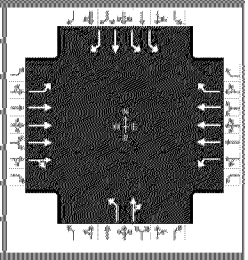
HCS7 Signalized Intersection Results Summary

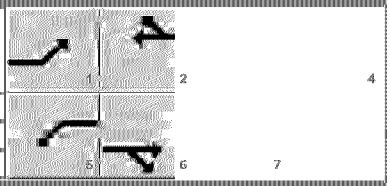
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	13	1007	71	29	568	301	29	39	12	553	37	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.0	43.0	30.0	12.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	16.0	50.0	16.0	50.0		18.0		36.0
Change Period, ($Y+R_c$), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.1
Queue Clearance Time (g_s), s	2.8	15.9	3.8	12.6		5.3		19.6
Green Extension Time (g_e), s	0.0	5.0	0.0	5.0		0.1		1.2
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.00	0.01	0.00	0.01		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	14	850	273	30	592	314	30	53		576	39	27
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1741	1781	1658		1781	1752		1730	1826	1585
Queue Service Time (g_s), s	0.8	13.8	13.9	1.8	10.1		1.8	3.3		17.6	1.9	1.5
Cycle Queue Clearance Time (g_c), s	0.8	13.8	13.9	1.8	10.1		1.8	3.3		17.6	1.9	1.5
Green Ratio (*g/C*)	0.11	0.38	0.38	0.11	0.38		0.12	0.12		0.27	0.27	0.27
Capacity (*c*), veh/h	193	2054	653	193	1865		208	204		922	487	423
Volume-to-Capacity Ratio (*X*)	0.070	0.414	0.417	0.157	0.317		0.145	0.260		0.624	0.079	0.064
Back of Queue (*Q*), ft/ln (95 th percentile)	16.2	248.2	236.2	36.4	176.2		37	67.6		301.8	39	26.7
Back of Queue (*Q*), veh/ln (95 th percentile)	0.6	9.5	9.3	1.4	6.8		1.5	2.6		11.9	1.5	1.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.05	0.00	0.00	0.12	0.00		0.09	0.00		0.39	0.00	0.04
Uniform Delay (d_1), s/veh	48.1	28.4	27.8	48.5	27.2		47.6	48.3		38.7	33.0	32.8
Incremental Delay (d_2), s/veh	0.1	0.0	0.2	0.1	0.0		0.1	0.2		1.0	0.0	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	48.1	28.5	27.9	48.7	27.3	10.0	47.7	48.5		39.7	33.0	32.9
Level of Service (LOS)	D	C	C	D	C	A	D	D		D	C	C
Approach Delay, s/veh / LOS	28.6	C		22.2	C		48.2	D		39.0	D	
Intersection Delay, s/veh / LOS	29.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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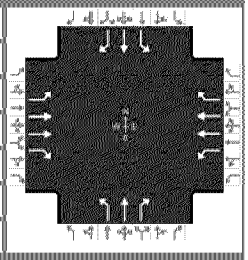
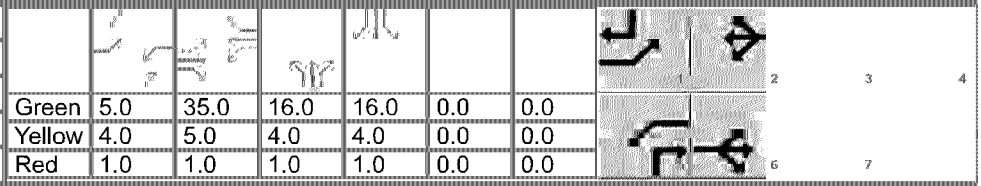
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	110	406	22	16	657	45	77	24	46	68	19	174

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	5.0	35.0		16.0	16.0	0.0	0.0					
Yellow	4.0	5.0		4.0	4.0	0.0	0.0					
Red	1.0	1.0		1.0	1.0	0.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	110	406	22	16	657	45	77	24	46	68	19	174
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	10.0	40.0	5.0	35.0		16.0		16.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		8
Start-Up Lost Time (*l*t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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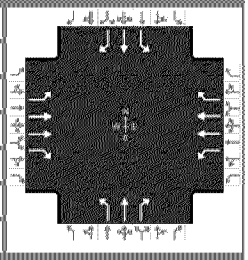
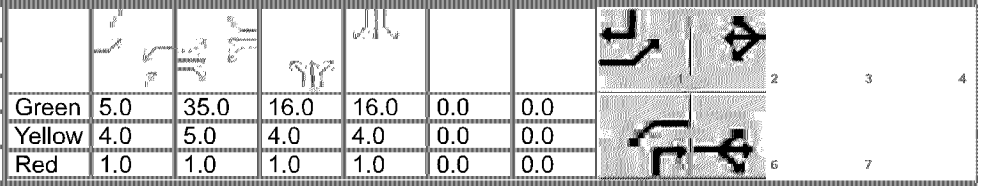
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	110	406	22	16	657	45	77	24	46	68	19	174

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	35.0	16.0	16.0	0.0	0.0						
Yellow	4.0	5.0	4.0	4.0	0.0	0.0						
Red	1.0	1.0	1.0	1.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	15.0	46.0	10.0	41.0		21.0		21.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	5.2	9.6	2.5	16.6		5.7		10.6
Green Extension Time (g_e), s	0.1	2.4	0.0	2.4		0.2		0.3
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.07	0.00	1.00	0.00		0.00		0.16

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	112	414	22	16	670	46	79	24	47	69	19	178
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	3.2	7.6	0.8	0.5	14.6	1.8	3.7	1.1	2.1	3.2	0.8	8.6
Cycle Queue Clearance Time (g_c), s	3.2	7.6	0.8	0.5	14.6	1.8	3.7	1.1	2.1	3.2	0.8	8.6
Green Ratio (*g/C*)	0.52	0.43	0.43	0.45	0.38	0.38	0.18	0.18	0.26	0.18	0.18	0.31
Capacity (*c*), veh/h	467	1490	679	502	1313	598	327	344	421	327	344	485
Volume-to-Capacity Ratio (*X*)	0.240	0.278	0.033	0.032	0.511	0.077	0.240	0.071	0.112	0.212	0.056	0.366
Back of Queue (*Q*), ft/ln (95 th percentile)	49.8	127.2	12.1	8.3	239.4	28	71.5	21.6	37.6	62.7	17	143.1
Back of Queue (*Q*), veh/ln (95 th percentile)	2.0	4.9	0.5	0.3	9.2	1.1	2.8	0.8	1.5	2.5	0.7	5.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.25	0.00	0.03	0.04	0.00	0.16	0.72	0.00	0.00	1.25	0.34	2.86
Uniform Delay (d_1), s/veh	13.7	18.8	16.2	15.2	24.2	19.6	34.2	33.1	28.0	34.0	33.0	26.6
Incremental Delay (d_2), s/veh	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	13.8	18.8	16.2	15.2	24.3	19.6	34.3	33.1	28.0	34.1	33.0	26.7
Level of Service (LOS)	B	B	B	B	C	B	C	C	C	C	C	C
Approach Delay, s/veh / LOS	17.7	B		23.8	C		32.1	C		29.1	C	
Intersection Delay, s/veh / LOS	23.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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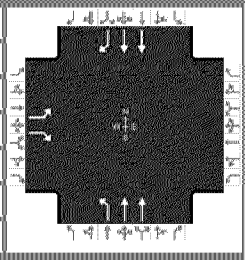
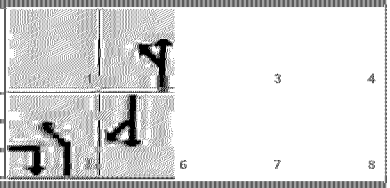
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	102		104				62	225			1116	172

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	18.0		50.0	15.0	0.0	0.0	0.0					
Yellow	4.0		5.0	4.0	0.0	0.0	0.0					
Red	2.0		1.0	1.0	0.0	0.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	102		104				62	225			1116	172
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		15.0			18.0	65.0		50.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*lt*), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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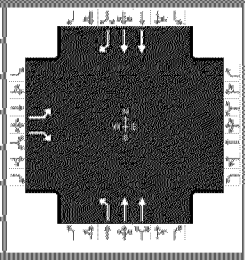
HCS7 Signalized Intersection Results Summary

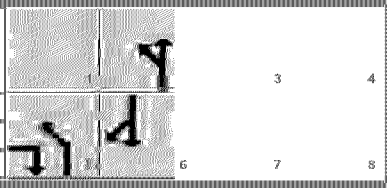
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	102		104				62	225			1116	172

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	50.0	15.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		20.0			24.0	80.0		56.0
Change Period, ($Y+R_c$), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.1			3.0	2.9		2.9
Queue Clearance Time (g_s), s		7.6			3.0	3.8		27.2
Green Extension Time (g_e), s		0.2			0.1	4.3		4.1
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.02			0.00	0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	112		114				68	247			1226	189
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (g_s), s	5.6						1.0	1.8			25.2	6.5
Cycle Queue Clearance Time (g_c), s	5.6						1.0	1.8			25.2	6.5
Green Ratio (*g/C*)	0.17						0.74	0.76			0.52	0.52
Capacity (*c*), veh/h	303						550	2706			1852	824
Volume-to-Capacity Ratio (*X*)	0.370						0.124	0.091			0.662	0.229
Back of Queue (*Q*), ft/ln (95 th percentile)	106.3						14.1	17.7			357.1	93.9
Back of Queue (*Q*), veh/ln (95 th percentile)	4.2						0.6	0.7			14.1	3.7
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.07	0.00			0.00	0.43
Uniform Delay (d_1), s/veh	36.8						7.9	3.3			17.6	13.1
Incremental Delay (d_2), s/veh	0.3						0.0	0.0			0.7	0.1
Initial Queue Delay (d_3), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	37.0		0.0				7.9	3.3			18.3	13.1
Level of Service (LOS)	D		A				A	A			B	B
Approach Delay, s/veh / LOS	18.3		B	0.0			4.3		A	17.6		B
Intersection Delay, s/veh / LOS	15.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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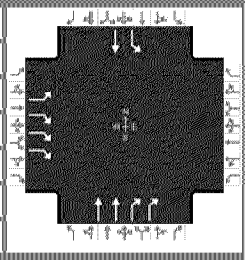
HCS7 Signalized Intersection Input Data

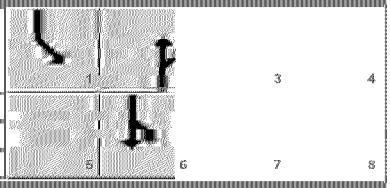
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	64		718					141	49	26	96	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	64		718					141	49	26	96	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*lt*), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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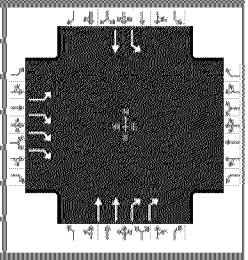
HCS7 Signalized Intersection Results Summary

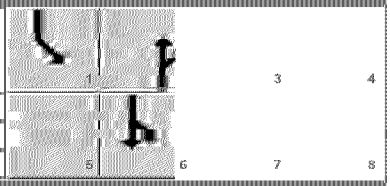
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	64		718					141	49	26	96	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		20.5				4.0	2.5	3.7
Green Extension Time (g_e), s		0.0				0.6	0.0	0.6
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		1.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	70		789					155	54	29	105	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	3.2							2.0		0.5	1.7	
Cycle Queue Clearance Time (g_c), s	3.2							2.0		0.5	1.7	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		977	1315	
Volume-to-Capacity Ratio (*X*)	0.190							0.078		0.029	0.080	
Back of Queue (*Q*), ft/ln (95 th percentile)	62							32.7		6.2	23.3	
Back of Queue (*Q*), veh/ln (95 th percentile)	2.4							1.3		0.2	0.9	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.21							0.00		0.04	0.00	
Uniform Delay (d_1), s/veh	33.3							9.7		4.4	4.4	
Incremental Delay (d_2), s/veh	0.1							0.0		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	33.4		0.0					9.7	0.0	4.4	4.5	
Level of Service (LOS)	C		A					A	A	A	A	
Approach Delay, s/veh / LOS	2.7		A	0.0			7.2		A	4.4		A
Intersection Delay, s/veh / LOS	3.7						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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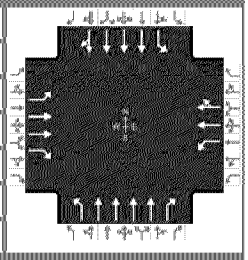
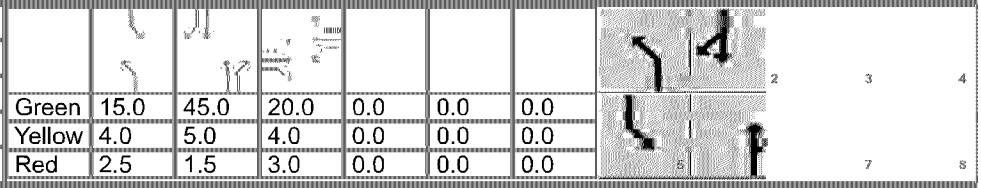
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	32	128	38	107	222	27	4	59	14	13	623	26

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	15.0	45.0		20.0	0.0	0.0	0.0					
Yellow	4.0	5.0		4.0	0.0	0.0	0.0					
Red	2.5	1.5		3.0	0.0	0.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	32	128	38	107	222	27	4	59	14	13	623	26
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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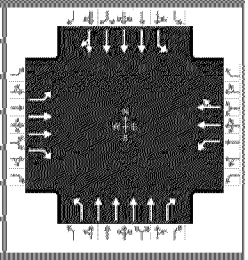
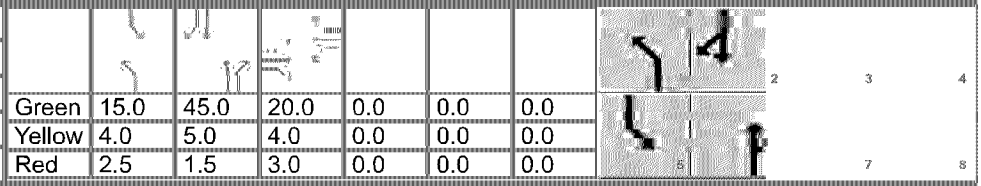
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Ex AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	32	128	38	107	222	27	4	59	14	13	623	26

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, (*Y+R c*), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.2		3.2	3.0	2.9	3.0	2.9
Queue Clearance Time (*g s*), s		11.1		13.7	2.2	2.5	2.7	7.7
Green Extension Time (*g e*), s		1.0		0.8	0.0	1.7	0.0	1.7
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.05		0.19	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	34	138	41	115	135	133	4	63	15	14	526	172
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1085	1738	1547	1222	1826	1757	1739	1658	1547	1739	1826	1774
Queue Service Time (*g s*), s	2.8	3.2	2.1	8.4	6.2	6.4	0.2	0.5	0.5	0.7	5.6	5.7
Cycle Queue Clearance Time (*g c*), s	9.1	3.2	2.1	11.7	6.2	6.4	0.2	0.5	0.5	0.7	5.6	5.7
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	242	765	340	301	402	386	296	3117	727	296	2575	834
Volume-to-Capacity Ratio (*X*)	0.142	0.180	0.120	0.382	0.336	0.343	0.015	0.020	0.021	0.047	0.204	0.207
Back of Queue (*Q*), ft/ln (95 th percentile)	34.5	63.1	37.1	116.8	127.6	122.6	4	8.3	7.9	12.9	101.3	97.6
Back of Queue (*Q*), veh/ln (95 th percentile)	1.3	2.4	1.4	4.5	4.9	4.8	0.2	0.3	0.3	0.5	3.9	3.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.17	0.00	0.10	0.39	0.00	0.00	0.01	0.00	0.03	0.22	0.00	0.00
Uniform Delay (*d 1*), s/veh	36.8	31.7	31.2	36.4	32.9	32.9	34.5	14.7	14.2	34.7	16.1	15.6
Incremental Delay (*d 2*), s/veh	0.1	0.0	0.1	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	36.9	31.7	31.3	36.7	33.0	33.1	34.5	14.7	14.2	34.7	16.1	15.6
Level of Service (LOS)	D	C	C	D	C	C	C	B	B	C	B	B
Approach Delay, s/veh / LOS	32.5	C		34.2	C		15.6	B		16.3	B	
Intersection Delay, s/veh / LOS	23.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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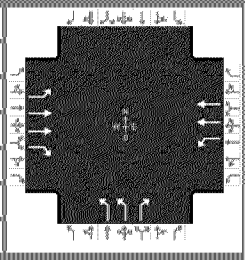
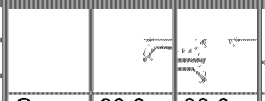
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Ex PM.xus		
Project Description	3762				

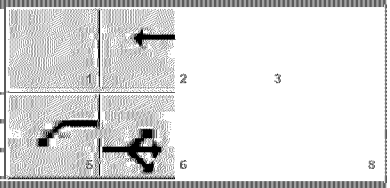


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	634	212	355	856		178		376			

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	60.0	33.0	15.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	634	212	355	856		178		376			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	2	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		33.0	60.0	93.0	15.0	15.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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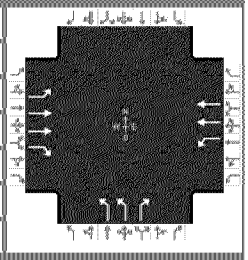
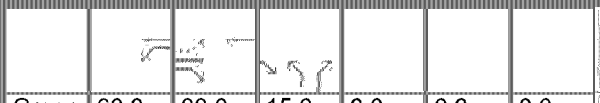
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Ex PM.xus		
Project Description	3762				

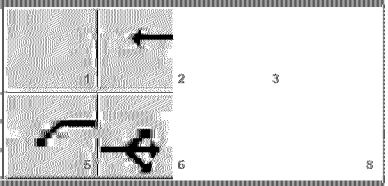


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	634	212	355	856		178		376			

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	60.0	33.0	15.0	0.0	0.0	0.0			
Yellow	0.0	5.0	4.0	0.0	0.0	0.0			
Red	0.0	2.0	1.0	0.0	0.0	0.0			



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		40.0	60.0	100.0		20.0		
Change Period, ($Y+R_c$), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (g_s), s		23.0	17.7	11.1		19.0		
Green Extension Time (g_e), s		3.6	0.7	4.9		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.25	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	689	230	386	930		193		409			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	611	1738		1809	1738		1689					
Queue Service Time (g_s), s	0.0	21.0		15.7	9.1		6.3					
Cycle Queue Clearance Time (g_c), s	0.0	21.0		15.7	9.1		6.3					
Green Ratio (*g/C*)	0.29	0.29		0.52	0.79		0.14					
Capacity (*c*), veh/h	60	1014		934	2752		478					
Volume-to-Capacity Ratio (*X*)	0.000	0.680		0.413	0.338		0.404					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	356.3		266.7	100.3		120.7					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	13.7		10.3	3.9		4.6					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.59	0.00		0.00					
Uniform Delay (d_1), s/veh	0.0	37.5		17.8	3.8		46.9					
Incremental Delay (d_2), s/veh	0.0	1.5		0.1	0.0		0.2					
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	39.1	0.0	17.9	3.8		47.1		0.0			
Level of Service (LOS)		D	A	B	A		D		A			
Approach Delay, s/veh / LOS	29.3	C		7.9	A		15.1	B		0.0		
Intersection Delay, s/veh / LOS	16.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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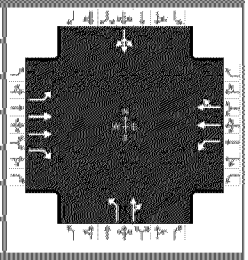
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Ex PM.xus		
Project Description	3762				

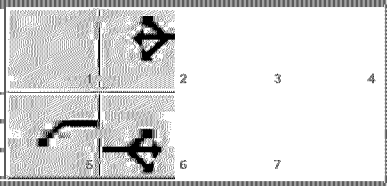


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	670	278	59	728	0	405	0	34	4	0	1

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	39.0	0.0	0.0	0.0
Yellow	4.0	5.0	4.0	0.0	0.0	0.0
Red	1.0	2.0	2.0	0.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	670	278	59	728	0	405	0	34	4	0	1
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	0	0	5		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	350	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		55.0	8.0	63.0		39.0		39.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0		4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0		2.0		2.0
Minimum Green (G_{min}), s		25	5	25		5		5
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0		2.0		2.0
Recall Mode		Min	Off	Min		Off		Off
Dual Entry		Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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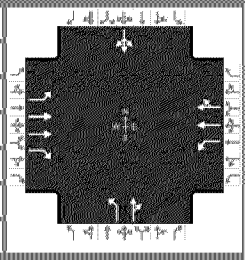
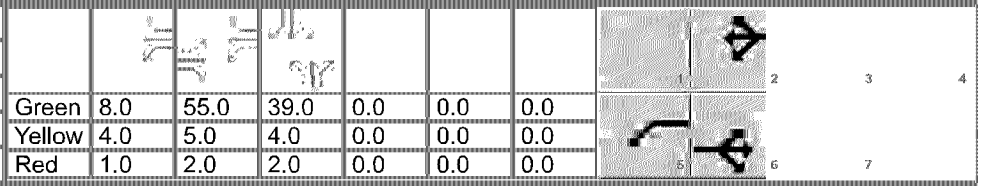
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	670	278	59	728	0	405	0	34	4	0	1

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	39.0	0.0	0.0	0.0
Yellow	4.0	5.0	4.0	0.0	0.0	0.0
Red	1.0	2.0	2.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		6.0		8.0
Phase Duration, s		62.0	13.0	75.0		45.0		45.0
Change Period, (*Y+R c*), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		2.9	2.9	2.9		3.1		3.1
Queue Clearance Time (*g s*), s		18.5	3.9	15.6		38.9		3.8
Green Extension Time (*g e*), s		4.4	0.0	4.4		0.0		0.9
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.00	0.13	0.00		1.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	9	720	299	63	783	0	435	37			5	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	691	1738	1675	1810	1826	0	1439	1610			1390	
Queue Service Time (*g s*), s	0.8	16.5	13.7	1.9	13.6	0.0	35.1	1.8			0.0	
Cycle Queue Clearance Time (*g c*), s	1.5	16.5	13.7	1.9	13.6	0.0	36.9	1.8			1.8	
Green Ratio (*g/C*)	0.48	0.48	0.48	0.57	0.58		0.34	0.34			0.34	
Capacity (*c*), veh/h	384	1651	795	462	2130		529	550			529	
Volume-to-Capacity Ratio (*X*)	0.022	0.436	0.376	0.137	0.367	0.000	0.823	0.066			0.010	
Back of Queue (*Q*), ft/ln (95 th percentile)	5.5	265.6	214.1	30.3	223.5	0	492	32.2			4.6	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.2	10.2	8.6	1.2	8.6	0.0	19.7	1.3			0.2	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.02	0.00	0.71	0.08	0.00	0.00	1.64	0.00			0.00	
Uniform Delay (*d 1*), s/veh	17.1	20.9	20.1	12.8	13.7		39.1	26.6			26.1	
Incremental Delay (*d 2*), s/veh	0.0	0.1	0.1	0.0	0.0	0.0	9.5	0.0			0.0	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	17.1	20.9	20.2	12.8	13.7		48.5	26.6			26.1	
Level of Service (LOS)	B	C	C	B	B		D	C			C	
Approach Delay, s/veh / LOS	20.7	C		13.7	B		46.8	D		26.1	C	
Intersection Delay, s/veh / LOS	23.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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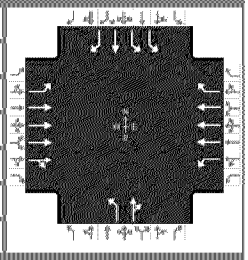
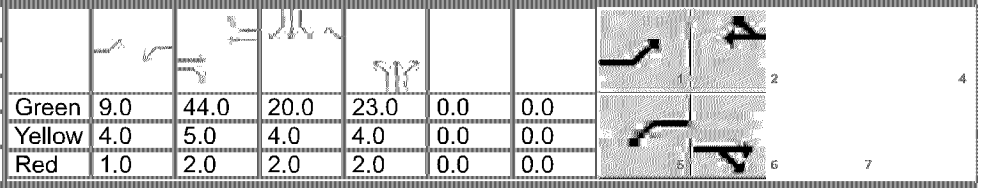
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	37	820	42	36	970	928	57	76	22	287	35	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	37	820	42	36	970	928	57	76	22	287	35	28
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		R	0		None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	9.0	44.0	9.0	44.0	23.0	23.0	20.0	20.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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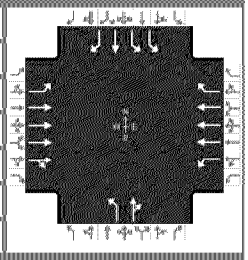
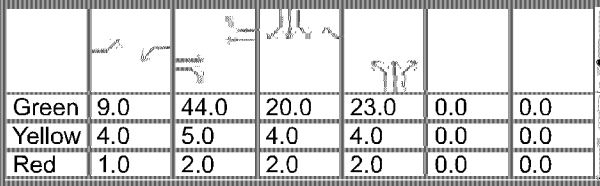
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Ex PM.xus		
Project Description	3762				

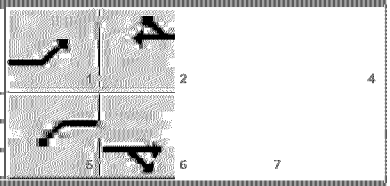


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	37	820	42	36	970	928	57	76	22	287	35	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	14.0	51.0	14.0	51.0		29.0		26.0
Change Period, ($Y+R_c$), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	3.0	2.9	3.0		3.1		3.1
Queue Clearance Time (g_s), s	4.4	12.8	4.3	48.0		7.8		11.2
Green Extension Time (g_e), s	0.0	9.2	0.0	0.0		0.2		0.6
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.04	0.11	0.03	1.00		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	38	688	201	37	1000	957	59	101		296	36	29
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1582	1781	1658		1781	1755		1730	1826	1585
Queue Service Time (g_s), s	2.4	10.6	10.8	2.3	18.6		3.2	5.8		9.2	2.0	1.8
Cycle Queue Clearance Time (g_c), s	2.4	10.6	10.8	2.3	18.6		3.2	5.8		9.2	2.0	1.8
Green Ratio (*g/C*)	0.09	0.38	0.38	0.09	0.38		0.21	0.21		0.18	0.18	0.18
Capacity (*c*), veh/h	163	2100	606	163	1907		371	366		634	335	291
Volume-to-Capacity Ratio (*X*)	0.234	0.328	0.331	0.227	0.524		0.158	0.276		0.467	0.108	0.099
Back of Queue (*Q*), ft/ln (95 th percentile)	47.3	201.8	174.9	46	292.1		64.3	116.2		177.4	41.3	32.3
Back of Queue (*Q*), veh/ln (95 th percentile)	1.9	7.8	6.9	1.8	11.2		2.5	4.5		7.0	1.6	1.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.14	0.00	0.00	0.15	0.00		0.16	0.00		0.23	0.00	0.05
Uniform Delay (d_1), s/veh	50.6	26.7	26.1	50.6	29.2		38.9	39.9		43.8	40.8	40.8
Incremental Delay (d_2), s/veh	0.3	0.0	0.1	0.3	0.1		0.1	0.2		0.2	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	50.9	26.8	26.3	50.8	29.4	35.0	39.0	40.1		44.0	40.9	40.8
Level of Service (LOS)	D	C	C	D	C	C	D	D		D	D	D
Approach Delay, s/veh / LOS	27.6	C		32.5	C		39.7	D		43.4	D	
Intersection Delay, s/veh / LOS	32.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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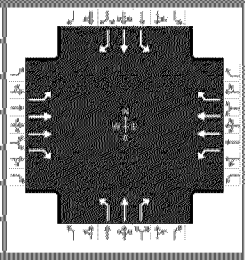
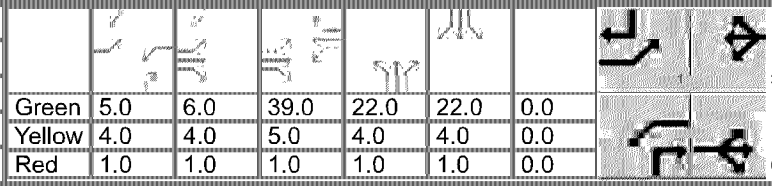
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	225	876	70	20	716	73	86	36	21	148	61	286

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0		39.0	22.0	22.0	0.0					
Yellow	4.0	4.0		5.0	4.0	4.0	0.0					
Red	1.0	1.0		1.0	1.0	1.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	225	876	70	20	716	73	86	36	21	148	61	286
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	16.0	50.0	5.0	39.0		22.0		22.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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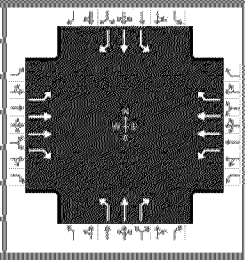
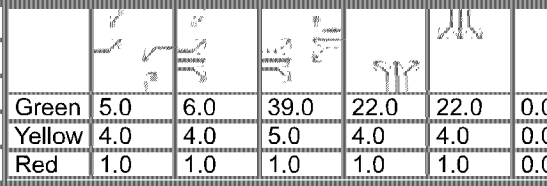
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Ex PM.xus		
Project Description	3762				

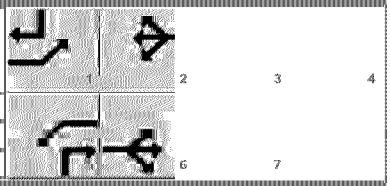


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	225	876	70	20	716	73	86	36	21	148	61	286

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0		39.0	22.0	22.0	0.0					
Yellow	4.0	4.0		5.0	4.0	4.0	0.0					
Red	1.0	1.0		1.0	1.0	1.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	21.0	56.0	10.0	45.0		27.0		27.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	10.7	25.5	2.8	23.0		7.0		19.6
Green Extension Time (g_e), s	0.2	4.1	0.0	3.9		0.2		0.3
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.09	0.01	1.00	0.05		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	230	894	71	20	731	74	88	37	21	151	62	292
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	8.7	23.5	3.2	0.8	21.0	3.9	5.0	1.9	1.2	8.9	3.3	17.6
Cycle Queue Clearance Time (g_c), s	8.7	23.5	3.2	0.8	21.0	3.9	5.0	1.9	1.2	8.9	3.3	17.6
Green Ratio (*g/C*)	0.51	0.43	0.43	0.40	0.34	0.34	0.20	0.20	0.26	0.20	0.20	0.35
Capacity (*c*), veh/h	448	1506	687	291	1188	542	356	374	426	356	374	555
Volume-to-Capacity Ratio (*X*)	0.513	0.593	0.104	0.070	0.615	0.138	0.246	0.098	0.050	0.424	0.166	0.526
Back of Queue (*Q*), ft/ln (95 th percentile)	150.9	363.3	51	15.2	342.2	64.3	98.9	40.1	21.3	177.2	68.9	275.4
Back of Queue (*Q*), veh/ln (95 th percentile)	5.9	14.0	2.0	0.6	13.2	2.5	3.9	1.6	0.8	7.0	2.7	10.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.75	0.00	0.12	0.08	0.00	0.38	0.99	0.00	0.00	3.54	1.38	5.51
Uniform Delay (d_1), s/veh	19.9	26.6	20.2	23.0	33.7	27.3	40.4	39.2	33.4	42.0	39.7	31.1
Incremental Delay (d_2), s/veh	0.4	0.4	0.0	0.0	0.7	0.0	0.1	0.0	0.0	0.3	0.1	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	20.3	27.0	20.2	23.1	34.4	27.3	40.5	39.2	33.5	42.3	39.8	31.5
Level of Service (LOS)	C	C	C	C	C	C	D	D	C	D	D	C
Approach Delay, s/veh / LOS	25.3	C		33.5	C		39.2	D		35.8	D	
Intersection Delay, s/veh / LOS	30.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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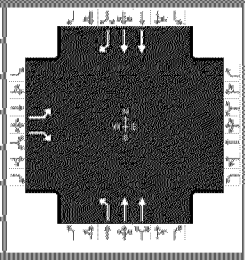
HCS7 Signalized Intersection Input Data

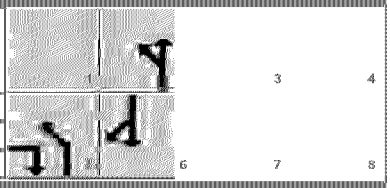
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	253		75				103	1084			584	200

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	253		75				103	1084			584	200
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		25.0			18.0	58.0		40.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*l1*), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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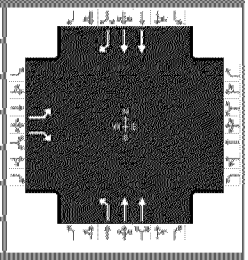
HCS7 Signalized Intersection Results Summary

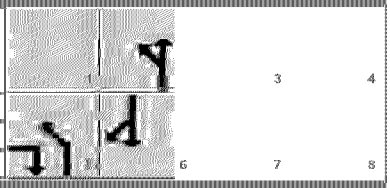
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	253		75				103	1084			584	200

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		30.0			24.0	70.0		46.0
Change Period, ($Y+R_c$), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.0			3.0	2.9		2.9
Queue Clearance Time (g_s), s		15.0			4.4	18.3		14.3
Green Extension Time (g_e), s		0.5			0.1	5.3		5.1
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.00			0.00	0.00		0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	269		80				110	1153			621	213
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (g_s), s	13.0						2.4	16.3			12.3	9.0
Cycle Queue Clearance Time (g_c), s	13.0						2.4	16.3			12.3	9.0
Green Ratio (*g/C*)	0.27						0.64	0.66			0.42	0.42
Capacity (*c*), veh/h	481						667	2350			1496	666
Volume-to-Capacity Ratio (*X*)	0.560						0.164	0.491			0.415	0.320
Back of Queue (*Q*), ft/ln (95 th percentile)	231.8						33.3	215.7			207.6	138.9
Back of Queue (*Q*), veh/ln (95 th percentile)	9.1						1.3	8.5			8.2	5.5
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.16	0.00			0.00	0.63
Uniform Delay (d_1), s/veh	31.4						8.1	8.9			20.4	19.4
Incremental Delay (d_2), s/veh	0.9						0.0	0.1			0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	32.3		0.0				8.1	9.0			20.4	19.5
Level of Service (LOS)	C		A				A	A			C	B
Approach Delay, s/veh / LOS	24.9		C	0.0			8.9		A	20.2		C
Intersection Delay, s/veh / LOS	15.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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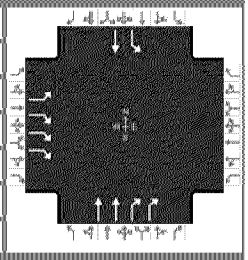
HCS7 Signalized Intersection Input Data

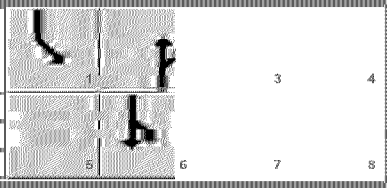
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	17		93					934	76	37	25	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	17		93					934	76	37	25	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None					0	L + R	0		None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	0	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*l1*), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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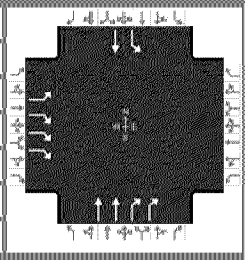
HCS7 Signalized Intersection Results Summary

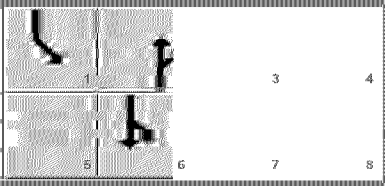
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	17		93					934	76	37	25	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		3.9				19.5	2.7	2.4
Green Extension Time (g_e), s		0.2				2.8	0.0	2.8
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		0.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	18		100					1004	82	40	27	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	0.8							17.5		0.7	0.4	
Cycle Queue Clearance Time (g_c), s	0.8							17.5		0.7	0.4	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		514	1315	
Volume-to-Capacity Ratio (*X*)	0.049							0.507		0.077	0.020	
Back of Queue (*Q*), ft/ln (95 th percentile)	15.6							263.1		8.7	5.7	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.6							10.1		0.3	0.2	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.05							0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	32.3							13.0		6.3	4.3	
Incremental Delay (d_2), s/veh	0.0							0.1		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	32.3		0.0					13.1	0.0	6.4	4.3	
Level of Service (LOS)	C		A					B	A	A	A	
Approach Delay, s/veh / LOS	5.0		A	0.0			12.1		B	5.5		A
Intersection Delay, s/veh / LOS	11.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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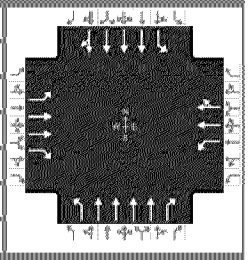
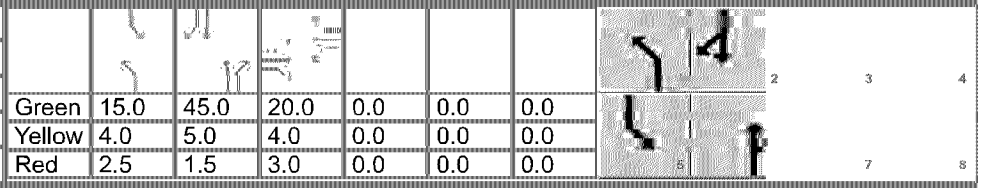
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	26	140	5	25	113	55	28	914	111	16	100	12

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	26	140	5	25	113	55	28	914	111	16	100	12
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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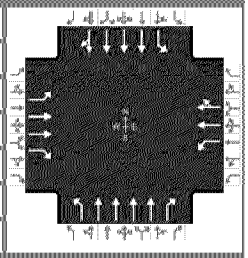
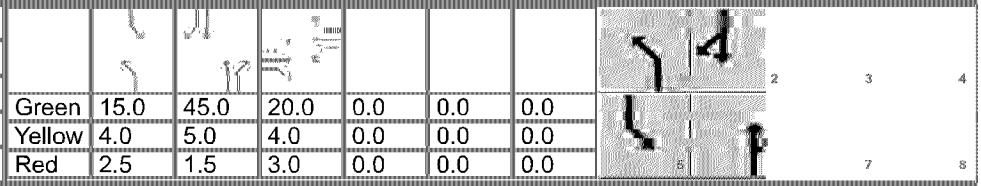
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Existing Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Ex PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	26	140	5	25	113	55	28	914	111	16	100	12

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	15.0	45.0		20.0	0.0	0.0	0.0					
Yellow	4.0	5.0		4.0	0.0	0.0	0.0					
Red	2.5	1.5		3.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, ($Y+R_c$), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.2		3.2	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s		8.6		7.5	3.5	11.3	2.8	3.0
Green Extension Time (g_e), s		0.7		0.7	0.0	3.1	0.0	3.1
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	28	152	5	27	93	89	30	993	121	17	92	30
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1173	1738	1547	1206	1826	1630	1739	1658	1547	1739	1826	1694
Queue Service Time (g_s), s	2.0	3.6	0.3	1.9	4.2	4.5	1.5	9.3	4.5	0.8	0.9	1.0
Cycle Queue Clearance Time (g_c), s	6.6	3.6	0.3	5.5	4.2	4.5	1.5	9.3	4.5	0.8	0.9	1.0
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	277	765	340	294	402	359	296	3117	727	296	2575	796
Volume-to-Capacity Ratio (*X*)	0.102	0.199	0.016	0.092	0.232	0.250	0.103	0.319	0.166	0.059	0.036	0.038
Back of Queue (*Q*), ft/ln (95 th percentile)	27.4	70.1	4.8	25.6	85.7	80.8	28.5	152.6	68.4	16.1	16.2	15.7
Back of Queue (*Q*), veh/ln (95 th percentile)	1.1	2.7	0.2	1.0	3.3	3.2	1.1	5.9	2.6	0.6	0.6	0.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.14	0.00	0.01	0.09	0.00	0.00	0.10	0.00	0.25	0.27	0.00	0.00
Uniform Delay (d_1), s/veh	34.9	31.8	30.5	34.0	32.1	32.2	35.1	17.1	15.2	34.8	14.8	14.3
Incremental Delay (d_2), s/veh	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	35.0	31.9	30.5	34.1	32.2	32.3	35.1	17.1	15.3	34.8	14.8	14.3
Level of Service (LOS)	C	C	C	C	C	C	D	B	B	C	B	B
Approach Delay, s/veh / LOS	32.3	C		32.5	C		17.4	B		17.2	B	
Intersection Delay, s/veh / LOS	20.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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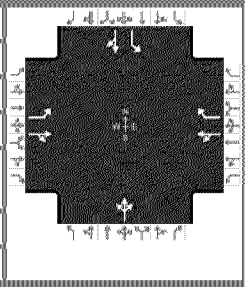
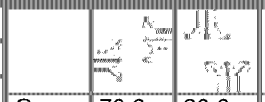
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Back AM.xus		
Project Description	3762				

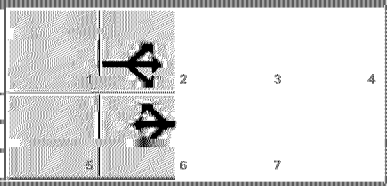


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	556	0	0	456	37	1	0	0	68	1	136

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	70.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	556	0	0	456	37	1	0	0	68	1	136
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5			5	2		2		2	2	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0			12.0	10.0		12.0		10.0	10.0	
Turn Bay Length, ft	200	0			0	250		0		150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		70.0		70.0		20.0		20.0
Yellow Change Interval (*Y*), s		4.0		4.0		4.0		4.0
Red Clearance Interval (R_c), s		1.0		1.0		1.0		1.0
Minimum Green (G_{min}), s		20		20		8		8
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0		2.0		2.0
Recall Mode		Min		Min		Off		Off
Dual Entry		Yes		Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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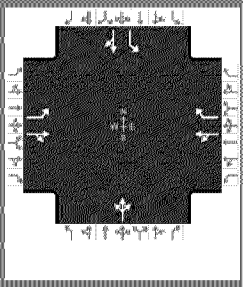
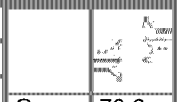
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Back AM.xus		
Project Description	3762				

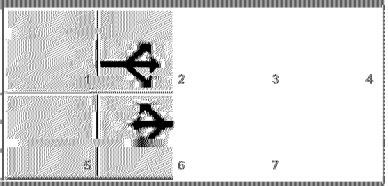


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	556	0	0	456	37	1	0	0	68	1	136

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	70.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		7.0		8.0		6.0
Phase Duration, s		75.0		75.0		25.0		25.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		15.6		11.7		9.7		13.2
Green Extension Time (g_e), s		2.5		2.5		0.3		0.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.04

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	87	0			0	38		1		70	141	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	923	0			0	1585		815		1781	1587	
Queue Service Time (g_s), s	3.9	0.0			0.0	0.7		0.1		3.5	7.6	
Cycle Queue Clearance Time (g_c), s	13.6	0.0			0.0	0.7		7.7		11.2	7.6	
Green Ratio (*g/C*)	0.72					0.72		0.22		0.22	0.22	
Capacity (*c*), veh/h	647					1141		251		327	349	
Volume-to-Capacity Ratio (*X*)	0.134	0.000			0.000	0.033		0.004		0.214	0.405	
Back of Queue (*Q*), ft/ln (95 th percentile)	32.5	0			0	8.4		0.9		69.5	132.7	
Back of Queue (*Q*), veh/ln (95 th percentile)	1.3	0.0			0.0	0.3		0.0		2.7	5.2	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.16	0.00			0.00	0.03		0.00		0.46	0.00	
Uniform Delay (d_1), s/veh	7.8					4.0		36.7		38.2	33.4	
Incremental Delay (d_2), s/veh	0.0	0.0			0.0	0.0		0.0		0.1	0.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	7.9					4.0		36.7		38.3	33.7	
Level of Service (LOS)	A					A		D		D	C	
Approach Delay, s/veh / LOS	6.1	A		5.2	A		36.7	D		35.2	D	
Intersection Delay, s/veh / LOS	10.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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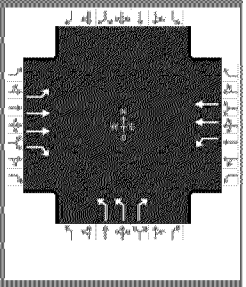
HCS7 Signalized Intersection Input Data

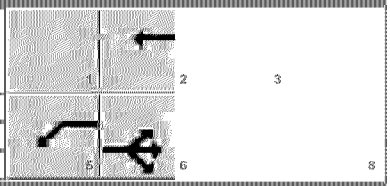
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	774	208	203	508		187		749			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	28.0	40.0	20.0	0.0	0.0	0.0	
Yellow	0.0	5.0	4.0	0.0	0.0	0.0	
Red	0.0	2.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	774	208	203	508		187		749			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	5	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		40.0	28.0	68.0	20.0	20.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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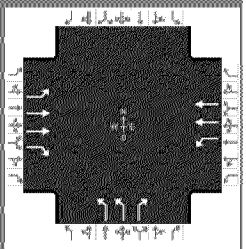
HCS7 Signalized Intersection Results Summary

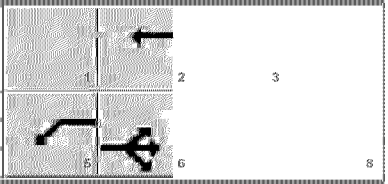
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	774	208	203	508		187		749			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



							
Green	28.0	40.0	20.0	0.0	0.0	0.0	
Yellow	0.0	5.0	4.0	0.0	0.0	0.0	
Red	0.0	2.0	1.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		47.0	28.0	75.0		25.0		
Change Period, (*Y+R c*), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (*g s*), s		20.8	11.8	7.7		24.0		
Green Extension Time (*g e*), s		3.9	0.3	4.1		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.02	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	851	229	223	558		205		823			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	865	1738	1609	1809	1738		1689					
Queue Service Time (*g s*), s	0.0	18.8	6.0	9.8	5.7		5.1					
Cycle Queue Clearance Time (*g c*), s	0.0	18.8	6.0	9.8	5.7		5.1					
Green Ratio (*g/C*)	0.42	0.42	0.64	0.30	0.70		0.22					
Capacity (*c*), veh/h	72	1460	1030	543	2434		743					
Volume-to-Capacity Ratio (*X*)	0.000	0.583	0.222	0.411	0.229		0.277					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	299.7	80.8	190.4	73.9		93.1					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	11.5	3.1	7.3	2.8		3.6					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.08	0.42	0.00		0.00					
Uniform Delay (*d 1*), s/veh	0.0	22.3	7.6	27.9	5.7		32.4					
Incremental Delay (*d 2*), s/veh	0.0	0.4	0.0	0.2	0.0		0.1					
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	22.7	7.6	28.1	5.7		32.5		0.0			
Level of Service (LOS)		C	A	C	A		C		A			
Approach Delay, s/veh / LOS	19.5	B		12.1	B		6.5	A		0.0		
Intersection Delay, s/veh / LOS	12.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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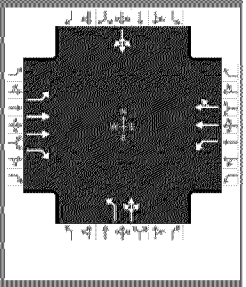
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Back AM +Co Imp - Split-phas…		
Project Description	3762				

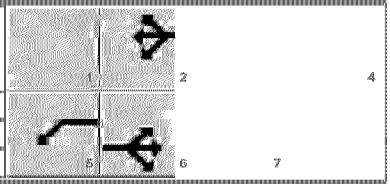


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	919	510	34	433	3	210	0	19	0	0	8

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	8.0	40.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	919	510	34	433	3	210	0	19	0	0	8
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	2	0	0	2		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	300	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		55.0	8.0	63.0	40.0	40.0		8.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0	4.0	4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0	2.0	2.0		2.0
Minimum Green (G_{min}), s		25	5	25	6	5		5
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		2.0
Recall Mode		Min	Off	Min	Off	Off		Off
Dual Entry		Yes	No	Yes	No	Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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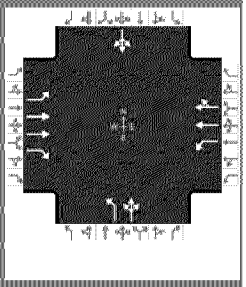
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Back AM +Co Imp - Split-phas…		
Project Description	3762				

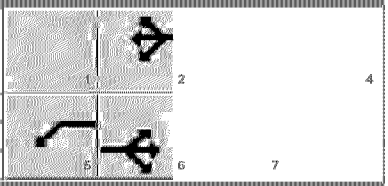


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	919	510	34	433	3	210	0	19	0	0	8

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	8.0	40.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		10.0		12.0
Phase Duration, s		62.0	13.0	75.0		46.0		14.0
Change Period, ($Y+R_c$), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		2.9	2.9	2.9		3.3		3.4
Queue Clearance Time (g_s), s		33.4	3.4	11.7		12.1		2.7
Green Extension Time (g_e), s		4.8	0.0	5.0		0.5		0.0
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.05	0.04	0.00		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	3	1021	567	38	242	242	117	138			0	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	911	1781	1675	1810	1870	1866	1810	1779			0	
Queue Service Time (g_s), s	0.3	31.4	18.4	1.4	9.7	9.7	6.4	10.1			0.0	
Cycle Queue Clearance Time (g_c), s	0.3	31.4	18.4	1.4	9.7	9.7	6.4	10.1			0.0	
Green Ratio (*g/C*)	0.42	0.42	0.73	0.51	0.52	0.52	0.31	0.31				
Capacity (*c*), veh/h	438	1504	1228	294	970	967	563	553				
Volume-to-Capacity Ratio (*X*)	0.008	0.679	0.461	0.129	0.250	0.250	0.207	0.249			0.000	
Back of Queue (*Q*), ft/ln (95 th percentile)	2.7	475.3	222.3	25.1	179.5	179.5	129.1	213.5			0	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.1	18.7	8.9	1.0	7.1	7.1	5.2	8.5			0.0	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.01	0.00	0.74	0.06	0.00	0.00	0.43	0.00			0.00	
Uniform Delay (d_1), s/veh	22.6	31.6	7.3	20.9	18.5	18.0	34.2	49.1				
Incremental Delay (d_2), s/veh	0.0	1.0	0.1	0.1	0.0	0.0	0.1	0.1			0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	22.6	32.6	7.4	21.0	18.5	18.0	34.3	49.2				
Level of Service (LOS)	C	C	A	C	B	B	C	D				
Approach Delay, s/veh / LOS	23.6	C		18.5	B		42.4	D		58.3	E	
Intersection Delay, s/veh / LOS	24.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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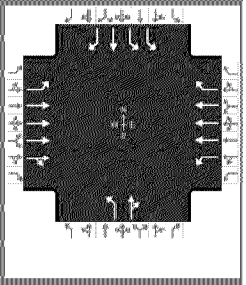
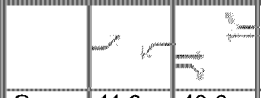
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - Back AM.xus		
Project Description	3762				

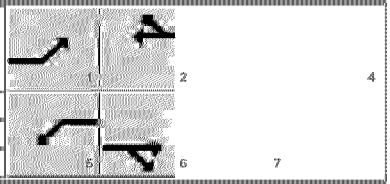


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	86	32	667	374	34	57	12	667	63	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	11.0	43.0	30.0	12.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	86	32	667	374	34	57	12	667	63	26
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	11.0	43.0	11.0	43.0	12.0	12.0	30.0	30.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*l*t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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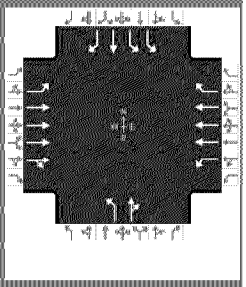
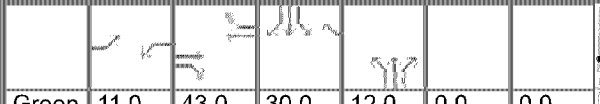
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - Back AM.xus		
Project Description	3762				

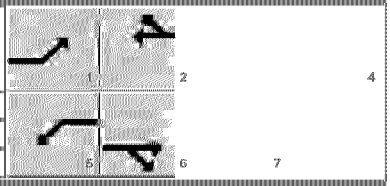


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	86	32	667	374	34	57	12	667	63	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	11.0	43.0	30.0	12.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	16.0	50.0	16.0	50.0		18.0		36.0
Change Period, ($Y+R_c$), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.0		3.1
Queue Clearance Time (g_s), s	2.9	18.4	4.0	16.0		6.5		24.1
Green Extension Time (g_e), s	0.0	6.1	0.0	6.2		0.1		1.2
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.00	0.05	0.00	0.04		0.04		0.26

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	15	978	312	33	695	390	35	72		695	66	27
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1736	1781	1658		1781	1770		1730	1826	1585
Queue Service Time (g_s), s	0.9	16.3	16.4	2.0	12.2		2.2	4.5		22.1	3.3	1.5
Cycle Queue Clearance Time (g_c), s	0.9	16.3	16.4	2.0	12.2		2.2	4.5		22.1	3.3	1.5
Green Ratio (*g/C*)	0.11	0.38	0.38	0.11	0.38		0.12	0.12		0.27	0.27	0.27
Capacity (*c*), veh/h	193	2054	651	193	1865		208	207		922	487	423
Volume-to-Capacity Ratio (*X*)	0.076	0.476	0.479	0.173	0.373		0.170	0.348		0.753	0.135	0.064
Back of Queue (*Q*), ft/ln (95 th percentile)	17.4	284.1	268.5	40.3	208.8		43.5	92.5		372	67.4	26.7
Back of Queue (*Q*), veh/ln (95 th percentile)	0.7	10.9	10.6	1.6	8.0		1.7	3.6		14.6	2.6	1.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.05	0.00	0.00	0.13	0.00		0.11	0.00		0.48	0.00	0.04
Uniform Delay (d_1), s/veh	48.1	29.2	28.6	48.6	27.9		47.8	48.8		40.4	33.5	32.8
Incremental Delay (d_2), s/veh	0.1	0.1	0.2	0.2	0.0		0.1	0.4		3.2	0.0	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	48.2	29.3	28.8	48.8	27.9	10.0	47.9	49.2		43.5	33.5	32.9
Level of Service (LOS)	D	C	C	D	C	A	D	D		D	C	C
Approach Delay, s/veh / LOS	29.4	C		22.3	C		48.8	D		42.3	D	
Intersection Delay, s/veh / LOS	30.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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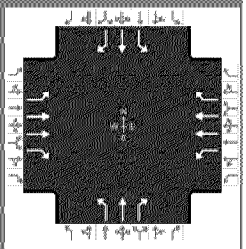
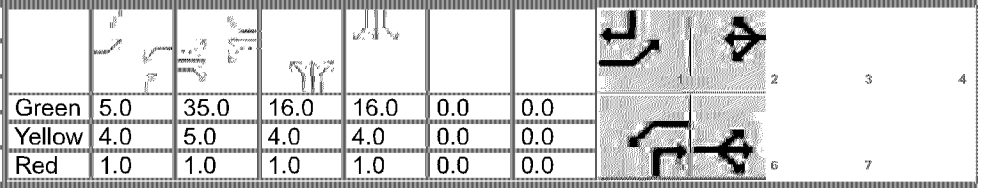
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	491	25	16	778	50	86	27	51	76	21	194

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	35.0	16.0	16.0	0.0	0.0						
Yellow	4.0	5.0	4.0	4.0	0.0	0.0						
Red	1.0	1.0	1.0	1.0	0.0	0.0						

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	491	25	16	778	50	86	27	51	76	21	194
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	10.0	40.0	5.0	35.0		16.0		16.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		8
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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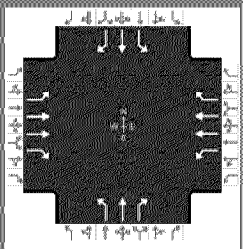
HCS7 Signalized Intersection Results Summary

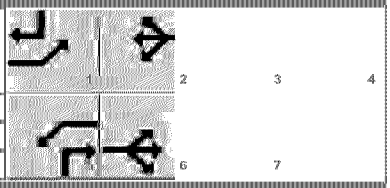
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	491	25	16	778	50	86	27	51	76	21	194

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	5.0	35.0	16.0	16.0	0.0	0.0	
Yellow	4.0	5.0	4.0	4.0	0.0	0.0	
Red	1.0	1.0	1.0	1.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	15.0	46.0	10.0	41.0		21.0		21.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	5.6	11.4	2.5	20.1		6.1		11.7
Green Extension Time (g_e), s	0.1	3.0	0.0	2.8		0.2		0.3
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.14	0.00	1.00	0.02		0.00		0.43

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	126	501	26	16	794	51	88	28	52	78	21	198
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	3.6	9.4	0.9	0.5	18.1	2.0	4.1	1.2	2.4	3.6	0.9	9.7
Cycle Queue Clearance Time (g_c), s	3.6	9.4	0.9	0.5	18.1	2.0	4.1	1.2	2.4	3.6	0.9	9.7
Green Ratio (*g/C*)	0.52	0.43	0.43	0.45	0.38	0.38	0.18	0.18	0.26	0.18	0.18	0.31
Capacity (*c*), veh/h	424	1490	679	462	1313	598	327	344	421	327	344	485
Volume-to-Capacity Ratio (*X*)	0.296	0.336	0.038	0.035	0.605	0.085	0.268	0.080	0.124	0.237	0.062	0.408
Back of Queue (*Q*), ft/ln (95 th percentile)	56.2	158.7	13.7	8.3	286.4	31.3	80.2	24.3	41.8	70.5	18.8	161.9
Back of Queue (*Q*), veh/ln (95 th percentile)	2.2	6.1	0.5	0.3	11.0	1.2	3.2	1.0	1.6	2.8	0.7	6.4
Queue Storage Ratio (*RQ*) (95 th percentile)	0.28	0.00	0.03	0.04	0.00	0.18	0.80	0.00	0.00	1.41	0.38	3.24
Uniform Delay (d_1), s/veh	14.6	19.3	16.3	15.4	25.3	19.6	34.3	33.1	28.1	34.1	33.0	27.0
Incremental Delay (d_2), s/veh	0.1	0.0	0.0	0.0	0.6	0.0	0.2	0.0	0.0	0.1	0.0	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	14.8	19.3	16.3	15.4	25.9	19.6	34.5	33.2	28.1	34.3	33.1	27.2
Level of Service (LOS)	B	B	B	B	C	B	C	C	C	C	C	C
Approach Delay, s/veh / LOS	18.3	B		25.3	C		32.3	C		29.4	C	
Intersection Delay, s/veh / LOS	24.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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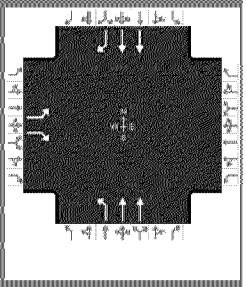
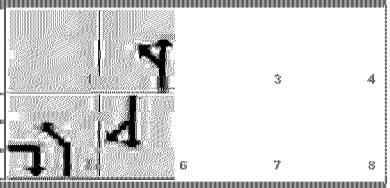
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	122		116				69	251			1244	198

Signal Information					EB			WB			NB		
Cycle, s	100.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	18.0	50.0		15.0	0.0	0.0	0.0		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	5.0		4.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	1.0		1.0	0.0	0.0	0.0		



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	122		116				69	251			1244	198
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		15.0			18.0	65.0		50.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*l1*), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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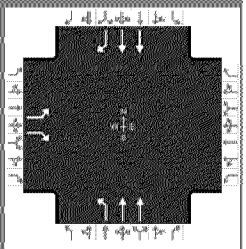
HCS7 Signalized Intersection Results Summary

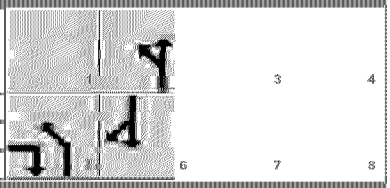
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	122		116				69	251			1244	198

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	50.0	15.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		20.0			24.0	80.0		56.0
Change Period, ($Y+R_c$), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.1			3.0	2.9		2.9
Queue Clearance Time (g_s), s		8.8			3.2	4.0		31.9
Green Extension Time (g_e), s		0.3			0.1	5.0		4.6
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.06			0.00	0.00		0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	134		127				76	276			1367	218
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (g_s), s	6.8						1.2	2.0			29.9	7.6
Cycle Queue Clearance Time (g_c), s	6.8						1.2	2.0			29.9	7.6
Green Ratio (*g/C*)	0.17						0.74	0.76			0.52	0.52
Capacity (*c*), veh/h	303						516	2706			1852	824
Volume-to-Capacity Ratio (*X*)	0.443						0.147	0.102			0.738	0.264
Back of Queue (*Q*), ft/ln (95 th percentile)	129						22.1	19.9			416.2	110.4
Back of Queue (*Q*), veh/ln (95 th percentile)	5.1						0.9	0.8			16.4	4.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.10	0.00			0.00	0.50
Uniform Delay (d_1), s/veh	37.2						9.8	3.4			18.7	13.4
Incremental Delay (d_2), s/veh	0.4						0.0	0.0			1.4	0.1
Initial Queue Delay (d_3), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	37.6		0.0				9.9	3.4			20.1	13.4
Level of Service (LOS)	D		A				A	A			C	B
Approach Delay, s/veh / LOS	19.3	B		0.0			4.8	A		19.2	B	
Intersection Delay, s/veh / LOS	16.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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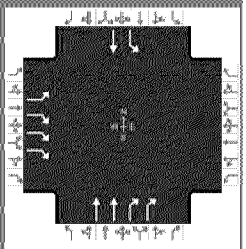
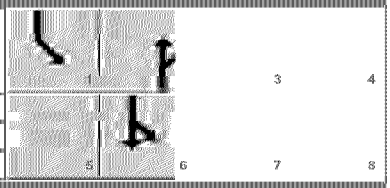
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra…	File Name	md 715 & us 40 EB - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	58	29	117	

Signal Information				EB			WB			NB			SB		
Cycle, s	100.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	10.0	55.0	18.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	5.0	4.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	2.0	1.0	0.0	0.0	0.0					



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	58	29	117	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*lt*), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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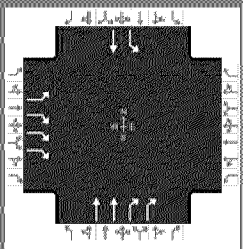
HCS7 Signalized Intersection Results Summary

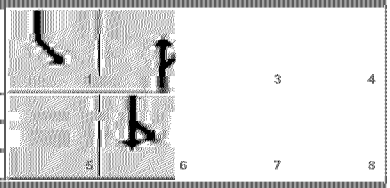
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra…	File Name	md 715 & us 40 EB - Back AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	58	29	117	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		22.0				4.3	2.5	4.1
Green Extension Time (g_e), s		0.0				0.7	0.0	0.7
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		1.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	78		891					177	64	32	129	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	3.5							2.3		0.5	2.1	
Cycle Queue Clearance Time (g_c), s	3.5							2.3		0.5	2.1	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		960	1315	
Volume-to-Capacity Ratio (*X*)	0.211							0.089		0.033	0.098	
Back of Queue (*Q*), ft/ln (95 th percentile)	69.1							37.6		6.9	29	
Back of Queue (*Q*), veh/ln (95 th percentile)	2.7							1.4		0.3	1.1	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.23							0.00		0.05	0.00	
Uniform Delay (d_1), s/veh	33.4							9.7		4.4	4.5	
Incremental Delay (d_2), s/veh	0.1							0.0		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	33.5		0.0					9.7	0.0	4.4	4.5	
Level of Service (LOS)	C		A					A	A	A	A	
Approach Delay, s/veh / LOS	2.7	A		0.0			7.2	A		4.5	A	
Intersection Delay, s/veh / LOS	3.7						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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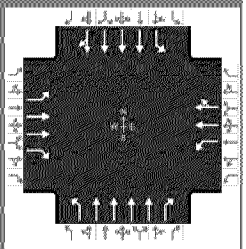
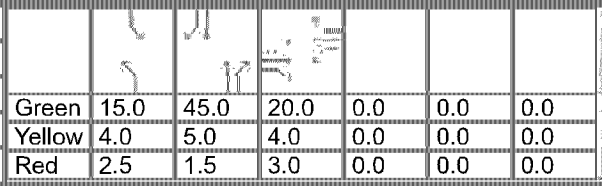
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Back AM.xus		
Project Description	3762				

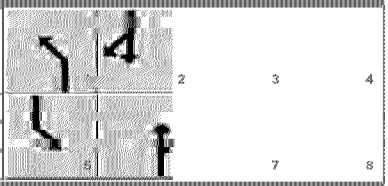


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	43	143	42	119	248	30	4	66	16	13	695	46

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	43	143	42	119	248	30	4	66	16	13	695	46
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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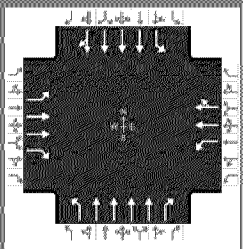
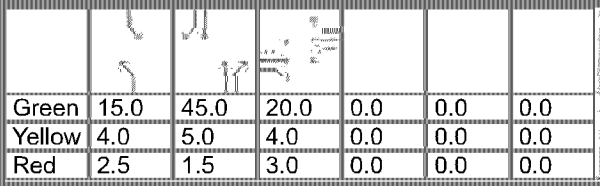
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Back AM.xus		
Project Description	3762				

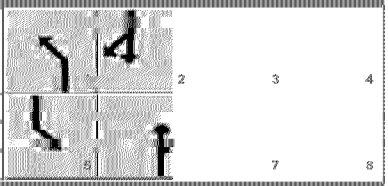


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	43	143	42	119	248	30	4	66	16	13	695	46

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, ($Y+R_c$), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.2		3.2	3.0	2.9	3.0	2.9
Queue Clearance Time (g_s), s		13.1		15.3	2.2	2.6	2.7	8.7
Green Extension Time (g_e), s		1.0		0.8	0.0	2.0	0.0	2.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.17		0.50	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	46	154	45	128	151	148	4	71	17	14	602	195
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1055	1738	1547	1204	1826	1757	1739	1658	1547	1739	1826	1746
Queue Service Time (g_s), s	3.9	3.6	2.3	9.7	7.0	7.2	0.2	0.6	0.6	0.7	6.5	6.7
Cycle Queue Clearance Time (g_c), s	11.1	3.6	2.3	13.3	7.0	7.2	0.2	0.6	0.6	0.7	6.5	6.7
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	228	765	340	293	402	387	296	3117	727	296	2575	821
Volume-to-Capacity Ratio (*X*)	0.202	0.201	0.133	0.436	0.376	0.383	0.015	0.023	0.024	0.047	0.234	0.237
Back of Queue (*Q*), ft/ln (95 th percentile)	47.5	70.9	41.1	132.5	144	138.1	4	9.4	9.1	12.9	117.6	112.4
Back of Queue (*Q*), veh/ln (95 th percentile)	1.8	2.7	1.6	5.1	5.5	5.4	0.2	0.4	0.4	0.5	4.5	4.4
Queue Storage Ratio (*RQ*) (95 th percentile)	0.24	0.00	0.11	0.44	0.00	0.00	0.01	0.00	0.03	0.22	0.00	0.00
Uniform Delay (d_1), s/veh	37.9	31.8	31.3	37.3	33.2	33.2	34.5	14.7	14.2	34.7	16.3	15.8
Incremental Delay (d_2), s/veh	0.2	0.0	0.1	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	38.1	31.9	31.4	37.6	33.4	33.4	34.5	14.7	14.2	34.7	16.3	15.9
Level of Service (LOS)	D	C	C	D	C	C	C	B	B	C	B	B
Approach Delay, s/veh / LOS	33.0	C		34.7	C		15.6	B		16.5	B	
Intersection Delay, s/veh / LOS	24.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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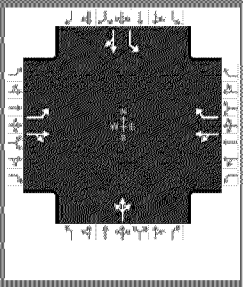
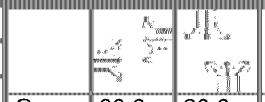
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Back PM.xus		
Project Description	3762				

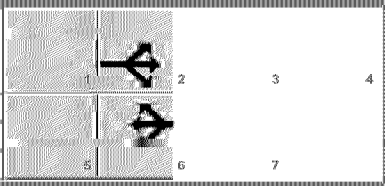


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	414	1	1	1045	132	1	1	1	42	0	130

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	90.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	414	1	1	1045	132	1	1	1	42	0	130
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5			5	2		2		2	2	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0			12.0	10.0		12.0		10.0	10.0	
Turn Bay Length, ft	200	0			0	250		0		150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		90.0		90.0		20.0		20.0
Yellow Change Interval (*Y*), s		4.0		4.0		4.0		4.0
Red Clearance Interval (R_c), s		1.0		1.0		1.0		1.0
Minimum Green (G_{min}), s		20		20		8		8
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0		2.0		2.0
Recall Mode		Min		Min		Off		Off
Dual Entry		Yes		Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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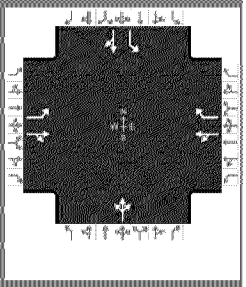
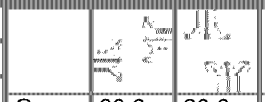
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Back PM.xus		
Project Description	3762				

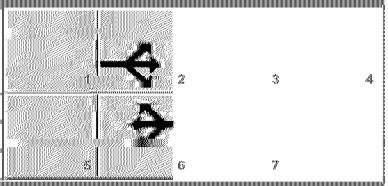


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	414	1	1	1045	132	1	1	1	42	0	130

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	90.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		7.0		8.0		6.0
Phase Duration, s		95.0		95.0		25.0		25.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.3		3.3		3.3		3.3
Queue Clearance Time (g_s), s		68.7		42.4		11.1		14.4
Green Extension Time (g_e), s		5.8		6.3		0.2		0.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.12		0.01		0.00		0.11

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	145	428			1078	136		3		43	134	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	524	1825			1826	1585		1217		1415	1585	
Queue Service Time (g_s), s	26.3	8.6			0.0	2.6		0.0		3.4	9.1	
Cycle Queue Clearance Time (g_c), s	66.7	8.6			40.4	2.6		9.1		12.4	9.1	
Green Ratio (*g/C*)	0.77	0.77			0.77	0.77		0.18		0.18	0.18	
Capacity (*c*), veh/h	285	1399			1430	1215		263		213	291	
Volume-to-Capacity Ratio (*X*)	0.510	0.306			0.754	0.112		0.012		0.204	0.461	
Back of Queue (*Q*), ft/ln (95 th percentile)	148.3	122.6			495.1	31.9		3.4		54.9	162.9	
Back of Queue (*Q*), veh/ln (95 th percentile)	5.8	4.7			19.0	1.3		0.1		2.2	6.4	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.74	0.00			0.00	0.13		0.00		0.37	0.00	
Uniform Delay (d_1), s/veh	27.0	4.3			8.0	3.6		40.2		49.3	43.7	
Incremental Delay (d_2), s/veh	0.6	0.0			2.1	0.0		0.0		0.2	0.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	27.6	4.3			10.1	3.6		40.2		49.4	44.1	
Level of Service (LOS)	C	A			B	A		D		D	D	
Approach Delay, s/veh / LOS	10.2	B		9.3	A		40.2	D		45.4	D	
Intersection Delay, s/veh / LOS	12.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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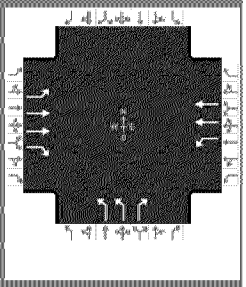
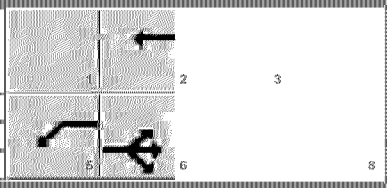
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	732	310	418	978		271		438			

Signal Information					EB			WB			NB		
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	60.0	33.0	15.0	0.0	0.0	0.0			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	0.0	5.0	4.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	2.0	1.0	0.0	0.0	0.0			



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	732	310	418	978		271		438			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	2	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		33.0	60.0	93.0	15.0	15.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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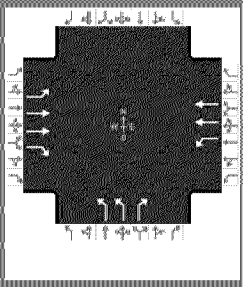
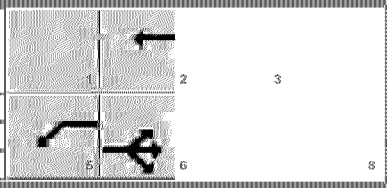
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	732	310	418	978		271		438			

Signal Information					EB			WB			NB		
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	60.0	33.0		15.0	0.0		0.0	0.0	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	0.0	5.0		4.0	0.0		0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	2.0		1.0	0.0		0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		40.0	60.0	100.0		20.0		
Change Period, ($Y+R_c$), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (g_s), s		27.2	21.5	13.0		19.0		
Green Extension Time (g_e), s		3.1	0.8	6.3		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.67	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	796	337	454	1063		295		476			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	539	1738		1809	1738		1689					
Queue Service Time (g_s), s	0.0	25.2		19.5	11.0		9.8					
Cycle Queue Clearance Time (g_c), s	0.0	25.2		19.5	11.0		9.8					
Green Ratio (*g/C*)	0.29	0.29		0.52	0.79		0.14					
Capacity (*c*), veh/h	60	1014		934	2752		478					
Volume-to-Capacity Ratio (*X*)	0.000	0.785		0.486	0.386		0.616					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	422.9		316.8	120.8		194.6					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	16.3		12.2	4.6		7.5					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.70	0.00		0.00					
Uniform Delay (d_1), s/veh	0.0	39.0		18.7	4.0		48.4					
Incremental Delay (d_2), s/veh	0.0	3.8		0.1	0.0		1.7					
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	42.8	0.0	18.9	4.0		50.2		0.0			
Level of Service (LOS)		D	A	B	A		D		A			
Approach Delay, s/veh / LOS	30.1	C		8.5	A		19.2	B		0.0		
Intersection Delay, s/veh / LOS	18.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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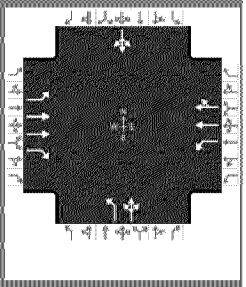
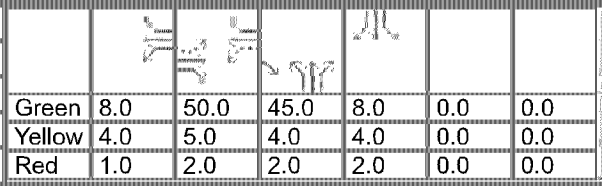
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Back PM + cO Imp - Split-pha…		
Project Description	3762				

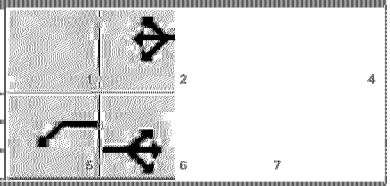


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	791	278	59	858	0	405	0	34	4	0	1

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	8.0	50.0		45.0	8.0	0.0	0.0					
Yellow	4.0	5.0		4.0	4.0	0.0	0.0					
Red	1.0	2.0		2.0	2.0	0.0	0.0					



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	791	278	59	858	0	405	0	34	4	0	1
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	2	0	0	2		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	350	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		50.0	8.0	58.0	45.0	45.0		8.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0	4.0	4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0	2.0	2.0		2.0
Minimum Green (G_{min}), s		25	5	25	6	5		5
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		2.0
Recall Mode		Min	Off	Min	Off	Off		Off
Dual Entry		Yes	No	Yes	No	Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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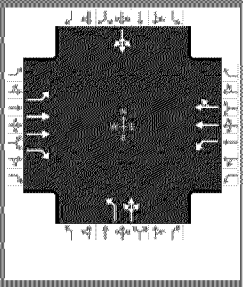
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Back PM + cO Imp - Split-pha…		
Project Description	3762				

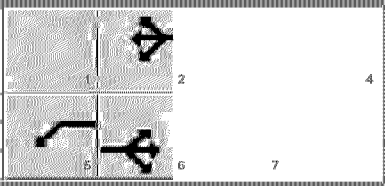


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	791	278	59	858	0	405	0	34	4	0	1

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	50.0	45.0	8.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		10.0		12.0
Phase Duration, s		57.0	13.0	70.0		51.0		14.0
Change Period, ($Y+R_c$), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		2.9	2.9	2.9		3.3		3.2
Queue Clearance Time (g_s), s		28.0	4.6	24.9		24.0		2.4
Green Extension Time (g_e), s		5.1	0.0	5.3		1.0		0.0
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.04	0.45	0.01		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	9	851	299	63	923	0	174	298			5	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	606	1781	1675	1810	1870	0	1810	1785			1766	
Queue Service Time (g_s), s	1.3	26.0	7.8	2.6	22.9	0.0	9.4	22.0			0.4	
Cycle Queue Clearance Time (g_c), s	11.3	26.0	7.8	2.6	22.9	0.0	9.4	22.0			0.4	
Green Ratio (*g/C*)	0.39	0.39	0.73	0.47	0.48		0.35	0.35			0.07	
Capacity (*c*), veh/h	242	1372	1228	314	1801		630	621			131	
Volume-to-Capacity Ratio (*X*)	0.036	0.620	0.243	0.202	0.512	0.000	0.277	0.479			0.041	
Back of Queue (*Q*), ft/ln (95 th percentile)	8.8	409.8	98.5	46.8	369.2	0	187.5	406.1			7.8	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.3	16.1	3.9	1.9	14.5	0.0	7.5	16.2			0.3	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.03	0.00	0.33	0.12	0.00	0.00	0.63	0.00			0.00	
Uniform Delay (d_1), s/veh	32.4	33.5	5.8	22.6	24.7		31.7	52.7			58.0	
Incremental Delay (d_2), s/veh	0.0	0.6	0.0	0.1	0.1	0.0	0.1	0.2			0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	32.5	34.2	5.9	22.7	24.8		31.8	52.9			58.1	
Level of Service (LOS)	C	C	A	C	C		C	D			E	
Approach Delay, s/veh / LOS	26.9	C		24.6	C		45.1	D		58.1	E	
Intersection Delay, s/veh / LOS	29.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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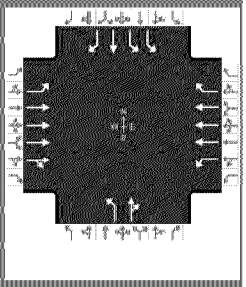
HCS7 Signalized Intersection Input Data

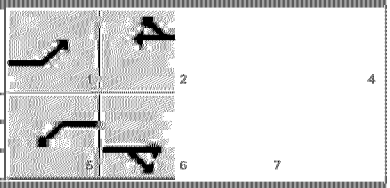
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	51	40	1120	1087	71	110	22	363	57	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	51	40	1120	1087	71	110	22	363	57	28
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		R	0		None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	9.0	44.0	9.0	44.0	23.0	23.0	20.0	20.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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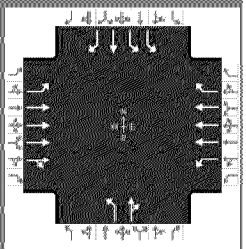
HCS7 Signalized Intersection Results Summary

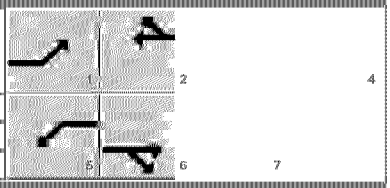
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	51	40	1120	1087	71	110	22	363	57	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	14.0	51.0	14.0	51.0		29.0		26.0
Change Period, ($Y+R_c$), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	3.0	2.9	3.0		3.0		3.1
Queue Clearance Time (g_s), s	4.6	14.8	4.6	48.0		9.9		13.9
Green Extension Time (g_e), s	0.0	12.1	0.0	0.0		0.3		0.6
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.07	0.26	0.06	1.00		0.00		0.11

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	42	803	233	41	1155	1121	73	136		374	59	29
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1579	1781	1658		1781	1773		1730	1826	1585
Queue Service Time (g_s), s	2.6	12.7	12.8	2.6	22.4		4.1	7.9		11.9	3.3	1.8
Cycle Queue Clearance Time (g_c), s	2.6	12.7	12.8	2.6	22.4		4.1	7.9		11.9	3.3	1.8
Green Ratio (*g/C*)	0.09	0.38	0.38	0.09	0.38		0.21	0.21		0.18	0.18	0.18
Capacity (*c*), veh/h	163	2100	605	163	1907		371	369		634	335	291
Volume-to-Capacity Ratio (*X*)	0.259	0.382	0.386	0.253	0.606		0.197	0.368		0.590	0.176	0.099
Back of Queue (*Q*), ft/ln (95 th percentile)	52.5	232.3	204.7	51.3	340.5		80.8	160		223.4	68.2	32.3
Back of Queue (*Q*), veh/ln (95 th percentile)	2.1	8.9	8.1	2.0	13.1		3.2	6.2		8.8	2.6	1.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.15	0.00	0.00	0.17	0.00		0.20	0.00		0.29	0.00	0.05
Uniform Delay (d_1), s/veh	50.7	27.4	26.8	50.7	30.4		39.2	40.7		44.9	41.3	40.8
Incremental Delay (d_2), s/veh	0.3	0.0	0.1	0.3	0.4		0.1	0.2		1.0	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	51.0	27.4	26.9	51.0	30.8	35.0	39.3	41.0		45.9	41.4	40.8
Level of Service (LOS)	D	C	C	D	C	C	D	D		D	D	D
Approach Delay, s/veh / LOS	28.2	C		33.2	C		40.4	D		45.0	D	
Intersection Delay, s/veh / LOS	33.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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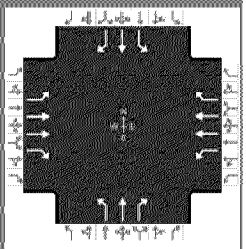
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Back PM.xus		
Project Description	3762				

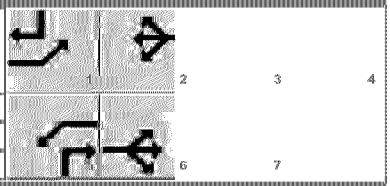


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1033	78	20	852	81	96	40	23	165	68	319

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0	39.0	22.0	22.0	0.0						
Yellow	4.0	4.0	5.0	4.0	4.0	0.0						
Red	1.0	1.0	1.0	1.0	1.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1033	78	20	852	81	96	40	23	165	68	319
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	16.0	50.0	5.0	39.0		22.0		22.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		10
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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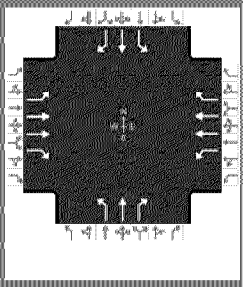
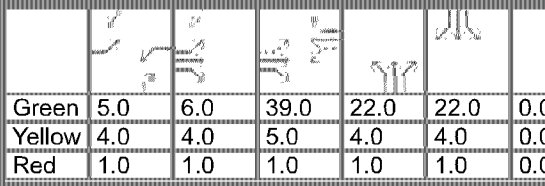
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Back PM.xus		
Project Description	3762				

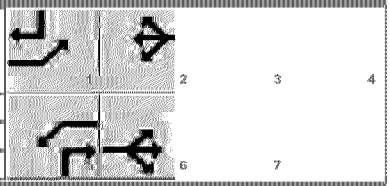


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1033	78	20	852	81	96	40	23	165	68	319

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0	39.0	22.0	22.0	0.0
Yellow	4.0	4.0	5.0	4.0	4.0	0.0
Red	1.0	1.0	1.0	1.0	1.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	21.0	56.0	10.0	45.0		27.0		27.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	11.9	31.6	2.8	28.3		7.6		22.2
Green Extension Time (g_e), s	0.2	5.0	0.0	4.1		0.2		0.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.33	0.06	1.00	0.25		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	256	1054	80	20	869	83	98	41	23	168	69	326
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	9.9	29.6	3.6	0.8	26.3	4.3	5.6	2.1	1.3	10.0	3.7	20.2
Cycle Queue Clearance Time (g_c), s	9.9	29.6	3.6	0.8	26.3	4.3	5.6	2.1	1.3	10.0	3.7	20.2
Green Ratio (*g/C*)	0.51	0.43	0.43	0.40	0.34	0.34	0.20	0.20	0.26	0.20	0.20	0.35
Capacity (*c*), veh/h	405	1506	687	246	1188	542	356	374	426	356	374	555
Volume-to-Capacity Ratio (*X*)	0.632	0.700	0.116	0.083	0.732	0.153	0.275	0.109	0.055	0.473	0.185	0.587
Back of Queue (*Q*), ft/ln (95 th percentile)	181	444.1	57.1	15.2	418.5	71.7	111.2	44.6	23.4	198	77.3	310.3
Back of Queue (*Q*), veh/ln (95 th percentile)	7.1	17.1	2.2	0.6	16.1	2.8	4.4	1.8	0.9	7.8	3.0	12.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.91	0.00	0.13	0.08	0.00	0.42	1.11	0.00	0.00	3.96	1.55	6.21
Uniform Delay (d_1), s/veh	22.4	28.4	20.3	24.1	35.5	27.4	40.6	39.3	33.5	42.4	39.9	31.9
Incremental Delay (d_2), s/veh	2.4	1.2	0.0	0.1	2.1	0.0	0.2	0.0	0.0	0.4	0.1	1.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	24.9	29.6	20.3	24.1	37.5	27.5	40.8	39.3	33.5	42.8	40.0	33.0
Level of Service (LOS)	C	C	C	C	D	C	D	D	C	D	D	C
Approach Delay, s/veh / LOS	28.2	C		36.4	D		39.4	D		36.8	D	
Intersection Delay, s/veh / LOS	32.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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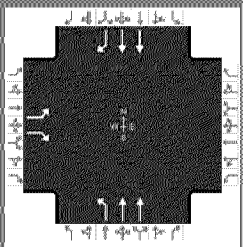
HCS7 Signalized Intersection Input Data

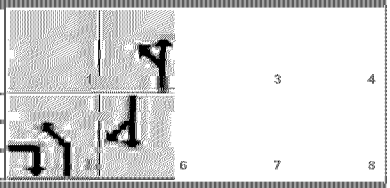
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	291		84				115	1209			651	234

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	291		84				115	1209			651	234
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		25.0			18.0	58.0		40.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*l1*), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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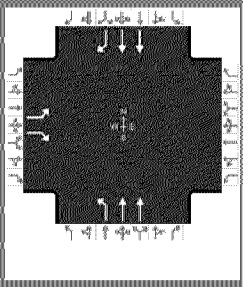
HCS7 Signalized Intersection Results Summary

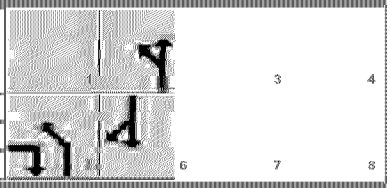
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	291		84				115	1209			651	234

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		30.0			24.0	70.0		46.0
Change Period, ($Y+R_c$), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.0			3.0	2.9		2.9
Queue Clearance Time (g_s), s		17.4			4.7	21.2		16.0
Green Extension Time (g_e), s		0.5			0.1	6.3		6.0
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.04			0.00	0.01		0.04

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	310		89				122	1286			693	249
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (g_s), s	15.4						2.7	19.2			14.0	10.8
Cycle Queue Clearance Time (g_c), s	15.4						2.7	19.2			14.0	10.8
Green Ratio (*g/C*)	0.27						0.64	0.66			0.42	0.42
Capacity (*c*), veh/h	481						639	2350			1496	666
Volume-to-Capacity Ratio (*X*)	0.644						0.192	0.547			0.463	0.374
Back of Queue (*Q*), ft/ln (95 th percentile)	270.4						37.6	246.5			231.1	167.4
Back of Queue (*Q*), veh/ln (95 th percentile)	10.6						1.5	9.7			9.1	6.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.17	0.00			0.00	0.76
Uniform Delay (d_1), s/veh	32.2						8.5	9.4			20.9	20.0
Incremental Delay (d_2), s/veh	2.3						0.1	0.2			0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	34.5		0.0				8.5	9.6			21.0	20.1
Level of Service (LOS)	C		A				A	A			C	C
Approach Delay, s/veh / LOS	26.8	C		0.0			9.5	A		20.7	C	
Intersection Delay, s/veh / LOS	15.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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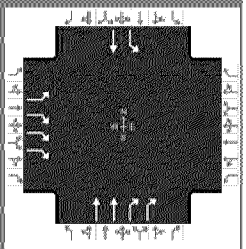
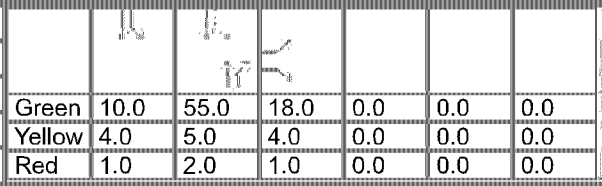
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra…	File Name	md 715 & us 40 EB - Back PM.xus		
Project Description	3762				

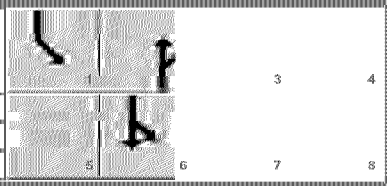


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	97	41	35	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	10.0	55.0		18.0	0.0	0.0	0.0					
Yellow	4.0	5.0		4.0	0.0	0.0	0.0					
Red	1.0	2.0		1.0	0.0	0.0	0.0					



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	97	41	35	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None					0	L + R	0		None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	0	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*l1*), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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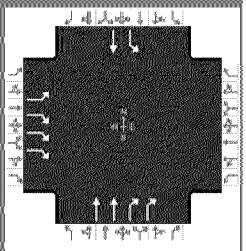
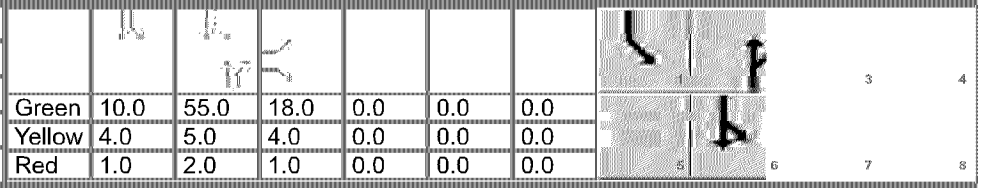
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra…	File Name	md 715 & us 40 EB - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	97	41	35	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Green	10.0	55.0	18.0	0.0	0.0	0.0		
Yellow	4.0	5.0	4.0	0.0	0.0	0.0		
Red	1.0	2.0	1.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		4.3				22.8	2.7	2.6
Green Extension Time (g_e), s		0.2				3.4	0.0	3.4
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		0.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	20		119					1132	104	44	38	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	0.9							20.8		0.7	0.6	
Cycle Queue Clearance Time (g_c), s	0.9							20.8		0.7	0.6	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		472	1315	
Volume-to-Capacity Ratio (*X*)	0.055							0.571		0.093	0.029	
Back of Queue (*Q*), ft/ln (95 th percentile)	17.5							304.1		9.7	8	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.7							11.7		0.4	0.3	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.06							0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	32.4							13.7		7.2	4.3	
Incremental Delay (d_2), s/veh	0.0							0.3		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	32.4		0.0					14.0	0.0	7.2	4.3	
Level of Service (LOS)	C		A					B	A	A	A	
Approach Delay, s/veh / LOS	4.7	A		0.0			12.8	B		5.8	A	
Intersection Delay, s/veh / LOS	11.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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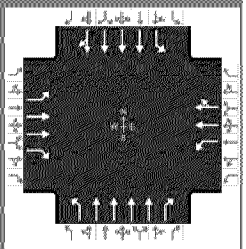
HCS7 Signalized Intersection Input Data

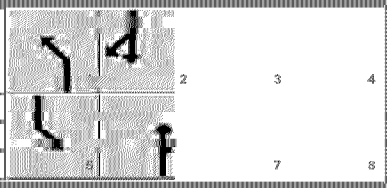
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	54	156	6	28	126	61	28	1019	124	16	111	26

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	54	156	6	28	126	61	28	1019	124	16	111	26
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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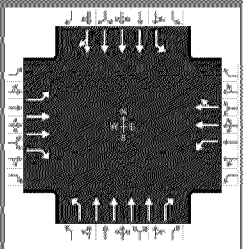
HCS7 Signalized Intersection Results Summary

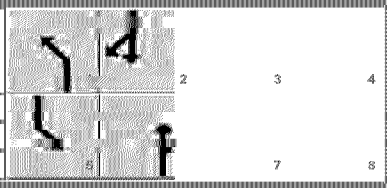
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Background Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Back PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	54	156	6	28	126	61	28	1019	124	16	111	26

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, (*Y+R c*), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.2		3.2	3.0	3.0	3.0	3.0
Queue Clearance Time (*g s*), s		11.5		8.2	3.5	12.6	2.8	3.2
Green Extension Time (*g e*), s		0.7		0.9	0.0	3.6	0.0	3.6
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.03		0.00	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	59	170	7	30	104	99	30	1108	135	17	112	37
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1151	1738	1547	1187	1826	1630	1739	1658	1547	1739	1826	1603
Queue Service Time (*g s*), s	4.5	4.0	0.3	2.2	4.7	5.1	1.5	10.6	5.1	0.8	1.1	1.2
Cycle Queue Clearance Time (*g c*), s	9.5	4.0	0.3	6.2	4.7	5.1	1.5	10.6	5.1	0.8	1.1	1.2
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	267	765	340	286	402	359	296	3117	727	296	2575	754
Volume-to-Capacity Ratio (*X*)	0.220	0.222	0.019	0.107	0.259	0.277	0.103	0.355	0.185	0.059	0.044	0.049
Back of Queue (*Q*), ft/ln (95 th percentile)	59	78.5	5.8	28.9	96.3	90.5	28.5	173.4	77.5	16.1	20	19.2
Back of Queue (*Q*), veh/ln (95 th percentile)	2.3	3.0	0.2	1.1	3.7	3.6	1.1	6.7	3.0	0.6	0.8	0.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.29	0.00	0.02	0.10	0.00	0.00	0.10	0.00	0.28	0.27	0.00	0.00
Uniform Delay (*d 1*), s/veh	36.4	32.0	30.5	34.5	32.3	32.4	35.1	17.4	15.4	34.8	14.9	14.4
Incremental Delay (*d 2*), s/veh	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	36.5	32.0	30.6	34.6	32.4	32.5	35.1	17.4	15.4	34.8	14.9	14.4
Level of Service (LOS)	D	C	C	C	C	C	D	B	B	C	B	B
Approach Delay, s/veh / LOS	33.1	C		32.7	C		17.7	B		16.9	B	
Intersection Delay, s/veh / LOS	21.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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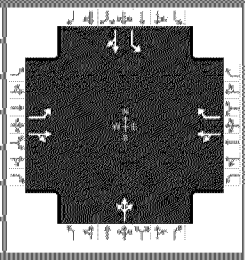
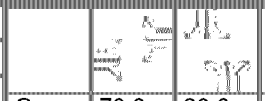
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Fu AM.xus		
Project Description	3762				

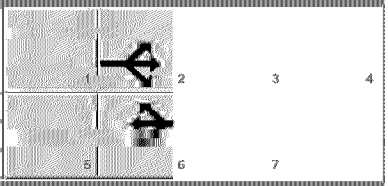


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	616	0	0	470	37	1	0	0	68	1	136

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	70.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	616	0	0	470	37	1	0	0	68	1	136
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5			5	2		2		2	2	
Ped / Bike / RTOR, /h	0	0		0	0	0	0	0		0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0			12.0	10.0		12.0		10.0	10.0	
Turn Bay Length, ft	200	0			0	250		0		150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		70.0		70.0		20.0		20.0
Yellow Change Interval (*Y*), s		4.0		4.0		4.0		4.0
Red Clearance Interval (R_c), s		1.0		1.0		1.0		1.0
Minimum Green (G_{min}), s		20		20		8		8
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0		2.0		2.0
Recall Mode		Min		Min		Off		Off
Dual Entry		Yes		Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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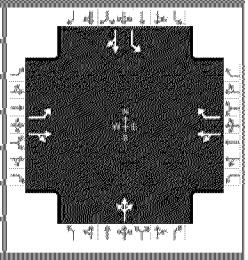
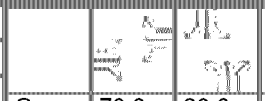
HCS7 Signalized Intersection Results Summary

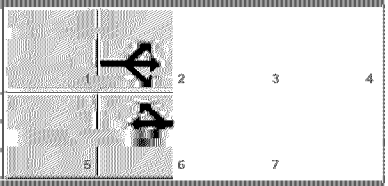
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	616	0	0	470	37	1	0	0	68	1	136

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On





Green	70.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		7.0		8.0		6.0
Phase Duration, s		75.0		75.0		25.0		25.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		16.9		12.1		9.7		13.2
Green Extension Time (g_e), s		2.8		2.8		0.3		0.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.04

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	87	0			0	38		1		70	141	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	911	0			0	1585		815		1781	1587	
Queue Service Time (g_s), s	4.0	0.0			0.0	0.7		0.1		3.5	7.6	
Cycle Queue Clearance Time (g_c), s	14.1	0.0			0.0	0.7		7.7		11.2	7.6	
Green Ratio (*g/C*)	0.72					0.72		0.22		0.22	0.22	
Capacity (*c*), veh/h	636					1141		251		327	349	
Volume-to-Capacity Ratio (*X*)	0.136	0.000			0.000	0.033		0.004		0.214	0.405	
Back of Queue (*Q*), ft/ln (95 th percentile)	33.1	0			0	8.4		0.9		69.5	132.7	
Back of Queue (*Q*), veh/ln (95 th percentile)	1.3	0.0			0.0	0.3		0.0		2.7	5.2	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.17	0.00			0.00	0.03		0.00		0.46	0.00	
Uniform Delay (d_1), s/veh	8.0					4.0		36.7		38.2	33.4	
Incremental Delay (d_2), s/veh	0.0	0.0			0.0	0.0		0.0		0.1	0.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	8.1					4.0		36.7		38.3	33.7	
Level of Service (LOS)	A					A		D		D	C	
Approach Delay, s/veh / LOS	6.3	A		5.3	A		36.7	D		35.2	D	
Intersection Delay, s/veh / LOS	10.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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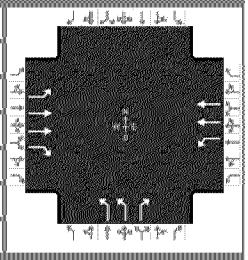
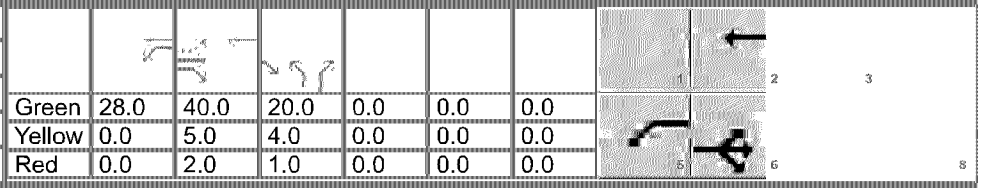
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	900	208	270	538		187		1036			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	28.0	40.0		20.0	0.0		0.0					
Yellow	0.0	5.0		4.0	0.0		0.0					
Red	0.0	2.0		1.0	0.0		0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	900	208	270	538		187		1036			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	5	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		40.0	28.0	68.0	20.0	20.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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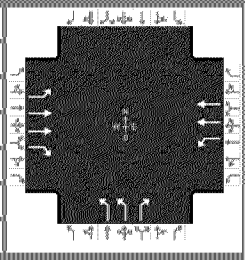
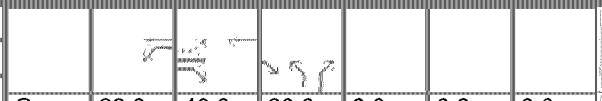
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 6:30
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Fu AM.xus		
Project Description	3762				

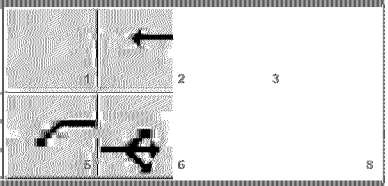


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	900	208	270	538		187		1036			

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	28.0	40.0	20.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		47.0	28.0	75.0		25.0		
Change Period, ($Y+R_c$), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (g_s), s		25.1	15.7	8.1		24.0		
Green Extension Time (g_e), s		4.1	0.4	4.7		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.09	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	989	229	297	591		205		1138			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	839	1738	1609	1809	1738		1689					
Queue Service Time (g_s), s	0.0	23.1	6.0	13.7	6.1		5.1					
Cycle Queue Clearance Time (g_c), s	0.0	23.1	6.0	13.7	6.1		5.1					
Green Ratio (*g/C*)	0.42	0.42	0.64	0.30	0.70		0.22					
Capacity (*c*), veh/h	72	1460	1030	543	2434		743					
Volume-to-Capacity Ratio (*X*)	0.000	0.677	0.222	0.547	0.243		0.277					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	357.9	80.8	251.3	79.8		93.1					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	13.8	3.1	9.7	3.1		3.6					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.08	0.56	0.00		0.00					
Uniform Delay (d_1), s/veh	0.0	23.5	7.6	29.3	5.7		32.4					
Incremental Delay (d_2), s/veh	0.0	1.0	0.0	0.7	0.0		0.1					
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	24.6	7.6	30.0	5.7		32.5		0.0			
Level of Service (LOS)		C	A	C	A		C		A			
Approach Delay, s/veh / LOS	21.4	C		13.8	B		5.0	A		0.0		
Intersection Delay, s/veh / LOS	13.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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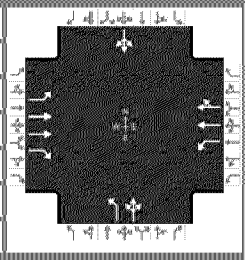
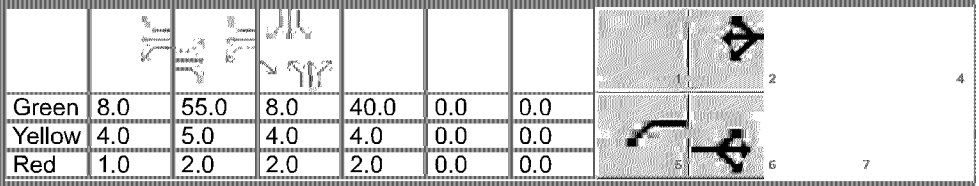
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Fu AM +Co Imp - Split-phase…		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	1061	781	34	466	3	274	0	19	0	0	8

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	8.0	40.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	1061	781	34	466	3	274	0	19	0	0	8
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	2	0	0	2		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	300	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		55.0	8.0	63.0	40.0	40.0		8.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0	4.0	4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0	2.0	2.0		2.0
Minimum Green (G_{min}), s		25	5	25	6	5		5
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		2.0
Recall Mode		Min	Off	Min	Off	Off		Off
Dual Entry		Yes	No	Yes	No	Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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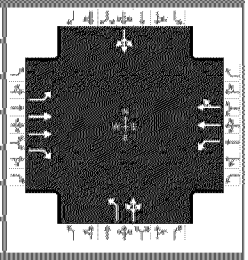
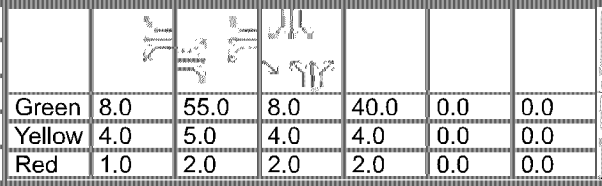
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.90
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 6:15
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Fu AM +Co Imp - Split-phase…		
Project Description	3762				

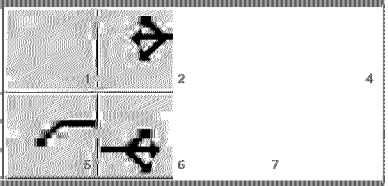


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	3	1061	781	34	466	3	274	0	19	0	0	8

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	55.0	8.0	40.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		10.0		12.0
Phase Duration, s		62.0	13.0	75.0		46.0		14.0
Change Period, ($Y+R_c$), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		3.0	2.9	3.0		3.3		3.4
Queue Clearance Time (g_s), s		40.7	3.4	12.5		14.8		2.7
Green Extension Time (g_e), s		5.9	0.0	7.6		0.7		0.0
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.33	0.04	0.01		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	3	1179	868	38	261	260	152	173			0	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	881	1781	1675	1810	1870	1866	1810	1785			0	
Queue Service Time (g_s), s	0.3	38.6	38.7	1.4	10.5	10.5	8.5	12.8			0.0	
Cycle Queue Clearance Time (g_c), s	0.3	38.6	38.7	1.4	10.5	10.5	8.5	12.8			0.0	
Green Ratio (*g/C*)	0.42	0.42	0.73	0.51	0.52	0.52	0.31	0.31				
Capacity (*c*), veh/h	425	1504	1228	253	970	968	563	555				
Volume-to-Capacity Ratio (*X*)	0.008	0.784	0.707	0.149	0.269	0.269	0.270	0.312			0.000	
Back of Queue (*Q*), ft/ln (95 th percentile)	2.7	575.7	421.8	25.1	194.9	194.7	172.1	259.9			0	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.1	22.7	16.9	1.0	7.7	7.7	6.9	10.4			0.0	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.01	0.00	1.41	0.06	0.00	0.00	0.57	0.00			0.00	
Uniform Delay (d_1), s/veh	22.6	33.7	10.0	23.1	18.7	18.2	35.0	50.9				
Incremental Delay (d_2), s/veh	0.0	2.6	1.6	0.1	0.1	0.1	0.1	0.1			0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	22.6	36.2	11.6	23.2	18.7	18.2	35.1	51.0				
Level of Service (LOS)	C	D	B	C	B	B	D	D				
Approach Delay, s/veh / LOS	25.8	C		18.8	B		43.5	D		58.3	E	
Intersection Delay, s/veh / LOS	26.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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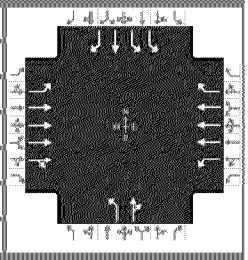
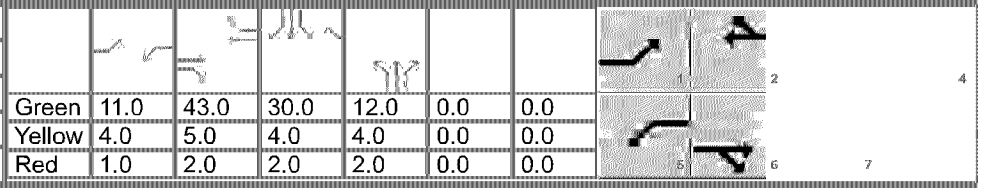
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	228	32	667	374	67	71	12	667	123	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	11.0	43.0	30.0	12.0	0.0	0.0						
Yellow	4.0	5.0	4.0	4.0	0.0	0.0						
Red	1.0	2.0	2.0	2.0	0.0	0.0						

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	228	32	667	374	67	71	12	667	123	26
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	11.0	43.0	11.0	43.0	12.0	12.0	30.0	30.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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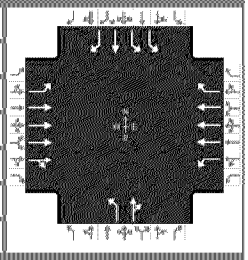
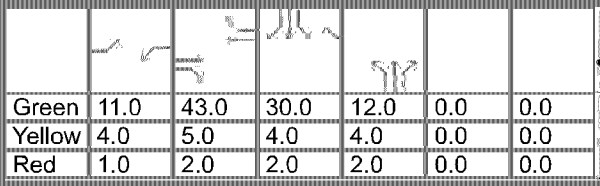
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.96
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	US 40 at MD 7/MD 159	File Name	US 40 at MD 7 - Fu AM.xus		
Project Description	3762				

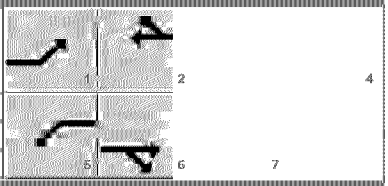


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	1152	228	32	667	374	67	71	12	667	123	26

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	11.0	43.0	30.0	12.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	16.0	50.0	16.0	50.0		18.0		36.0
Change Period, (*Y+R c*), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.0		3.1
Queue Clearance Time (*g s*), s	2.9	21.2	4.0	16.0		7.4		24.1
Green Extension Time (*g e*), s	0.0	6.7	0.0	7.0		0.1		1.3
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.00	0.11	0.00	0.06		0.17		0.28

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	15	1108	330	33	695	390	70	86		695	128	27
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1616	1781	1658		1781	1780		1730	1826	1585
Queue Service Time (*g s*), s	0.9	19.0	19.2	2.0	12.2		4.3	5.4		22.1	6.6	1.5
Cycle Queue Clearance Time (*g c*), s	0.9	19.0	19.2	2.0	12.2		4.3	5.4		22.1	6.6	1.5
Green Ratio (*g/C*)	0.11	0.38	0.38	0.11	0.38		0.12	0.12		0.27	0.27	0.27
Capacity (*c*), veh/h	193	2054	606	193	1865		208	208		922	487	423
Volume-to-Capacity Ratio (*X*)	0.076	0.539	0.544	0.173	0.373		0.336	0.416		0.753	0.263	0.064
Back of Queue (*Q*), ft/ln (95 th percentile)	17.4	322.4	289.7	40.3	208.8		87.6	112.3		372	136.8	26.7
Back of Queue (*Q*), veh/ln (95 th percentile)	0.7	12.4	11.4	1.6	8.0		3.4	4.3		14.6	5.3	1.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.05	0.00	0.00	0.13	0.00		0.22	0.00		0.48	0.00	0.04
Uniform Delay (*d 1*), s/veh	48.1	30.1	29.4	48.6	27.9		48.7	49.2		40.4	34.7	32.8
Incremental Delay (*d 2*), s/veh	0.1	0.2	0.6	0.2	0.0		0.4	0.5		3.2	0.1	0.0
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	48.2	30.2	30.0	48.8	27.9	10.0	49.1	49.7		43.5	34.8	32.9
Level of Service (LOS)	D	C	C	D	C	A	D	D		D	C	C
Approach Delay, s/veh / LOS	30.4	C		22.3	C		49.4	D		41.9	D	
Intersection Delay, s/veh / LOS	31.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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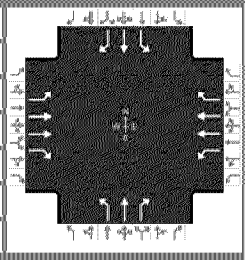
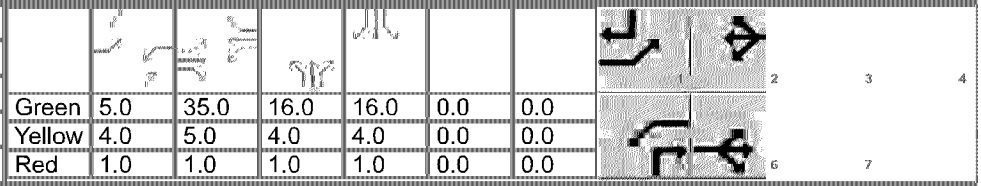
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	528	25	16	937	50	86	27	51	76	21	194

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	35.0	16.0	16.0	0.0	0.0						
Yellow	4.0	5.0	4.0	4.0	0.0	0.0						
Red	1.0	1.0	1.0	1.0	0.0	0.0						

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	528	25	16	937	50	86	27	51	76	21	194
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	10.0	40.0	5.0	35.0		16.0		16.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		8
Start-Up Lost Time (*l*t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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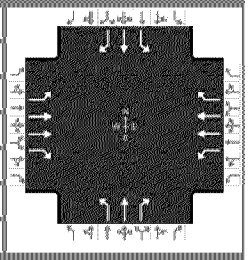
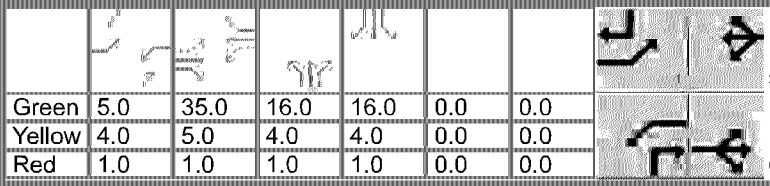
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.98
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:00
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	123	528	25	16	937	50	86	27	51	76	21	194

Signal Information			
Cycle, s	98.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	35.0	16.0	16.0	0.0	0.0						
Yellow	4.0	5.0	4.0	4.0	0.0	0.0						
Red	1.0	1.0	1.0	1.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	15.0	46.0	10.0	41.0		21.0		21.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	5.6	12.3	2.5	25.1		6.1		11.7
Green Extension Time (g_e), s	0.1	3.6	0.0	2.9		0.2		0.3
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.14	0.00	1.00	0.15		0.00		0.43

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	126	539	26	16	956	51	88	28	52	78	21	198
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	3.6	10.3	0.9	0.5	23.1	2.0	4.1	1.2	2.4	3.6	0.9	9.7
Cycle Queue Clearance Time (g_c), s	3.6	10.3	0.9	0.5	23.1	2.0	4.1	1.2	2.4	3.6	0.9	9.7
Green Ratio (*g/C*)	0.52	0.43	0.43	0.45	0.38	0.38	0.18	0.18	0.26	0.18	0.18	0.31
Capacity (*c*), veh/h	375	1490	679	446	1313	598	327	344	421	327	344	485
Volume-to-Capacity Ratio (*X*)	0.335	0.362	0.038	0.037	0.728	0.085	0.268	0.080	0.124	0.237	0.062	0.408
Back of Queue (*Q*), ft/ln (95 th percentile)	56.4	172.5	13.7	8.3	356.7	31.3	80.2	24.3	41.8	70.5	18.8	161.9
Back of Queue (*Q*), veh/ln (95 th percentile)	2.2	6.6	0.5	0.3	13.7	1.2	3.2	1.0	1.6	2.8	0.7	6.4
Queue Storage Ratio (*RQ*) (95 th percentile)	0.28	0.00	0.03	0.04	0.00	0.18	0.80	0.00	0.00	1.41	0.38	3.24
Uniform Delay (d_1), s/veh	16.2	19.5	16.3	15.5	27.0	19.6	34.3	33.1	28.1	34.1	33.0	27.0
Incremental Delay (d_2), s/veh	0.2	0.1	0.0	0.0	1.8	0.0	0.2	0.0	0.0	0.1	0.0	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	16.4	19.6	16.3	15.5	28.8	19.6	34.5	33.2	28.1	34.3	33.1	27.2
Level of Service (LOS)	B	B	B	B	C	B	C	C	C	C	C	C
Approach Delay, s/veh / LOS	18.9	B		28.1	C		32.3	C		29.4	C	
Intersection Delay, s/veh / LOS	25.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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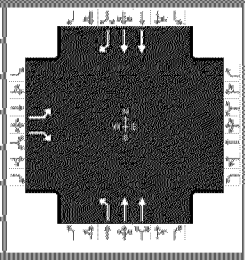
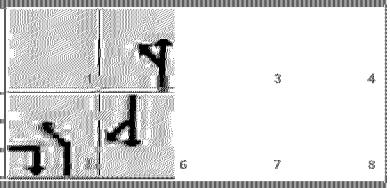
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	136		116				69	251			1244	261

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	18.0	50.0		15.0	0.0	0.0	0.0					
Yellow	4.0	5.0		4.0	0.0	0.0	0.0					
Red	2.0	1.0		1.0	0.0	0.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	136		116				69	251			1244	261
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		15.0			18.0	65.0		50.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*l*t), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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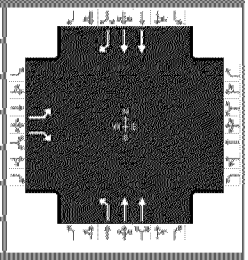
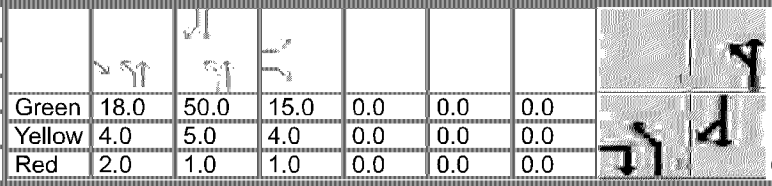
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	136		116				69	251			1244	261

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	18.0	50.0	15.0	0.0	0.0	0.0	3	4	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0			
Red	2.0	1.0	1.0	0.0	0.0	0.0	6	7	8

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		20.0			24.0	80.0		56.0
Change Period, (*Y+R c*), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.1			3.0	2.9		2.9
Queue Clearance Time (*g s*), s		9.6			3.2	4.0		31.9
Green Extension Time (*g e*), s		0.3			0.1	5.3		4.8
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.13			0.00	0.00		0.06

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	149		127				76	276			1367	287
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (*g s*), s	7.6						1.2	2.0			29.9	10.6
Cycle Queue Clearance Time (*g c*), s	7.6						1.2	2.0			29.9	10.6
Green Ratio (*g/C*)	0.17						0.74	0.76			0.52	0.52
Capacity (*c*), veh/h	303						516	2706			1852	824
Volume-to-Capacity Ratio (*X*)	0.494						0.147	0.102			0.738	0.348
Back of Queue (*Q*), ft/ln (95 th percentile)	145.3						22.1	19.9			416.2	154
Back of Queue (*Q*), veh/ln (95 th percentile)	5.7						0.9	0.8			16.4	6.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.10	0.00			0.00	0.70
Uniform Delay (*d 1*), s/veh	37.6						9.8	3.4			18.7	14.1
Incremental Delay (*d 2*), s/veh	0.5						0.0	0.0			1.4	0.1
Initial Queue Delay (*d 3*), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	38.1		0.0				9.9	3.4			20.1	14.2
Level of Service (LOS)	D		A				A	A			C	B
Approach Delay, s/veh / LOS	20.5		C	0.0			4.8		A	19.1		B
Intersection Delay, s/veh / LOS	17.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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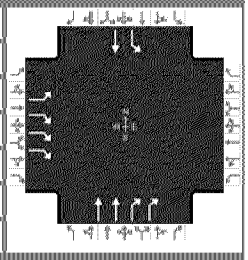
HCS7 Signalized Intersection Input Data

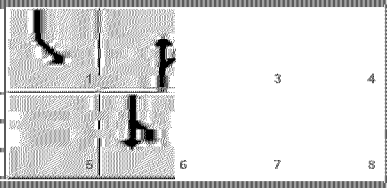
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	77	29	197	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	77	29	197	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*l*t), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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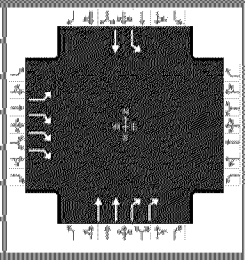
HCS7 Signalized Intersection Results Summary

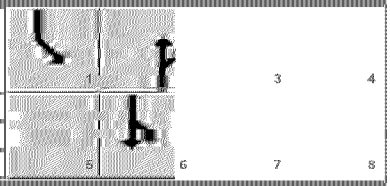
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	AM Peak	PHF	0.91
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	71		811					161	77	29	197	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		22.0				4.3	2.5	5.8
Green Extension Time (g_e), s		0.0				1.0	0.0	1.0
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		1.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	78		891					177	85	32	216	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	3.5							2.3		0.5	3.8	
Cycle Queue Clearance Time (g_c), s	3.5							2.3		0.5	3.8	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		960	1315	
Volume-to-Capacity Ratio (*X*)	0.211							0.089		0.033	0.165	
Back of Queue (*Q*), ft/ln (95 th percentile)	69.1							37.6		6.9	51.6	
Back of Queue (*Q*), veh/ln (95 th percentile)	2.7							1.4		0.3	2.0	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.23							0.00		0.05	0.00	
Uniform Delay (d_1), s/veh	33.4							9.7		4.4	4.7	
Incremental Delay (d_2), s/veh	0.1							0.0		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	33.5		0.0					9.7	0.0	4.4	4.8	
Level of Service (LOS)	C		A					A	A	A	A	
Approach Delay, s/veh / LOS	2.7		A	0.0			6.6		A	4.7		A
Intersection Delay, s/veh / LOS	3.7						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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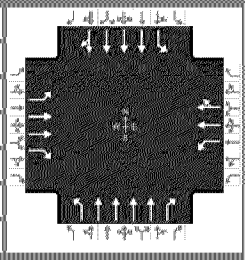
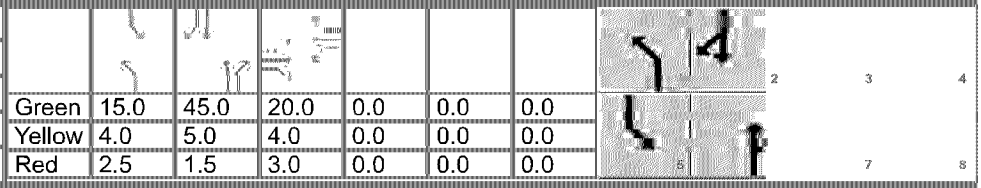
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Fu AM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	62	161	42	119	327	30	4	66	16	13	695	126

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	15.0	45.0		20.0	0.0	0.0	0.0					
Yellow	4.0	5.0		4.0	0.0	0.0	0.0					
Red	2.5	1.5		3.0	0.0	0.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	62	161	42	119	327	30	4	66	16	13	695	126
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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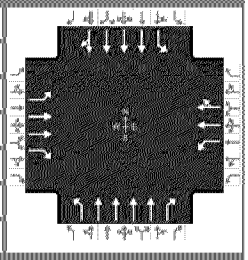
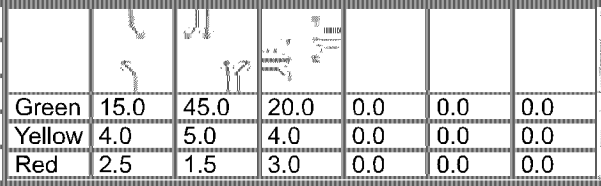
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	AM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 7:15
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Fu AM.xus		
Project Description	3762				

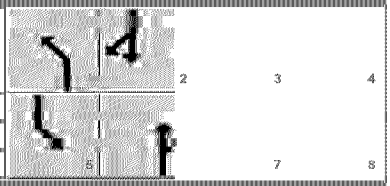


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	62	161	42	119	327	30	4	66	16	13	695	126

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, ($Y+R_c$), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.3		3.3	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s		17.8		16.0	2.2	2.6	2.7	9.7
Green Extension Time (g_e), s		0.6		0.9	0.0	2.2	0.0	2.2
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		1.00		0.75	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	67	173	45	128	194	190	4	71	17	14	675	208
Adjusted Saturation Flow Rate (*s*), veh/h/ln	976	1738	1547	1183	1826	1772	1739	1658	1547	1739	1826	1634
Queue Service Time (g_s), s	6.4	4.1	2.3	10.0	9.3	9.4	0.2	0.6	0.6	0.7	7.4	7.7
Cycle Queue Clearance Time (g_c), s	15.8	4.1	2.3	14.0	9.3	9.4	0.2	0.6	0.6	0.7	7.4	7.7
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	195	765	340	284	402	390	296	3117	727	296	2575	768
Volume-to-Capacity Ratio (*X*)	0.342	0.226	0.133	0.451	0.482	0.488	0.015	0.023	0.024	0.047	0.262	0.271
Back of Queue (*Q*), ft/ln (95 th percentile)	72.6	80.3	41.1	133.6	189.9	182.3	4	9.4	9.1	12.9	133.9	121.9
Back of Queue (*Q*), veh/ln (95 th percentile)	2.8	3.1	1.6	5.1	7.3	7.2	0.2	0.4	0.4	0.5	5.1	4.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.36	0.00	0.11	0.45	0.00	0.00	0.01	0.00	0.03	0.22	0.00	0.00
Uniform Delay (d_1), s/veh	41.0	32.0	31.3	37.8	34.0	34.1	34.5	14.7	14.2	34.7	16.6	16.1
Incremental Delay (d_2), s/veh	0.4	0.1	0.1	0.4	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	41.4	32.1	31.4	38.2	34.4	34.4	34.5	14.7	14.2	34.7	16.6	16.2
Level of Service (LOS)	D	C	C	D	C	C	C	B	B	C	B	B
Approach Delay, s/veh / LOS	34.1	C		35.3	D		15.6	B		16.8	B	
Intersection Delay, s/veh / LOS	24.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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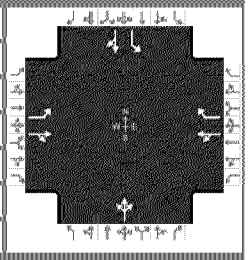
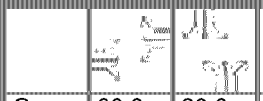
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Future PM.xus		
Project Description	3762				

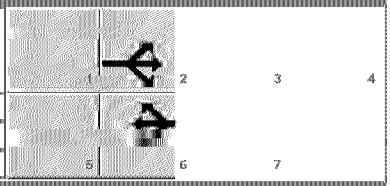


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	445	1	1	1094	132	1	1	1	42	0	130

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	90.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	445	1	1	1094	132	1	1	1	42	0	130
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5			5	2		2		2	2	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0			12.0	10.0		12.0		10.0	10.0	
Turn Bay Length, ft	200	0			0	250		0		150	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		90.0		90.0		20.0		20.0
Yellow Change Interval (*Y*), s		4.0		4.0		4.0		4.0
Red Clearance Interval (R_c), s		1.0		1.0		1.0		1.0
Minimum Green (G_{min}), s		20		20		8		8
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0		2.0		2.0
Recall Mode		Min		Min		Off		Off
Dual Entry		Yes		Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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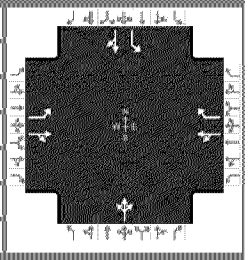
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	5/12/2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 7 at Stepney Rd	File Name	md 7 at stepney - Future PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	141	445	1	1	1094	132	1	1	1	42	0	130

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	1	2	3	4	5	6	7	8				
Green	90.0	20.0	0.0	0.0	0.0	0.0						
Yellow	4.0	4.0	0.0	0.0	0.0	0.0						
Red	1.0	1.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		7.0		8.0		6.0
Phase Duration, s		95.0		95.0		25.0		25.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.3		3.3		3.3		3.3
Queue Clearance Time (g_s), s		77.5		47.3		11.1		14.4
Green Extension Time (g_e), s		5.1		6.9		0.2		0.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.38		0.02		0.00		0.11

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	145	460			1129	136		3		43	134	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	499	1825			1826	1585		1217		1415	1585	
Queue Service Time (g_s), s	30.1	9.4			0.0	2.6		0.0		3.4	9.1	
Cycle Queue Clearance Time (g_c), s	75.5	9.4			45.3	2.6		9.1		12.4	9.1	
Green Ratio (*g/C*)	0.77	0.77			0.77	0.77		0.18		0.18	0.18	
Capacity (*c*), veh/h	254	1399			1430	1215		263		213	291	
Volume-to-Capacity Ratio (*X*)	0.572	0.329			0.790	0.112		0.012		0.204	0.461	
Back of Queue (*Q*), ft/ln (95 th percentile)	168.3	134.8			552.4	31.9		3.4		54.9	162.9	
Back of Queue (*Q*), veh/ln (95 th percentile)	6.6	5.2			21.2	1.3		0.1		2.2	6.4	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.84	0.00			0.00	0.13		0.00		0.37	0.00	
Uniform Delay (d_1), s/veh	31.6	4.4			8.6	3.6		40.2		49.3	43.7	
Incremental Delay (d_2), s/veh	2.0	0.1			2.8	0.0		0.0		0.2	0.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	33.6	4.4			11.4	3.6		40.2		49.4	44.1	
Level of Service (LOS)	C	A			B	A		D		D	D	
Approach Delay, s/veh / LOS	11.4	B		10.5	B		40.2	D		45.4	D	
Intersection Delay, s/veh / LOS	13.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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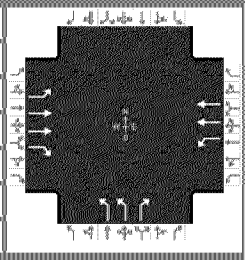
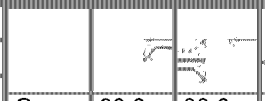
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Fu PM.xus		
Project Description	3762				

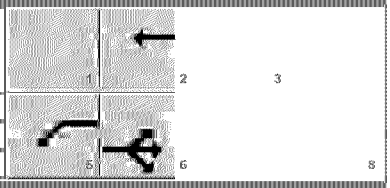


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	796	310	649	1079		271		586			

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	60.0	33.0	15.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	796	310	649	1079		271		586			
Initial Queue (Q_b), veh/h	0	0	0	0	0		0		0			
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900		1900		1900			
Parking (N_m), man/h		None			None			None				
Heavy Vehicles (P_{HV}), %	0	5	2	5	5		5		0			
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0		0	0	
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0			
Arrival Type (*AT*)	3	3	3	3	3		3		3			
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Lane Width (*W*), ft	11.0	12.0	13.0	13.0	12.0		10.0		12.0			
Turn Bay Length, ft	200	0	1035	450	0		0		0			
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	45	45	45	45	45		45		45			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		33.0	60.0	93.0	15.0	15.0		
Yellow Change Interval (*Y*), s		5.0	0.0	5.0	4.0	4.0		
Red Clearance Interval (R_c), s		2.0	0.0	2.0	2.0	1.0		
Minimum Green (G_{min}), s		25	10	25	5	5		
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0			
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0			
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (*Walk*), s		0.0				0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0				0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0		No	0	0	No		0	
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50			0.50		No	0.50		No		

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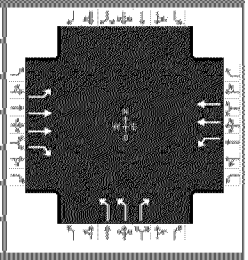
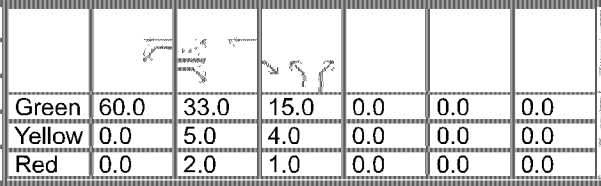
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Apr 27, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 3:45
Intersection	US 40 & MD 543	File Name	us 40 & md 543 - Fu PM.xus		
Project Description	3762				

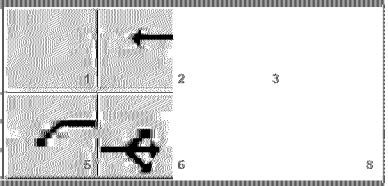


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	0	796	310	649	1079		271		586			

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	60.0	33.0	15.0	0.0	0.0	0.0
Yellow	0.0	5.0	4.0	0.0	0.0	0.0
Red	0.0	2.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		5.3	2.0	4.0		9.0		
Phase Duration, s		40.0	60.0	100.0		20.0		
Change Period, ($Y+R_c$), s		7.0	0.0	7.0		5.0		
Max Allow Headway (*MAH*), s		3.0	3.0	3.0		3.2		
Queue Clearance Time (g_s), s		30.2	39.1	14.7		19.0		
Green Extension Time (g_e), s		1.9	1.4	7.3		0.0		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		1.00	0.00	0.00		1.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2		7		14			
Adjusted Flow Rate (*v*), veh/h	0	865	337	705	1173		295		637			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	486	1738		1809	1738		1689					
Queue Service Time (g_s), s	0.0	28.2		37.1	12.7		9.8					
Cycle Queue Clearance Time (g_c), s	0.0	28.2		37.1	12.7		9.8					
Green Ratio (*g/C*)	0.29	0.29		0.52	0.79		0.14					
Capacity (*c*), veh/h	60	1014		934	2752		478					
Volume-to-Capacity Ratio (*X*)	0.000	0.853		0.755	0.426		0.616					
Back of Queue (*Q*), ft/ln (95 th percentile)	0	475.7		565.3	140.2		194.6					
Back of Queue (*Q*), veh/ln (95 th percentile)	0.0	18.3		21.7	5.4		7.5					
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		1.26	0.00		0.00					
Uniform Delay (d_1), s/veh	0.0	40.1		23.0	4.2		48.4					
Incremental Delay (d_2), s/veh	0.0	6.8		3.2	0.0		1.7					
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0					
Control Delay (*d*), s/veh	0.0	46.9	0.0	26.1	4.2		50.2		0.0			
Level of Service (LOS)		D	A	C	A		D		A			
Approach Delay, s/veh / LOS	33.8	C		12.4	B		15.9	B		0.0		
Intersection Delay, s/veh / LOS	19.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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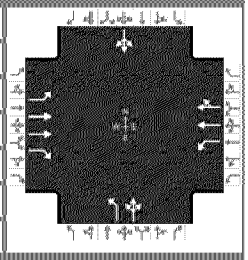
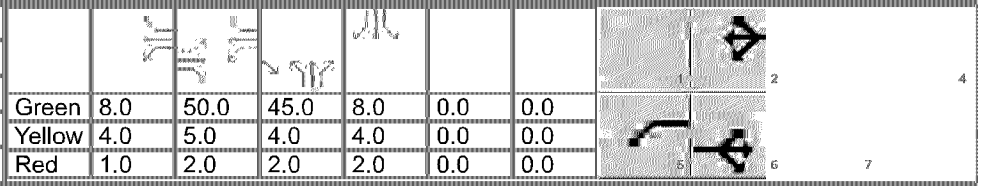
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Fu PM + cO Imp - Split-phase…		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	864	417	59	972	0	623	0	34	4	0	1

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	50.0	45.0	8.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	864	417	59	972	0	623	0	34	4	0	1
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	2	0	0	2		0	0			0	
Ped / Bike / RTOR, /h	0	0	0	0	0		0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	15.0	12.0	12.0		10.0	11.0			12.0	
Turn Bay Length, ft	350	0	300	400	0		300	0			0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		50.0	8.0	58.0	45.0	45.0		8.0
Yellow Change Interval (*Y*), s		5.0	4.0	0.0	4.0	4.0		4.0
Red Clearance Interval (R_c), s		2.0	1.0	0.0	2.0	2.0		2.0
Minimum Green (G_{min}), s		25	5	25	6	5		5
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0	2.0	2.0	2.0	2.0		2.0
Recall Mode		Min	Off	Min	Off	Off		Off
Dual Entry		Yes	No	Yes	No	Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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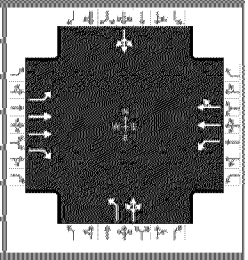
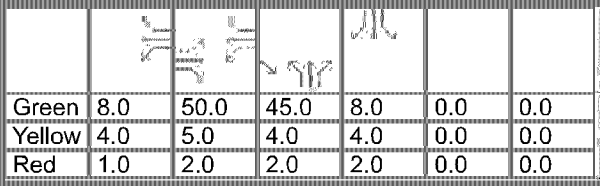
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:45
Intersection	US 40 & Spesutia Road	File Name	US 40 & Spesutia - Fu PM + cO Imp - Split-phase…		
Project Description	3762				

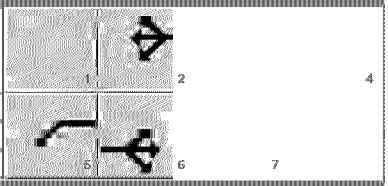


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	8	864	417	59	972	0	623	0	34	4	0	1

Signal Information			
Cycle, s	135.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	50.0	45.0	8.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		8		4
Case Number		5.3	1.0	4.0		10.0		12.0
Phase Duration, s		57.0	13.0	70.0		51.0		14.0
Change Period, ($Y+R_c$), s		7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s		2.9	2.9	2.9		3.3		3.2
Queue Clearance Time (g_s), s		31.3	4.6	29.1		34.7		2.4
Green Extension Time (g_e), s		6.1	0.0	6.7		1.4		0.0
Phase Call Probability		1.00	1.00	1.00		1.00		1.00
Max Out Probability		0.13	0.45	0.04		0.06		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	9	929	448	63	1045	0	268	438			5	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	540	1781	1675	1810	1870	0	1810	1793			1766	
Queue Service Time (g_s), s	1.6	29.3	13.2	2.6	27.1	0.0	15.3	32.7			0.4	
Cycle Queue Clearance Time (g_c), s	15.7	29.3	13.2	2.6	27.1	0.0	15.3	32.7			0.4	
Green Ratio (*g/C*)	0.39	0.39	0.73	0.47	0.48		0.35	0.35			0.07	
Capacity (*c*), veh/h	205	1372	1228	290	1801		630	624			131	
Volume-to-Capacity Ratio (*X*)	0.042	0.677	0.365	0.219	0.580	0.000	0.425	0.702			0.041	
Back of Queue (*Q*), ft/ln (95 th percentile)	9.3	454.9	165.8	46.9	426.1	0	277	585.5			7.8	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.4	17.9	6.6	1.9	16.8	0.0	11.1	23.4			0.3	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.03	0.00	0.55	0.12	0.00	0.00	0.92	0.00			0.00	
Uniform Delay (d_1), s/veh	35.5	34.5	6.6	23.4	25.8		33.7	58.6			58.0	
Incremental Delay (d_2), s/veh	0.0	1.1	0.1	0.1	0.3	0.0	0.2	3.0			0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (*d*), s/veh	35.6	35.6	6.6	23.5	26.1		33.8	61.6			58.1	
Level of Service (LOS)	D	D	A	C	C		C	E			E	
Approach Delay, s/veh / LOS	26.2		C	26.0		C	51.1		D	58.1		E
Intersection Delay, s/veh / LOS	31.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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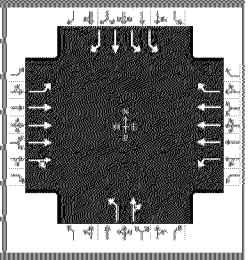
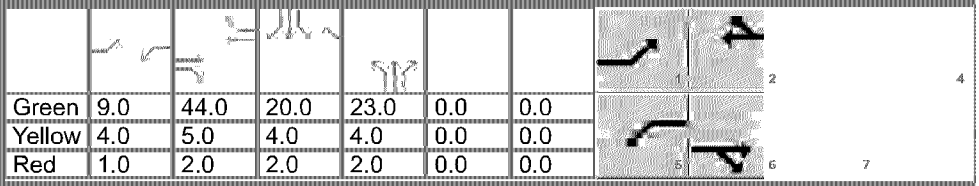
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	124	40	1120	1087	185	159	22	363	88	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	124	40	1120	1087	185	159	22	363	88	28
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		R	0		None			None			None	
Heavy Vehicles (P_{HV}), %	2	5		2	5	2	2	5		2	5	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0	12.0	12.0	11.0		12.0	12.0	12.0
Turn Bay Length, ft	350	0		300	0	0	400	0		775	0	600
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	9.0	44.0	9.0	44.0	23.0	23.0	20.0	20.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0
Red Clearance Interval (R_c), s	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Minimum Green (G_{min}), s	5	30	5	30	5	10	5	10
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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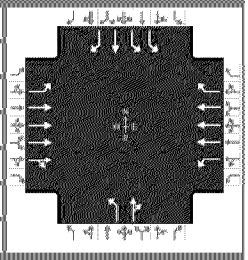
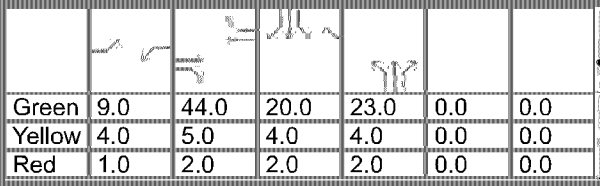
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.97
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 3:45
Intersection	US 40 at MD 7-MD 159	File Name	US 40 at MD 7 - Fu PM.xus		
Project Description	3762				

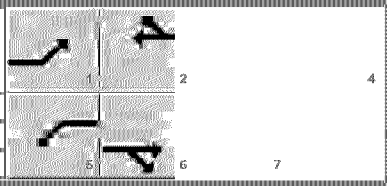


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	41	954	124	40	1120	1087	185	159	22	363	88	28

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	9.0	44.0	20.0	23.0	0.0	0.0
Yellow	4.0	5.0	4.0	4.0	0.0	0.0
Red	1.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	2.0	4.0	2.0	3.0		10.0		9.0
Phase Duration, s	14.0	51.0	14.0	51.0		29.0		26.0
Change Period, ($Y+R_c$), s	5.0	7.0	5.0	7.0		6.0		6.0
Max Allow Headway (*MAH*), s	2.9	3.0	2.9	3.0		3.0		3.1
Queue Clearance Time (g_s), s	4.6	16.2	4.6	48.0		13.4		13.9
Green Extension Time (g_e), s	0.0	12.3	0.0	0.0		0.5		0.7
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.07	0.30	0.06	1.00		0.01		0.12

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	42	869	242	41	1155	1121	191	187		374	91	29
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1826	1501	1781	1658		1781	1787		1730	1826	1585
Queue Service Time (g_s), s	2.6	14.0	14.2	2.6	22.4		11.4	11.1		11.9	5.1	1.8
Cycle Queue Clearance Time (g_c), s	2.6	14.0	14.2	2.6	22.4		11.4	11.1		11.9	5.1	1.8
Green Ratio (*g/C*)	0.09	0.38	0.38	0.09	0.38		0.21	0.21		0.18	0.18	0.18
Capacity (*c*), veh/h	163	2100	575	163	1907		371	372		634	335	291
Volume-to-Capacity Ratio (*X*)	0.259	0.414	0.421	0.253	0.606		0.514	0.501		0.590	0.271	0.099
Back of Queue (*Q*), ft/ln (95 th percentile)	52.5	250.3	213	51.3	340.5		219.4	219.7		223.4	107.2	32.3
Back of Queue (*Q*), veh/ln (95 th percentile)	2.1	9.6	8.4	2.0	13.1		8.6	8.4		8.8	4.1	1.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.15	0.00	0.00	0.17	0.00		0.55	0.00		0.29	0.00	0.05
Uniform Delay (d_1), s/veh	50.7	27.8	27.2	50.7	30.4		42.1	42.0		44.9	42.1	40.8
Incremental Delay (d_2), s/veh	0.3	0.0	0.2	0.3	0.4		0.5	0.4		1.0	0.2	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	51.0	27.8	27.4	51.0	30.8	35.0	42.7	42.4		45.9	42.3	40.8
Level of Service (LOS)	D	C	C	D	C	C	D	D		D	D	D
Approach Delay, s/veh / LOS	28.6	C		33.2	C		42.5	D		44.9	D	
Intersection Delay, s/veh / LOS	34.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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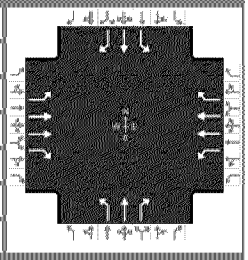
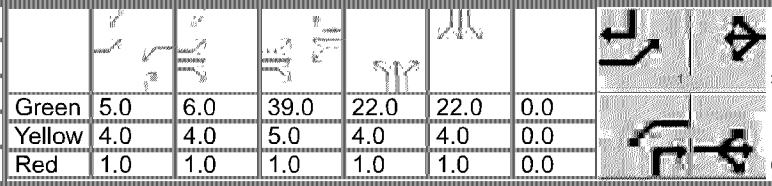
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1160	78	20	933	81	96	40	23	165	68	319

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0		39.0	22.0	22.0	0.0					
Yellow	4.0	4.0		5.0	4.0	4.0	0.0					
Red	1.0	1.0		1.0	1.0	1.0	0.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1160	78	20	933	81	96	40	23	165	68	319
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	5	2	2	5	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	10.0	12.0	11.0	10.0	12.0	11.0	11.0	11.0	15.0	10.0	10.0	10.0
Turn Bay Length, ft	200	0	425	185	0	170	100	0	0	50	50	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	55	55	55	55	55	55	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	16.0	50.0	5.0	39.0		22.0		22.0
Yellow Change Interval (*Y*), s	4.0	5.0	4.0	5.0		4.0		4.0
Red Clearance Interval (R_c), s	1.0	1.0	1.0	1.0		1.0		1.0
Minimum Green (G_{min}), s	5	20	5	20		8		10
Start-Up Lost Time (*l*t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s	2.0	2.0	2.0	2.0		2.0		2.0
Recall Mode	Off	Min	Off	Min		Off		Off
Dual Entry	No	Yes	No	Yes		Yes		Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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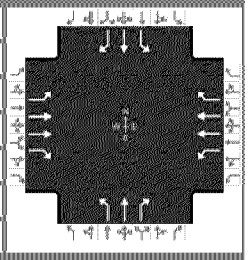
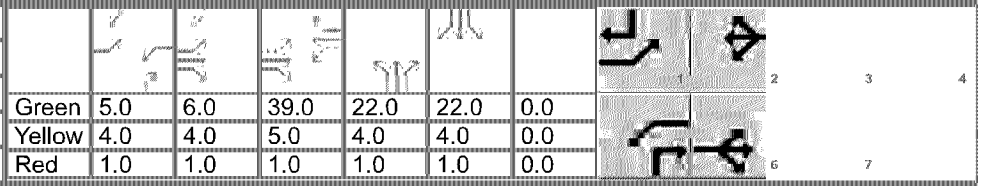
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.98
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:15
Intersection	US 40 at MD 132	File Name	US 40 at MD 132 - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	251	1160	78	20	933	81	96	40	23	165	68	319

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	6.0		39.0	22.0	22.0	0.0					
Yellow	4.0	4.0		5.0	4.0	4.0	0.0					
Red	1.0	1.0		1.0	1.0	1.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2		8		4
Case Number	1.1	3.0	1.1	3.0		9.0		9.0
Phase Duration, s	21.0	56.0	10.0	45.0		27.0		27.0
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		5.0		5.0
Max Allow Headway (*MAH*), s	2.9	2.9	2.9	2.9		3.1		3.2
Queue Clearance Time (g_s), s	11.9	37.1	2.8	31.8		7.6		22.2
Green Extension Time (g_e), s	0.2	5.0	0.0	3.7		0.2		0.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.33	0.23	1.00	0.52		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	256	1184	80	20	952	83	98	41	23	168	69	326
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1738	1585	1781	1738	1585	1781	1870	1648	1781	1870	1585
Queue Service Time (g_s), s	9.9	35.1	3.6	0.8	29.8	4.3	5.6	2.1	1.3	10.0	3.7	20.2
Cycle Queue Clearance Time (g_c), s	9.9	35.1	3.6	0.8	29.8	4.3	5.6	2.1	1.3	10.0	3.7	20.2
Green Ratio (*g/C*)	0.51	0.43	0.43	0.40	0.34	0.34	0.20	0.20	0.26	0.20	0.20	0.35
Capacity (*c*), veh/h	382	1506	687	215	1188	542	356	374	426	356	374	555
Volume-to-Capacity Ratio (*X*)	0.670	0.786	0.116	0.095	0.802	0.153	0.275	0.109	0.055	0.473	0.185	0.587
Back of Queue (*Q*), ft/ln (95 th percentile)	186.3	519.5	57.1	15.2	471.6	71.7	111.2	44.6	23.4	198	77.3	310.3
Back of Queue (*Q*), veh/ln (95 th percentile)	7.3	20.0	2.2	0.6	18.1	2.8	4.4	1.8	0.9	7.8	3.0	12.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.93	0.00	0.13	0.08	0.00	0.42	1.11	0.00	0.00	3.96	1.55	6.21
Uniform Delay (d_1), s/veh	23.4	30.0	20.3	25.3	36.7	27.4	40.6	39.3	33.5	42.4	39.9	31.9
Incremental Delay (d_2), s/veh	3.7	2.6	0.0	0.1	3.7	0.0	0.2	0.0	0.0	0.4	0.1	1.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	27.1	32.6	20.3	25.4	40.4	27.5	40.8	39.3	33.5	42.8	40.0	33.0
Level of Service (LOS)	C	C	C	C	D	C	D	D	C	D	D	C
Approach Delay, s/veh / LOS	31.0	C		39.1	D		39.4	D		36.8	D	
Intersection Delay, s/veh / LOS	35.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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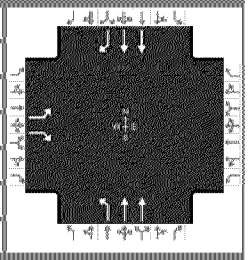
HCS7 Signalized Intersection Input Data

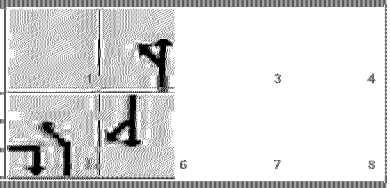
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	342		84				115	1209			651	267

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	342		84				115	1209			651	267
Initial Queue (Q_b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s_o), veh/h	1900		1900				1900	1900			1900	1900
Parking (N_m), man/h		None						None			None	
Heavy Vehicles (P_{HV}), %	2		2				2	2			2	2
Ped / Bike / RTOR, /h	0	0		0	0		0	0		0	0	0
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3				3	3			3	3
Upstream Filtering (*I*)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (*W*), ft	12.0		12.0				11.0	12.0			12.0	12.0
Turn Bay Length, ft	0		0				215	0			0	220
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50				50	50			50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		25.0			18.0	58.0		40.0
Yellow Change Interval (*Y*), s		4.0			4.0	5.0		5.0
Red Clearance Interval (R_c), s		1.0			2.0	1.0		1.0
Minimum Green (G_{min}), s		5			5	25		25
Start-Up Lost Time (*l1*), s	2.0				2.0	2.0		2.0
Extension of Effective Green (*e*), s	4.0				4.0	4.0		4.0
Passage (*PT*), s		2.0			2.0	2.0		2.0
Recall Mode		Off			Off	Min		Min
Dual Entry		Yes			No	Yes		Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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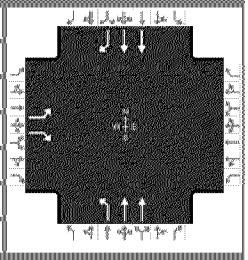
HCS7 Signalized Intersection Results Summary

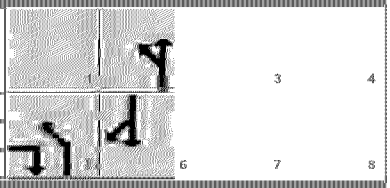
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	Oct 15, 2021	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.94
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	US 40 EB & MD 22 Sign…	File Name	md 22 & us 40 EB - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	342		84				115	1209			651	267

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	40.0	25.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	2.0	1.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		30.0			24.0	70.0		46.0
Change Period, (*Y+R c*), s		5.0			6.0	6.0		6.0
Max Allow Headway (*MAH*), s		3.0			3.0	2.9		2.9
Queue Clearance Time (*g s*), s		20.7			4.7	21.2		16.0
Green Extension Time (*g e*), s		0.4			0.1	6.4		6.1
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.44			0.00	0.01		0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (*v*), veh/h	364		89				122	1286			693	284
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781						1781	1781			1781	1585
Queue Service Time (*g s*), s	18.7						2.7	19.2			14.0	12.7
Cycle Queue Clearance Time (*g c*), s	18.7						2.7	19.2			14.0	12.7
Green Ratio (*g/C*)	0.27						0.64	0.66			0.42	0.42
Capacity (*c*), veh/h	481						639	2350			1496	666
Volume-to-Capacity Ratio (*X*)	0.756						0.192	0.547			0.463	0.427
Back of Queue (*Q*), ft/ln (95 th percentile)	332.5						37.6	246.5			231.1	195.3
Back of Queue (*Q*), veh/ln (95 th percentile)	13.1						1.5	9.7			9.1	7.7
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00						0.17	0.00			0.00	0.89
Uniform Delay (*d 1*), s/veh	33.5						8.5	9.4			20.9	20.5
Incremental Delay (*d 2*), s/veh	6.1						0.1	0.2			0.1	0.2
Initial Queue Delay (*d 3*), s/veh	0.0						0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	39.6		0.0				8.5	9.6			21.0	20.7
Level of Service (LOS)	D		A				A	A			C	C
Approach Delay, s/veh / LOS	31.8		C	0.0			9.5		A	20.9		C
Intersection Delay, s/veh / LOS	17.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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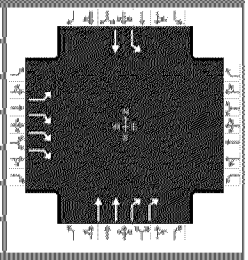
HCS7 Signalized Intersection Input Data

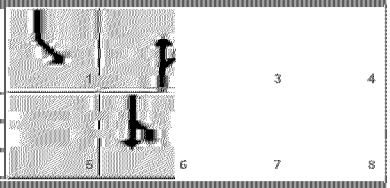
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	160	41	76	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	160	41	76	
Initial Queue (Q_b), veh/h	0		0					0	0	0	0	
Base Saturation Flow Rate (s_o), veh/h	1900		1900					1900	1900	1900	1900	
Parking (N_m), man/h		None					0	L + R	0		None	
Heavy Vehicles (P_{HV}), %	2		2					5	0	0	5	
Ped / Bike / RTOR, /h	0	0		0	0		0	0	0	0	0	
Buses (N_b), buses/h	0	0	0				0	0	0	0	0	0
Arrival Type (*AT*)	3		3					3	3	3	3	
Upstream Filtering (*I*)	1.00		1.00					1.00	1.00	1.00	1.00	
Lane Width (*W*), ft	15.0		12.0					12.0	12.0	12.0	12.0	
Turn Bay Length, ft	300		0					0	0	0	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	50		50					40	40	40	40	

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		18.0				55.0	10.0	65.0
Yellow Change Interval (*Y*), s		4.0				5.0	4.0	5.0
Red Clearance Interval (R_c), s		1.0				2.0	1.0	2.0
Minimum Green (G_{min}), s		8				25	5	25
Start-Up Lost Time (*l*t), s	2.0					2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0					4.0	4.0	4.0
Passage (*PT*), s		2.0				2.0	2.0	2.0
Recall Mode		Off				Min	Off	Min
Dual Entry		Yes				Yes	No	Yes
Walk (*Walk*), s		0.0		0.0				0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0				0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25				0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0				9.0	12	0
Street Width / Island / Curb	0	0	No		0		0		No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No				0.50		No	0.50	

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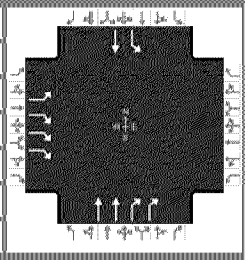
HCS7 Signalized Intersection Results Summary

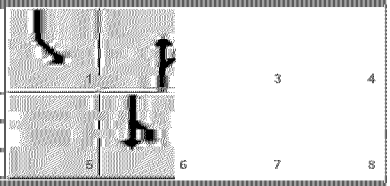
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford County, MD	Time Period	PM Peak	PHF	0.93
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 715 at US 40 EB Ra...	File Name	md 715 & us 40 EB - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	19		111					1053	160	41	76	

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	55.0	18.0	0.0	0.0	0.0	
Yellow	4.0	5.0	4.0	0.0	0.0	0.0	
Red	1.0	2.0	1.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4				2	1	6
Case Number		9.0				7.3	1.0	4.0
Phase Duration, s		23.0				62.0	15.0	77.0
Change Period, ($Y+R_c$), s		5.0				7.0	5.0	7.0
Max Allow Headway (*MAH*), s		3.2				3.0	3.1	3.0
Queue Clearance Time (g_s), s		4.3				22.8	2.7	3.3
Green Extension Time (g_e), s		0.2				3.7	0.0	3.7
Phase Call Probability		1.00				1.00	1.00	1.00
Max Out Probability		0.00				0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14					2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	20		119					1132	172	44	82	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1853							1738		1810	1826	
Queue Service Time (g_s), s	0.9							20.8		0.7	1.3	
Cycle Queue Clearance Time (g_c), s	0.9							20.8		0.7	1.3	
Green Ratio (*g/C*)	0.20							0.57		0.71	0.72	
Capacity (*c*), veh/h	371							1982		472	1315	
Volume-to-Capacity Ratio (*X*)	0.055							0.571		0.093	0.062	
Back of Queue (*Q*), ft/ln (95 th percentile)	17.5							304.1		9.7	17.9	
Back of Queue (*Q*), veh/ln (95 th percentile)	0.7							11.7		0.4	0.7	
Queue Storage Ratio (*RQ*) (95 th percentile)	0.06							0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	32.4							13.7		7.2	4.4	
Incremental Delay (d_2), s/veh	0.0							0.3		0.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0							0.0		0.0	0.0	
Control Delay (*d*), s/veh	32.4		0.0					14.0	0.0	7.2	4.4	
Level of Service (LOS)	C		A					B	A	A	A	
Approach Delay, s/veh / LOS	4.7		A	0.0			12.1		B	5.4		A
Intersection Delay, s/veh / LOS	10.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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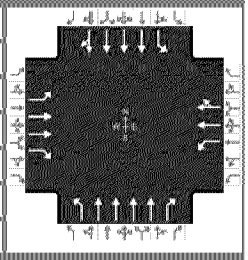
HCS7 Signalized Intersection Input Data

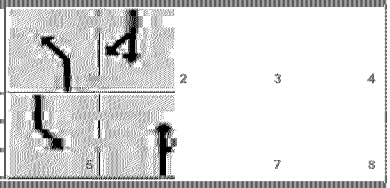
General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	116	220	6	28	166	61	28	1019	124	16	111	67

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	15.0	45.0		20.0	0.0		0.0					
Yellow	4.0	5.0		4.0	0.0		0.0					
Red	2.5	1.5		3.0	0.0		0.0					



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	116	220	6	28	166	61	28	1019	124	16	111	67
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	5	5	5	5	5		5	5	5	5	5	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0	12.0	10.0	10.0		12.0	12.0	12.0	11.0	12.0	
Turn Bay Length, ft	200	0	375	300	0		275	0	275	60	0	
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	35	35	35	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s		20.0		20.0	15.0	45.0	15.0	45.0
Yellow Change Interval (*Y*), s		4.0		4.0	4.0	5.0	4.0	5.0
Red Clearance Interval (R_c), s		3.0		3.0	2.5	1.5	2.5	1.5
Minimum Green (G_{min}), s		8		8	5	20	5	20
Start-Up Lost Time (*l1*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Passage (*PT*), s		2.0		2.0	2.0	2.0	2.0	2.0
Recall Mode		Off		Off	Off	Min	Off	Min
Dual Entry		Yes		Yes	No	Yes	No	Yes
Walk (*Walk*), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (*PC*), s		0.0		0.0		0.0		0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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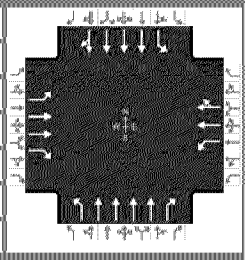
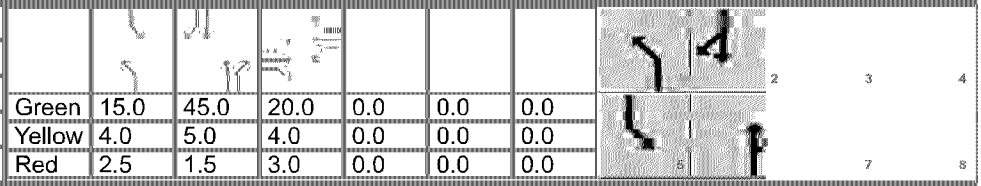
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Traffic Concepts, Inc.			Duration, h	0.250
Analyst	J. Carey	Analysis Date	May 14, 2022	Area Type	Other
Jurisdiction	Harford Co, MD	Time Period	PM Peak	PHF	0.92
Urban Street		Analysis Year	Future Condition	Analysis Period	1> 4:00
Intersection	MD 715 at Old Philadelp…	File Name	MD 715 at Old Phil - Fu PM.xus		
Project Description	3762				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	116	220	6	28	166	61	28	1019	124	16	111	67

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	45.0	20.0	0.0	0.0	0.0						
Yellow	4.0	5.0	4.0	0.0	0.0	0.0						
Red	2.5	1.5	3.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4	1	6	5	2
Case Number		5.0		6.0	2.0	3.0	2.0	4.0
Phase Duration, s		27.0		27.0	21.5	51.5	21.5	51.5
Change Period, ($Y+R_c$), s		7.0		7.0	6.5	6.5	6.5	6.5
Max Allow Headway (*MAH*), s		3.3		3.3	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s		18.9		10.1	3.5	12.6	2.8	4.6
Green Extension Time (g_e), s		0.2		1.2	0.0	3.7	0.0	3.7
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		1.00		0.04	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	126	239	7	30	126	121	30	1108	135	17	121	73
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1106	1738	1547	1114	1826	1662	1739	1658	1547	1739	1826	1547
Queue Service Time (g_s), s	10.8	5.8	0.3	2.4	5.8	6.1	1.5	10.6	5.1	0.8	1.2	2.6
Cycle Queue Clearance Time (g_c), s	16.9	5.8	0.3	8.1	5.8	6.1	1.5	10.6	5.1	0.8	1.2	2.6
Green Ratio (*g/C*)	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.47	0.47	0.17	0.47	0.47
Capacity (*c*), veh/h	248	765	340	253	402	366	296	3117	727	296	2575	727
Volume-to-Capacity Ratio (*X*)	0.509	0.313	0.019	0.120	0.314	0.330	0.103	0.355	0.185	0.059	0.047	0.100
Back of Queue (*Q*), ft/ln (95 th percentile)	138.7	113.1	5.8	29.8	118.3	111.3	28.5	173.4	77.5	16.1	21.5	39.1
Back of Queue (*Q*), veh/ln (95 th percentile)	5.3	4.4	0.2	1.1	4.6	4.4	1.1	6.7	3.0	0.6	0.8	1.5
Queue Storage Ratio (*RQ*) (95 th percentile)	0.69	0.00	0.02	0.10	0.00	0.00	0.10	0.00	0.28	0.27	0.00	0.00
Uniform Delay (d_1), s/veh	39.9	32.7	30.5	36.1	32.7	32.8	35.1	17.4	15.4	34.8	14.9	14.7
Incremental Delay (d_2), s/veh	0.7	0.1	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	40.6	32.8	30.6	36.1	32.8	33.0	35.1	17.4	15.4	34.8	14.9	14.8
Level of Service (LOS)	D	C	C	D	C	C	D	B	B	C	B	B
Approach Delay, s/veh / LOS	35.4	D		33.3	C		17.7	B		16.5	B	
Intersection Delay, s/veh / LOS	22.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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HCS7 Two-Way Stop-Control Report

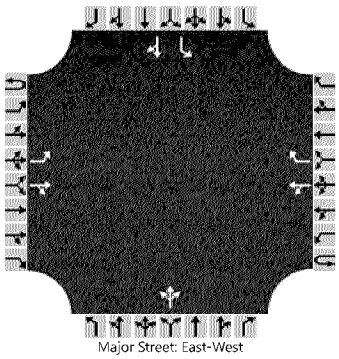
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/22
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	East-West
Project Description	3762

Site Information

Intersection	MD 7 at Stepney Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 7
North/South Street	Stepney Rd
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	1	0		1	1	0
Configuration		L		TR		LT		R			LTR			L		TR
Volume (veh/h)		60	472	0		0	354	33		1	0	0		61	1	103
Percent Heavy Vehicles (%)		2				2				2	2	2		2	0	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized						No										
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.50	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.00	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		65				0					1			66		112
Capacity, c (veh/h)		1143				1057					153			207		666
v/c Ratio		0.06				0.00					0.01			0.32		0.17
95% Queue Length, Q_{95} (veh)		0.2				0.0					0.0			1.3		0.6
Control Delay (s/veh)		8.3				8.4					28.7			30.3		11.5
Level of Service (LOS)		A				A					D			D		B
Approach Delay (s/veh)		0.9				0.0				28.7				18.4		
Approach LOS										D				C		

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HCS7 Two-Way Stop-Control Report

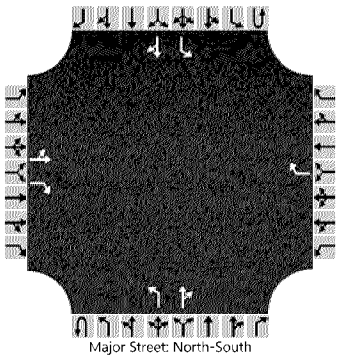
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/21
Analysis Year	2021
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		52	12	529				14		161	126	0		26	237	24
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		71		588				16		179				29		
Capacity, c (veh/h)		249		762				887		1272				1395		
v/c Ratio		0.29		0.77				0.02		0.14				0.02		
95% Queue Length, Q_{95} (veh)		1.1		7.5				0.1		0.5				0.1		
Control Delay (s/veh)		25.2		23.7				9.1		8.3				7.6		
Level of Service (LOS)		D		C				A		A				A		
Approach Delay (s/veh)	23.9				9.1				4.7				0.7			
Approach LOS	C				A											

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HCS7 Two-Way Stop-Control Report

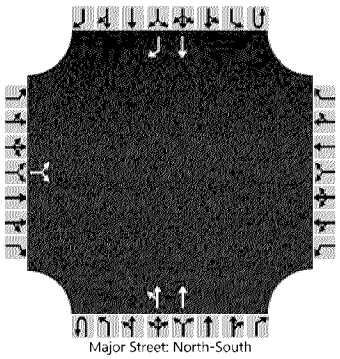
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	2021
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		110		1						1	174				724	30
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized														No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			123							1						
Capacity, c (veh/h)			277							792						
v/c Ratio			0.45							0.00						
95% Queue Length, Q_{95} (veh)			2.2							0.0						
Control Delay (s/veh)			28.0							9.6						
Level of Service (LOS)			D							A						
Approach Delay (s/veh)		28.0								0.1						
Approach LOS		D														

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HCS7 Two-Way Stop-Control Report

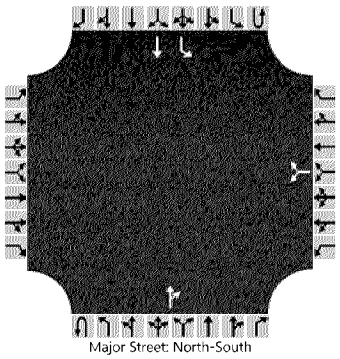
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	2021
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		15			77	0		32	108	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							17							36		
Capacity, c (veh/h)							965							1492		
v/c Ratio							0.02							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							8.8							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)						8.8								1.7		
Approach LOS						A										

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HCS7 Two-Way Stop-Control Report

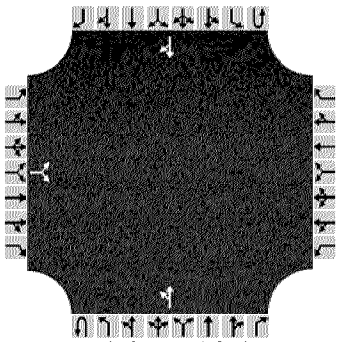
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		4		0						0	139				35	0
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			4							0						
Capacity, c (veh/h)			806							1574						
v/c Ratio			0.01							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			9.5							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.5								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

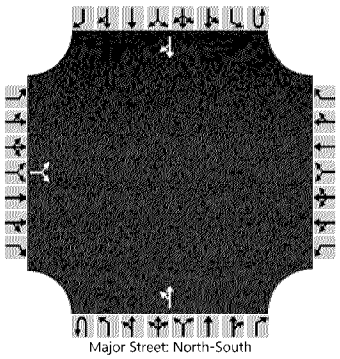
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		45		0						0	92				23	12
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			50							0						
Capacity, c (veh/h)			859							1571						
v/c Ratio			0.06							0.00						
95% Queue Length, Q_{95} (veh)			0.2							0.0						
Control Delay (s/veh)			9.4							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.4								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

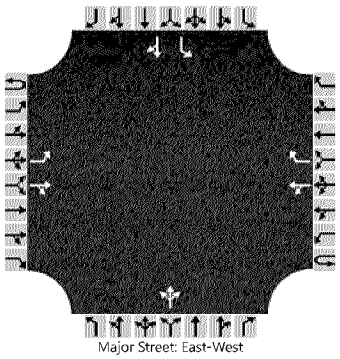
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/22
Analysis Year	2026
Time Analyzed	Existing PM
Intersection Orientation	East-West
Project Description	3762

Site Information

Intersection	MD 7 at Stepney Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 7
North/South Street	Stepney Rd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	1	0		1	1	0
Configuration		L		TR		LT		R			LTR			L		TR
Volume (veh/h)		115	342	1		1	862	118		1	1	1		38	0	103
Percent Heavy Vehicles (%)		2				2				2	2	2		2	0	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized						No										
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.50	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.00	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		120				1					3			40		107
Capacity, c (veh/h)		680				1201					90			86		338
v/c Ratio		0.18				0.00					0.03			0.46		0.32
95% Queue Length, Q_{95} (veh)		0.6				0.0					0.1			1.9		1.3
Control Delay (s/veh)		11.4				8.0					46.6			78.3		20.5
Level of Service (LOS)		B				A					E			F		C
Approach Delay (s/veh)		2.9				0.0				46.6				36.1		
Approach LOS										E				E		

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HCS7 Two-Way Stop-Control Report

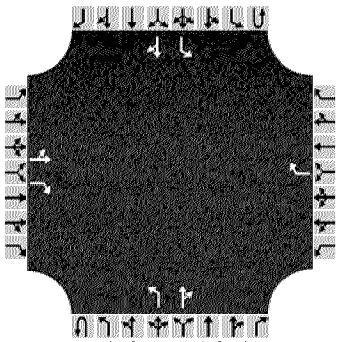
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	2021
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		10	2	270				32		344	232	0		24	151	47
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13		300				36		382				27		
Capacity, c (veh/h)		106		848				762		1349				1262		
v/c Ratio		0.13		0.35				0.05		0.28				0.02		
95% Queue Length, Q_{95} (veh)		0.4		1.6				0.1		1.2				0.1		
Control Delay (s/veh)		43.6		11.6				10.0		8.7				7.9		
Level of Service (LOS)		E		B				A		A				A		
Approach Delay (s/veh)	12.9				10.0				5.2				0.9			
Approach LOS	B				A											

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HCS7 Two-Way Stop-Control Report

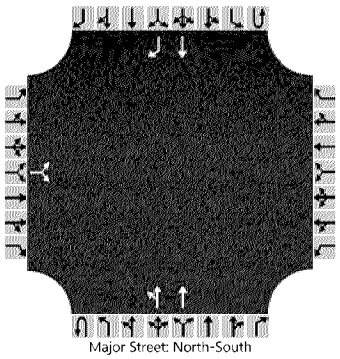
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	2021
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		87		1						1	500				292	133
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			98							1						
Capacity, c (veh/h)			431							1086						
v/c Ratio			0.23							0.00						
95% Queue Length, Q_{95} (veh)			0.9							0.0						
Control Delay (s/veh)			15.8							8.3						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		15.8								0.0						
Approach LOS		C														

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HCS7 Two-Way Stop-Control Report

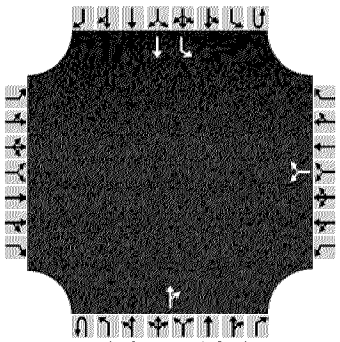
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	2026
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		21			301	1		18	139	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							23							20		
Capacity, c (veh/h)							700							1207		
v/c Ratio							0.03							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							10.3							8.0		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)						10.3							0.9			
Approach LOS						B										

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HCS7 Two-Way Stop-Control Report

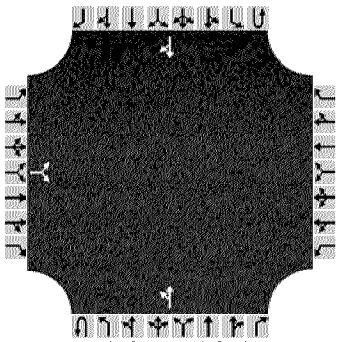
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2022
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		3		0						0	85				154	2
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			3							0						
Capacity, c (veh/h)			722							1403						
v/c Ratio			0.00							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			10.0							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		10.0								0.0						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

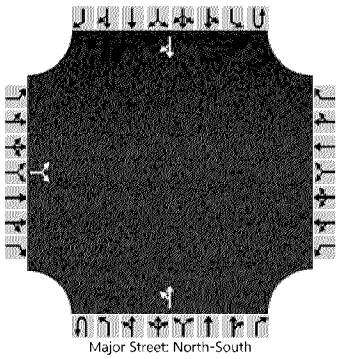
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2022
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		23		0						0	55				92	51
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26							0						
Capacity, c (veh/h)			797							1421						
v/c Ratio			0.03							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			9.7							7.5						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.7								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

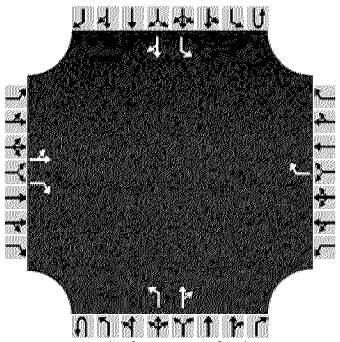
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/21
Analysis Year	2021
Time Analyzed	Background AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		52	12	529				14		161	126	0		26	237	24
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	2.0				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	2.00				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		71		588				16		179				29		
Capacity, c (veh/h)		249		1054				887		1272				1395		
v/c Ratio		0.29		0.56				0.02		0.14				0.02		
95% Queue Length, Q_{95} (veh)		1.1		3.6				0.1		0.5				0.1		
Control Delay (s/veh)		25.2		12.6				9.1		8.3				7.6		
Level of Service (LOS)		D		B				A		A				A		
Approach Delay (s/veh)	14.0				9.1				4.7				0.7			
Approach LOS	B				A											

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HCS7 Two-Way Stop-Control Report

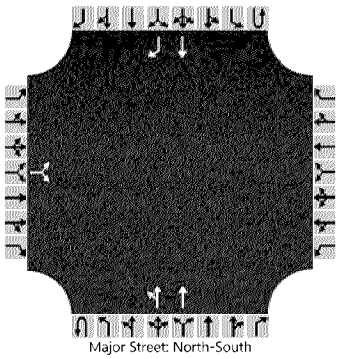
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	Back
Time Analyzed	Background AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		110		1						1	174				724	30
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			123							1						
Capacity, c (veh/h)			277							792						
v/c Ratio			0.45							0.00						
95% Queue Length, Q_{95} (veh)			2.2							0.0						
Control Delay (s/veh)			28.0							9.6						
Level of Service (LOS)			D							A						
Approach Delay (s/veh)		28.0								0.1						
Approach LOS		D														

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HCS7 Two-Way Stop-Control Report

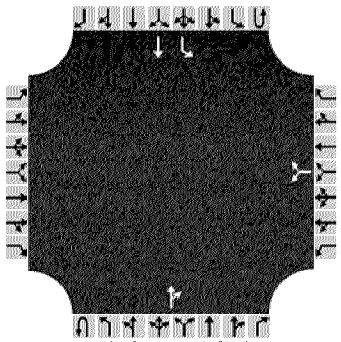
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	Back
Time Analyzed	Background AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		15			77	0		32	108	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							17							36		
Capacity, c (veh/h)							965							1492		
v/c Ratio							0.02							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							8.8							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)						8.8							1.7			
Approach LOS						A										

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HCS7 Two-Way Stop-Control Report

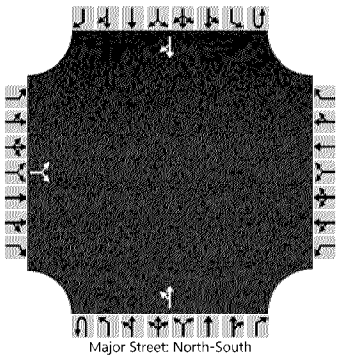
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	Back
Time Analyzed	Background AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		4		0						0	139				35	0
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			4							0						
Capacity, c (veh/h)			806							1574						
v/c Ratio			0.01							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			9.5							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.5								0.0							
Approach LOS	A															

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HCS7 Two-Way Stop-Control Report

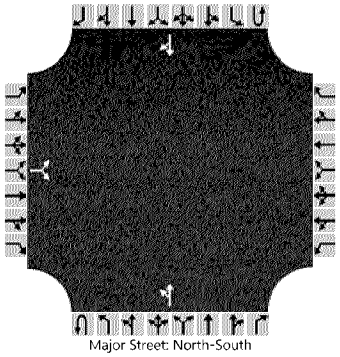
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	Back
Time Analyzed	Background AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		45		0						0	92				23	12
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			50							0						
Capacity, c (veh/h)			859							1571						
v/c Ratio			0.06							0.00						
95% Queue Length, Q_{95} (veh)			0.2							0.0						
Control Delay (s/veh)			9.4							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.4								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

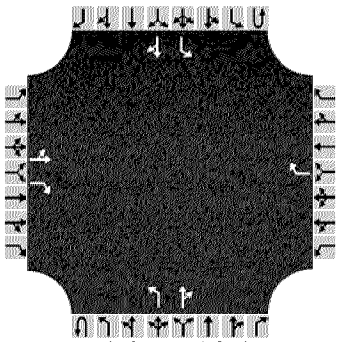
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	2021
Time Analyzed	Background PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		10	2	270				32		344	232	0		24	151	47
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	2.0				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	2.00				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13		300				36		382				27		
Capacity, c (veh/h)		106		1064				762		1349				1262		
v/c Ratio		0.13		0.28				0.05		0.28				0.02		
95% Queue Length, Q_{95} (veh)		0.4		1.2				0.1		1.2				0.1		
Control Delay (s/veh)		43.6		9.7				10.0		8.7				7.9		
Level of Service (LOS)		E		A				A		A				A		
Approach Delay (s/veh)	11.2				10.0				5.2				0.9			
Approach LOS	B				A											

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HCS7 Two-Way Stop-Control Report

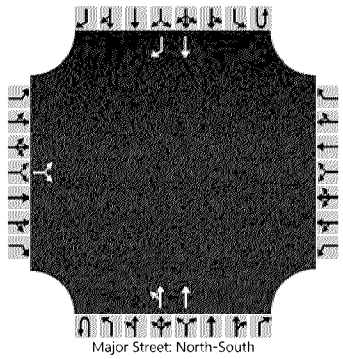
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	Back
Time Analyzed	Background PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		87		1						1	500				292	133
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			98							1						
Capacity, c (veh/h)			431							1086						
v/c Ratio			0.23							0.00						
95% Queue Length, Q_{95} (veh)			0.9							0.0						
Control Delay (s/veh)			15.8							8.3						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		15.8								0.0						
Approach LOS		C														

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HCS7 Two-Way Stop-Control Report

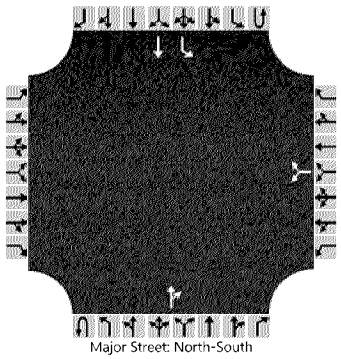
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	Back
Time Analyzed	Background PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		21			301	1		18	139	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							23							20		
Capacity, c (veh/h)							700							1207		
v/c Ratio							0.03							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							10.3							8.0		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)						10.3								0.9		
Approach LOS						B										

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HCS7 Two-Way Stop-Control Report

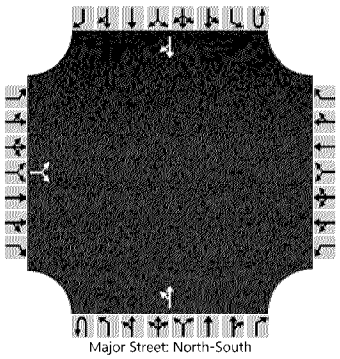
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	Back
Time Analyzed	Background PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		3		0						0	85				154	2
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			3							0						
Capacity, c (veh/h)			722							1403						
v/c Ratio			0.00							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			10.0							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		10.0								0.0						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

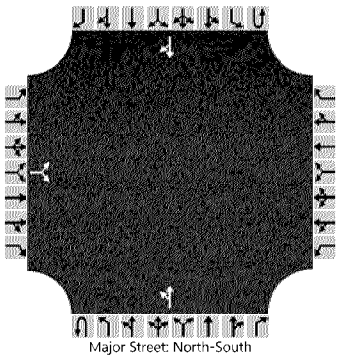
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	Back
Time Analyzed	Background PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		23		0						0	55				92	51
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26							0						
Capacity, c (veh/h)			797							1421						
v/c Ratio			0.03							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			9.7							7.5						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.7								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

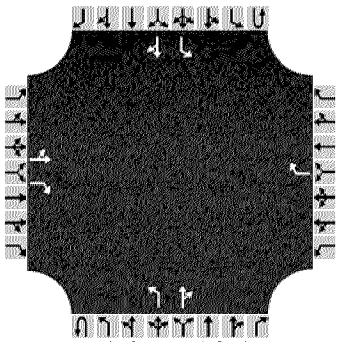
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/21
Analysis Year	2021
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		52	12	800				14		225	210	0		26	598	24
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	2.0				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	2.00				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		71		889				16		250				29		
Capacity, c (veh/h)		80		1001				786		904				1288		
v/c Ratio		0.89		0.89				0.02		0.28				0.02		
95% Queue Length, Q_{95} (veh)		4.6		12.5				0.1		1.1				0.1		
Control Delay (s/veh)		161.5		28.9				9.7		10.5				7.9		
Level of Service (LOS)		F		D				A		B				A		
Approach Delay (s/veh)	38.7				9.7				5.4				0.3			
Approach LOS	E				A											

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HCS7 Two-Way Stop-Control Report

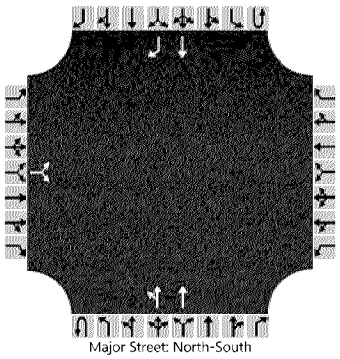
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2021
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		19		1						1	413				1356	30
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized														No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			22							1						
Capacity, c (veh/h)			80							427						
v/c Ratio			0.28							0.00						
95% Queue Length, Q_{95} (veh)			1.0							0.0						
Control Delay (s/veh)			66.6							13.4						
Level of Service (LOS)			F							B						
Approach Delay (s/veh)		66.6								0.1						
Approach LOS		F														

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HCS7 Two-Way Stop-Control Report

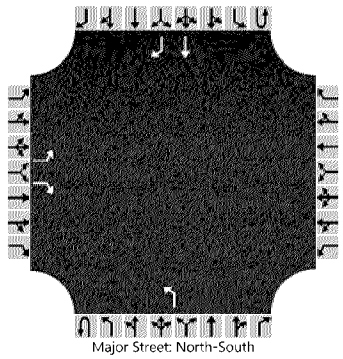
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/24/2022
Analysis Year	2026
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House Ext
North/South Street	Chelsea Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration		L		R						L					T	R
Volume (veh/h)		239		0						0					725	632
Percent Heavy Vehicles (%)		10		0						0						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												No		
Median Type | Storage		Left Only								1						

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.50		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.59		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		266		0						0						
Capacity, c (veh/h)		380		385						450						
v/c Ratio		0.70		0.00						0.00						
95% Queue Length, Q_{95} (veh)		5.1		0.0						0.0						
Control Delay (s/veh)		33.7		14.3						13.0						
Level of Service (LOS)		D		B						B						
Approach Delay (s/veh)		33.7														
Approach LOS		D														

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HCS7 Two-Way Stop-Control Report

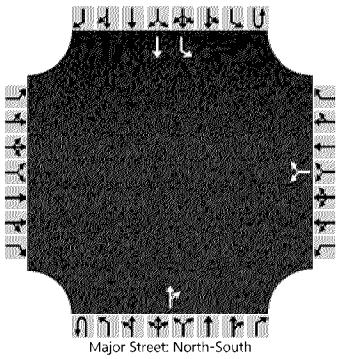
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	FU
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		15			77	0		32	108	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							17							36		
Capacity, c (veh/h)							965							1492		
v/c Ratio							0.02							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							8.8							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)						8.8								1.7		
Approach LOS						A										

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HCS7 Two-Way Stop-Control Report

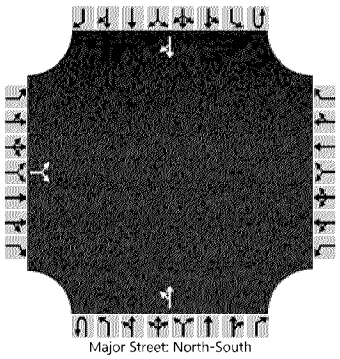
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2026
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		4		0						0	48				35	0
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			4							0						
Capacity, c (veh/h)			914							1574						
v/c Ratio			0.00							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			9.0							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.0								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

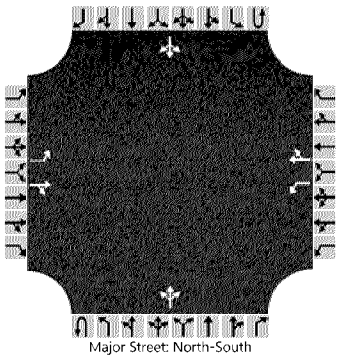
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/22
Analysis Year	2026
Time Analyzed	Future AM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House Relocated
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	0	1	0	0	0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		15	178	1		1	632	1		0	31	61		0	23	12
Percent Heavy Vehicles (%)		2	10	2		2	10	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.60	6.22		7.12	6.60	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.09	3.32		3.52	4.09	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17		199		1		703		0				0		
Capacity, c (veh/h)		105		1042		602		995		1571				1490		
v/c Ratio		0.16		0.19		0.00		0.71		0.00				0.00		
95% Queue Length, Q_{95} (veh)		0.5		0.7		0.0		6.2		0.0				0.0		
Control Delay (s/veh)		45.5		9.3		11.0		16.8		7.3				7.4		
Level of Service (LOS)		E		A		B		C		A				A		
Approach Delay (s/veh)	12.1				16.8				0.0				0.0			
Approach LOS	B				C											

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HCS7 Two-Way Stop-Control Report

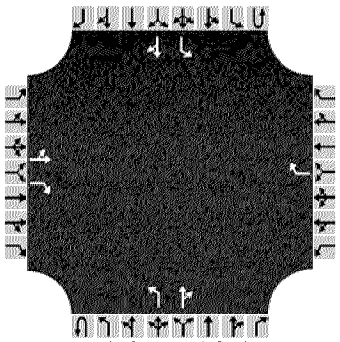
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	2021
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Spesutia Rd
Jurisdiction	Harford Co, MD
East/West Street	Spesutia Rd-Access
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	1	0	1	1	0	0	1	1	0
Configuration		LT		R				R		L		TR		L		TR
Volume (veh/h)		10	2	409				32		562	522	0		24	336	47
Percent Heavy Vehicles (%)		2	2	2				10		2				10		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	Yes				Yes											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	2.0				6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	2.02				6.30		4.12				4.20		
Base Follow-Up Headway (sec)		3.5	4.0	3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32				3.39		2.22				2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13		454				36		624				27		
Capacity, c (veh/h)		14		1037				499		1134				956		
v/c Ratio		0.93		0.44				0.07		0.55				0.03		
95% Queue Length, Q_{95} (veh)		2.2		2.3				0.2		3.5				0.1		
Control Delay (s/veh)		560.9		11.2				12.8		12.0				8.9		
Level of Service (LOS)		F		B				B		B				A		
Approach Delay (s/veh)	26.8				12.8				6.2				0.5			
Approach LOS	D				B											

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HCS7 Two-Way Stop-Control Report

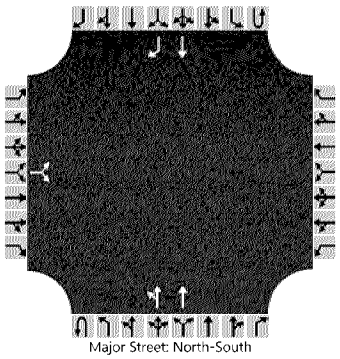
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/18/22
Analysis Year	FU
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Chelsea Rd
Jurisdiction	Harford Co, MD
East/West Street	MD 159
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	1
Configuration			LR							LT	T				T	R
Volume (veh/h)		35		1						1	1060				616	133
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.2						4.1						
Critical Headway (sec)		6.84		6.24						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			40							1						
Capacity, c (veh/h)			161							796						
v/c Ratio			0.25							0.00						
95% Queue Length, Q_{95} (veh)			0.9							0.0						
Control Delay (s/veh)			34.6							9.5						
Level of Service (LOS)			D							A						
Approach Delay (s/veh)		34.6								0.0						
Approach LOS		D														

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HCS7 Two-Way Stop-Control Report

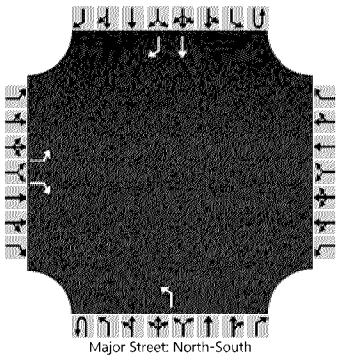
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	4/24/2022
Analysis Year	2026
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House Ext
North/South Street	Chelsea Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	0	0	0	0	1	1
Configuration		L		R						L					T	R
Volume (veh/h)		560		0						0					293	324
Percent Heavy Vehicles (%)		10		0						0						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No												No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.50		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.59		3.30						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		622		0						0						
Capacity, c (veh/h)		652		720						917						
v/c Ratio		0.95		0.00						0.00						
95% Queue Length, Q_{95} (veh)		13.5		0.0						0.0						
Control Delay (s/veh)		49.9		10.0						8.9						
Level of Service (LOS)		E		A						A						
Approach Delay (s/veh)		49.9														
Approach LOS		E														

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HCS7 Two-Way Stop-Control Report

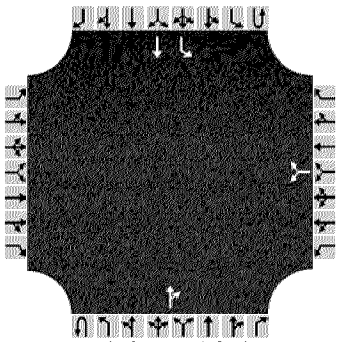
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	10/15/21
Analysis Year	FU
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	Chelsea Rd at Woodley Rd
Jurisdiction	Harford Co, MD
East/West Street	Woodley Rd
North/South Street	Chelsea Rd
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						0		21			301	1		18	139	
Percent Heavy Vehicles (%)						5		5						5		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.15		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							23							20		
Capacity, c (veh/h)							700							1207		
v/c Ratio							0.03							0.02		
95% Queue Length, Q_{95} (veh)							0.1							0.1		
Control Delay (s/veh)							10.3							8.0		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)						10.3							0.9			
Approach LOS						B										

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HCS7 Two-Way Stop-Control Report

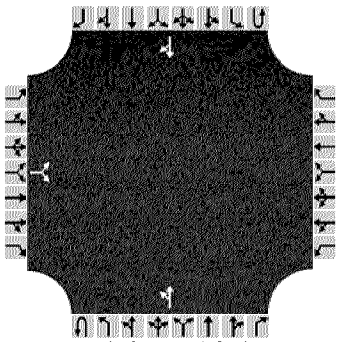
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/2022
Analysis Year	2026
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Fords Lane
Jurisdiction	Harford Co, MD
East/West Street	Fords Lane
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		3		0						0	33				154	2
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			3							0						
Capacity, c (veh/h)			779							1403						
v/c Ratio			0.00							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			9.6							7.6						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		9.6								0.0						
Approach LOS		A														

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HCS7 Two-Way Stop-Control Report

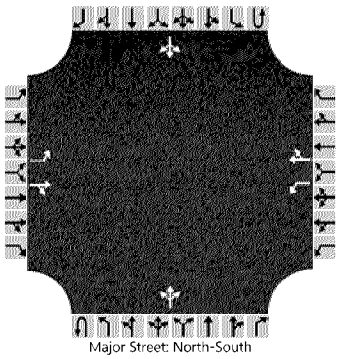
General Information

Analyst	J. Carey
Agency/Co.	Traffic Concepts, Inc.
Date Performed	5/14/22
Analysis Year	2026
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3762

Site Information

Intersection	MD 159 at Canning House
Jurisdiction	Harford Co, MD
East/West Street	Canning House Relocated
North/South Street	MD 159
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	0	1	0	0	0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		8	523	1		1	234	1		0	18	37		0	92	51
Percent Heavy Vehicles (%)		2	10	2		2	10	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.60	6.22		7.12	6.60	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.09	3.32		3.52	4.09	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9		582		1		261		0				0		
Capacity, c (veh/h)		457		919		148		1031		1421				1542		
v/c Ratio		0.02		0.63		0.01		0.25		0.00				0.00		
95% Queue Length, Q_{95} (veh)		0.1		4.7		0.0		1.0		0.0				0.0		
Control Delay (s/veh)		13.0		15.4		29.6		9.7		7.5				7.3		
Level of Service (LOS)		B		C		D		A		A				A		
Approach Delay (s/veh)	15.4				9.8				0.0				0.0			
Approach LOS	C				A											

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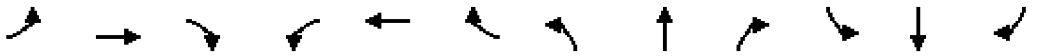
APPENDIX I-C

HCM 2000 REPORTS



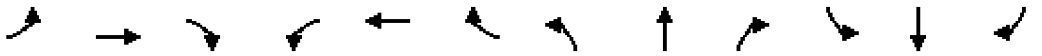
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	146	2	42	667	439	0	0	553	380
Future Volume (vph)	0	0	0	146	2	42	667	439	0	0	553	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1774	1538	1719	3438			3438	1538
Flt Permitted					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					1774	1538	1719	3438			3438	1538
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	155	2	45	710	467	0	0	588	404
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	0	308
Lane Group Flow (vph)	0	0	0	0	157	7	710	467	0	0	588	96
Heavy Vehicles (%)	2%	2%	2%	2%	5%	5%	5%	5%	2%	2%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)					14.8	14.8	45.2	72.4			22.2	22.2
Effective Green, g (s)					17.8	15.8	49.2	76.4			26.2	23.2
Actuated g/C Ratio					0.18	0.16	0.50	0.78			0.27	0.24
Clearance Time (s)					5.0	5.0	5.0	5.5			5.5	5.5
Vehicle Extension (s)					4.0	4.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					323	248	865	2688			921	365
v/s Ratio Prot					c0.09		c0.41	0.14			c0.17	
v/s Ratio Perm						0.00						0.06
v/c Ratio					0.49	0.03	0.82	0.17			0.64	0.26
Uniform Delay, d1					35.8	34.5	20.5	2.7			31.6	30.3
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					1.6	0.1	7.0	0.1			2.0	0.8
Delay (s)					37.4	34.6	27.6	2.8			33.6	31.1
Level of Service					D	C	C	A			C	C
Approach Delay (s)		0.0			36.8			17.7			32.6	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	97.7	Sum of lost time (s)	4.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	8	161	0	0	0	0	864	89	62	550	0
Future Volume (vph)	203	8	161	0	0	0	0	864	89	62	550	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5	4.5	2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1633	1643	1538					3438	1538	1719	3438	
Flt Permitted	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1633	1643	1538					3438	1538	1719	3438	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	209	8	166	0	0	0	0	891	92	64	567	0
RTOR Reduction (vph)	0	0	142	0	0	0	0	0	36	0	0	0
Lane Group Flow (vph)	109	108	24	0	0	0	0	891	56	64	567	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	5%	5%	5%	5%	2%
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	10.0	10.0	10.0					44.3	44.3	5.2	54.5	
Effective Green, g (s)	13.0	11.0	11.0					47.3	45.3	8.2	57.5	
Actuated g/C Ratio	0.17	0.15	0.15					0.63	0.60	0.11	0.77	
Clearance Time (s)	5.0	5.0	5.0					5.5	5.5	5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0	7.0	3.0	7.0	
Lane Grp Cap (vph)	283	240	225					2168	928	187	2635	
v/s Ratio Prot	0.07	c0.07						c0.26		c0.04	0.16	
v/s Ratio Perm			0.02						0.04			
v/c Ratio	0.39	0.45	0.11					0.41	0.06	0.34	0.22	
Uniform Delay, d1	27.5	29.2	27.7					6.9	6.1	30.9	2.4	
Progression Factor	1.00	1.00	1.00					0.67	1.10	1.00	1.00	
Incremental Delay, d2	1.2	1.8	0.3					0.6	0.1	1.1	0.2	
Delay (s)	28.7	31.1	28.0					5.2	6.8	32.0	2.6	
Level of Service	C	C	C					A	A	C	A	
Approach Delay (s)		29.1			0.0			5.3			5.6	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



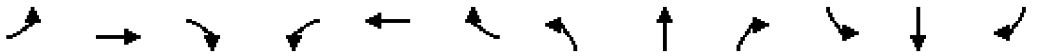
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	173	65	36	116	359	43	451	42	362	776	55
Future Volume (vph)	131	173	65	36	116	359	43	451	42	362	776	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	0.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	138	182	68	38	122	378	45	475	44	381	817	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	138	182	68	38	122	378	45	475	44	381	817	58
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	11.1	13.2	150.0	8.2	10.3	150.0	7.8	83.9	150.0	22.7	98.8	150.0
Effective Green, g (s)	13.1	17.2	150.0	10.2	14.3	150.0	9.8	87.9	150.0	24.7	102.8	150.0
Actuated g/C Ratio	0.09	0.11	1.00	0.07	0.10	1.00	0.07	0.59	1.00	0.16	0.69	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0		2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	291	394	1538	116	327	1538	112	2014	1538	549	2356	1538
v/s Ratio Prot	c0.04	c0.05		0.02	0.04		0.03	0.14		c0.11	c0.24	
v/s Ratio Perm			0.04			c0.25			0.03			0.04
v/c Ratio	0.47	0.46	0.04	0.33	0.37	0.25	0.40	0.24	0.03	0.69	0.35	0.04
Uniform Delay, d1	65.2	62.1	0.0	66.6	63.6	0.0	67.3	14.9	0.0	59.1	9.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.91	1.00
Incremental Delay, d2	0.9	0.9	0.1	1.2	0.7	0.4	1.7	0.3	0.0	3.8	0.4	0.0
Delay (s)	66.1	62.9	0.1	67.8	64.4	0.4	69.0	15.2	0.0	61.5	9.3	0.0
Level of Service	E	E	A	E	E	A	E	B	A	E	A	A
Approach Delay (s)		53.0			19.7			18.3			24.7	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	682	122	169	438	100	652
Future Volume (vph)	682	122	169	438	100	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	758	136	188	487	111	724
RTOR Reduction (vph)	0	81	0	0	0	0
Lane Group Flow (vph)	758	55	188	487	111	724
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	26.9	26.9	14.5	46.9	6.9	66.8
Effective Green, g (s)	26.9	26.9	14.5	46.9	6.9	66.8
Actuated g/C Ratio	0.40	0.40	0.22	0.70	0.10	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1384	619	373	2413	321	1487
v/s Ratio Prot	0.22		0.11	0.14	0.04	
v/s Ratio Perm		0.04				c0.49
v/c Ratio	0.55	0.09	0.50	0.20	0.35	0.49
Uniform Delay, d1	15.3	12.4	23.0	3.5	27.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.2	1.5	0.1	0.8	1.1
Delay (s)	16.3	12.5	24.5	3.6	28.6	1.1
Level of Service	B	B	C	A	C	A
Approach Delay (s)	15.7			9.4	4.8	
Approach LOS	B			A	A	

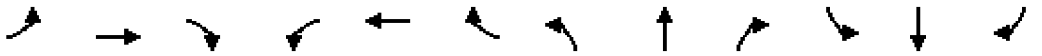
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	18.5
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	792	510	34	357	3	210	0	19	0	0	8
Future Volume (vph)	3	792	510	34	357	3	210	0	19	0	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	12	12	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3534		1652	1583			1611	
Flt Permitted	0.49	1.00	1.00	0.20	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	921	3539	1583	375	3534		1306	1583			1611	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	4	978	630	42	441	4	259	0	23	0	0	10
RTOR Reduction (vph)	0	0	311	0	1	0	0	17	0	0	8	0
Lane Group Flow (vph)	4	978	319	42	444	0	259	6	0	0	2	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6		6	2			8			4		
Actuated Green, G (s)	45.5	45.5	45.5	54.5	54.5		22.4	22.4			22.4	
Effective Green, g (s)	45.5	45.5	45.5	54.5	54.5		22.4	22.4			22.4	
Actuated g/C Ratio	0.51	0.51	0.51	0.61	0.61		0.25	0.25			0.25	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	466	1791	801	289	2142		325	394			401	
v/s Ratio Prot		c0.28		0.01	c0.13			0.00			0.00	
v/s Ratio Perm	0.00		0.20	0.08			c0.20					
v/c Ratio	0.01	0.55	0.40	0.15	0.21		0.80	0.01			0.01	
Uniform Delay, d1	11.0	15.2	13.7	8.6	8.0		31.6	25.4			25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.2	1.5	0.2	0.2		12.7	0.0			0.0	
Delay (s)	11.0	16.4	15.2	8.9	8.2		44.3	25.4			25.4	
Level of Service	B	B	B	A	A		D	C			C	
Approach Delay (s)		15.9			8.3			42.8			25.4	
Approach LOS		B			A			D			C	

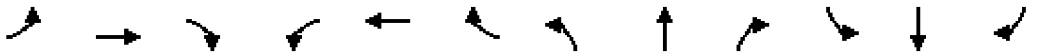
Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1007	71	29	569	301	29	39	12	554	37	26
Future Volume (vph)	13	1007	71	29	569	301	29	39	12	554	37	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6163		1719	4940	1538	1719	1628		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6163		1719	4940	1538	1719	1628		3335	1810	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	14	1049	74	30	593	314	30	41	12	577	39	27
RTOR Reduction (vph)	0	6	0	0	0	196	0	8	0	0	0	20
Lane Group Flow (vph)	14	1117	0	30	593	118	30	46	0	577	39	7
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	2.5	33.8		4.4	35.7	35.7	8.3	8.3		24.3	24.3	24.3
Effective Green, g (s)	2.5	33.8		4.4	35.7	35.7	8.3	8.3		24.3	24.3	24.3
Actuated g/C Ratio	0.03	0.36		0.05	0.38	0.38	0.09	0.09		0.26	0.26	0.26
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	45	2197		79	1860	579	150	142		854	463	394
v/s Ratio Prot	0.01	c0.18		c0.02	0.12		0.02	c0.03		c0.17	0.02	
v/s Ratio Perm						0.08						0.00
v/c Ratio	0.31	0.51		0.38	0.32	0.20	0.20	0.32		0.68	0.08	0.02
Uniform Delay, d1	45.3	24.0		43.9	20.9	20.0	40.2	40.6		31.7	26.8	26.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	0.4		3.0	0.2	0.4	1.4	2.8		2.3	0.1	0.0
Delay (s)	49.2	24.4		46.9	21.1	20.3	41.5	43.4		34.0	26.9	26.4
Level of Service	D	C		D	C	C	D	D		C	C	C
Approach Delay (s)		24.7			21.7			42.7			33.3	
Approach LOS		C			C			D			C	

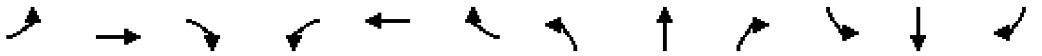
Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	19	174	77	24	46	110	406	22	16	657	45
Future Volume (vph)	68	19	174	77	24	46	110	406	22	16	657	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.27	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	478	3539	1531	917	3539	1531
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	69	19	178	79	24	47	112	414	22	16	670	46
RTOR Reduction (vph)	0	0	155	0	0	42	0	0	12	0	0	29
Lane Group Flow (vph)	69	19	23	79	24	5	112	414	10	16	670	17
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	9.5	9.5	9.5	7.5	7.5	7.5	39.2	33.1	33.1	27.1	26.0	26.0
Effective Green, g (s)	9.5	9.5	9.5	7.5	7.5	7.5	39.2	33.1	33.1	27.1	26.0	26.0
Actuated g/C Ratio	0.13	0.13	0.13	0.10	0.10	0.10	0.54	0.46	0.46	0.38	0.36	0.36
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	217	228	194	183	193	164	399	1622	701	356	1274	551
v/s Ratio Prot	c0.04	0.01		c0.04	0.01		c0.03	0.12		0.00	c0.19	
v/s Ratio Perm			0.02			0.00	0.12		0.01	0.02		0.01
v/c Ratio	0.32	0.08	0.12	0.43	0.12	0.03	0.28	0.26	0.01	0.04	0.53	0.03
Uniform Delay, d1	28.4	27.5	27.7	30.4	29.4	29.1	8.9	12.0	10.7	14.2	18.2	14.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2	0.3	1.6	0.3	0.1	0.4	0.2	0.0	0.1	0.7	0.0
Delay (s)	29.3	27.7	27.9	32.0	29.7	29.2	9.3	12.2	10.7	14.3	19.0	15.0
Level of Service	C	C	C	C	C	C	A	B	B	B	B	B
Approach Delay (s)		28.3			30.7			11.5			18.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	0	104	0	0	325	62	225	0	0	1116	172
Future Volume (vph)	102	0	104	0	0	325	62	225	0	0	1116	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.11	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	196	3539			3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	120	0	122	0	0	382	73	265	0	0	1313	202
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	120	0	122	0	0	382	73	265	0	0	1313	202
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	12.0		75.8			75.8	51.3	51.3			39.3	75.8
Effective Green, g (s)	12.0		75.8			75.8	51.3	51.3			39.3	75.8
Actuated g/C Ratio	0.16		1.00			1.00	0.68	0.68			0.52	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	270		1583			1611	272	2395			1834	1583
v/s Ratio Prot							0.02	0.07			c0.37	
v/s Ratio Perm	c0.07		0.08			c0.24	0.16					0.13
v/c Ratio	0.44		0.08			0.24	0.27	0.11			0.72	0.13
Uniform Delay, d1	28.9		0.0			0.0	7.8	4.3			14.0	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.2		0.1			0.3	0.5	0.0			1.7	0.2
Delay (s)	30.0		0.1			0.3	8.4	4.3			15.7	0.2
Level of Service	C		A			A	A	A			B	A
Approach Delay (s)		14.9			0.3			5.2			13.6	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	17.5
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	26	96	0	0	141	0	64	0	718	0	0
Future Volume (vph)	26	96	0	0	141	0	64	0	718	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.54	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	1003	1863			3539		1770		3610		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	27	100	0	0	147	0	67	0	748	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	27	100	0	0	147	0	67	0	748	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	34.0	34.0			26.9		4.9		51.9		
Effective Green, g (s)	34.0	34.0			26.9		4.9		51.9		
Actuated g/C Ratio	0.66	0.66			0.52		0.09		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	673	1220			1834		167		3610		
v/s Ratio Prot	0.00	0.05			0.04		0.04				
v/s Ratio Perm	0.03								c0.21		
v/c Ratio	0.04	0.08			0.08		0.40		0.21		
Uniform Delay, d1	3.5	3.3			6.3		22.1		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.0	0.1			0.0		1.6		0.1		
Delay (s)	3.5	3.3			6.3		23.7		0.1		
Level of Service	A	A			A		C		A		
Approach Delay (s)		3.4			6.3		2.1			0.0	
Approach LOS		A			A		A			A	

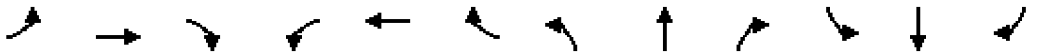
Intersection Summary			
HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	623	26	4	59	14	32	128	38	107	222	27
Future Volume (vph)	13	623	26	4	59	14	32	128	38	107	222	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6369		1770	3800	1583	1770	3539	1583	1711	3366	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.58	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	1711	6369		1770	3800	1583	1074	3539	1583	1186	3366	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	15	716	30	5	68	16	37	147	44	123	255	31
RTOR Reduction (vph)	0	4	0	0	0	10	0	0	34	0	8	0
Lane Group Flow (vph)	15	742	0	5	68	6	37	147	10	123	278	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	1.1	20.6		1.1	20.6	20.6	12.2	12.2	12.2	12.2	12.2	
Effective Green, g (s)	1.1	20.6		1.1	20.6	20.6	12.2	12.2	12.2	12.2	12.2	
Actuated g/C Ratio	0.02	0.38		0.02	0.38	0.38	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	34	2434		36	1452	605	243	801	358	268	761	
v/s Ratio Prot	0.01	c0.12		0.00	c0.02			0.04			0.08	
v/s Ratio Perm						0.00	0.03		0.01	c0.10		
v/c Ratio	0.44	0.30		0.14	0.05	0.01	0.15	0.18	0.03	0.46	0.37	
Uniform Delay, d1	26.1	11.6		25.9	10.5	10.3	16.7	16.8	16.2	18.0	17.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.9	0.1		1.8	0.0	0.0	0.4	0.2	0.0	1.7	0.4	
Delay (s)	35.0	11.8		27.7	10.5	10.3	17.1	17.0	16.3	19.7	18.0	
Level of Service	C	B		C	B	B	B	B	B	B	B	
Approach Delay (s)		12.2			11.4			16.9			18.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	163	1	57	749	1028	0	0	315	119
Future Volume (vph)	0	0	0	163	1	57	749	1028	0	0	315	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1724	1538	1719	3438			3438	1538
Flt Permitted					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					1724	1538	1719	3438			3438	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	166	1	58	764	1049	0	0	321	121
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	0	0	0	93
Lane Group Flow (vph)	0	0	0	0	167	9	764	1049	0	0	321	28
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1 9	6			2	
Permitted Phases						4						2
Actuated Green, G (s)					19.3	19.3	64.8	72.2			29.9	29.9
Effective Green, g (s)					22.3	20.3	72.8	76.2			33.9	30.9
Actuated g/C Ratio					0.17	0.15	0.54	0.56			0.25	0.23
Clearance Time (s)					5.0	5.0		5.5			5.5	5.5
Vehicle Extension (s)					4.0	4.0		5.0			5.0	5.0
Lane Grp Cap (vph)					284	231	926	1940			863	352
v/s Ratio Prot					c0.10		c0.44	c0.31			0.09	
v/s Ratio Perm						0.01						0.02
v/c Ratio					0.59	0.04	0.83	0.54			0.37	0.08
Uniform Delay, d1					52.1	49.0	25.8	18.4			41.8	40.9
Progression Factor					1.00	1.00	1.34	0.76			1.00	1.00
Incremental Delay, d2					3.7	0.1	6.1	0.9			1.2	0.4
Delay (s)					55.8	49.1	40.8	14.9			43.0	41.3
Level of Service					E	D	D	B			D	D
Approach Delay (s)		0.0			54.0			25.8			42.5	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	435	1	134	0	0	0	0	1350	184	57	390	0
Future Volume (vph)	435	1	134	0	0	0	0	1350	184	57	390	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5	4.5	2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1633	1638	1538					3438	1538	1719	3438	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1633	1638	1538					3438	1538	1719	3438	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	444	1	137	0	0	0	0	1378	188	58	398	0
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	58	0	0	0
Lane Group Flow (vph)	222	223	30	0	0	0	0	1378	130	58	398	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	28.1	28.1	28.1					82.9	82.9	8.5	96.4	
Effective Green, g (s)	31.1	29.1	29.1					85.9	83.9	11.5	99.4	
Actuated g/C Ratio	0.23	0.22	0.22					0.64	0.62	0.09	0.74	
Clearance Time (s)	5.0	5.0	5.0					5.5	5.5	5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0	7.0	3.0	7.0	
Lane Grp Cap (vph)	376	353	331					2187	955	146	2531	
v/s Ratio Prot	0.14	c0.14						c0.40		c0.03	0.12	
v/s Ratio Perm			0.02						0.08			
v/c Ratio	0.59	0.63	0.09					0.63	0.14	0.40	0.16	
Uniform Delay, d1	46.3	48.1	42.4					14.9	10.6	58.5	5.3	
Progression Factor	1.00	1.00	1.00					0.54	0.05	0.50	0.09	
Incremental Delay, d2	2.9	4.1	0.2					1.3	0.3	1.7	0.1	
Delay (s)	49.2	52.2	42.5					9.3	0.8	30.6	0.6	
Level of Service	D	D	D					A	A	C	A	
Approach Delay (s)		48.8			0.0			8.3			4.4	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



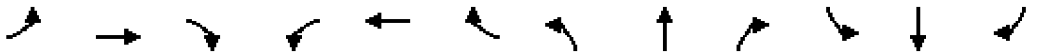
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	165	60	32	319	721	153	673	71	316	553	68
Future Volume (vph)	155	165	60	32	319	721	153	673	71	316	553	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	0.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	157	167	61	32	322	728	155	680	72	319	559	69
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	157	167	61	32	322	728	155	680	72	319	559	69
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	10.9	18.7	135.0	7.5	15.3	135.0	17.0	68.2	135.0	18.6	69.8	135.0
Effective Green, g (s)	12.9	22.7	135.0	9.5	19.3	135.0	19.0	72.2	135.0	20.6	73.8	135.0
Actuated g/C Ratio	0.10	0.17	1.00	0.07	0.14	1.00	0.14	0.53	1.00	0.15	0.55	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0		2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	318	578	1538	120	491	1538	241	1838	1538	508	1879	1538
v/s Ratio Prot	0.05	0.05		0.02	c0.09		0.09	0.20		c0.10	0.16	
v/s Ratio Perm			0.04			c0.47			0.05			0.04
v/c Ratio	0.49	0.29	0.04	0.27	0.66	0.47	0.64	0.37	0.05	0.63	0.30	0.04
Uniform Delay, d1	58.0	49.1	0.0	59.4	54.7	0.0	54.8	18.2	0.0	53.6	16.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.88	1.00	1.21	0.96	1.00
Incremental Delay, d2	0.9	0.3	0.0	0.9	3.1	1.0	4.7	0.5	0.1	2.5	0.4	0.1
Delay (s)	58.8	49.4	0.0	60.3	57.9	1.0	57.1	16.6	0.1	67.2	16.4	0.1
Level of Service	E	D	A	E	E	A	E	B	A	E	B	A
Approach Delay (s)		45.4			19.7			22.2			32.3	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	634	212	355	856	178	376
Future Volume (vph)	634	212	355	856	178	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	689	230	386	930	193	409
RTOR Reduction (vph)	0	154	0	0	0	0
Lane Group Flow (vph)	689	76	386	930	193	409
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	27.6	27.6	25.3	58.4	11.6	83.0
Effective Green, g (s)	27.6	27.6	25.3	58.4	11.6	83.0
Actuated g/C Ratio	0.33	0.33	0.30	0.70	0.14	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1143	511	523	2419	435	1487
v/s Ratio Prot	c0.20		c0.22	0.27	c0.06	
v/s Ratio Perm		0.05				0.28
v/c Ratio	0.60	0.15	0.74	0.38	0.44	0.28
Uniform Delay, d1	23.1	19.5	25.9	5.0	32.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.4	5.8	0.3	0.9	0.5
Delay (s)	24.7	19.8	31.6	5.3	33.6	0.5
Level of Service	C	B	C	A	C	A
Approach Delay (s)	23.5			13.0	11.1	
Approach LOS	C			B	B	

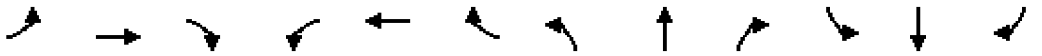
Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	670	278	59	728	0	405	0	34	4	0	1
Future Volume (vph)	8	670	278	59	728	0	405	0	34	4	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	12	12	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1770	3539	1583	1770	3539		1652	1583			1743	
Flt Permitted	0.36	1.00	1.00	0.29	1.00		0.75	1.00			0.89	
Satd. Flow (perm)	662	3539	1583	548	3539		1312	1583			1614	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	9	720	299	63	783	0	435	0	37	4	0	1
RTOR Reduction (vph)	0	0	156	0	0	0	0	27	0	0	4	0
Lane Group Flow (vph)	9	720	143	63	783	0	435	10	0	0	1	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6		6	2			8			4		
Actuated Green, G (s)	45.1	45.1	45.1	56.1	56.1		25.1	25.1			25.1	
Effective Green, g (s)	45.1	45.1	45.1	56.1	56.1		25.1	25.1			25.1	
Actuated g/C Ratio	0.48	0.48	0.48	0.60	0.60		0.27	0.27			0.27	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	316	1694	757	404	2107		349	421			430	
v/s Ratio Prot		c0.20		0.01	c0.22			0.01				
v/s Ratio Perm	0.01		0.09	0.08			c0.33				0.00	
v/c Ratio	0.03	0.43	0.19	0.16	0.37		1.25	0.02			0.00	
Uniform Delay, d1	13.0	16.1	14.1	8.7	9.9		34.5	25.5			25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.8	0.6	0.2	0.5		132.7	0.0			0.0	
Delay (s)	13.1	16.8	14.6	8.9	10.4		167.2	25.5			25.4	
Level of Service	B	B	B	A	B		F	C			C	
Approach Delay (s)		16.2			10.3			156.1			25.4	
Approach LOS		B			B			F			C	

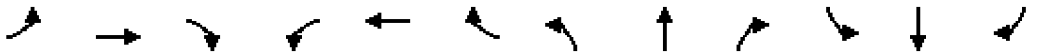
Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	820	42	36	970	928	57	76	22	287	35	28
Future Volume (vph)	37	820	42	36	970	928	57	76	22	287	35	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6179		1719	4940	1538	1719	1633		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6179		1719	4940	1538	1719	1633		3335	1810	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	38	837	43	37	990	947	58	78	22	293	36	29
RTOR Reduction (vph)	0	4	0	0	0	502	0	7	0	0	0	24
Lane Group Flow (vph)	38	876	0	37	990	445	58	93	0	293	36	5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	4.8	41.5		4.8	41.5	41.5	13.8	13.8		16.2	16.2	16.2
Effective Green, g (s)	4.8	41.5		4.8	41.5	41.5	13.8	13.8		16.2	16.2	16.2
Actuated g/C Ratio	0.05	0.41		0.05	0.41	0.41	0.14	0.14		0.16	0.16	0.16
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	82	2556		82	2043	636	236	224		538	292	248
v/s Ratio Prot	c0.02	0.14		0.02	0.20		0.03	c0.06		c0.09	0.02	
v/s Ratio Perm						c0.29						0.00
v/c Ratio	0.46	0.34		0.45	0.48	0.70	0.25	0.42		0.54	0.12	0.02
Uniform Delay, d1	46.5	20.1		46.5	21.6	24.2	38.6	39.6		38.7	36.0	35.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.2		3.9	0.4	4.3	1.1	2.6		1.4	0.3	0.0
Delay (s)	50.6	20.3		50.4	21.9	28.5	39.7	42.2		40.1	36.2	35.4
Level of Service	D	C		D	C	C	D	D		D	D	D
Approach Delay (s)		21.5			25.6			41.3			39.3	
Approach LOS		C			C			D			D	

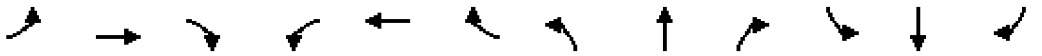
Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	61	286	86	36	21	225	876	70	20	716	73
Future Volume (vph)	148	61	286	86	36	21	225	876	70	20	716	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.19	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	346	3539	1531	528	3539	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	66	311	93	39	23	245	952	76	22	778	79
RTOR Reduction (vph)	0	0	256	0	0	21	0	0	40	0	0	52
Lane Group Flow (vph)	161	66	55	93	39	2	245	952	36	22	778	27
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	16.0	16.0	16.0	8.9	8.9	8.9	50.0	42.8	42.8	33.2	31.0	31.0
Effective Green, g (s)	16.0	16.0	16.0	8.9	8.9	8.9	50.0	42.8	42.8	33.2	31.0	31.0
Actuated g/C Ratio	0.18	0.18	0.18	0.10	0.10	0.10	0.55	0.47	0.47	0.37	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	290	306	260	173	182	154	400	1666	720	221	1206	522
v/s Ratio Prot	c0.10	0.04		c0.05	0.02		c0.09	0.27		0.00	0.22	
v/s Ratio Perm			0.04			0.00	c0.24		0.02	0.03		0.02
v/c Ratio	0.56	0.22	0.21	0.54	0.21	0.01	0.61	0.57	0.05	0.10	0.65	0.05
Uniform Delay, d1	34.2	32.1	32.0	39.0	37.8	37.0	13.2	17.4	13.0	18.6	25.3	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.4	0.4	3.2	0.6	0.0	2.8	0.8	0.1	0.2	1.6	0.1
Delay (s)	36.5	32.4	32.5	42.2	38.4	37.1	16.0	18.2	13.1	18.8	26.9	20.2
Level of Service	D	C	C	D	D	D	B	B	B	B	C	C
Approach Delay (s)		33.7			40.5			17.4			26.1	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	253	0	75	0	0	376	103	1084	0	0	584	200
Future Volume (vph)	253	0	75	0	0	376	103	1084	0	0	584	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.31	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	557	3539			3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	264	0	78	0	0	392	107	1129	0	0	608	208
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	264	0	78	0	0	392	107	1129	0	0	608	208
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	17.6		69.9			69.9	39.8	39.8			25.4	69.9
Effective Green, g (s)	17.6		69.9			69.9	39.8	39.8			25.4	69.9
Actuated g/C Ratio	0.25		1.00			1.00	0.57	0.57			0.36	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	430		1583			1611	472	2015			1285	1583
v/s Ratio Prot							0.03	c0.32			0.17	
v/s Ratio Perm	c0.15		0.05			0.24	0.10					0.13
v/c Ratio	0.61		0.05			0.24	0.23	0.56			0.47	0.13
Uniform Delay, d1	23.1		0.0			0.0	7.5	9.5			17.1	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.6		0.1			0.4	0.2	0.6			0.6	0.2
Delay (s)	25.7		0.1			0.4	7.7	10.1			17.7	0.2
Level of Service	C		A			A	A	B			B	A
Approach Delay (s)		19.9			0.4			9.9			13.2	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	17.5
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	37	25	0	0	934	0	17	0	93	0	0
Future Volume (vph)	37	25	0	0	934	0	17	0	93	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.20	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	380	1863			3539		1770		3610		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	42	28	0	0	1049	0	19	0	104	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	42	28	0	0	1049	0	19	0	104	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	43.0	43.0			32.8		1.2		57.2		
Effective Green, g (s)	43.0	43.0			32.8		1.2		57.2		
Actuated g/C Ratio	0.75	0.75			0.57		0.02		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	387	1400			2029		37		3610		
v/s Ratio Prot	c0.01	0.02			c0.30		c0.01				
v/s Ratio Perm	0.07								0.03		
v/c Ratio	0.11	0.02			0.52		0.51		0.03		
Uniform Delay, d1	2.7	1.8			7.4		27.7		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.1	0.0			0.4		11.5		0.0		
Delay (s)	2.8	1.8			7.8		39.2		0.0		
Level of Service	A	A			A		D		A		
Approach Delay (s)		2.4			7.8		6.1			0.0	
Approach LOS		A			A		A			A	

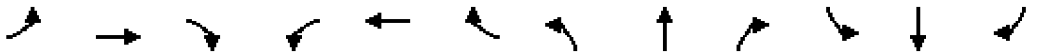
Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	19.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	100	12	28	914	111	26	140	5	25	113	55
Future Volume (vph)	16	100	12	28	914	111	26	140	5	25	113	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6305		1770	3800	1583	1770	3539	1583	1711	3253	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.64	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	1711	6305		1770	3800	1583	1186	3539	1583	1181	3253	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	109	13	30	993	121	28	152	5	27	123	60
RTOR Reduction (vph)	0	8	0	0	0	69	0	0	4	0	49	0
Lane Group Flow (vph)	17	114	0	30	993	52	28	152	1	27	134	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	1.1	21.6		2.4	22.9	22.9	9.6	9.6	9.6	9.6	9.6	
Effective Green, g (s)	1.1	21.6		2.4	22.9	22.9	9.6	9.6	9.6	9.6	9.6	
Actuated g/C Ratio	0.02	0.40		0.04	0.43	0.43	0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	35	2540		79	1623	676	212	633	283	211	582	
v/s Ratio Prot	c0.01	0.02		0.02	c0.26			c0.04			0.04	
v/s Ratio Perm						0.03	0.02		0.00	0.02		
v/c Ratio	0.49	0.04		0.38	0.61	0.08	0.13	0.24	0.00	0.13	0.23	
Uniform Delay, d1	26.0	9.7		24.9	11.9	9.1	18.5	18.9	18.1	18.5	18.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.2	0.0		3.0	1.0	0.1	0.4	0.3	0.0	0.4	0.3	
Delay (s)	36.2	9.7		27.9	12.9	9.2	18.9	19.1	18.1	18.9	19.1	
Level of Service	D	A		C	B	A	B	B	B	B	B	
Approach Delay (s)		13.0			12.9			19.1			19.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



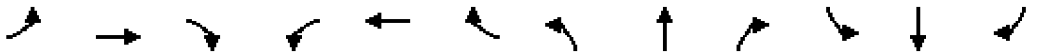
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	194	2	147	804	833	0	0	896	570
Future Volume (vph)	0	0	0	194	2	147	804	833	0	0	896	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				2.0	2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1686	1538	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1686	1538	3335	3438			3438	1538
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	206	2	156	855	886	0	0	953	606
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	0	0	0	264
Lane Group Flow (vph)	0	0	0	103	105	23	855	886	0	0	953	342
Heavy Vehicles (%)	2%	2%	2%	2%	5%	5%	5%	5%	2%	2%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				13.4	13.4	13.4	35.1	74.8			34.7	34.7
Effective Green, g (s)				16.4	16.4	14.4	39.1	78.8			38.7	35.7
Actuated g/C Ratio				0.17	0.17	0.15	0.40	0.80			0.39	0.36
Clearance Time (s)				5.0	5.0	5.0	5.0	5.5			5.5	5.5
Vehicle Extension (s)				4.0	4.0	4.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				279	280	224	1321	2744			1348	556
v/s Ratio Prot				0.06	c0.06		c0.26	0.26			c0.28	
v/s Ratio Perm						0.01						0.22
v/c Ratio				0.37	0.38	0.10	0.65	0.32			0.71	0.61
Uniform Delay, d1				36.6	36.6	36.5	24.2	2.7			25.2	25.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.1	1.2	0.3	1.5	0.1			2.2	2.9
Delay (s)				37.7	37.7	36.8	25.7	2.8			27.4	28.8
Level of Service				D	D	D	C	A			C	C
Approach Delay (s)		0.0			37.3			14.1			27.9	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	4.5
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	8	192	0	0	0	0	1218	136	169	823	0
Future Volume (vph)	375	8	192	0	0	0	0	1218	136	169	823	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5		2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.91		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1633	1640	1538					4866		1719	3438	
Flt Permitted	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1633	1640	1538					4866		1719	3438	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	387	8	198	0	0	0	0	1256	140	174	848	0
RTOR Reduction (vph)	0	0	169	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	197	198	29	0	0	0	0	1378	0	174	848	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	5%	5%	5%	5%	2%
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	10.0	10.0	10.0					40.7		8.8	54.5	
Effective Green, g (s)	13.0	11.0	11.0					43.7		11.8	57.5	
Actuated g/C Ratio	0.17	0.15	0.15					0.58		0.16	0.77	
Clearance Time (s)	5.0	5.0	5.0					5.5		5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0		3.0	7.0	
Lane Grp Cap (vph)	283	240	225					2835		270	2635	
v/s Ratio Prot	0.12	c0.12						c0.28		c0.10	0.25	
v/s Ratio Perm			0.02									
v/c Ratio	0.70	0.82	0.13					0.49		0.64	0.32	
Uniform Delay, d1	29.1	31.1	27.8					9.1		29.6	2.7	
Progression Factor	1.00	1.00	1.00					1.33		1.00	1.00	
Incremental Delay, d2	7.8	20.9	0.4					0.6		5.2	0.3	
Delay (s)	36.9	52.0	28.2					12.7		34.8	3.0	
Level of Service	D	D	C					B		C	A	
Approach Delay (s)		39.0			0.0			12.7			8.4	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	218	72	70	166	204	48	585	69	550	952	87
Future Volume (vph)	173	218	72	70	166	204	48	585	69	550	952	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	2.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	229	76	74	175	215	51	616	73	579	1002	92
RTOR Reduction (vph)	0	0	0	0	0	192	0	0	0	0	0	0
Lane Group Flow (vph)	182	229	76	74	175	23	51	616	73	579	1002	92
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			2			Free			Free
Actuated Green, G (s)	13.0	13.6	150.0	11.3	11.9	11.9	8.2	63.8	150.0	39.3	94.9	150.0
Effective Green, g (s)	15.0	17.6	150.0	13.3	15.9	15.9	10.2	67.8	150.0	41.3	98.9	150.0
Actuated g/C Ratio	0.10	0.12	1.00	0.09	0.11	0.11	0.07	0.45	1.00	0.28	0.66	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	333	403	1538	152	364	163	116	1553	1538	918	2266	1538
v/s Ratio Prot	c0.05	c0.07		0.04	0.05		0.03	0.18		c0.17	c0.29	
v/s Ratio Perm			0.05			0.01			0.05			c0.06
v/c Ratio	0.55	0.57	0.05	0.49	0.48	0.14	0.44	0.40	0.05	0.63	0.44	0.06
Uniform Delay, d1	64.3	62.6	0.0	65.1	63.2	60.8	67.2	27.4	0.0	47.7	12.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.88	1.00
Incremental Delay, d2	1.4	1.8	0.1	1.8	1.0	0.4	1.9	0.8	0.1	1.4	0.6	0.1
Delay (s)	65.7	64.4	0.1	66.9	64.2	61.2	69.1	28.2	0.1	47.2	11.5	0.1
Level of Service	E	E	A	E	E	E	E	C	A	D	B	A
Approach Delay (s)		54.9			63.2			28.2			23.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	556	0	0	456	37	1	0	0	68	1	136
Future Volume (vph)	84	556	0	0	456	37	1	0	0	68	1	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	12	12	10	12	12	12	10	10	10
Total Lost time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (prot)	1652	1749			1810	1478		1770		1652	1480	
Flt Permitted	0.28	1.00			1.00	1.00		0.66		0.76	1.00	
Satd. Flow (perm)	488	1749			1810	1478		1234		1316	1480	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	604	0	0	496	40	1	0	0	74	1	148
RTOR Reduction (vph)	0	0	0	0	0	23	0	0	0	0	122	0
Lane Group Flow (vph)	91	604	0	0	496	17	0	1	0	74	27	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	32.4	32.4			22.0	22.0		9.2		9.2	9.2	
Effective Green, g (s)	32.4	32.4			22.0	22.0		9.2		9.2	9.2	
Actuated g/C Ratio	0.63	0.63			0.43	0.43		0.18		0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)	3.0	5.0			5.0	5.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	428	1098			771	630		220		234	263	
v/s Ratio Prot	0.02	c0.35			c0.27						0.02	
v/s Ratio Perm	0.11					0.01		0.00		c0.06		
v/c Ratio	0.21	0.55			0.64	0.03		0.00		0.32	0.10	
Uniform Delay, d1	5.2	5.5			11.7	8.6		17.4		18.5	17.7	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.0			2.5	0.0		0.0		0.8	0.2	
Delay (s)	5.4	6.5			14.2	8.6		17.4		19.2	17.9	
Level of Service	A	A			B	A		B		B	B	
Approach Delay (s)		6.3			13.8			17.4			18.4	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	774	208	203	508	187	749
Future Volume (vph)	774	208	203	508	187	749
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	860	231	226	564	208	832
RTOR Reduction (vph)	0	141	0	0	0	0
Lane Group Flow (vph)	860	90	226	564	208	832
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	29.4	29.4	17.3	52.2	11.6	76.8
Effective Green, g (s)	29.4	29.4	17.3	52.2	11.6	76.8
Actuated g/C Ratio	0.38	0.38	0.23	0.68	0.15	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1316	588	387	2336	470	1487
v/s Ratio Prot	0.25		0.13	0.16	0.07	
v/s Ratio Perm		0.06				c0.56
v/c Ratio	0.65	0.15	0.58	0.24	0.44	0.56
Uniform Delay, d1	19.5	15.5	26.5	4.7	29.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.3	2.7	0.2	0.8	1.5
Delay (s)	21.4	15.9	29.2	4.9	30.4	1.5
Level of Service	C	B	C	A	C	A
Approach Delay (s)	20.2			11.8	7.3	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	18.5
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	919	510	34	433	3	210	0	19	0	0	8
Future Volume (vph)	3	919	510	34	433	3	210	0	19	0	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.98			0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3535		1569	1546			1611	
Flt Permitted	0.45	1.00	1.00	0.16	1.00		0.95	0.96			1.00	
Satd. Flow (perm)	840	3539	1583	296	3535		1569	1546			1611	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	4	1135	630	42	535	4	259	0	23	0	0	10
RTOR Reduction (vph)	0	0	233	0	0	0	0	97	0	0	10	0
Lane Group Flow (vph)	4	1135	397	42	539	0	142	43	0	0	0	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Split	NA			NA	
Protected Phases		6		5	2		4	4		3	3	
Permitted Phases	6		6	2								
Actuated Green, G (s)	46.1	46.1	46.1	55.0	55.0		12.9	12.9			0.9	
Effective Green, g (s)	46.1	46.1	46.1	55.0	55.0		12.9	12.9			0.9	
Actuated g/C Ratio	0.53	0.53	0.53	0.63	0.63		0.15	0.15			0.01	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	441	1858	831	250	2214		230	227			16	
v/s Ratio Prot		c0.32		0.01	c0.15		c0.09	0.03			c0.00	
v/s Ratio Perm	0.00		0.25	0.10								
v/c Ratio	0.01	0.61	0.48	0.17	0.24		0.62	0.19			0.01	
Uniform Delay, d1	9.9	14.6	13.2	8.5	7.2		35.1	32.9			43.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.5	2.0	0.3	0.3		4.9	0.4			0.2	
Delay (s)	10.0	16.1	15.2	8.8	7.5		40.0	33.3			43.2	
Level of Service	A	B	B	A	A		D	C			D	
Approach Delay (s)		15.7			7.6			36.7			43.2	
Approach LOS		B			A			D			D	

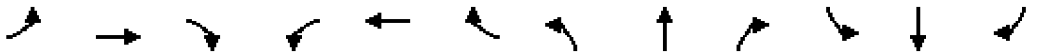
Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1152	86	32	667	374	34	57	12	667	63	26
Future Volume (vph)	14	1152	86	32	667	374	34	57	12	667	63	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6160		1719	4940	1538	1719	1643		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6160		1719	4940	1538	1719	1643		3335	1810	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	1200	90	33	695	390	35	59	12	695	66	27
RTOR Reduction (vph)	0	7	0	0	0	254	0	5	0	0	0	18
Lane Group Flow (vph)	15	1283	0	33	695	136	35	67	0	695	66	9
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	2.6	36.0		4.8	38.2	38.2	9.9	9.9		35.1	35.1	35.1
Effective Green, g (s)	2.6	36.0		4.8	38.2	38.2	9.9	9.9		35.1	35.1	35.1
Actuated g/C Ratio	0.02	0.33		0.04	0.35	0.35	0.09	0.09		0.32	0.32	0.32
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	40	2019		75	1718	535	154	148		1066	578	491
v/s Ratio Prot	0.01	c0.21		c0.02	0.14		0.02	c0.04		c0.21	0.04	
v/s Ratio Perm						0.09						0.01
v/c Ratio	0.38	0.64		0.44	0.40	0.25	0.23	0.45		0.65	0.11	0.02
Uniform Delay, d1	52.8	31.3		51.2	27.2	25.6	46.4	47.4		32.1	26.4	25.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.9		4.1	0.3	0.5	1.6	4.5		1.6	0.1	0.0
Delay (s)	58.6	32.3		55.3	27.5	26.1	48.0	51.9		33.7	26.5	25.6
Level of Service	E	C		E	C	C	D	D		C	C	C
Approach Delay (s)		32.6			27.8			50.6			32.8	
Approach LOS		C			C			D			C	

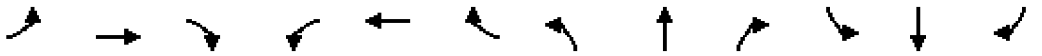
Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	21	194	86	27	51	123	491	25	16	778	50
Future Volume (vph)	76	21	194	86	27	51	123	491	25	16	778	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.21	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	378	3539	1531	843	3539	1531
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	78	21	198	88	28	52	126	501	26	16	794	51
RTOR Reduction (vph)	0	0	172	0	0	47	0	0	14	0	0	32
Lane Group Flow (vph)	78	21	26	88	28	5	126	501	12	16	794	19
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	10.2	10.2	10.2	8.1	8.1	8.1	42.4	36.3	36.3	29.7	28.6	28.6
Effective Green, g (s)	10.2	10.2	10.2	8.1	8.1	8.1	42.4	36.3	36.3	29.7	28.6	28.6
Actuated g/C Ratio	0.13	0.13	0.13	0.11	0.11	0.11	0.55	0.47	0.47	0.39	0.37	0.37
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	219	231	196	186	196	167	361	1674	724	338	1319	570
v/s Ratio Prot	c0.05	0.01		c0.05	0.02		c0.04	0.14		0.00	c0.22	
v/s Ratio Perm			0.02			0.00	0.15		0.01	0.02		0.01
v/c Ratio	0.36	0.09	0.13	0.47	0.14	0.03	0.35	0.30	0.02	0.05	0.60	0.03
Uniform Delay, d1	30.3	29.2	29.4	32.3	31.1	30.8	9.8	12.4	10.7	14.5	19.4	15.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.2	0.3	1.9	0.3	0.1	0.6	0.2	0.0	0.1	1.1	0.1
Delay (s)	31.3	29.4	29.7	34.2	31.5	30.9	10.4	12.6	10.7	14.6	20.6	15.3
Level of Service	C	C	C	C	C	C	B	B	B	B	C	B
Approach Delay (s)		30.1			32.7			12.1			20.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	76.7	Sum of lost time (s)	21.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	0	116	0	0	362	69	251	0	0	1244	198
Future Volume (vph)	122	0	116	0	0	362	69	251	0	0	1244	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.10	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	177	3539			3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	144	0	136	0	0	426	81	295	0	0	1464	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	0	136	0	0	426	81	295	0	0	1464	233
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	13.5		94.2			94.2	68.2	68.2			55.5	94.2
Effective Green, g (s)	13.5		94.2			94.2	68.2	68.2			55.5	94.2
Actuated g/C Ratio	0.14		1.00			1.00	0.72	0.72			0.59	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	245		1583			1611	253	2562			2085	1583
v/s Ratio Prot							0.03	0.08			c0.41	
v/s Ratio Perm	c0.08		0.09			c0.26	0.21					0.15
v/c Ratio	0.59		0.09			0.26	0.32	0.12			0.70	0.15
Uniform Delay, d1	37.7		0.0			0.0	9.1	3.9			13.6	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	3.6		0.1			0.4	0.7	0.0			1.4	0.2
Delay (s)	41.3		0.1			0.4	9.8	4.0			14.9	0.2
Level of Service	D		A			A	A	A			B	A
Approach Delay (s)		21.3			0.4			5.2			12.9	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	17.5
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	29	117	0	0	161	0	71	0	811	0	0
Future Volume (vph)	29	117	0	0	161	0	71	0	811	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.53	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	981	1863			3539		1770		3610		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	122	0	0	168	0	74	0	845	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	30	122	0	0	168	0	74	0	845	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	33.7	33.7			26.6		5.0		51.7		
Effective Green, g (s)	33.7	33.7			26.6		5.0		51.7		
Actuated g/C Ratio	0.65	0.65			0.51		0.10		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	656	1214			1820		171		3610		
v/s Ratio Prot	0.00	0.07			0.05		0.04				
v/s Ratio Perm	0.03								c0.23		
v/c Ratio	0.05	0.10			0.09		0.43		0.23		
Uniform Delay, d1	3.5	3.4			6.4		22.0		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.0	0.1			0.0		1.8		0.2		
Delay (s)	3.6	3.4			6.4		23.8		0.2		
Level of Service	A	A			A		C		A		
Approach Delay (s)		3.5			6.4		2.1			0.0	
Approach LOS		A			A		A			A	

Intersection Summary			
HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	19.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	695	46	4	66	16	43	143	42	119	248	30
Future Volume (vph)	13	695	46	4	66	16	43	143	42	119	248	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6348		1770	3800	1583	1770	3539	1583	1711	3367	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	1711	6348		1770	3800	1583	1040	3539	1583	1167	3367	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	15	799	53	5	76	18	49	164	48	137	285	34
RTOR Reduction (vph)	0	7	0	0	0	11	0	0	36	0	8	0
Lane Group Flow (vph)	15	845	0	5	76	7	49	164	12	137	311	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	1.1	20.6		1.1	20.6	20.6	13.2	13.2	13.2	13.2	13.2	
Effective Green, g (s)	1.1	20.6		1.1	20.6	20.6	13.2	13.2	13.2	13.2	13.2	
Actuated g/C Ratio	0.02	0.38		0.02	0.38	0.38	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	34	2381		35	1425	593	250	850	380	280	809	
v/s Ratio Prot	0.01	c0.13		0.00	c0.02			0.05			0.09	
v/s Ratio Perm						0.00	0.05		0.01	c0.12		
v/c Ratio	0.44	0.35		0.14	0.05	0.01	0.20	0.19	0.03	0.49	0.38	
Uniform Delay, d1	26.6	12.4		26.4	10.9	10.8	16.6	16.6	16.0	17.9	17.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.9	0.2		1.9	0.0	0.0	0.5	0.2	0.0	1.8	0.4	
Delay (s)	35.5	12.6		28.3	11.0	10.8	17.1	16.8	16.0	19.8	17.9	
Level of Service	D	B		C	B	B	B	B	B	B	B	
Approach Delay (s)		12.9			11.8			16.7			18.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



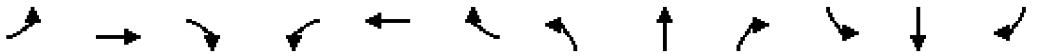
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	223	1	153	895	1456	0	0	613	270
Future Volume (vph)	0	0	0	223	1	153	895	1456	0	0	613	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				2.0	2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1633	1638	1538	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1633	1638	1538	3335	3438			3438	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	228	1	156	913	1486	0	0	626	276
RTOR Reduction (vph)	0	0	0	0	0	136	0	0	0	0	0	192
Lane Group Flow (vph)	0	0	0	114	115	20	913	1486	0	0	626	84
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1 9	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				15.9	15.9	15.9	58.0	75.6			40.1	40.1
Effective Green, g (s)				18.9	18.9	16.9	66.0	79.6			44.1	41.1
Actuated g/C Ratio				0.14	0.14	0.13	0.49	0.59			0.33	0.30
Clearance Time (s)				5.0	5.0	5.0		5.5			5.5	5.5
Vehicle Extension (s)				4.0	4.0	4.0		5.0			5.0	5.0
Lane Grp Cap (vph)				228	229	192	1630	2027			1123	468
v/s Ratio Prot				0.07	c0.07		c0.27	c0.43			0.18	
v/s Ratio Perm						0.01						0.05
v/c Ratio				0.50	0.50	0.10	0.56	0.73			0.56	0.18
Uniform Delay, d1				53.7	53.7	52.3	24.3	20.0			37.4	34.5
Progression Factor				1.00	1.00	1.00	0.87	0.72			1.00	1.00
Incremental Delay, d2				2.3	2.4	0.3	0.8	1.7			2.0	0.8
Delay (s)				56.0	56.1	52.6	22.0	16.0			39.4	35.4
Level of Service				E	E	D	C	B			D	D
Approach Delay (s)		0.0			54.7			18.3			38.2	
Approach LOS		A			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	625	1	167	0	0	0	0	1735	244	160	642	0
Future Volume (vph)	625	1	167	0	0	0	0	1735	244	160	642	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5		2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.91		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1633	1637	1538					4849		1719	3438	
Flt Permitted	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1633	1637	1538					4849		1719	3438	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	638	1	170	0	0	0	0	1770	249	163	655	0
RTOR Reduction (vph)	0	0	125	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	319	320	45	0	0	0	0	2006	0	163	655	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	35.1	35.1	35.1					70.7		13.7	89.4	
Effective Green, g (s)	38.1	36.1	36.1					73.7		16.7	92.4	
Actuated g/C Ratio	0.28	0.27	0.27					0.55		0.12	0.68	
Clearance Time (s)	5.0	5.0	5.0					5.5		5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0		3.0	7.0	
Lane Grp Cap (vph)	460	437	411					2647		212	2353	
v/s Ratio Prot	0.20	c0.20						c0.41		c0.09	0.19	
v/s Ratio Perm			0.03									
v/c Ratio	0.69	0.73	0.11					0.76		0.77	0.28	
Uniform Delay, d1	43.2	45.0	37.3					23.7		57.3	8.3	
Progression Factor	1.00	1.00	1.00					0.51		0.43	0.71	
Incremental Delay, d2	4.8	6.6	0.2					2.0		13.1	0.3	
Delay (s)	48.1	51.7	37.5					14.2		37.7	6.2	
Level of Service	D	D	D					B		D	A	
Approach Delay (s)		47.3			0.0			14.2			12.4	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	223	67	58	386	338	171	832	110	532	693	98
Future Volume (vph)	197	223	67	58	386	338	171	832	110	532	693	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	2.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	199	225	68	59	390	341	173	840	111	537	700	99
RTOR Reduction (vph)	0	0	0	0	0	285	0	0	0	0	0	0
Lane Group Flow (vph)	199	225	68	59	390	56	173	840	111	537	700	99
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			2			Free			Free
Actuated Green, G (s)	11.9	20.8	135.0	9.4	18.3	18.3	18.3	55.5	135.0	27.3	64.5	135.0
Effective Green, g (s)	13.9	24.8	135.0	11.4	22.3	22.3	20.3	59.5	135.0	29.3	68.5	135.0
Actuated g/C Ratio	0.10	0.18	1.00	0.08	0.17	0.17	0.15	0.44	1.00	0.22	0.51	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	343	631	1538	145	567	254	258	1515	1538	723	1744	1538
v/s Ratio Prot	c0.06	0.07		0.03	c0.11		0.10	c0.24		c0.16	0.20	
v/s Ratio Perm			0.04			0.04			c0.07			0.06
v/c Ratio	0.58	0.36	0.04	0.41	0.69	0.22	0.67	0.55	0.07	0.74	0.40	0.06
Uniform Delay, d1	57.8	48.1	0.0	58.6	53.1	48.8	54.2	27.9	0.0	49.3	20.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.92	1.00	1.47	0.93	1.00
Incremental Delay, d2	2.1	0.3	0.1	1.4	3.5	0.4	5.2	1.2	0.1	4.2	0.7	0.1
Delay (s)	59.8	48.5	0.1	60.0	56.5	49.3	58.2	26.8	0.1	76.6	19.7	0.1
Level of Service	E	D	A	E	E	D	E	C	A	E	B	A
Approach Delay (s)		46.4			53.7			29.0			41.1	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	414	1	1	1045	132	1	1	1	42	0	130
Future Volume (vph)	141	414	1	1	1045	132	1	1	1	42	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	12	12	10	12	12	12	10	10	10
Total Lost time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1652	1749			1809	1478		1750		1652	1478	
Flt Permitted	0.08	1.00			1.00	1.00		0.90		0.76	1.00	
Satd. Flow (perm)	144	1749			1809	1478		1606		1314	1478	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	145	427	1	1	1077	136	1	1	1	43	0	134
RTOR Reduction (vph)	0	0	0	0	0	32	0	1	0	0	121	0
Lane Group Flow (vph)	145	428	0	0	1078	104	0	2	0	43	13	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	86.0	86.0			70.4	70.4		9.9		9.9	9.9	
Effective Green, g (s)	86.0	86.0			70.4	70.4		9.9		9.9	9.9	
Actuated g/C Ratio	0.81	0.81			0.66	0.66		0.09		0.09	0.09	
Clearance Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)	3.0	5.0			5.0	5.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1420			1202	982		150		122	138	
v/s Ratio Prot	c0.05	0.24									0.01	
v/s Ratio Perm	0.38				0.60	0.07		0.00		c0.03		
v/c Ratio	0.54	0.30			0.90	0.11		0.01		0.35	0.09	
Uniform Delay, d1	21.0	2.5			14.7	6.4		43.6		45.0	43.9	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.3			9.6	0.1		0.0		1.8	0.3	
Delay (s)	23.3	2.7			24.3	6.5		43.6		46.8	44.2	
Level of Service	C	A			C	A		D		D	D	
Approach Delay (s)		7.9			22.3			43.6			44.8	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	732	310	418	978	271	438
Future Volume (vph)	732	310	418	978	271	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	796	337	454	1063	295	476
RTOR Reduction (vph)	0	229	0	0	0	0
Lane Group Flow (vph)	796	108	454	1063	295	476
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	31.2	31.2	32.1	68.8	15.7	97.5
Effective Green, g (s)	31.2	31.2	32.1	68.8	15.7	97.5
Actuated g/C Ratio	0.32	0.32	0.33	0.71	0.16	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1100	492	565	2425	501	1487
v/s Ratio Prot	c0.23		c0.26	0.31	c0.09	
v/s Ratio Perm		0.07				0.32
v/c Ratio	0.72	0.22	0.80	0.44	0.59	0.32
Uniform Delay, d1	29.3	24.2	29.8	6.1	37.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.6	8.6	0.4	1.9	0.6
Delay (s)	32.7	24.9	38.4	6.5	39.8	0.6
Level of Service	C	C	D	A	D	A
Approach Delay (s)	30.4			16.0	15.6	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	791	278	59	858	0	405	0	34	4	0	1
Future Volume (vph)	8	791	278	59	858	0	405	0	34	4	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.98			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96			0.96	
Satd. Flow (prot)	1770	3539	1583	1770	3539		1569	1547			1743	
Flt Permitted	0.31	1.00	1.00	0.23	1.00		0.95	0.96			0.96	
Satd. Flow (perm)	576	3539	1583	436	3539		1569	1547			1743	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	9	851	299	63	923	0	435	0	37	4	0	1
RTOR Reduction (vph)	0	0	158	0	0	0	0	90	0	0	5	0
Lane Group Flow (vph)	9	851	141	63	923	0	239	143	0	0	0	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases		6		5	2		4	4		3	3	
Permitted Phases	6		6	2								
Actuated Green, G (s)	45.8	45.8	45.8	56.8	56.8		20.4	20.4			0.9	
Effective Green, g (s)	45.8	45.8	45.8	56.8	56.8		20.4	20.4			0.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.58	0.58		0.21	0.21			0.01	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	271	1669	746	337	2070		329	325			16	
v/s Ratio Prot		c0.24		0.01	c0.26		c0.15	0.09			c0.00	
v/s Ratio Perm	0.02		0.09	0.10								
v/c Ratio	0.03	0.51	0.19	0.19	0.45		0.73	0.44			0.00	
Uniform Delay, d1	13.8	17.8	14.9	10.0	11.3		35.7	33.4			47.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	1.1	0.6	0.3	0.7		7.8	1.0			0.1	
Delay (s)	14.0	19.0	15.4	10.2	12.0		43.5	34.3			47.7	
Level of Service	B	B	B	B	B		D	C			D	
Approach Delay (s)		18.0			11.9			39.0			47.7	
Approach LOS		B			B			D			D	

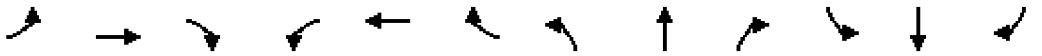
Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	954	51	40	1120	1087	71	110	22	363	57	28
Future Volume (vph)	41	954	51	40	1120	1087	71	110	22	363	57	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6177		1719	4940	1538	1719	1647		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6177		1719	4940	1538	1719	1647		3335	1810	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	42	973	52	41	1143	1109	72	112	22	370	58	29
RTOR Reduction (vph)	0	3	0	0	0	459	0	4	0	0	0	24
Lane Group Flow (vph)	42	1022	0	41	1143	650	72	130	0	370	58	5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	7.1	50.9		7.0	50.8	50.8	16.8	16.8		19.8	19.8	19.8
Effective Green, g (s)	7.1	50.9		7.0	50.8	50.8	16.8	16.8		19.8	19.8	19.8
Actuated g/C Ratio	0.06	0.43		0.06	0.43	0.43	0.14	0.14		0.17	0.17	0.17
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	102	2653		101	2117	659	243	233		557	302	256
v/s Ratio Prot	c0.02	0.17		0.02	0.23		0.04	c0.08		c0.11	0.03	
v/s Ratio Perm						c0.42						0.00
v/c Ratio	0.41	0.39		0.41	0.54	0.99	0.30	0.56		0.66	0.19	0.02
Uniform Delay, d1	53.7	23.1		53.7	25.2	33.5	45.6	47.4		46.2	42.5	41.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.2		2.7	0.5	31.6	1.4	4.8		3.3	0.4	0.0
Delay (s)	56.4	23.3		56.4	25.7	65.1	47.0	52.2		49.5	42.9	41.3
Level of Service	E	C		E	C	E	D	D		D	D	D
Approach Delay (s)		24.6			45.3			50.4			48.2	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	68	319	96	40	23	251	1033	78	20	852	81
Future Volume (vph)	165	68	319	96	40	23	251	1033	78	20	852	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.12	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	218	3539	1531	409	3539	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	74	347	104	43	25	273	1123	85	22	926	88
RTOR Reduction (vph)	0	0	287	0	0	22	0	0	43	0	0	58
Lane Group Flow (vph)	179	74	60	104	43	3	273	1123	42	22	926	30
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	18.6	18.6	18.6	12.3	12.3	12.3	60.8	53.4	53.4	39.1	36.7	36.7
Effective Green, g (s)	18.6	18.6	18.6	12.3	12.3	12.3	60.8	53.4	53.4	39.1	36.7	36.7
Actuated g/C Ratio	0.17	0.17	0.17	0.11	0.11	0.11	0.56	0.50	0.50	0.36	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	285	300	255	202	212	180	387	1754	759	177	1205	521
v/s Ratio Prot	c0.11	0.04		c0.06	0.02		c0.12	0.32		0.00	c0.26	
v/s Ratio Perm			0.04			0.00	0.27		0.03	0.04		0.02
v/c Ratio	0.63	0.25	0.24	0.51	0.20	0.02	0.71	0.64	0.06	0.12	0.77	0.06
Uniform Delay, d1	41.3	38.5	38.4	44.9	43.3	42.3	22.1	20.1	14.1	22.2	31.7	23.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.4	0.5	2.2	0.5	0.0	5.8	1.1	0.1	0.3	3.5	0.1
Delay (s)	45.6	38.9	38.9	47.1	43.7	42.4	27.9	21.2	14.1	22.5	35.3	24.0
Level of Service	D	D	D	D	D	D	C	C	B	C	D	C
Approach Delay (s)		40.9			45.6			22.0			34.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	107.7	Sum of lost time (s)	21.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	291	0	84	0	0	419	115	1209	0	0	651	234
Future Volume (vph)	291	0	84	0	0	419	115	1209	0	0	651	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.26	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	475	3539			3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	303	0	88	0	0	436	120	1259	0	0	678	244
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	303	0	88	0	0	436	120	1259	0	0	678	244
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	21.0		75.3			75.3	41.8	41.8			26.8	75.3
Effective Green, g (s)	21.0		75.3			75.3	41.8	41.8			26.8	75.3
Actuated g/C Ratio	0.28		1.00			1.00	0.56	0.56			0.36	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	477		1583			1611	427	1964			1259	1583
v/s Ratio Prot							0.04	c0.36			0.19	
v/s Ratio Perm	c0.18		0.06			0.27	0.12					0.15
v/c Ratio	0.64		0.06			0.27	0.28	0.64			0.54	0.15
Uniform Delay, d1	23.8		0.0			0.0	8.9	11.6			19.3	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.8		0.1			0.4	0.4	1.0			0.8	0.2
Delay (s)	26.6		0.1			0.4	9.3	12.6			20.1	0.2
Level of Service	C		A			A	A	B			C	A
Approach Delay (s)		20.6			0.4			12.3			14.9	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	17.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	41	35	0	0	1053	0	19	0	111	0	0
Future Volume (vph)	41	35	0	0	1053	0	19	0	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.16	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	307	1863			3539		1770		3610		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	46	39	0	0	1183	0	21	0	125	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	39	0	0	1183	0	21	0	125	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	45.1	45.1			34.8		2.5		60.6		
Effective Green, g (s)	45.1	45.1			34.8		2.5		60.6		
Actuated g/C Ratio	0.74	0.74			0.57		0.04		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	332	1386			2032		73		3610		
v/s Ratio Prot	c0.01	0.02			c0.33		c0.01				
v/s Ratio Perm	0.09								0.03		
v/c Ratio	0.14	0.03			0.58		0.29		0.03		
Uniform Delay, d1	3.5	2.0			8.3		28.2		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.2	0.0			0.7		2.2		0.0		
Delay (s)	3.7	2.0			8.9		30.4		0.0		
Level of Service	A	A			A		C		A		
Approach Delay (s)		2.9			8.9		4.4			0.0	
Approach LOS		A			A		A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	19.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	111	26	28	1019	124	54	156	6	28	126	61
Future Volume (vph)	16	111	26	28	1019	124	54	156	6	28	126	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6227		1770	3800	1583	1770	3539	1583	1711	3254	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.62	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	1711	6227		1770	3800	1583	1163	3539	1583	1160	3254	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	121	28	30	1108	135	59	170	7	30	137	66
RTOR Reduction (vph)	0	17	0	0	0	75	0	0	6	0	52	0
Lane Group Flow (vph)	17	132	0	30	1108	60	59	170	1	30	151	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	1.0	22.9		3.2	25.1	25.1	10.6	10.6	10.6	10.6	10.6	
Effective Green, g (s)	1.0	22.9		3.2	25.1	25.1	10.6	10.6	10.6	10.6	10.6	
Actuated g/C Ratio	0.02	0.40		0.06	0.44	0.44	0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	30	2514		99	1682	700	217	661	295	216	608	
v/s Ratio Prot	c0.01	0.02		0.02	c0.29			0.05			0.05	
v/s Ratio Perm						0.04	c0.05		0.00	0.03		
v/c Ratio	0.57	0.05		0.30	0.66	0.09	0.27	0.26	0.00	0.14	0.25	
Uniform Delay, d1	27.6	10.3		25.7	12.4	9.2	19.7	19.7	18.8	19.2	19.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	22.3	0.0		1.7	1.3	0.1	0.9	0.3	0.0	0.4	0.3	
Delay (s)	49.9	10.3		27.4	13.7	9.3	20.7	20.0	18.8	19.6	19.9	
Level of Service	D	B		C	B	A	C	B	B	B	B	
Approach Delay (s)		14.4			13.6			20.1			19.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



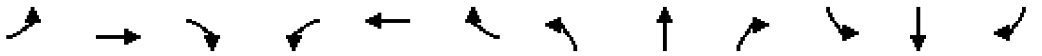
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	288	2	147	841	847	0	0	959	570
Future Volume (vph)	0	0	0	288	2	147	841	847	0	0	959	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				2.0	2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1686	1538	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1686	1538	3335	3438			3438	1538
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	306	2	156	895	901	0	0	1020	606
RTOR Reduction (vph)	0	0	0	0	0	130	0	0	0	0	0	260
Lane Group Flow (vph)	0	0	0	153	155	26	895	901	0	0	1020	346
Heavy Vehicles (%)	2%	2%	2%	2%	5%	5%	5%	5%	2%	2%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				17.5	17.5	17.5	38.1	82.4			39.3	39.3
Effective Green, g (s)				20.5	20.5	18.5	42.1	86.4			43.3	40.3
Actuated g/C Ratio				0.19	0.19	0.17	0.38	0.78			0.39	0.37
Clearance Time (s)				5.0	5.0	5.0	5.0	5.5			5.5	5.5
Vehicle Extension (s)				4.0	4.0	4.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				312	313	257	1271	2690			1348	561
v/s Ratio Prot				0.09	c0.09		c0.27	0.26			c0.30	
v/s Ratio Perm						0.02						0.22
v/c Ratio				0.49	0.50	0.10	0.70	0.33			0.76	0.62
Uniform Delay, d1				40.3	40.3	38.9	28.9	3.5			29.0	28.7
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.7	1.7	0.2	2.3	0.2			3.0	2.9
Delay (s)				41.9	42.0	39.2	31.1	3.7			31.9	31.6
Level of Service				D	D	D	C	A			C	C
Approach Delay (s)		0.0			41.0			17.4			31.8	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	4.5
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	8	219	0	0	0	0	1269	159	169	980	0
Future Volume (vph)	375	8	219	0	0	0	0	1269	159	169	980	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5		2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.91		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1633	1640	1538					4857		1719	3438	
Flt Permitted	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1633	1640	1538					4857		1719	3438	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	387	8	226	0	0	0	0	1308	164	174	1010	0
RTOR Reduction (vph)	0	0	166	0	0	0	0	21	0	0	0	0
Lane Group Flow (vph)	197	198	60	0	0	0	0	1451	0	174	1010	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	5%	5%	5%	5%	2%
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	10.0	10.0	10.0					40.7		8.8	54.5	
Effective Green, g (s)	13.0	11.0	11.0					43.7		11.8	57.5	
Actuated g/C Ratio	0.17	0.15	0.15					0.58		0.16	0.77	
Clearance Time (s)	5.0	5.0	5.0					5.5		5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0		3.0	7.0	
Lane Grp Cap (vph)	283	240	225					2830		270	2635	
v/s Ratio Prot	0.12	c0.12						c0.30		c0.10	0.29	
v/s Ratio Perm			0.04									
v/c Ratio	0.70	0.82	0.27					0.51		0.64	0.38	
Uniform Delay, d1	29.1	31.1	28.4					9.3		29.6	2.9	
Progression Factor	1.00	1.00	1.00					1.41		1.00	1.00	
Incremental Delay, d2	7.8	20.9	0.9					0.7		5.2	0.4	
Delay (s)	36.9	52.0	29.3					13.8		34.8	3.3	
Level of Service	D	D	C					B		C	A	
Approach Delay (s)		39.0			0.0			13.8			7.9	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	223	98	70	167	209	54	646	69	605	1213	87
Future Volume (vph)	173	223	98	70	167	209	54	646	69	605	1213	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	2.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	235	103	74	176	220	57	680	73	637	1277	92
RTOR Reduction (vph)	0	0	0	0	0	196	0	0	0	0	0	0
Lane Group Flow (vph)	182	235	103	74	176	24	57	680	73	637	1277	92
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			2			Free			Free
Actuated Green, G (s)	13.0	13.8	150.0	11.3	12.1	12.1	8.7	58.4	150.0	44.5	94.2	150.0
Effective Green, g (s)	15.0	17.8	150.0	13.3	16.1	16.1	10.7	62.4	150.0	46.5	98.2	150.0
Actuated g/C Ratio	0.10	0.12	1.00	0.09	0.11	0.11	0.07	0.42	1.00	0.31	0.65	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	333	407	1538	152	369	165	122	1430	1538	1033	2250	1538
v/s Ratio Prot	c0.05	c0.07		0.04	0.05		0.03	0.20		c0.19	c0.37	
v/s Ratio Perm			c0.07			0.02			0.05			0.06
v/c Ratio	0.55	0.58	0.07	0.49	0.48	0.14	0.47	0.48	0.05	0.62	0.57	0.06
Uniform Delay, d1	64.3	62.5	0.0	65.1	63.0	60.7	66.9	31.9	0.0	44.1	14.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.84	1.00
Incremental Delay, d2	1.4	2.0	0.1	1.8	1.0	0.4	2.1	1.1	0.1	1.1	1.0	0.1
Delay (s)	65.7	64.5	0.1	66.9	64.0	61.1	69.0	33.0	0.1	43.4	13.1	0.1
Level of Service	E	E	A	E	E	E	E	C	A	D	B	A
Approach Delay (s)		52.2			63.1			32.6			22.1	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	616	0	0	470	37	1	0	0	68	1	136
Future Volume (vph)	84	616	0	0	470	37	1	0	0	68	1	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	12	12	10	12	12	12	10	10	10
Total Lost time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (prot)	1652	1749			1810	1478		1770		1652	1480	
Flt Permitted	0.27	1.00			1.00	1.00		0.66		0.76	1.00	
Satd. Flow (perm)	470	1749			1810	1478		1234		1316	1480	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	670	0	0	511	40	1	0	0	74	1	148
RTOR Reduction (vph)	0	0	0	0	0	23	0	0	0	0	121	0
Lane Group Flow (vph)	91	670	0	0	511	17	0	1	0	74	28	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	32.9	32.9			22.5	22.5		9.5		9.5	9.5	
Effective Green, g (s)	32.9	32.9			22.5	22.5		9.5		9.5	9.5	
Actuated g/C Ratio	0.63	0.63			0.43	0.43		0.18		0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)	3.0	5.0			5.0	5.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	416	1098			777	634		223		238	268	
v/s Ratio Prot	0.02	c0.38			0.28						0.02	
v/s Ratio Perm	0.11					0.01		0.00		c0.06		
v/c Ratio	0.22	0.61			0.66	0.03		0.00		0.31	0.10	
Uniform Delay, d1	5.3	5.9			11.9	8.6		17.6		18.6	17.9	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.5			2.7	0.0		0.0		0.7	0.2	
Delay (s)	5.6	7.3			14.6	8.7		17.6		19.4	18.1	
Level of Service	A	A			B	A		B		B	B	
Approach Delay (s)		7.1			14.2			17.6			18.5	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	900	208	270	538	187	1036
Future Volume (vph)	900	208	270	538	187	1036
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1000	231	300	598	208	1151
RTOR Reduction (vph)	0	119	0	0	0	0
Lane Group Flow (vph)	1000	112	300	598	208	1151
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	34.5	34.5	22.2	62.2	12.3	87.5
Effective Green, g (s)	34.5	34.5	22.2	62.2	12.3	87.5
Actuated g/C Ratio	0.39	0.39	0.25	0.71	0.14	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1355	606	436	2443	437	1487
v/s Ratio Prot	0.29		0.17	0.17	0.07	
v/s Ratio Perm		0.07				c0.77
v/c Ratio	0.74	0.18	0.69	0.24	0.48	0.77
Uniform Delay, d1	22.6	17.3	29.5	4.4	34.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.4	4.9	0.1	1.0	4.0
Delay (s)	25.6	17.7	34.4	4.6	35.6	4.0
Level of Service	C	B	C	A	D	A
Approach Delay (s)	24.1			14.5	8.8	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1061	781	34	466	3	274	0	19	0	0	8
Future Volume (vph)	3	1061	781	34	466	3	274	0	19	0	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.98			0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3536		1569	1552			1611	
Flt Permitted	0.43	1.00	1.00	0.11	1.00		0.95	0.96			1.00	
Satd. Flow (perm)	808	3539	1583	196	3536		1569	1552			1611	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	4	1310	964	42	575	4	338	0	23	0	0	10
RTOR Reduction (vph)	0	0	319	0	0	0	0	95	0	0	10	0
Lane Group Flow (vph)	4	1310	645	42	579	0	183	83	0	0	0	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Split	NA			NA	
Protected Phases		6		5	2		4	4		3	3	
Permitted Phases	6		6	2								
Actuated Green, G (s)	46.2	46.2	46.2	55.2	55.2		15.4	15.4			0.9	
Effective Green, g (s)	46.2	46.2	46.2	55.2	55.2		15.4	15.4			0.9	
Actuated g/C Ratio	0.51	0.51	0.51	0.61	0.61		0.17	0.17			0.01	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	412	1806	808	189	2156		266	264			16	
v/s Ratio Prot		0.37		0.01	c0.16		c0.12	0.05			c0.00	
v/s Ratio Perm	0.00		c0.41	0.13								
v/c Ratio	0.01	0.73	0.80	0.22	0.27		0.69	0.32			0.01	
Uniform Delay, d1	10.9	17.2	18.3	11.1	8.2		35.3	32.9			44.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	2.6	8.1	0.6	0.3		7.2	0.7			0.2	
Delay (s)	10.9	19.8	26.4	11.7	8.5		42.5	33.6			44.5	
Level of Service	B	B	C	B	A		D	C			D	
Approach Delay (s)		22.6			8.8			38.1			44.5	
Approach LOS		C			A			D			D	

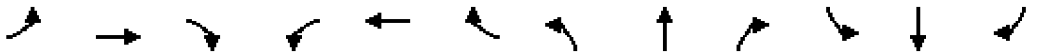
Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1152	228	32	667	374	67	71	12	667	123	26
Future Volume (vph)	14	1152	228	32	667	374	67	71	12	667	123	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6070		1719	4940	1538	1719	1651		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6070		1719	4940	1538	1719	1651		3335	1810	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	1200	238	33	695	390	70	74	12	695	128	27
RTOR Reduction (vph)	0	20	0	0	0	250	0	4	0	0	0	19
Lane Group Flow (vph)	15	1418	0	33	695	140	70	83	0	695	128	8
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	2.7	40.0		5.0	42.3	42.3	13.6	13.6		35.3	35.3	35.3
Effective Green, g (s)	2.7	40.0		5.0	42.3	42.3	13.6	13.6		35.3	35.3	35.3
Actuated g/C Ratio	0.02	0.34		0.04	0.36	0.36	0.12	0.12		0.30	0.30	0.30
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	39	2059		72	1772	551	198	190		998	541	460
v/s Ratio Prot	0.01	c0.23		c0.02	0.14		0.04	c0.05		c0.21	0.07	
v/s Ratio Perm						0.09						0.01
v/c Ratio	0.38	0.69		0.46	0.39	0.25	0.35	0.43		0.70	0.24	0.02
Uniform Delay, d1	56.8	33.6		55.1	28.2	26.7	48.1	48.6		36.6	31.1	29.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.2	1.3		4.6	0.3	0.5	2.3	3.3		2.3	0.3	0.0
Delay (s)	63.0	34.8		59.7	28.5	27.2	50.4	51.9		38.9	31.4	29.1
Level of Service	E	C		E	C	C	D	D		D	C	C
Approach Delay (s)		35.1			29.0			51.2			37.4	
Approach LOS		D			C			D			D	

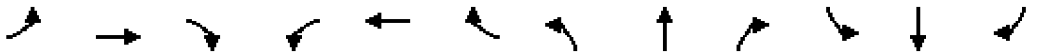
Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	117.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	21	194	86	27	51	123	528	25	16	937	50
Future Volume (vph)	76	21	194	86	27	51	123	528	25	16	937	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.16	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	287	3539	1531	812	3539	1531
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	78	21	198	88	28	52	126	539	26	16	956	51
RTOR Reduction (vph)	0	0	173	0	0	47	0	0	13	0	0	30
Lane Group Flow (vph)	78	21	25	88	28	5	126	539	13	16	956	21
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	10.6	10.6	10.6	8.3	8.3	8.3	47.5	40.4	40.4	35.6	33.5	33.5
Effective Green, g (s)	10.6	10.6	10.6	8.3	8.3	8.3	47.5	40.4	40.4	35.6	33.5	33.5
Actuated g/C Ratio	0.13	0.13	0.13	0.10	0.10	0.10	0.58	0.49	0.49	0.43	0.41	0.41
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	212	223	190	178	187	159	320	1735	750	373	1438	622
v/s Ratio Prot	c0.05	0.01		c0.05	0.02		c0.04	0.15		0.00	c0.27	
v/s Ratio Perm			0.02			0.00	0.18		0.01	0.02		0.01
v/c Ratio	0.37	0.09	0.13	0.49	0.15	0.03	0.39	0.31	0.02	0.04	0.66	0.03
Uniform Delay, d1	32.8	31.7	31.8	35.1	33.8	33.4	10.5	12.6	10.8	13.4	19.9	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.3	2.2	0.4	0.1	0.8	0.2	0.0	0.0	1.6	0.0
Delay (s)	33.9	31.8	32.2	37.2	34.2	33.5	11.3	12.8	10.8	13.5	21.4	14.8
Level of Service	C	C	C	D	C	C	B	B	B	B	C	B
Approach Delay (s)		32.6			35.6			12.5			21.0	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	0	116	0	0	362	69	251	0	0	1244	261
Future Volume (vph)	136	0	116	0	0	362	69	251	0	0	1244	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.10	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	175	3539			3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	160	0	136	0	0	426	81	295	0	0	1464	307
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	0	136	0	0	426	81	295	0	0	1464	307
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	14.5		95.9			95.9	68.9	68.9			56.2	95.9
Effective Green, g (s)	14.5		95.9			95.9	68.9	68.9			56.2	95.9
Actuated g/C Ratio	0.15		1.00			1.00	0.72	0.72			0.59	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	258		1583			1611	249	2542			2073	1583
v/s Ratio Prot							0.03	0.08			c0.41	
v/s Ratio Perm	c0.09		0.09			c0.26	0.21					0.19
v/c Ratio	0.62		0.09			0.26	0.33	0.12			0.71	0.19
Uniform Delay, d1	38.1		0.0			0.0	9.5	4.1			14.0	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	4.6		0.1			0.4	0.8	0.0			1.4	0.3
Delay (s)	42.7		0.1			0.4	10.3	4.2			15.4	0.3
Level of Service	D		A			A	B	A			B	A
Approach Delay (s)		23.1			0.4			5.5			12.8	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	95.9	Sum of lost time (s)	17.5
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	29	197	0	0	161	0	71	0	811	0	0
Future Volume (vph)	29	197	0	0	161	0	71	0	811	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.53	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	981	1863			3539		1770		3610		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	205	0	0	168	0	74	0	845	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	30	205	0	0	168	0	74	0	845	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	33.7	33.7			26.6		5.0		51.7		
Effective Green, g (s)	33.7	33.7			26.6		5.0		51.7		
Actuated g/C Ratio	0.65	0.65			0.51		0.10		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	656	1214			1820		171		3610		
v/s Ratio Prot	0.00	0.11			0.05		0.04				
v/s Ratio Perm	0.03								c0.23		
v/c Ratio	0.05	0.17			0.09		0.43		0.23		
Uniform Delay, d1	3.5	3.5			6.4		22.0		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.0	0.1			0.0		1.8		0.2		
Delay (s)	3.6	3.7			6.4		23.8		0.2		
Level of Service	A	A			A		C		A		
Approach Delay (s)		3.6			6.4		2.1			0.0	
Approach LOS		A			A		A			A	

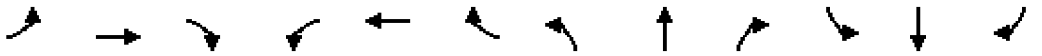
Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	19.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	695	126	4	66	16	62	161	42	119	327	30
Future Volume (vph)	13	695	126	4	66	16	62	161	42	119	327	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6260		1770	3800	1583	1770	3539	1583	1711	3379	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.51	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	1711	6260		1770	3800	1583	953	3539	1583	1144	3379	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	15	799	145	5	76	18	71	185	48	137	376	34
RTOR Reduction (vph)	0	26	0	0	0	11	0	0	36	0	5	0
Lane Group Flow (vph)	15	918	0	5	76	7	71	185	12	137	405	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	1.1	20.9		1.0	20.8	20.8	14.4	14.4	14.4	14.4	14.4	
Effective Green, g (s)	1.1	20.9		1.0	20.8	20.8	14.4	14.4	14.4	14.4	14.4	
Actuated g/C Ratio	0.02	0.37		0.02	0.37	0.37	0.26	0.26	0.26	0.26	0.26	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	33	2323		31	1403	584	243	905	404	292	864	
v/s Ratio Prot	0.01	c0.15		0.00	c0.02			0.05			c0.12	
v/s Ratio Perm						0.00	0.07		0.01	0.12		
v/c Ratio	0.45	0.40		0.16	0.05	0.01	0.29	0.20	0.03	0.47	0.47	
Uniform Delay, d1	27.3	13.0		27.2	11.4	11.2	16.9	16.5	15.7	17.7	17.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.6	0.2		2.4	0.0	0.0	0.9	0.2	0.0	1.6	0.5	
Delay (s)	36.9	13.3		29.7	11.5	11.3	17.8	16.6	15.8	19.3	18.3	
Level of Service	D	B		C	B	B	B	B	B	B	B	
Approach Delay (s)		13.6			12.3			16.7			18.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



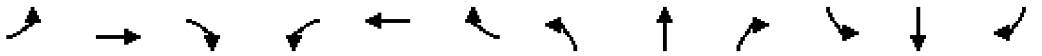
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	271	1	163	1022	1507	0	0	646	270
Future Volume (vph)	0	0	0	271	1	163	1022	1507	0	0	646	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				2.0	2.0	4.0	1.0	1.5			1.5	4.5
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1633	1638	1538	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1633	1638	1538	3335	3438			3438	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	277	1	166	1043	1538	0	0	659	276
RTOR Reduction (vph)	0	0	0	0	0	142	0	0	0	0	0	204
Lane Group Flow (vph)	0	0	0	138	140	24	1043	1538	0	0	659	72
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1 9	6			2	
Permitted Phases						4						2
Actuated Green, G (s)				18.3	18.3	18.3	61.4	73.2			34.3	34.3
Effective Green, g (s)				21.3	21.3	19.3	69.4	77.2			38.3	35.3
Actuated g/C Ratio				0.16	0.16	0.14	0.51	0.57			0.28	0.26
Clearance Time (s)				5.0	5.0	5.0		5.5			5.5	5.5
Vehicle Extension (s)				4.0	4.0	4.0		5.0			5.0	5.0
Lane Grp Cap (vph)				257	258	219	1714	1966			975	402
v/s Ratio Prot				0.08	c0.09		c0.31	c0.45			0.19	
v/s Ratio Perm						0.02						0.05
v/c Ratio				0.54	0.54	0.11	0.61	0.78			0.68	0.18
Uniform Delay, d1				52.3	52.4	50.4	23.2	22.4			42.8	38.6
Progression Factor				1.00	1.00	1.00	1.15	0.74			1.00	1.00
Incremental Delay, d2				2.7	2.9	0.3	0.7	2.0			3.8	1.0
Delay (s)				55.1	55.3	50.7	27.5	18.5			46.6	39.6
Level of Service				E	E	D	C	B			D	D
Approach Delay (s)		0.0			53.5			22.1			44.5	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



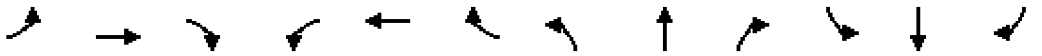
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	625	1	181	0	0	0	0	1913	320	160	723	0
Future Volume (vph)	625	1	181	0	0	0	0	1913	320	160	723	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	4.0					2.5		2.0	2.5	
Lane Util. Factor	0.95	0.95	1.00					0.91		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1633	1637	1538					4834		1719	3438	
Flt Permitted	0.95	0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1633	1637	1538					4834		1719	3438	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	638	1	185	0	0	0	0	1952	327	163	738	0
RTOR Reduction (vph)	0	0	135	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	319	320	50	0	0	0	0	2263	0	163	738	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	35.2	35.2	35.2					70.7		13.6	89.3	
Effective Green, g (s)	38.2	36.2	36.2					73.7		16.6	92.3	
Actuated g/C Ratio	0.28	0.27	0.27					0.55		0.12	0.68	
Clearance Time (s)	5.0	5.0	5.0					5.5		5.0	5.5	
Vehicle Extension (s)	4.0	4.0	4.0					7.0		3.0	7.0	
Lane Grp Cap (vph)	462	438	412					2639		211	2350	
v/s Ratio Prot	0.20	c0.20						c0.47		c0.09	0.21	
v/s Ratio Perm			0.03									
v/c Ratio	0.69	0.73	0.12					0.86		0.77	0.31	
Uniform Delay, d1	43.1	45.0	37.4					26.2		57.4	8.6	
Progression Factor	1.00	1.00	1.00					0.44		0.45	0.36	
Incremental Delay, d2	4.8	6.6	0.2					3.7		12.1	0.3	
Delay (s)	47.9	51.5	37.5					15.3		38.0	3.4	
Level of Service	D	D	D					B		D	A	
Approach Delay (s)		47.0			0.0			15.3			9.7	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	226	80	58	390	354	193	1041	110	559	828	98
Future Volume (vph)	197	226	80	58	390	354	193	1041	110	559	828	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.0	0.0	3.0	2.0	2.0	3.0	2.0	0.0	3.0	2.0	0.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	199	228	81	59	394	358	195	1052	111	565	836	99
RTOR Reduction (vph)	0	0	0	0	0	298	0	0	0	0	0	0
Lane Group Flow (vph)	199	228	81	59	394	60	195	1052	111	565	836	99
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			Free			2			Free			Free
Actuated Green, G (s)	11.9	21.0	135.0	9.4	18.5	18.5	20.0	53.9	135.0	28.7	62.6	135.0
Effective Green, g (s)	13.9	25.0	135.0	11.4	22.5	22.5	22.0	57.9	135.0	30.7	66.6	135.0
Actuated g/C Ratio	0.10	0.19	1.00	0.08	0.17	0.17	0.16	0.43	1.00	0.23	0.49	1.00
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	5.0		3.5	5.0	
Lane Grp Cap (vph)	343	636	1538	145	573	256	280	1474	1538	758	1696	1538
v/s Ratio Prot	c0.06	0.07		0.03	c0.11		0.11	c0.31		c0.17	0.24	
v/s Ratio Perm			0.05			0.04			c0.07			0.06
v/c Ratio	0.58	0.36	0.05	0.41	0.69	0.23	0.70	0.71	0.07	0.75	0.49	0.06
Uniform Delay, d1	57.8	48.0	0.0	58.6	52.9	48.8	53.3	31.7	0.0	48.5	22.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.95	1.00	1.45	0.91	1.00
Incremental Delay, d2	2.1	0.3	0.1	1.4	3.4	0.5	5.3	2.3	0.1	4.0	1.0	0.1
Delay (s)	59.8	48.3	0.1	60.0	56.4	49.2	58.0	32.4	0.1	74.3	21.9	0.1
Level of Service	E	D	A	E	E	D	E	C	A	E	C	A
Approach Delay (s)		45.1			53.5			33.5			40.2	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	445	1	1	1094	132	1	1	1	42	0	130
Future Volume (vph)	141	445	1	1	1094	132	1	1	1	42	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	12	12	10	12	12	12	10	10	10
Total Lost time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1652	1749			1809	1478		1750		1652	1478	
Flt Permitted	0.08	1.00			1.00	1.00		0.90		0.76	1.00	
Satd. Flow (perm)	137	1749			1809	1478		1603		1314	1478	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	145	459	1	1	1128	136	1	1	1	43	0	134
RTOR Reduction (vph)	0	0	0	0	0	28	0	1	0	0	123	0
Lane Group Flow (vph)	145	460	0	0	1129	108	0	2	0	43	11	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	95.8	95.8			80.0	80.0		9.8		9.8	9.8	
Effective Green, g (s)	95.8	95.8			80.0	80.0		9.8		9.8	9.8	
Actuated g/C Ratio	0.83	0.83			0.69	0.69		0.08		0.08	0.08	
Clearance Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)	3.0	5.0			5.0	5.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	255	1449			1251	1022		135		111	125	
v/s Ratio Prot	c0.05	0.26									0.01	
v/s Ratio Perm	0.42				0.62	0.07		0.00		c0.03		
v/c Ratio	0.57	0.32			0.90	0.11		0.02		0.39	0.09	
Uniform Delay, d1	25.3	2.3			14.6	5.9		48.5		50.1	48.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	2.9	0.3			9.8	0.1		0.0		2.2	0.3	
Delay (s)	28.2	2.6			24.4	6.0		48.5		52.3	49.1	
Level of Service	C	A			C	A		D		D	D	
Approach Delay (s)		8.7			22.4			48.5			49.9	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	796	310	649	1079	271	586
Future Volume (vph)	796	310	649	1079	271	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	10	11
Total Lost time (s)	7.0	7.0	5.5	7.0	6.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1538	1719	3438	3113	1487
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1538	1719	3438	3113	1487
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	865	337	705	1173	295	637
RTOR Reduction (vph)	0	229	0	0	0	0
Lane Group Flow (vph)	865	108	705	1173	295	637
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6				Free
Actuated Green, G (s)	33.3	33.3	40.3	79.1	16.2	108.3
Effective Green, g (s)	33.3	33.3	40.3	79.1	16.2	108.3
Actuated g/C Ratio	0.31	0.31	0.37	0.73	0.15	1.00
Clearance Time (s)	7.0	7.0	5.5	7.0	6.0	
Vehicle Extension (s)	6.0	6.0	4.0	6.0	3.5	
Lane Grp Cap (vph)	1057	472	639	2511	465	1487
v/s Ratio Prot	c0.25		c0.41	0.34	c0.09	
v/s Ratio Perm		0.07				0.43
v/c Ratio	0.82	0.23	1.10	0.47	0.63	0.43
Uniform Delay, d1	34.7	27.9	34.0	6.0	43.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	0.7	67.3	0.4	3.0	0.9
Delay (s)	40.7	28.6	101.3	6.4	46.2	0.9
Level of Service	D	C	F	A	D	A
Approach Delay (s)	37.3			42.0	15.2	
Approach LOS	D			D	B	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	108.3	Sum of lost time (s)	18.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	864	417	59	972	0	623	0	34	4	0	1
Future Volume (vph)	8	864	417	59	972	0	623	0	34	4	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	10	10	10	12	12	12
Total Lost time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.98			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96			0.96	
Satd. Flow (prot)	1770	3539	1583	1770	3539		1569	1556			1743	
Flt Permitted	0.26	1.00	1.00	0.19	1.00		0.95	0.96			0.96	
Satd. Flow (perm)	490	3539	1583	357	3539		1569	1556			1743	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	9	929	448	63	1045	0	670	0	37	4	0	1
RTOR Reduction (vph)	0	0	236	0	0	0	0	86	0	0	5	0
Lane Group Flow (vph)	9	929	212	63	1045	0	355	266	0	0	0	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Split	NA		Split	NA	
Protected Phases		6		5	2		4	4		3	3	
Permitted Phases	6		6	2								
Actuated Green, G (s)	45.3	45.3	45.3	56.4	56.4		25.2	25.2			1.0	
Effective Green, g (s)	45.3	45.3	45.3	56.4	56.4		25.2	25.2			1.0	
Actuated g/C Ratio	0.45	0.45	0.45	0.56	0.56		0.25	0.25			0.01	
Clearance Time (s)	7.0	7.0	7.0	5.0	7.0		6.0	6.0			6.0	
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	218	1577	705	283	1964		389	385			17	
v/s Ratio Prot		c0.26		0.01	c0.30		c0.23	0.17			c0.00	
v/s Ratio Perm	0.02		0.13	0.11								
v/c Ratio	0.04	0.59	0.30	0.22	0.53		0.91	0.69			0.00	
Uniform Delay, d1	15.9	21.2	18.0	12.4	14.3		37.1	34.7			49.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.4	1.6	1.1	0.4	1.0		25.2	5.3			0.1	
Delay (s)	16.2	22.8	19.1	12.8	15.3		62.3	40.0			49.9	
Level of Service	B	C	B	B	B		E	D			D	
Approach Delay (s)		21.5			15.2			51.2			49.9	
Approach LOS		C			B			D			D	

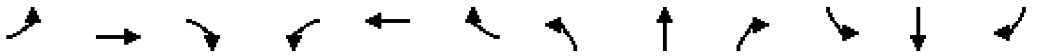
Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	954	124	40	1120	1087	185	159	22	363	88	28
Future Volume (vph)	41	954	124	40	1120	1087	185	159	22	363	88	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	6117		1719	4940	1538	1719	1659		3335	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	6117		1719	4940	1538	1719	1659		3335	1810	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	42	973	127	41	1143	1109	189	162	22	370	90	29
RTOR Reduction (vph)	0	12	0	0	0	442	0	3	0	0	0	24
Lane Group Flow (vph)	42	1088	0	41	1143	667	189	181	0	370	90	5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases						2						4
Actuated Green, G (s)	7.2	51.2		7.1	51.1	51.1	21.7	21.7		20.9	20.9	20.9
Effective Green, g (s)	7.2	51.2		7.1	51.1	51.1	21.7	21.7		20.9	20.9	20.9
Actuated g/C Ratio	0.06	0.41		0.06	0.41	0.41	0.17	0.17		0.17	0.17	0.17
Clearance Time (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	5.0	5.0		4.0	4.0	4.0
Lane Grp Cap (vph)	99	2507		97	2021	629	298	288		558	302	257
v/s Ratio Prot	c0.02	0.18		0.02	0.23		c0.11	0.11		c0.11	0.05	
v/s Ratio Perm						c0.43						0.00
v/c Ratio	0.42	0.43		0.42	0.57	1.06	0.63	0.63		0.66	0.30	0.02
Uniform Delay, d1	56.8	26.5		56.9	28.4	36.9	47.9	47.9		48.7	45.6	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.3		3.0	0.6	53.0	6.0	5.9		3.3	0.8	0.0
Delay (s)	59.8	26.7		59.9	29.0	89.9	53.9	53.8		52.0	46.3	43.5
Level of Service	E	C		E	C	F	D	D		D	D	D
Approach Delay (s)		27.9			59.0			53.9			50.4	
Approach LOS		C			E			D			D	

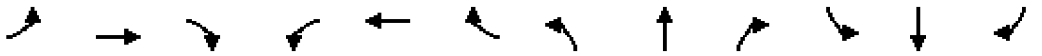
Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	68	319	96	40	23	251	1160	78	20	933	81
Future Volume (vph)	165	68	319	96	40	23	251	1160	78	20	933	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	12	11	11	12	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	1739	1478	1770	1863	1583	1711	3539	1531	1711	3539	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	1652	1739	1478	1770	1863	1583	181	3539	1531	290	3539	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	74	347	104	43	25	273	1261	85	22	1014	88
RTOR Reduction (vph)	0	0	288	0	0	22	0	0	42	0	0	56
Lane Group Flow (vph)	179	74	59	104	43	3	273	1261	43	22	1014	32
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4			3	6		6	2		2
Actuated Green, G (s)	18.9	18.9	18.9	12.4	12.4	12.4	64.6	56.0	56.0	43.9	40.3	40.3
Effective Green, g (s)	18.9	18.9	18.9	12.4	12.4	12.4	64.6	56.0	56.0	43.9	40.3	40.3
Actuated g/C Ratio	0.17	0.17	0.17	0.11	0.11	0.11	0.58	0.50	0.50	0.39	0.36	0.36
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	279	293	249	196	206	175	368	1771	766	159	1274	551
v/s Ratio Prot	c0.11	0.04		c0.06	0.02		c0.13	0.36		0.00	c0.29	
v/s Ratio Perm			0.04			0.00	0.30		0.03	0.05		0.02
v/c Ratio	0.64	0.25	0.24	0.53	0.21	0.02	0.74	0.71	0.06	0.14	0.80	0.06
Uniform Delay, d1	43.3	40.4	40.2	47.0	45.3	44.3	26.8	21.7	14.4	21.5	32.1	23.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.5	0.5	2.7	0.5	0.0	7.8	1.7	0.1	0.4	4.1	0.1
Delay (s)	48.3	40.8	40.7	49.7	45.8	44.4	34.6	23.4	14.4	21.9	36.2	23.5
Level of Service	D	D	D	D	D	D	C	C	B	C	D	C
Approach Delay (s)		43.0			48.0			24.8			34.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	111.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	342	0	84	0	0	419	115	1209	0	0	651	267
Future Volume (vph)	342	0	84	0	0	419	115	1209	0	0	651	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)	6.0		4.0			4.0	5.0	6.5			6.5	4.0
Lane Util. Factor	1.00		1.00			1.00	1.00	0.95			0.95	1.00
Frt	1.00		0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1711		1583			1611	1711	3539			3539	1583
Flt Permitted	0.95		1.00			1.00	0.25	1.00			1.00	1.00
Satd. Flow (perm)	1711		1583			1611	445	3539			3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	356	0	88	0	0	436	120	1259	0	0	678	278
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	356	0	88	0	0	436	120	1259	0	0	678	278
Turn Type	Perm		Free			Free	pm+pt	NA			NA	Free
Protected Phases							5	2			6	
Permitted Phases	4		Free			Free	2					Free
Actuated Green, G (s)	26.3		80.7			80.7	41.9	41.9			26.8	80.7
Effective Green, g (s)	26.3		80.7			80.7	41.9	41.9			26.8	80.7
Actuated g/C Ratio	0.33		1.00			1.00	0.52	0.52			0.33	1.00
Clearance Time (s)	6.0						5.0	6.5			6.5	
Vehicle Extension (s)	3.0						3.0	5.0			5.0	
Lane Grp Cap (vph)	557		1583			1611	389	1837			1175	1583
v/s Ratio Prot							0.04	c0.36			0.19	
v/s Ratio Perm	c0.21		0.06			0.27	0.12					0.18
v/c Ratio	0.64		0.06			0.27	0.31	0.69			0.58	0.18
Uniform Delay, d1	23.2		0.0			0.0	11.1	14.5			22.3	0.0
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.4		0.1			0.4	0.5	1.4			1.1	0.2
Delay (s)	25.6		0.1			0.4	11.5	15.9			23.4	0.2
Level of Service	C		A			A	B	B			C	A
Approach Delay (s)		20.5			0.4			15.5			16.6	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	41	76	0	0	1053	0	19	0	111	0	0
Future Volume (vph)	41	76	0	0	1053	0	19	0	111	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0			7.0		6.0		4.0		
Lane Util. Factor	1.00	1.00			0.95		1.00		0.76		
Frt	1.00	1.00			1.00		1.00		0.85		
Flt Protected	0.95	1.00			1.00		0.95		1.00		
Satd. Flow (prot)	1770	1863			3539		1770		3610		
Flt Permitted	0.16	1.00			1.00		0.95		1.00		
Satd. Flow (perm)	307	1863			3539		1770		3610		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	46	85	0	0	1183	0	21	0	125	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	85	0	0	1183	0	21	0	125	0	0
Turn Type	pm+pt	NA			NA		Prot		Free		
Protected Phases	5	2			6		4				
Permitted Phases	2								Free		
Actuated Green, G (s)	45.1	45.1			34.8		2.5		60.6		
Effective Green, g (s)	45.1	45.1			34.8		2.5		60.6		
Actuated g/C Ratio	0.74	0.74			0.57		0.04		1.00		
Clearance Time (s)	6.0	7.0			7.0		6.0				
Vehicle Extension (s)	3.0	5.0			5.0		3.0				
Lane Grp Cap (vph)	332	1386			2032		73		3610		
v/s Ratio Prot	c0.01	0.05			c0.33		c0.01				
v/s Ratio Perm	0.09								0.03		
v/c Ratio	0.14	0.06			0.58		0.29		0.03		
Uniform Delay, d1	3.5	2.1			8.3		28.2		0.0		
Progression Factor	1.00	1.00			1.00		1.00		1.00		
Incremental Delay, d2	0.2	0.0			0.7		2.2		0.0		
Delay (s)	3.7	2.1			8.9		30.4		0.0		
Level of Service	A	A			A		C		A		
Approach Delay (s)		2.7			8.9		4.4			0.0	
Approach LOS		A			A		A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	19.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	111	67	28	1019	124	116	220	6	28	166	61
Future Volume (vph)	16	111	67	28	1019	124	116	220	6	28	166	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	0.86		1.00	*0.51	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1711	6046		1770	3800	1583	1770	3539	1583	1711	3284	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.60	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	1711	6046		1770	3800	1583	1116	3539	1583	1086	3284	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	121	73	30	1108	135	126	239	7	30	180	66
RTOR Reduction (vph)	0	48	0	0	0	78	0	0	5	0	32	0
Lane Group Flow (vph)	17	146	0	30	1108	57	126	239	2	30	214	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases						6	4		4	8		
Actuated Green, G (s)	2.1	22.7		7.2	27.8	27.8	15.6	15.6	15.6	15.6	15.6	
Effective Green, g (s)	2.1	22.7		7.2	27.8	27.8	15.6	15.6	15.6	15.6	15.6	
Actuated g/C Ratio	0.03	0.35		0.11	0.42	0.42	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	54	2095		194	1612	671	265	842	377	258	782	
v/s Ratio Prot	c0.01	0.02		0.02	c0.29			0.07			0.07	
v/s Ratio Perm						0.04	c0.11		0.00	0.03		
v/c Ratio	0.31	0.07		0.15	0.69	0.09	0.48	0.28	0.00	0.12	0.27	
Uniform Delay, d1	31.0	14.3		26.4	15.3	11.3	21.4	20.4	19.0	19.5	20.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.0		0.4	1.6	0.1	1.8	0.3	0.0	0.3	0.3	
Delay (s)	34.3	14.4		26.8	16.9	11.4	23.3	20.6	19.0	19.8	20.6	
Level of Service	C	B		C	B	B	C	C	B	B	C	
Approach Delay (s)		16.0			16.6			21.5			20.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX I-D

SIMTRAFFIC REPORTS

Intersection: 1: MD 543 & I-95 SB Ramps

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	L	L	T	T	T	T	R
Maximum Queue (ft)	130	118	327	355	123	630	404	384	141
Average Queue (ft)	63	59	199	200	54	80	263	215	5
95th Queue (ft)	111	105	311	320	108	299	384	336	72
Link Distance (ft)		1014		837	837	837	496	496	496
Upstream Blk Time (%)						0			
Queuing Penalty (veh)						0			
Storage Bay Dist (ft)	335		800						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: MD 543 & I-95 NB Ramps

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	TR	L	T	T
Maximum Queue (ft)	291	242	157	389	337	201	279	200	159
Average Queue (ft)	171	131	66	225	146	93	126	83	48
95th Queue (ft)	250	224	122	350	256	163	233	170	116
Link Distance (ft)	1159			596	596			837	837
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		750	750			545	575		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: MD 543 & MD 7

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	L	T	T	L	T	T	R	L	T	T	L
Maximum Queue (ft)	193	238	271	234	171	188	162	149	115	291	302	338
Average Queue (ft)	81	111	131	101	75	108	65	63	48	161	158	200
95th Queue (ft)	151	187	213	187	139	168	139	111	100	265	264	295
Link Distance (ft)			939	939		995	995			597	597	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200	200			430			865	280			575
Storage Blk Time (%)	0	0	2							1		
Queuing Penalty (veh)	0	0	3							0		

Intersection: 3: MD 543 & MD 7

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	352	318	292
Average Queue (ft)	220	170	140
95th Queue (ft)	317	283	244
Link Distance (ft)		596	596
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	575		
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 4: Stepney Rd S. & MD 7

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	LT	R	LTR	L	TR
Maximum Queue (ft)	84	177	244	40	25	95	95
Average Queue (ft)	35	79	98	9	1	38	44
95th Queue (ft)	64	148	195	33	11	76	79
Link Distance (ft)		1458	1844		476	619	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	175			235			155
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 5: MD 543 & US 40

Movement	EB	EB	WB	WB	WB	NB	NB	B70	B70
Directions Served	T	T	L	T	T	L	L	T	
Maximum Queue (ft)	222	180	214	137	115	104	105	460	463
Average Queue (ft)	121	87	110	39	38	52	59	196	124
95th Queue (ft)	190	160	187	96	86	90	98	475	403
Link Distance (ft)	1193	1193		493	493	747	747	501	501
Upstream Blk Time (%)								0	0
Queuing Penalty (veh)								0	0
Storage Bay Dist (ft)			460						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 6: Spesutia Rd & US 40

Movement	EB	EB	EB	EB	B71	B71	WB	WB	WB	B32	B32	NB
Directions Served	L	T	T	R	T	T	L	T	TR	T	T	L
Maximum Queue (ft)	21	140	139	122	7	10	74	95	104	210	211	127
Average Queue (ft)	1	59	72	54	0	0	20	26	37	7	7	62
95th Queue (ft)	10	118	122	93	5	5	52	75	87	148	149	102
Link Distance (ft)		6937	6937		493	493		2747	2747	1094	1094	1019
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			295			360					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Spesutia Rd & US 40

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	134	31
Average Queue (ft)	57	9
95th Queue (ft)	102	32
Link Distance (ft)		259
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: MD 159/MD 7 & US 40

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	R	L	TR
Maximum Queue (ft)	59	265	272	253	202	75	165	167	174	8	76	125
Average Queue (ft)	13	149	173	156	105	30	84	89	86	0	31	54
95th Queue (ft)	40	236	256	230	176	68	148	152	155	5	68	105
Link Distance (ft)		1094	1094	1094			3061	3061	3061		665	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	340				415	300				815		400
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: MD 159/MD 7 & US 40

Movement	SB	SB	SB
Directions Served	L	L	T
Maximum Queue (ft)	337	355	91
Average Queue (ft)	183	215	35
95th Queue (ft)	285	312	76
Link Distance (ft)		806	806
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	510		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: MD 159 & Old Philadelphia Rd

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	124	103	72
Average Queue (ft)	36	24	18
95th Queue (ft)	85	78	54
Link Distance (ft)	825	2938	715
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: US 40 & MD 132

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	L	T	T	R	L	T	T
Maximum Queue (ft)	106	85	115	110	85	129	146	181	36	44	237	252
Average Queue (ft)	46	17	60	53	24	55	69	84	11	10	131	141
95th Queue (ft)	90	54	100	91	61	99	123	141	35	35	207	223
Link Distance (ft)	487				436		2753	2753			1751	1751
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		40	40	75		195			590	200		
Storage Blk Time (%)	14	2	18	4	0						1	9
Queuing Penalty (veh)	31	1	14	3	0						0	5

Intersection: 9: US 40 & MD 132

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	11
95th Queue (ft)	85
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	140
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: MD 22 & N. Rogers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	T	T
Maximum Queue (ft)	161	85	87	55	208	204
Average Queue (ft)	71	36	32	11	107	96
95th Queue (ft)	129	67	71	38	186	183
Link Distance (ft)	934		317	317	922	922
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		215				
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 11: US 40 EB Ramps & MD 715

Movement	EB	EB	WB	WB	NB
Directions Served	L	T	T	T	L
Maximum Queue (ft)	48	70	61	45	90
Average Queue (ft)	10	17	16	8	36
95th Queue (ft)	34	50	46	32	71
Link Distance (ft)		627	337	337	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				305
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	L	T	T
Maximum Queue (ft)	42	78	91	109	133	36	52	19	38	49	51	64
Average Queue (ft)	9	32	43	52	55	2	17	1	9	17	19	14
95th Queue (ft)	32	67	77	93	112	15	46	8	31	42	40	41
Link Distance (ft)		543	543	543	543		586	586	586		532	532
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80					260				200		
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	NB	SB	SB	SB
Directions Served	R	L	T	TR
Maximum Queue (ft)	26	124	143	85
Average Queue (ft)	3	56	74	34
95th Queue (ft)	14	100	126	66
Link Distance (ft)			488	488
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	425	305		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: MD 159 & Spesutia Rd

Movement	EB	NB	SB	SB
Directions Served	LT	L	L	TR
Maximum Queue (ft)	72	58	35	4
Average Queue (ft)	32	25	3	0
95th Queue (ft)	59	53	17	3
Link Distance (ft)	692	511		1865
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			145	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Chelsea Rd & MD 159

Movement	EB	B67	NB	SB
Directions Served	LR	T	L	T
Maximum Queue (ft)	127	54	12	4
Average Queue (ft)	66	4	0	0
95th Queue (ft)	117	25	6	3
Link Distance (ft)	77	1267		511
Upstream Blk Time (%)	11			
Queuing Penalty (veh)	15			
Storage Bay Dist (ft)			165	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Chelsea Rd & Woodley Rd

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	47	34
Average Queue (ft)	12	2
95th Queue (ft)	40	16
Link Distance (ft)	500	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 159 & Fords Ln

Movement	EB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	385
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: MD 159 & Canning House Rd

Movement	EB
Directions Served	LR
Maximum Queue (ft)	56
Average Queue (ft)	24
95th Queue (ft)	48
Link Distance (ft)	361
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 75

Intersection: 1: MD 543 & I-95 SB Ramps

Movement	WB	WB	NB	NB	NB	NB	SB	SB	B22	B22
Directions Served	L	LT	L	L	T	T	T	T	T	T
Maximum Queue (ft)	191	180	406	416	382	431	572	518	160	100
Average Queue (ft)	104	82	114	117	121	131	381	319	26	12
95th Queue (ft)	168	151	349	354	313	332	594	551	144	102
Link Distance (ft)		1014		837	837	837	496	496	1302	1302
Upstream Blk Time (%)							12	2		
Queuing Penalty (veh)							0	0		
Storage Bay Dist (ft)	335		800							
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: MD 543 & I-95 NB Ramps

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	TR	L	T	T
Maximum Queue (ft)	432	403	120	482	434	403	402	330	108
Average Queue (ft)	254	217	52	316	259	193	187	28	8
95th Queue (ft)	363	333	97	470	409	345	362	166	52
Link Distance (ft)	1159			596	596			837	837
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		750	750			545	575		
Storage Blk Time (%)							0		
Queuing Penalty (veh)							1		

Intersection: 3: MD 543 & MD 7

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	B201
Directions Served	L	L	T	T	L	T	T	R	L	T	T	T
Maximum Queue (ft)	167	220	242	211	149	414	380	296	327	384	375	7
Average Queue (ft)	88	118	115	77	54	285	252	138	152	203	211	0
95th Queue (ft)	161	194	198	160	114	397	367	251	267	341	344	5
Link Distance (ft)			939	939		995	995			597	597	568
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200	200			430			865	280			
Storage Blk Time (%)	0	0	1			1			1	4		
Queuing Penalty (veh)	0	0	3			0			3	7		

Intersection: 3: MD 543 & MD 7

Movement	SB	SB	SB	SB
Directions Served	L	L	T	T
Maximum Queue (ft)	338	340	278	235
Average Queue (ft)	216	232	155	123
95th Queue (ft)	301	313	248	211
Link Distance (ft)			596	596
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	575	575		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Stepney Rd S. & MD 7

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	LT	R	LTR	L	TR
Maximum Queue (ft)	182	219	979	289	24	106	158
Average Queue (ft)	79	62	399	83	3	36	84
95th Queue (ft)	145	140	844	265	17	90	141
Link Distance (ft)		1458	1844		476	619	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	175			235			155
Storage Blk Time (%)	1	0	15			0	0
Queuing Penalty (veh)	3	0	20			0	0

Intersection: 5: MD 543 & US 40

Movement	EB	EB	WB	WB	WB	NB	NB	B70	B70
Directions Served	T	T	L	T	T	L	L	T	
Maximum Queue (ft)	326	284	416	325	252	144	163	71	29
Average Queue (ft)	174	137	226	88	82	83	91	4	1
95th Queue (ft)	271	241	367	209	185	134	146	31	15
Link Distance (ft)	1193	1193		493	493	747	747	501	501
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			460						
Storage Blk Time (%)			0	0					
Queuing Penalty (veh)			0	0					

Intersection: 6: Spesutia Rd & US 40

Movement	EB	EB	EB	EB	B71	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	T	L	T	TR	L	LTR	LTR
Maximum Queue (ft)	30	162	179	97	11	78	201	220	171	195	39
Average Queue (ft)	5	75	92	43	0	31	87	93	103	117	6
95th Queue (ft)	21	154	167	81	8	66	174	181	160	179	26
Link Distance (ft)		6937	6937		493		2747	2747	1019		259
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			295		360				450	
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 7: MD 159/MD 7 & US 40

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	R	L	TR
Maximum Queue (ft)	99	230	246	216	154	100	276	477	458	485	136	176
Average Queue (ft)	36	142	151	112	51	37	160	175	148	106	57	83
95th Queue (ft)	78	224	241	195	124	81	241	338	354	395	109	147
Link Distance (ft)		1094	1094	1094			3061	3061	3061		665	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	340				415	300				815		400
Storage Blk Time (%)							0			1		
Queuing Penalty (veh)							0			2		

Intersection: 7: MD 159/MD 7 & US 40

Movement	SB	SB	SB
Directions Served	L	L	T
Maximum Queue (ft)	196	218	120
Average Queue (ft)	99	124	45
95th Queue (ft)	167	188	98
Link Distance (ft)		806	806
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	510		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: MD 159 & Old Philadelphia Rd

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	86	87	88
Average Queue (ft)	21	30	21
95th Queue (ft)	64	76	64
Link Distance (ft)	825	2938	715
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: US 40 & MD 132

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	286	204	122	107	109	8	285	346	358	63	56	377
Average Queue (ft)	120	100	94	53	35	0	130	189	204	23	15	238
95th Queue (ft)	231	207	137	95	80	6	229	310	328	54	43	353
Link Distance (ft)	487				436			2753	2753			1751
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		40	40	75		80	195			590	200	
Storage Blk Time (%)	39	14	37	7	2		2	7				18
Queuing Penalty (veh)	152	23	61	4	3		13	19				4

Intersection: 9: US 40 & MD 132

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	403	200
Average Queue (ft)	259	72
95th Queue (ft)	380	229
Link Distance (ft)	1751	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		140
Storage Blk Time (%)	39	
Queuing Penalty (veh)	31	

Intersection: 10: MD 22 & N. Rogers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	T	T
Maximum Queue (ft)	250	177	319	248	179	169
Average Queue (ft)	129	53	176	122	98	81
95th Queue (ft)	203	120	290	226	156	144
Link Distance (ft)	934		317	317	922	922
Upstream Blk Time (%)		0	0	0		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (ft)		215				
Storage Blk Time (%)			3			0
Queuing Penalty (veh)			4			0

Intersection: 11: US 40 EB Ramps & MD 715

Movement	EB	EB	WB	WB	NB
Directions Served	L	T	T	T	L
Maximum Queue (ft)	44	18	152	171	42
Average Queue (ft)	18	2	40	43	13
95th Queue (ft)	43	13	109	118	36
Link Distance (ft)		627	337	337	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				305
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	L	T
Maximum Queue (ft)	56	43	39	42	27	62	246	208	95	6	74	89
Average Queue (ft)	15	10	12	12	3	24	127	80	28	0	25	23
95th Queue (ft)	44	35	36	35	20	57	200	162	71	4	58	53
Link Distance (ft)		543	543	543	543		586	586	586			532
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80					260				285	200	
Storage Blk Time (%)	0						0					
Queuing Penalty (veh)	0						0					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (ft)	83	3	52	128	64
Average Queue (ft)	23	0	18	53	29
95th Queue (ft)	59	1	48	96	58
Link Distance (ft)	532			488	488
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		425	305		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: MD 159 & Spesutia Rd

Movement	EB	NB	SB	SB
Directions Served	LT	L	L	TR
Maximum Queue (ft)	50	100	37	13
Average Queue (ft)	12	43	5	0
95th Queue (ft)	39	85	26	5
Link Distance (ft)	692	511		1865
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			145	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Chelsea Rd & MD 159

Movement	EB	B67	NB
Directions Served	LR	T	L
Maximum Queue (ft)	90	5	12
Average Queue (ft)	44	0	0
95th Queue (ft)	78	3	6
Link Distance (ft)	77	1267	
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	1		
Storage Bay Dist (ft)			165
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Chelsea Rd & Woodley Rd

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	68	42
Average Queue (ft)	21	4
95th Queue (ft)	54	23
Link Distance (ft)	500	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 159 & Fords Ln

Movement	EB
Directions Served	LR
Maximum Queue (ft)	25
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	385
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: MD 159 & Canning House Rd

Movement	EB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	17
95th Queue (ft)	41
Link Distance (ft)	361
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 354

Intersection: 1: MD 543 & I-95 SB Ramps

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	L	L	T	T	T	T	R
Maximum Queue (ft)	179	177	367	386	144	465	477	452	72
Average Queue (ft)	92	94	229	232	62	84	314	269	2
95th Queue (ft)	157	158	338	349	124	265	450	410	51
Link Distance (ft)		1014		837	837	837	496	496	496
Upstream Blk Time (%)						0	0	0	
Queuing Penalty (veh)						0	0	0	
Storage Bay Dist (ft)	335		800						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: MD 543 & I-95 NB Ramps

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	TR	L	T	T
Maximum Queue (ft)	261	231	152	372	301	176	282	199	161
Average Queue (ft)	167	132	76	223	141	87	143	97	63
95th Queue (ft)	242	225	129	333	245	147	272	186	136
Link Distance (ft)	1159			596	596			837	837
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		750	750			545	575		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: MD 543 & MD 7

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	L	T	T	L	T	T	R	L	T	T	L
Maximum Queue (ft)	184	217	240	209	177	195	167	170	156	311	316	355
Average Queue (ft)	86	107	124	100	74	109	71	69	60	161	158	225
95th Queue (ft)	156	184	207	183	145	173	150	132	119	270	271	320
Link Distance (ft)			939	939		995	995			597	597	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200	200			430			865	280			575
Storage Blk Time (%)	0	0	1							1		
Queuing Penalty (veh)	0	0	2							0		

Intersection: 3: MD 543 & MD 7

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	354	391	396
Average Queue (ft)	238	240	210
95th Queue (ft)	329	365	348
Link Distance (ft)		596	596
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	575		
Storage Blk Time (%)			1
Queuing Penalty (veh)			1

Intersection: 4: Stepney Rd S. & MD 7

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	LT	R	LTR	L	TR
Maximum Queue (ft)	73	203	219	46	25	89	104
Average Queue (ft)	32	84	92	10	2	34	44
95th Queue (ft)	65	161	186	35	13	75	78
Link Distance (ft)		1458	1844		476	619	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	175			235			155
Storage Blk Time (%)		0	0			0	0
Queuing Penalty (veh)		0	0			0	0

Intersection: 5: MD 543 & US 40

Movement	EB	EB	WB	WB	WB	NB	NB	B70	B70
Directions Served	T	T	L	T	T	L	L	T	
Maximum Queue (ft)	295	295	229	122	103	99	112	508	506
Average Queue (ft)	163	138	129	40	38	55	57	419	383
95th Queue (ft)	255	236	217	94	81	90	96	584	590
Link Distance (ft)	1193	1193		493	493	747	747	501	501
Upstream Blk Time (%)								1	0
Queuing Penalty (veh)								4	3
Storage Bay Dist (ft)			460						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 6: Spesutia Rd & US 40

Movement	EB	EB	EB	EB	B71	B71	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	T	T	L	T	TR	L	LTR	LTR
Maximum Queue (ft)	16	180	198	224	20	108	78	111	113	119	134	31
Average Queue (ft)	1	80	97	97	1	6	25	30	39	69	69	6
95th Queue (ft)	7	148	159	166	10	75	60	82	91	107	113	26
Link Distance (ft)		6937	6937		493	493		2747	2747	1019		259
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			295			360				450	
Storage Blk Time (%)				0								
Queuing Penalty (veh)				0								

Intersection: 7: MD 159/MD 7 & US 40

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	R	L	TR
Maximum Queue (ft)	64	267	311	269	255	100	188	210	204	4	138	130
Average Queue (ft)	12	167	187	161	139	33	96	103	98	0	54	64
95th Queue (ft)	42	252	274	237	221	79	164	172	172	3	110	121
Link Distance (ft)		1094	1094	1094			3061	3061	3061		665	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	340				415	300				815		400
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 7: MD 159/MD 7 & US 40

Movement	SB	SB	SB
Directions Served	L	L	T
Maximum Queue (ft)	333	369	151
Average Queue (ft)	182	218	70
95th Queue (ft)	279	319	140
Link Distance (ft)		806	806
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	510		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: MD 159 & Old Philadelphia Rd

Movement	EB	WB	B38	NB
Directions Served	TR	LT		LR
Maximum Queue (ft)	253	207	3	103
Average Queue (ft)	107	65	0	26
95th Queue (ft)	206	155	2	74
Link Distance (ft)	825	2938	532	715
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: US 40 & MD 132

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	126	113	115	108	70	11	130	163	161	50	36	310
Average Queue (ft)	45	23	66	49	21	0	58	76	91	10	12	167
95th Queue (ft)	93	76	107	85	56	8	101	139	148	36	37	262
Link Distance (ft)	487				436			2753	2753			1751
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		40	40	75		80	195			590	200	
Storage Blk Time (%)	14	2	22	4	0		0	0				4
Queuing Penalty (veh)	30	1	17	3	0		0	0				1

Intersection: 9: US 40 & MD 132

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	345	160
Average Queue (ft)	185	24
95th Queue (ft)	283	130
Link Distance (ft)	1751	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		140
Storage Blk Time (%)	19	
Queuing Penalty (veh)	9	

Intersection: 10: MD 22 & N. Rogers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	T	T
Maximum Queue (ft)	172	68	110	54	229	214
Average Queue (ft)	81	32	34	8	102	93
95th Queue (ft)	139	59	78	33	180	177
Link Distance (ft)	934		317	317	922	922
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		215				
Storage Blk Time (%)						0
Queuing Penalty (veh)						1

Intersection: 11: US 40 EB Ramps & MD 715

Movement	EB	EB	WB	WB	NB
Directions Served	L	T	T	T	L
Maximum Queue (ft)	38	69	52	57	82
Average Queue (ft)	9	23	15	12	37
95th Queue (ft)	32	58	44	41	70
Link Distance (ft)		627	337	337	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				305
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	L	T	T
Maximum Queue (ft)	46	111	100	111	163	34	65	12	44	71	52	65
Average Queue (ft)	12	48	53	53	59	5	17	1	12	27	20	18
95th Queue (ft)	38	93	90	98	124	23	48	8	37	60	43	48
Link Distance (ft)		543	543	543	543		586	586	586		532	532
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80					260				200		
Storage Blk Time (%)	0	2										
Queuing Penalty (veh)	0	0										

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	NB	SB	SB	SB
Directions Served	R	L	T	TR
Maximum Queue (ft)	22	114	152	116
Average Queue (ft)	3	57	82	43
95th Queue (ft)	13	102	139	87
Link Distance (ft)			488	488
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	425	305		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: MD 159 & Spesutia Rd

Movement	EB	NB	SB	SB
Directions Served	LT	L	L	TR
Maximum Queue (ft)	172	131	44	15
Average Queue (ft)	49	59	6	1
95th Queue (ft)	112	106	28	8
Link Distance (ft)	692	511		1865
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			145	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Chelsea Rd & MD 159

Movement	EB	B67	NB	SB	SB
Directions Served	LR	T	L	T	R
Maximum Queue (ft)	127	89	12	172	128
Average Queue (ft)	44	8	1	15	7
95th Queue (ft)	116	61	8	133	91
Link Distance (ft)	77	1267		511	511
Upstream Blk Time (%)	18				
Queuing Penalty (veh)	10				
Storage Bay Dist (ft)			165		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Chelsea Rd & Canning House Rd

Movement	EB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	245	25	11
Average Queue (ft)	99	1	0
95th Queue (ft)	190	12	7
Link Distance (ft)	792	421	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Chelsea Rd & Woodley Rd

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	58	33
Average Queue (ft)	14	2
95th Queue (ft)	43	16
Link Distance (ft)	500	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 159 & Fords Ln

Movement	EB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	385
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: MD 159 & Canning House Rd

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	TR	LTR	LTR
Maximum Queue (ft)	54	102	342	4	13
Average Queue (ft)	12	51	141	0	0
95th Queue (ft)	39	84	255	3	5
Link Distance (ft)		412	748	457	845
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 83

Intersection: 1: MD 543 & I-95 SB Ramps

Movement	WB	WB	NB	NB	NB	NB	SB	SB	B22	B22	B22
Directions Served	L	LT	L	L	T	T	T	T	T	T	T
Maximum Queue (ft)	210	199	438	450	481	471	599	580	350	314	43
Average Queue (ft)	116	100	119	120	162	178	486	426	101	70	1
95th Queue (ft)	192	176	319	328	366	383	678	622	310	256	30
Link Distance (ft)		1014		837	837	837	496	496	1302	1302	1302
Upstream Blk Time (%)							39	6			
Queuing Penalty (veh)							0	0			
Storage Bay Dist (ft)	335		800								
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 2: MD 543 & I-95 NB Ramps

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	TR	L	T	T
Maximum Queue (ft)	443	389	130	525	536	448	360	208	104
Average Queue (ft)	275	232	55	366	317	245	144	11	5
95th Queue (ft)	397	346	101	507	486	414	288	86	52
Link Distance (ft)	1159			596	596			837	837
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		750	750			545	575		
Storage Blk Time (%)					0	0			
Queuing Penalty (veh)					0	0			

Intersection: 3: MD 543 & MD 7

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	L	T	T	R	L	T	T	R
Maximum Queue (ft)	172	205	241	191	132	444	411	390	373	527	538	87
Average Queue (ft)	81	112	113	82	51	260	232	203	169	306	318	3
95th Queue (ft)	154	179	192	158	106	390	360	338	313	503	519	61
Link Distance (ft)			939	939		995	995			597	597	597
Upstream Blk Time (%)										2	2	
Queuing Penalty (veh)										9	8	
Storage Bay Dist (ft)	200	200			430			865	280			
Storage Blk Time (%)	0	0	1			1			1	16		
Queuing Penalty (veh)	0	0	2			0			5	31		

Intersection: 3: MD 543 & MD 7

Movement	B201	B201	SB	SB	SB	SB
Directions Served	T	T	L	L	T	T
Maximum Queue (ft)	41	152	354	344	305	288
Average Queue (ft)	3	7	231	243	180	156
95th Queue (ft)	27	80	317	327	280	251
Link Distance (ft)	568	568			596	596
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			575	575		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Stepney Rd S. & MD 7

Movement	EB	EB	WB	WB	B27	B26	NB	SB	SB
Directions Served	L	TR	LT	R	T	T	LTR	L	TR
Maximum Queue (ft)	183	191	1258	290	283	6	31	99	161
Average Queue (ft)	91	67	649	92	34	0	4	34	83
95th Queue (ft)	161	140	1504	278	307	4	19	78	146
Link Distance (ft)		1458	1844		1179	352	476	619	
Upstream Blk Time (%)			2		0				
Queuing Penalty (veh)			28		3				
Storage Bay Dist (ft)	175			235					155
Storage Blk Time (%)	1	0	20					0	1
Queuing Penalty (veh)	5	0	26					0	0

Intersection: 5: MD 543 & US 40

Movement	EB	EB	EB	WB	WB	WB	B71	B71	NB	NB	B70	B70
Directions Served	T	T	R	L	T	T	T	T	L	L	T	
Maximum Queue (ft)	324	303	44	492	590	486	239	94	164	161	232	194
Average Queue (ft)	213	186	3	439	394	178	61	9	90	91	26	10
95th Queue (ft)	302	275	41	562	721	430	234	78	142	140	132	82
Link Distance (ft)	1193	1193	1193		493	493	6937	6937	747	747	501	501
Upstream Blk Time (%)				13	15	0						
Queuing Penalty (veh)				0	121	1						
Storage Bay Dist (ft)				460								
Storage Blk Time (%)				26	1					0		
Queuing Penalty (veh)				141	6					0		

Intersection: 6: Spesutia Rd & US 40

Movement	EB	EB	EB	EB	B71	B71	B71	WB	WB	WB	B32	B32
Directions Served	L	T	T	R	T	T		L	T	TR	T	T
Maximum Queue (ft)	35	226	223	130	100	194	11	78	264	242	218	229
Average Queue (ft)	6	103	119	59	3	7	0	34	120	123	7	8
95th Queue (ft)	26	186	202	101	63	90	8	69	224	221	154	162
Link Distance (ft)		6937	6937		493	493	493		2747	2747	1094	1094
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	400			295				360				
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Spesutia Rd & US 40

Movement	NB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	269	280	35
Average Queue (ft)	149	165	5
95th Queue (ft)	230	246	24
Link Distance (ft)	1019		259
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		450	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: MD 159/MD 7 & US 40

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	R	L	TR
Maximum Queue (ft)	106	291	298	234	185	104	279	294	282	579	215	251
Average Queue (ft)	37	172	183	137	76	40	189	194	172	196	122	125
95th Queue (ft)	80	271	288	232	154	88	272	281	260	494	194	207
Link Distance (ft)		1094	1094	1094			3061	3061	3061		665	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	340				415	300				815		400
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			1		

Intersection: 7: MD 159/MD 7 & US 40

Movement	SB	SB	SB
Directions Served	L	L	T
Maximum Queue (ft)	209	214	148
Average Queue (ft)	122	139	58
95th Queue (ft)	193	197	117
Link Distance (ft)		806	806
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	510		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: MD 159 & Old Philadelphia Rd

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	135	173	153
Average Queue (ft)	42	68	50
95th Queue (ft)	101	136	125
Link Distance (ft)	825	2938	715
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: US 40 & MD 132

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	L	T	T	R	L	T	T
Maximum Queue (ft)	371	205	122	132	113	414	447	472	63	40	460	470
Average Queue (ft)	142	122	101	62	35	150	248	260	24	15	261	287
95th Queue (ft)	282	237	143	109	84	295	400	417	54	42	389	420
Link Distance (ft)	487				436		2753	2753			1751	1751
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		40	40	75		195			590	200		
Storage Blk Time (%)	42	16	42	11	3	4	14				21	41
Queuing Penalty (veh)	164	27	70	7	3	22	36				4	33

Intersection: 9: US 40 & MD 132

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	85
95th Queue (ft)	247
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	140
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 10: MD 22 & N. Rogers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	T	T
Maximum Queue (ft)	325	193	322	304	185	187
Average Queue (ft)	163	56	194	137	102	89
95th Queue (ft)	269	136	314	251	165	159
Link Distance (ft)	934		317	317	922	922
Upstream Blk Time (%)		0	1	0		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (ft)		215				
Storage Blk Time (%)			4			0
Queuing Penalty (veh)			5			0

Intersection: 11: US 40 EB Ramps & MD 715

Movement	EB	EB	WB	WB	NB
Directions Served	L	T	T	T	L
Maximum Queue (ft)	60	52	156	158	47
Average Queue (ft)	19	5	43	47	15
95th Queue (ft)	48	27	114	125	38
Link Distance (ft)		627	337	337	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				305
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	L	T
Maximum Queue (ft)	52	68	56	50	34	65	241	231	114	18	116	81
Average Queue (ft)	14	20	12	13	3	23	140	93	45	1	51	30
95th Queue (ft)	41	56	38	40	18	56	219	178	92	10	97	63
Link Distance (ft)		543	543	543	543		586	586	586			532
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80					260				285	200	
Storage Blk Time (%)		0					0					
Queuing Penalty (veh)		0					0					

Intersection: 12: Old Philadelphia Rd & MD 715

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (ft)	85	7	58	126	88
Average Queue (ft)	34	0	20	63	31
95th Queue (ft)	72	4	52	112	64
Link Distance (ft)	532			488	488
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		425	305		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: MD 159 & Spesutia Rd

Movement	EB	NB	SB	SB
Directions Served	LT	L	L	TR
Maximum Queue (ft)	57	224	50	13
Average Queue (ft)	11	92	10	1
95th Queue (ft)	39	167	35	8
Link Distance (ft)	692	511		1865
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			145	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Chelsea Rd & MD 159

Movement	EB	NB	B86
Directions Served	LR	L	T
Maximum Queue (ft)	66	12	22
Average Queue (ft)	28	0	1
95th Queue (ft)	61	6	12
Link Distance (ft)	77		421
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		165	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: Chelsea Rd & Canning House Rd

Movement	EB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	352	4	4
Average Queue (ft)	160	0	0
95th Queue (ft)	290	3	3
Link Distance (ft)	792	421	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Chelsea Rd & Woodley Rd

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	58	45
Average Queue (ft)	18	5
95th Queue (ft)	48	26
Link Distance (ft)	500	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 17: MD 159 & Fords Ln

Movement	EB
Directions Served	LR
Maximum Queue (ft)	32
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	385
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: MD 159 & Canning House Rd

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	TR	LTR	LTR
Maximum Queue (ft)	38	271	118	22	23
Average Queue (ft)	8	121	66	1	1
95th Queue (ft)	31	205	102	9	11
Link Distance (ft)		412	748	457	845
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 759

13: MD 159 & Spesutia Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.1
Total Del/Veh (s)	9.3	2.1	4.3	4.1	6.3

13: MD 159 & Spesutia Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	5.3	2.1	4.2	3.6	4.3

15: Chelsea Rd & Canning House Rd Performance by movement

Movement	EBL	EBT	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.0
Total Del/Veh (s)	21.5	0.1	0.4	1.5	3.0	4.6

15: Chelsea Rd & Canning House Rd Performance by movement

Movement	EBL	EBT	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.1
Total Del/Veh (s)	19.3	0.2	1.1	0.9	1.6	7.3

APPENDIX I-D

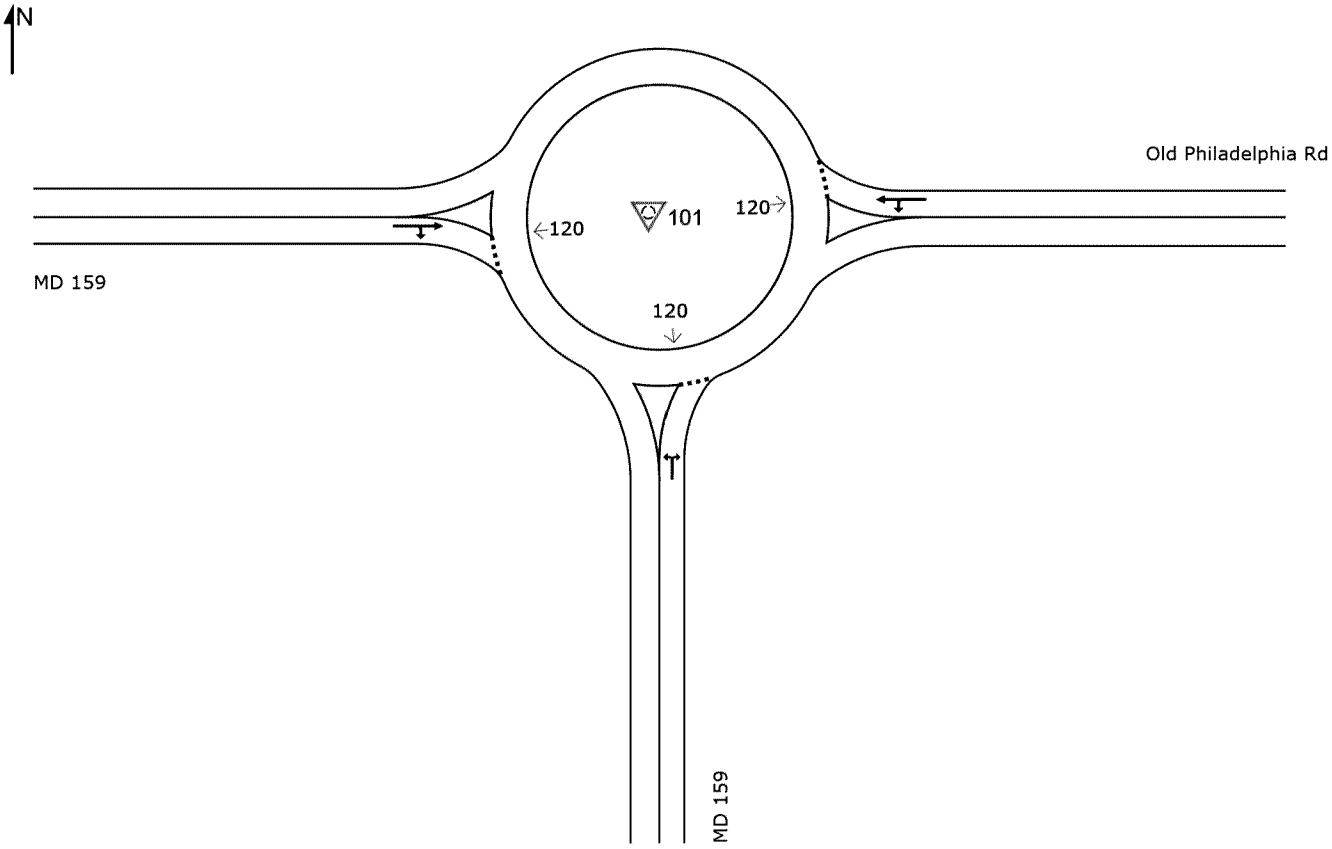
SIDRA
REPORTS

SITE LAYOUT

Site: 101 [Future PM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [Existing AM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	59	5.0	66	5.0	0.180	4.5	LOS A	1.2	30.8	0.33	0.16	0.33	35.0
18	R2	136	5.0	151	5.0	0.180	4.5	LOS A	1.2	30.8	0.33	0.16	0.33	33.7
Approach		195	5.0	217	5.0	0.180	4.5	LOS A	1.2	30.8	0.33	0.16	0.33	34.1
East: Old Philadelphia Rd														
1	L2	241	5.0	268	5.0	0.245	5.0	LOS A	1.6	40.8	0.27	0.12	0.27	33.1
6	T1	34	5.0	38	5.0	0.245	5.0	LOS A	1.6	40.8	0.27	0.12	0.27	33.0
Approach		275	5.0	306	5.0	0.245	5.0	LOS A	1.6	40.8	0.27	0.12	0.27	33.1
West: MD 159														
2	T1	81	5.0	90	5.0	0.237	5.7	LOS A	1.4	37.5	0.51	0.37	0.51	35.3
12	R2	140	5.0	156	5.0	0.237	5.7	LOS A	1.4	37.5	0.51	0.37	0.51	34.1
Approach		221	5.0	246	5.0	0.237	5.7	LOS A	1.4	37.5	0.51	0.37	0.51	34.5
All Vehicles		691	5.0	768	5.0	0.245	5.1	LOS A	1.6	40.8	0.36	0.21	0.36	33.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Existing PM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	120	5.0	128	5.0	0.304	5.6	LOS A	2.3	58.7	0.24	0.09	0.24	34.3
18	R2	244	5.0	260	5.0	0.304	5.6	LOS A	2.3	58.7	0.24	0.09	0.24	33.1
Approach		364	5.0	387	5.0	0.304	5.6	LOS A	2.3	58.7	0.24	0.09	0.24	33.5
East: Old Philadelphia Rd														
1	L2	148	5.0	157	5.0	0.224	5.0	LOS A	1.4	35.3	0.36	0.20	0.36	33.9
6	T1	99	5.0	105	5.0	0.224	5.0	LOS A	1.4	35.3	0.36	0.20	0.36	33.8
Approach		247	5.0	263	5.0	0.224	5.0	LOS A	1.4	35.3	0.36	0.20	0.36	33.9
West: MD 159														
2	T1	40	5.0	43	5.0	0.134	4.3	LOS A	0.8	20.1	0.38	0.22	0.38	36.1
12	R2	104	5.0	111	5.0	0.134	4.3	LOS A	0.8	20.1	0.38	0.22	0.38	34.8
Approach		144	5.0	153	5.0	0.134	4.3	LOS A	0.8	20.1	0.38	0.22	0.38	35.1
All Vehicles		755	5.0	803	5.0	0.304	5.2	LOS A	2.3	58.7	0.31	0.15	0.31	33.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Background AM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	68	5.0	76	5.0	0.195	4.8	LOS A	1.3	33.6	0.39	0.21	0.39	34.7
18	R2	136	5.0	151	5.0	0.195	4.8	LOS A	1.3	33.6	0.39	0.21	0.39	33.5
Approach		204	5.0	227	5.0	0.195	4.8	LOS A	1.3	33.6	0.39	0.21	0.39	33.9
East: Old Philadelphia Rd														
1	L2	241	5.0	268	5.0	0.257	5.2	LOS A	1.7	43.9	0.29	0.14	0.29	33.1
6	T1	45	5.0	50	5.0	0.257	5.2	LOS A	1.7	43.9	0.29	0.14	0.29	33.0
Approach		286	5.0	318	5.0	0.257	5.2	LOS A	1.7	43.9	0.29	0.14	0.29	33.1
West: MD 159														
2	T1	111	5.0	123	5.0	0.278	6.2	LOS A	1.8	45.7	0.53	0.38	0.53	35.0
12	R2	148	5.0	164	5.0	0.278	6.2	LOS A	1.8	45.7	0.53	0.38	0.53	33.9
Approach		259	5.0	288	5.0	0.278	6.2	LOS A	1.8	45.7	0.53	0.38	0.53	34.4
All Vehicles		749	5.0	832	5.0	0.278	5.4	LOS A	1.8	45.7	0.40	0.24	0.40	33.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\3700\3762\Sidra\2022 MD 159 at Old Philadephia Rd.sip9

MOVEMENT SUMMARY

Site: 101 [Background PM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	128	5.0	136	5.0	0.318	5.8	LOS A	2.4	61.7	0.30	0.13	0.30	34.2
18	R2	244	5.0	260	5.0	0.318	5.8	LOS A	2.4	61.7	0.30	0.13	0.30	32.9
Approach		372	5.0	396	5.0	0.318	5.8	LOS A	2.4	61.7	0.30	0.13	0.30	33.3
East: Old Philadelphia Rd														
1	L2	148	5.0	157	5.0	0.258	5.4	LOS A	1.6	42.5	0.39	0.22	0.39	34.0
6	T1	134	5.0	143	5.0	0.258	5.4	LOS A	1.6	42.5	0.39	0.22	0.39	33.9
Approach		282	5.0	300	5.0	0.258	5.4	LOS A	1.6	42.5	0.39	0.22	0.39	33.9
West: MD 159														
2	T1	59	5.0	63	5.0	0.160	4.5	LOS A	0.9	24.5	0.39	0.22	0.39	35.9
12	R2	112	5.0	119	5.0	0.160	4.5	LOS A	0.9	24.5	0.39	0.22	0.39	34.7
Approach		171	5.0	182	5.0	0.160	4.5	LOS A	0.9	24.5	0.39	0.22	0.39	35.1
All Vehicles		825	5.0	878	5.0	0.318	5.4	LOS A	2.4	61.7	0.35	0.18	0.35	33.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\3700\3762\Sidra\2022 MD 159 at Old Philadephia Rd.sip9

MOVEMENT SUMMARY

Site: 101 [Future AM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	115	5.0	128	5.0	0.280	5.8	LOS A	2.1	55.4	0.44	0.25	0.44	34.0
18	R2	173	5.0	192	5.0	0.280	5.8	LOS A	2.1	55.4	0.44	0.25	0.44	32.8
Approach		288	5.0	320	5.0	0.280	5.8	LOS A	2.1	55.4	0.44	0.25	0.44	33.3
East: Old Philadelphia Rd														
1	L2	400	5.0	444	5.0	0.425	7.5	LOS A	3.3	86.6	0.46	0.27	0.46	31.9
6	T1	45	5.0	50	5.0	0.425	7.5	LOS A	3.3	86.6	0.46	0.27	0.46	31.8
Approach		445	5.0	494	5.0	0.425	7.5	LOS A	3.3	86.6	0.46	0.27	0.46	31.9
West: MD 159														
2	T1	111	5.0	123	5.0	0.594	13.1	LOS B	6.7	173.7	0.84	0.87	1.12	31.6
12	R2	350	5.0	389	5.0	0.594	13.1	LOS B	6.7	173.7	0.84	0.87	1.12	30.6
Approach		461	5.0	512	5.0	0.594	13.1	LOS B	6.7	173.7	0.84	0.87	1.12	30.8
All Vehicles		1194	5.0	1327	5.0	0.594	9.2	LOS A	6.7	173.7	0.60	0.50	0.71	31.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Future PM (Site Folder: MD 159 at Old Philadelphia Rd)]

MD 159 at Old Philadelphia Rd
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: MD 159														
3	L2	291	5.0	310	5.0	0.569	9.5	LOS A	6.3	162.5	0.44	0.21	0.44	32.1
18	R2	371	5.0	395	5.0	0.569	9.5	LOS A	6.3	162.5	0.44	0.21	0.44	31.0
Approach		662	5.0	704	5.0	0.569	9.5	LOS A	6.3	162.5	0.44	0.21	0.44	31.5
East: Old Philadelphia Rd														
1	L2	229	5.0	244	5.0	0.395	8.0	LOS A	2.8	72.7	0.64	0.50	0.64	32.4
6	T1	134	5.0	143	5.0	0.395	8.0	LOS A	2.8	72.7	0.64	0.50	0.64	32.3
Approach		363	5.0	386	5.0	0.395	8.0	LOS A	2.8	72.7	0.64	0.50	0.64	32.4
West: MD 159														
2	T1	59	5.0	63	5.0	0.285	6.3	LOS A	1.9	50.1	0.55	0.39	0.55	34.9
12	R2	216	5.0	230	5.0	0.285	6.3	LOS A	1.9	50.1	0.55	0.39	0.55	33.7
Approach		275	5.0	293	5.0	0.285	6.3	LOS A	1.9	50.1	0.55	0.39	0.55	33.9
All Vehicles		1300	5.0	1383	5.0	0.569	8.4	LOS A	6.3	162.5	0.52	0.33	0.52	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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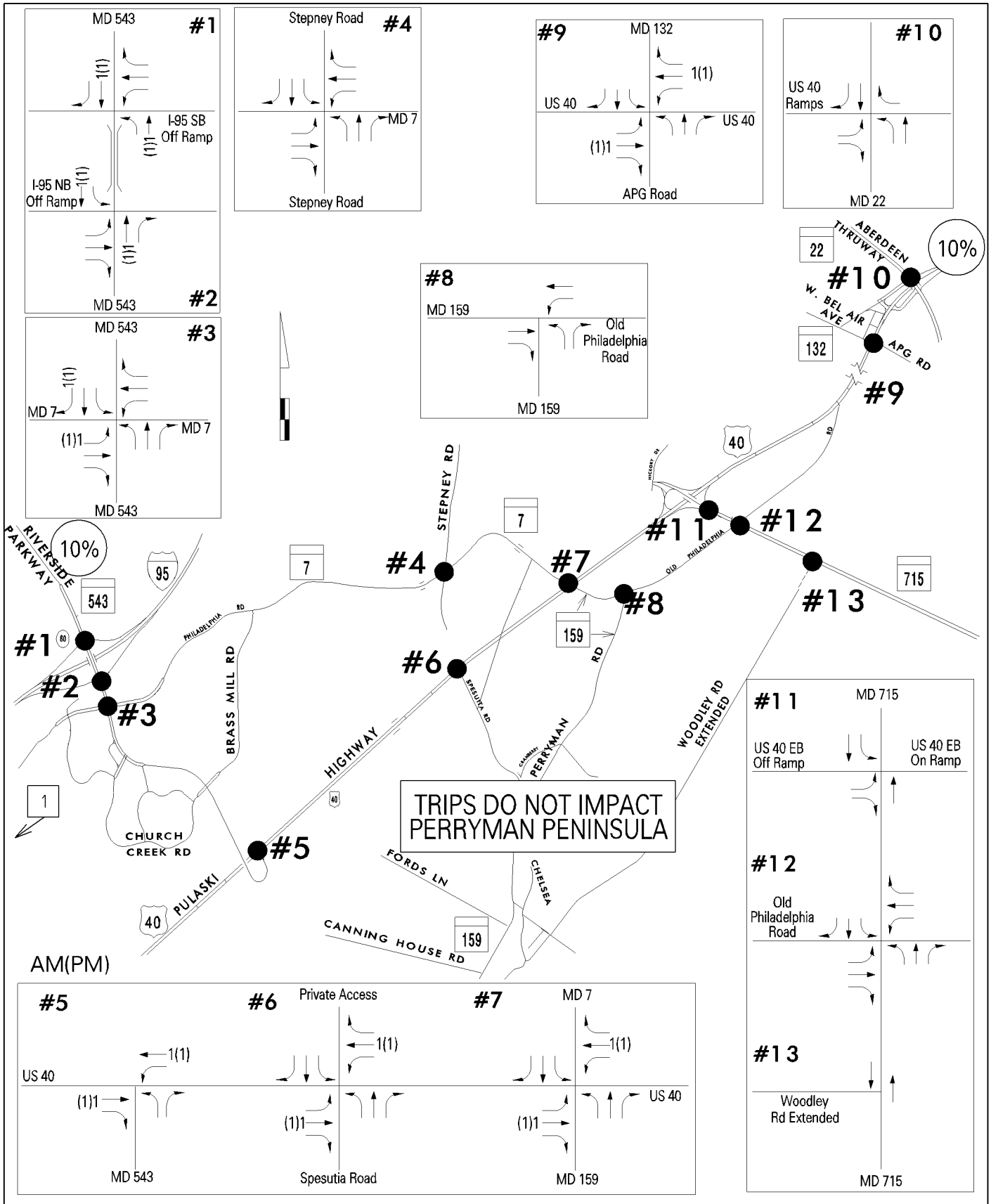
APPENDIX II

BAGKROUND TRAFFIC DISTRIBUTION



TRAFFIC CONCEPTS, INC.
7525 Connelly Drive
Suite B
Hanover, Maryland 21076
410-760-2911

BACKGROUND 1

Abingdon Addition

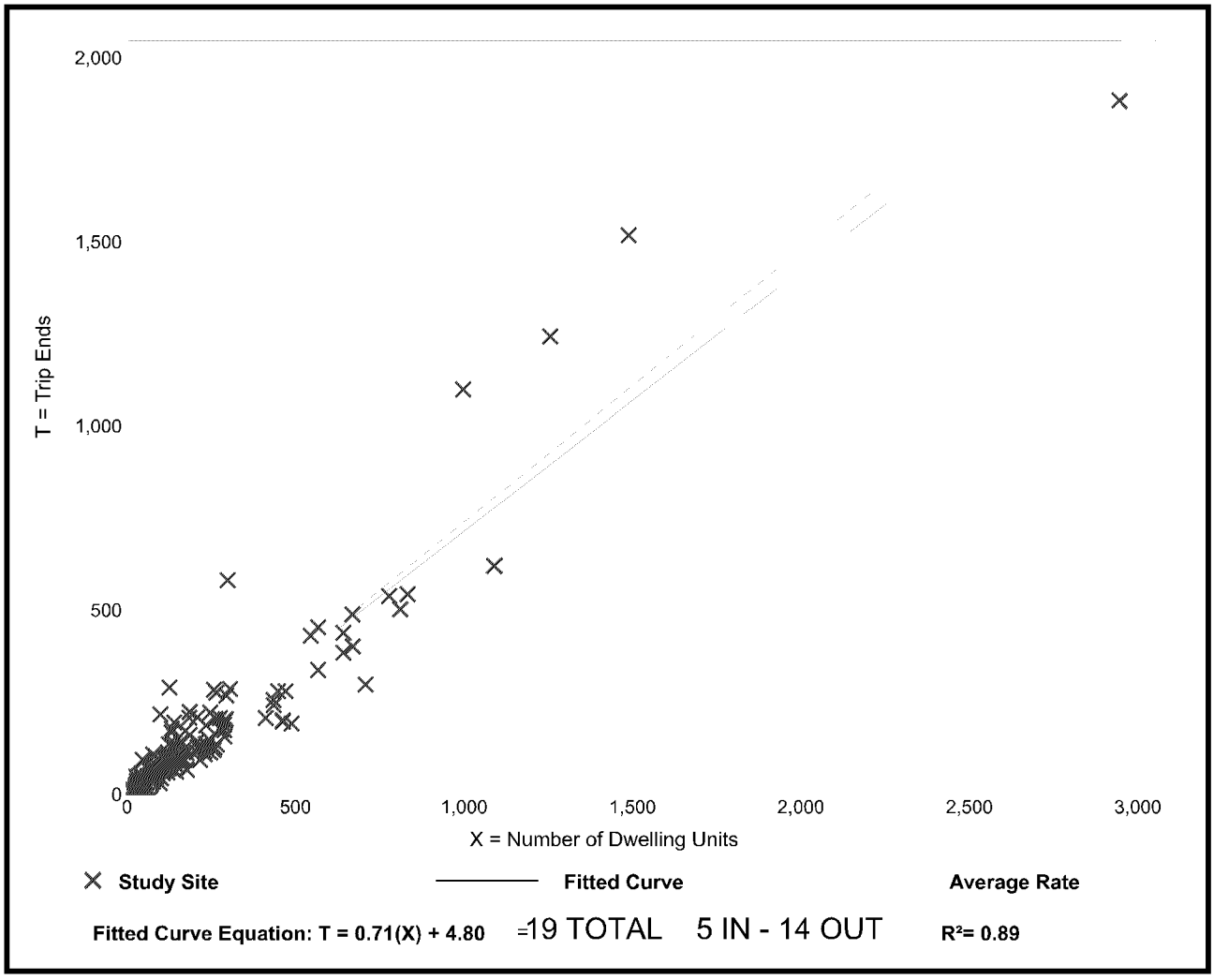
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



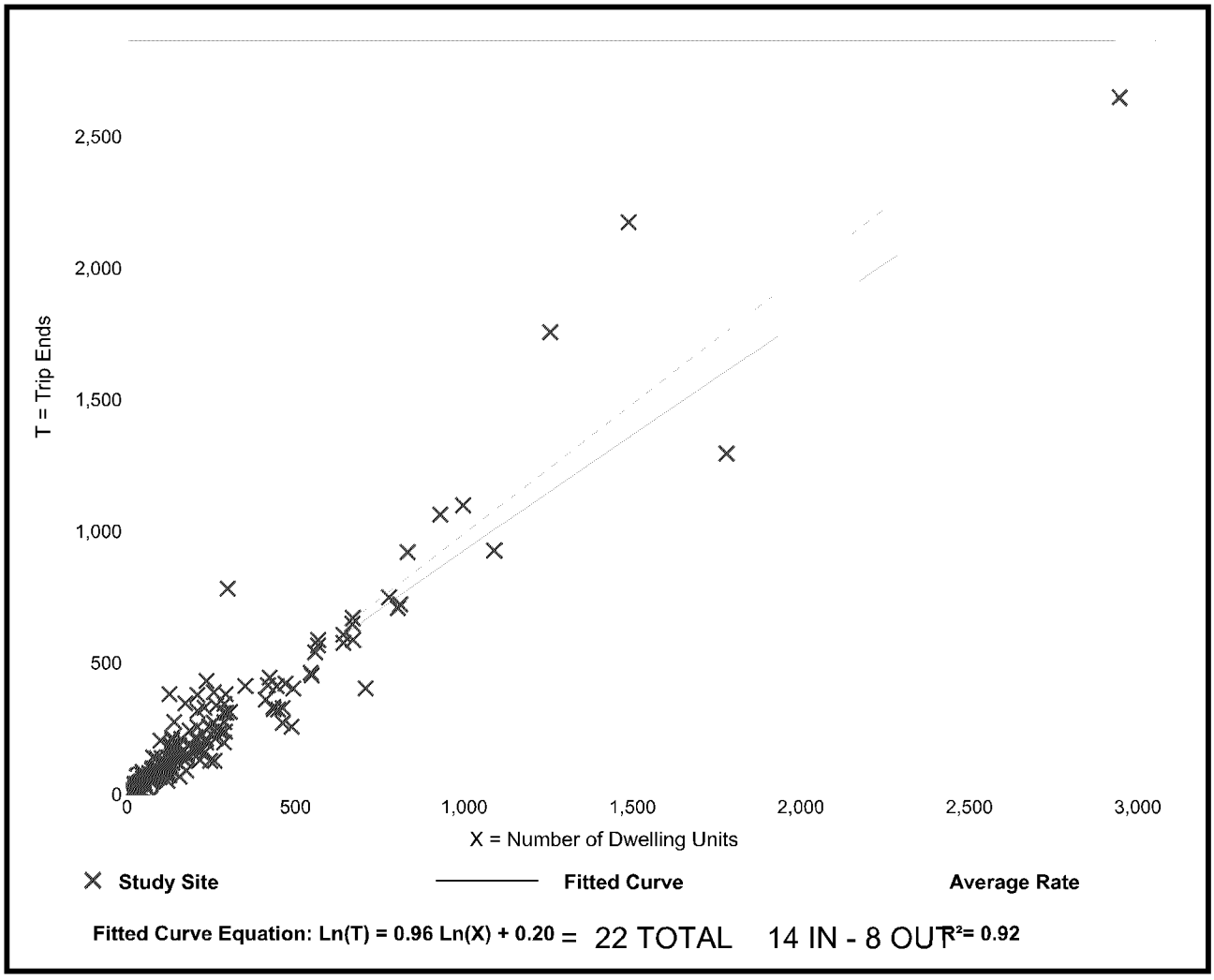
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

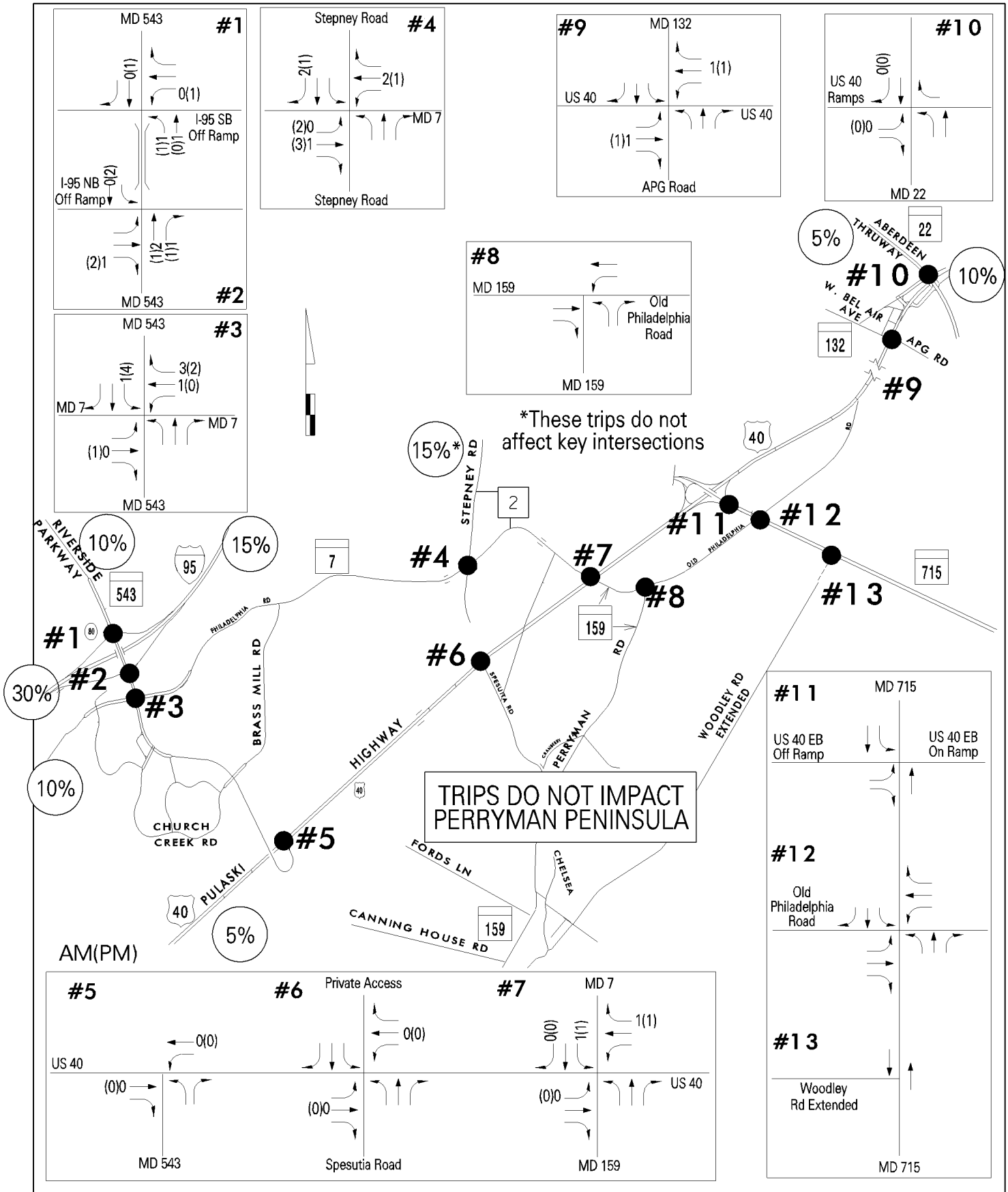
Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 = 22 TOTAL 14 IN - 8 OUT **R^2= 0.92**



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BACKGROUND 2

Beech Creek Estates

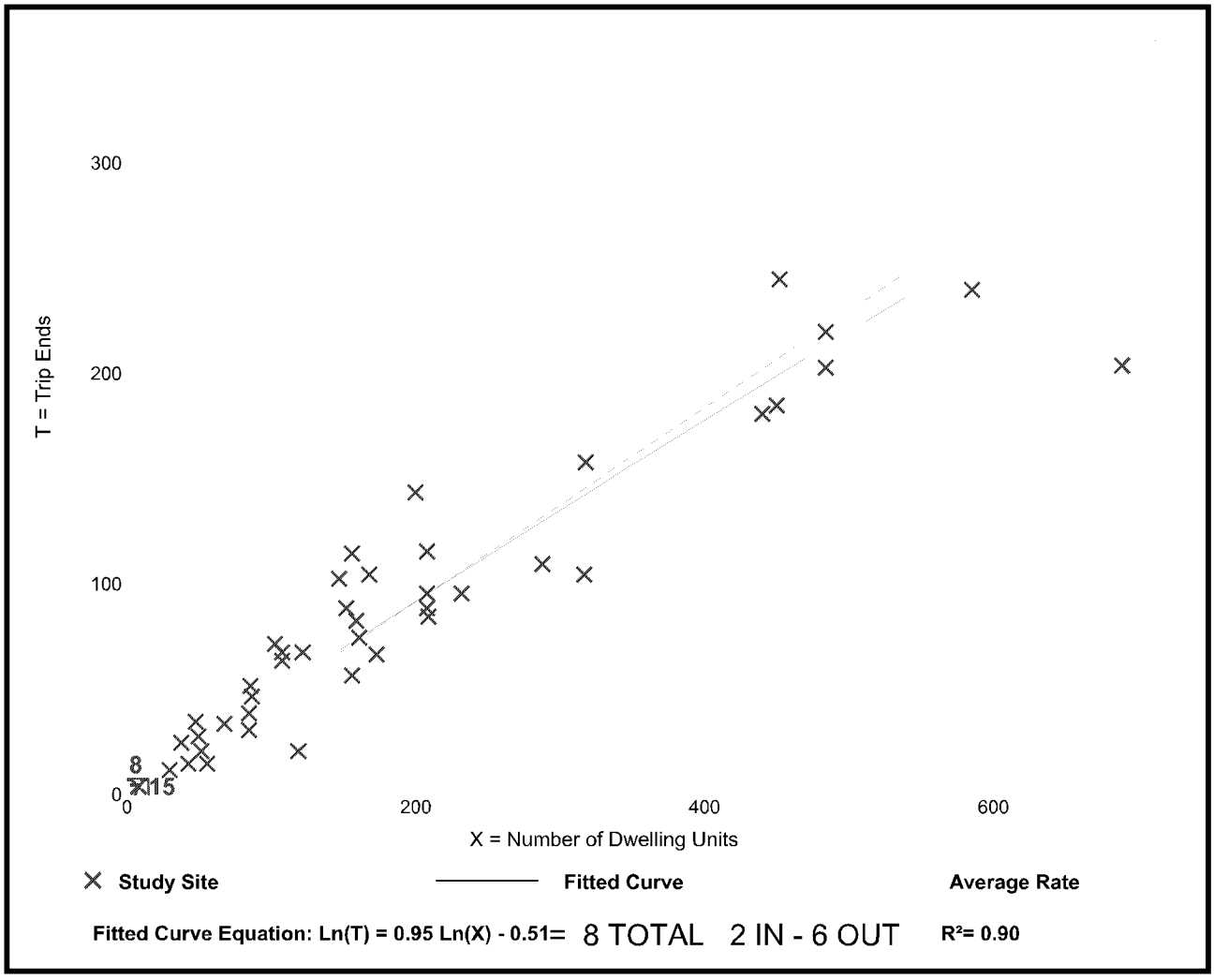
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



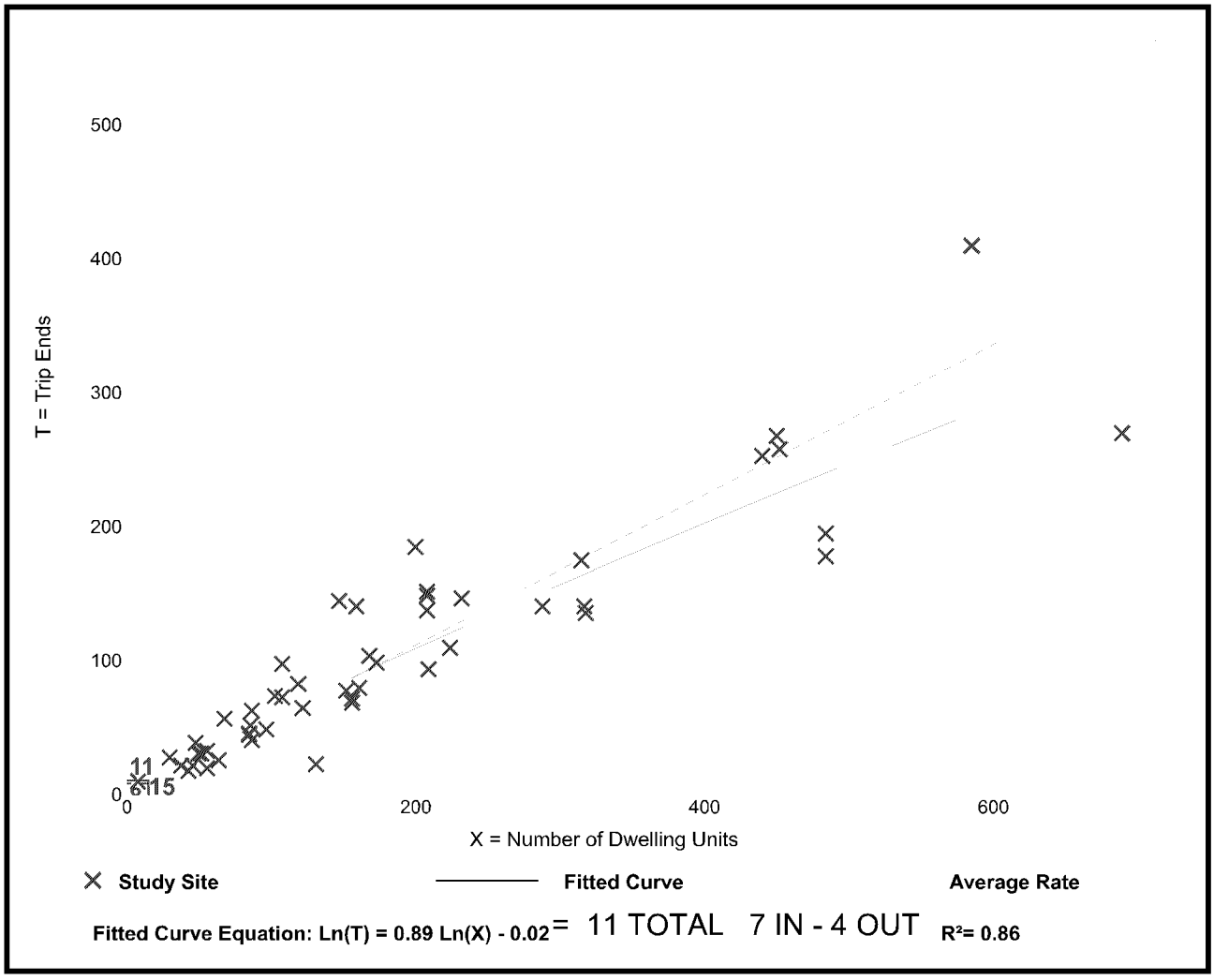
Multifamily Housing (Low-Rise)
(220)

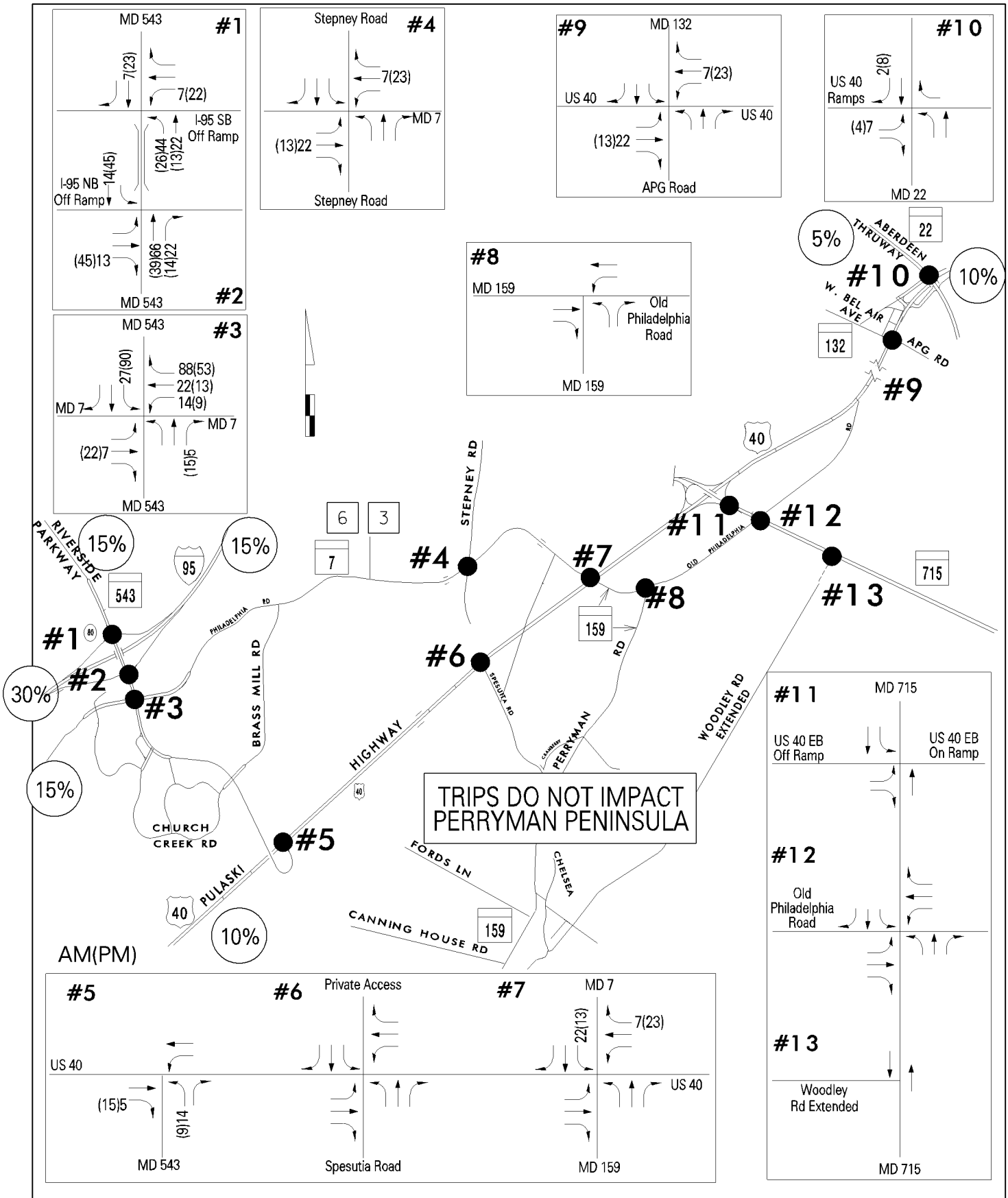
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation





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BACKGROUNDS 3 & 6

Hollywoods & Woodlawn

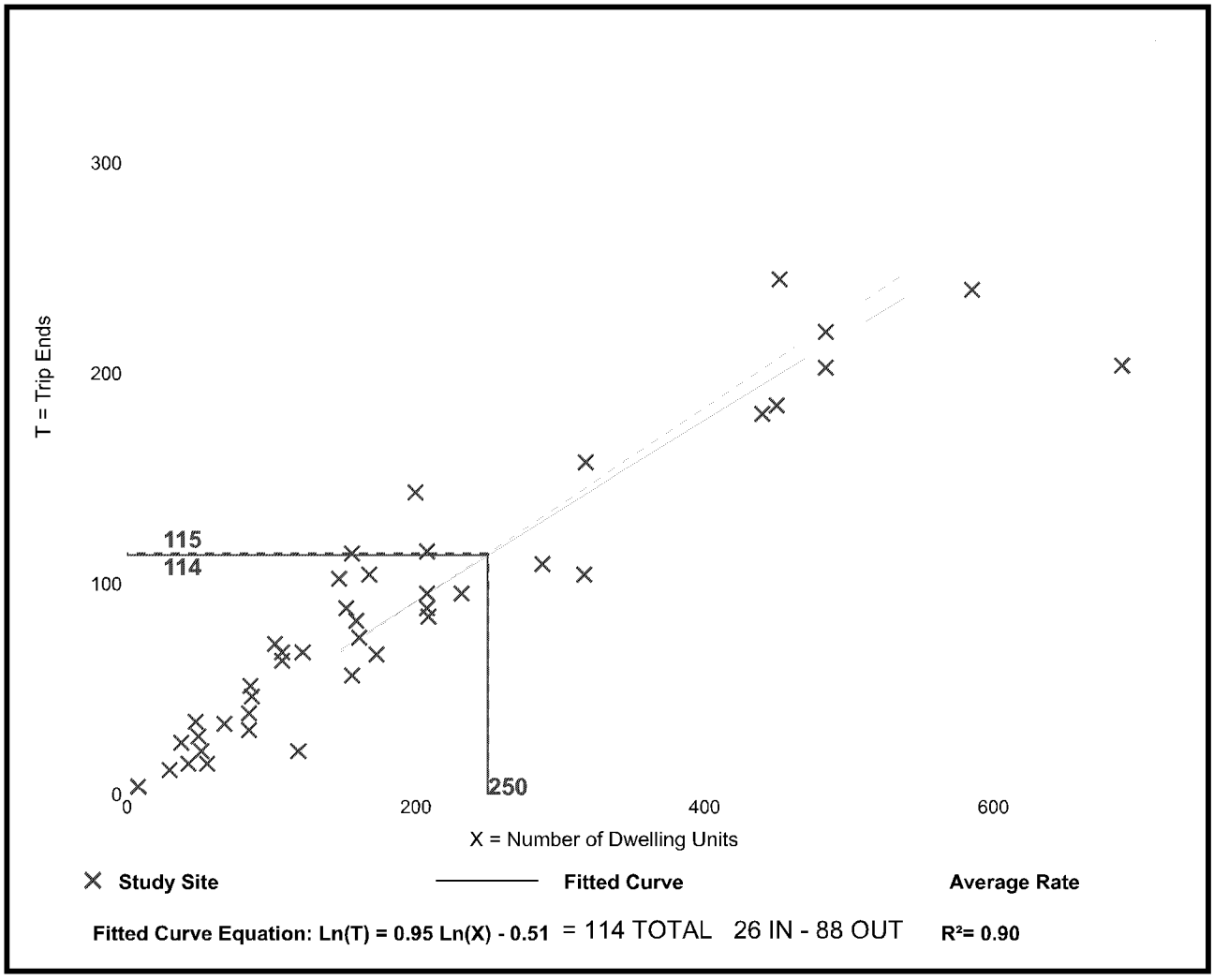
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.95 Ln(X) - 0.51 = 114 TOTAL 26 IN - 88 OUT **R^2= 0.90**

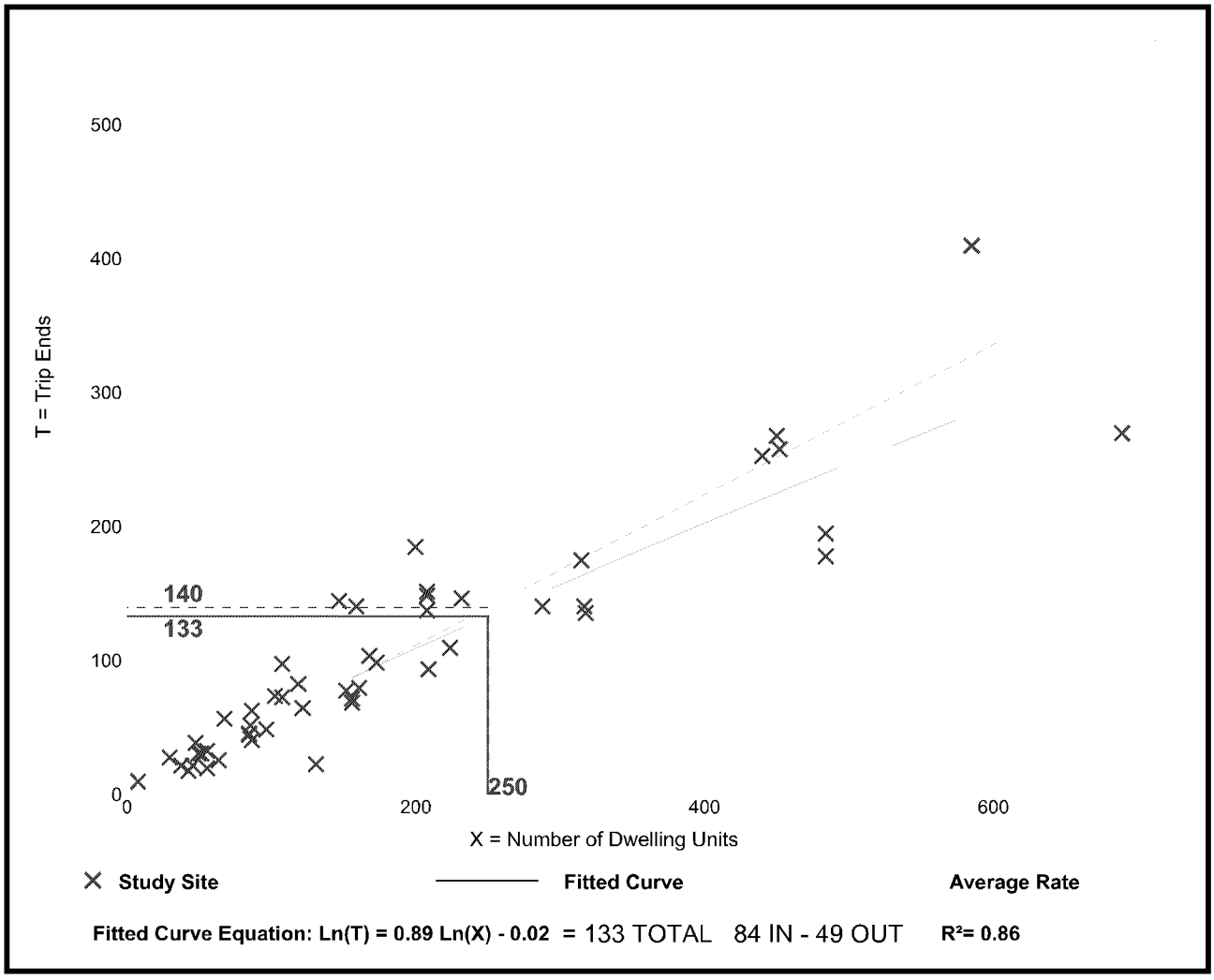
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.89 Ln(X) - 0.02 = 133 TOTAL 84 IN - 49 OUT **R^2= 0.86**

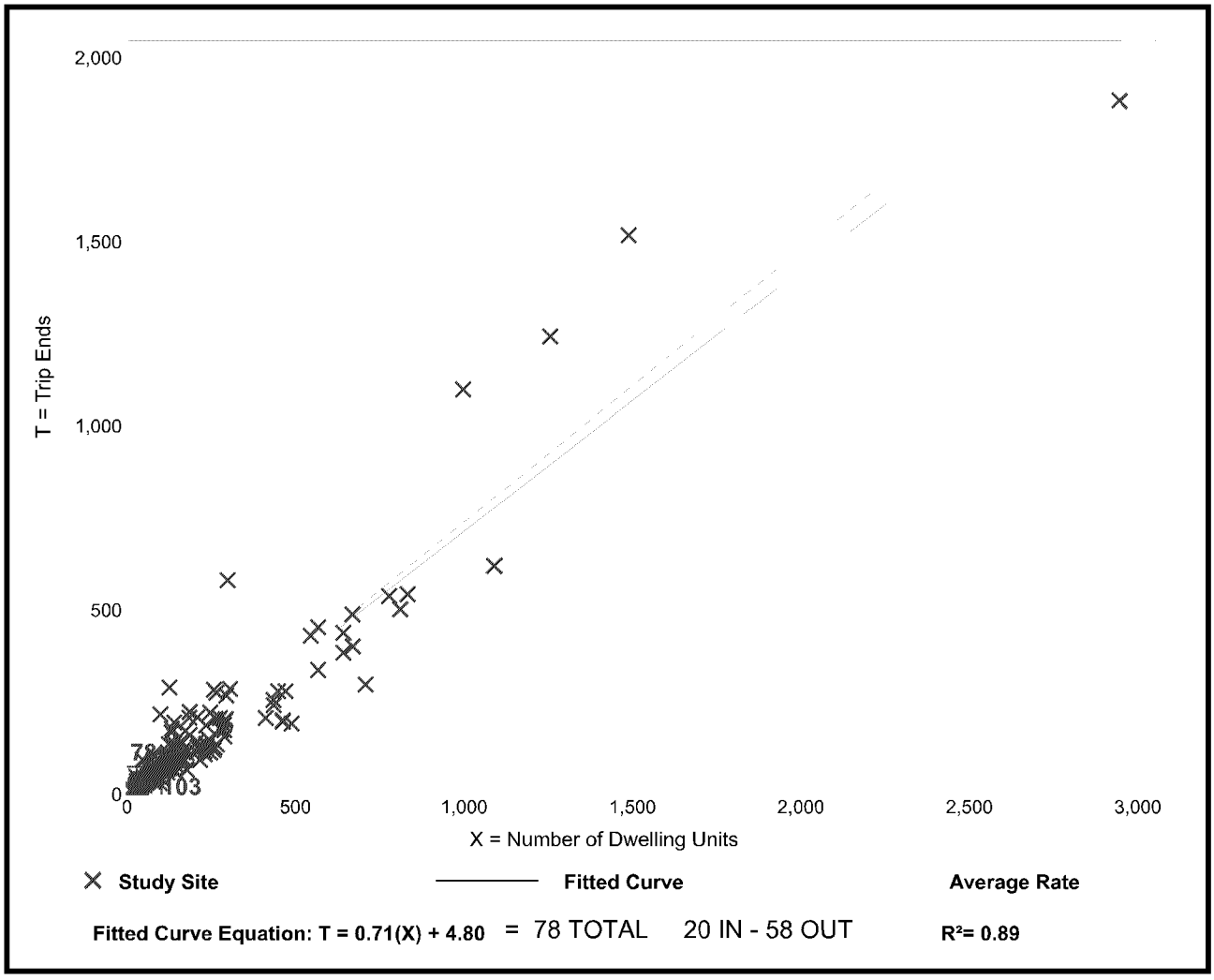
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Fitted Curve Equation: T = 0.71(X) + 4.80 = 78 TOTAL 20 IN - 58 OUT **R^2= 0.89**

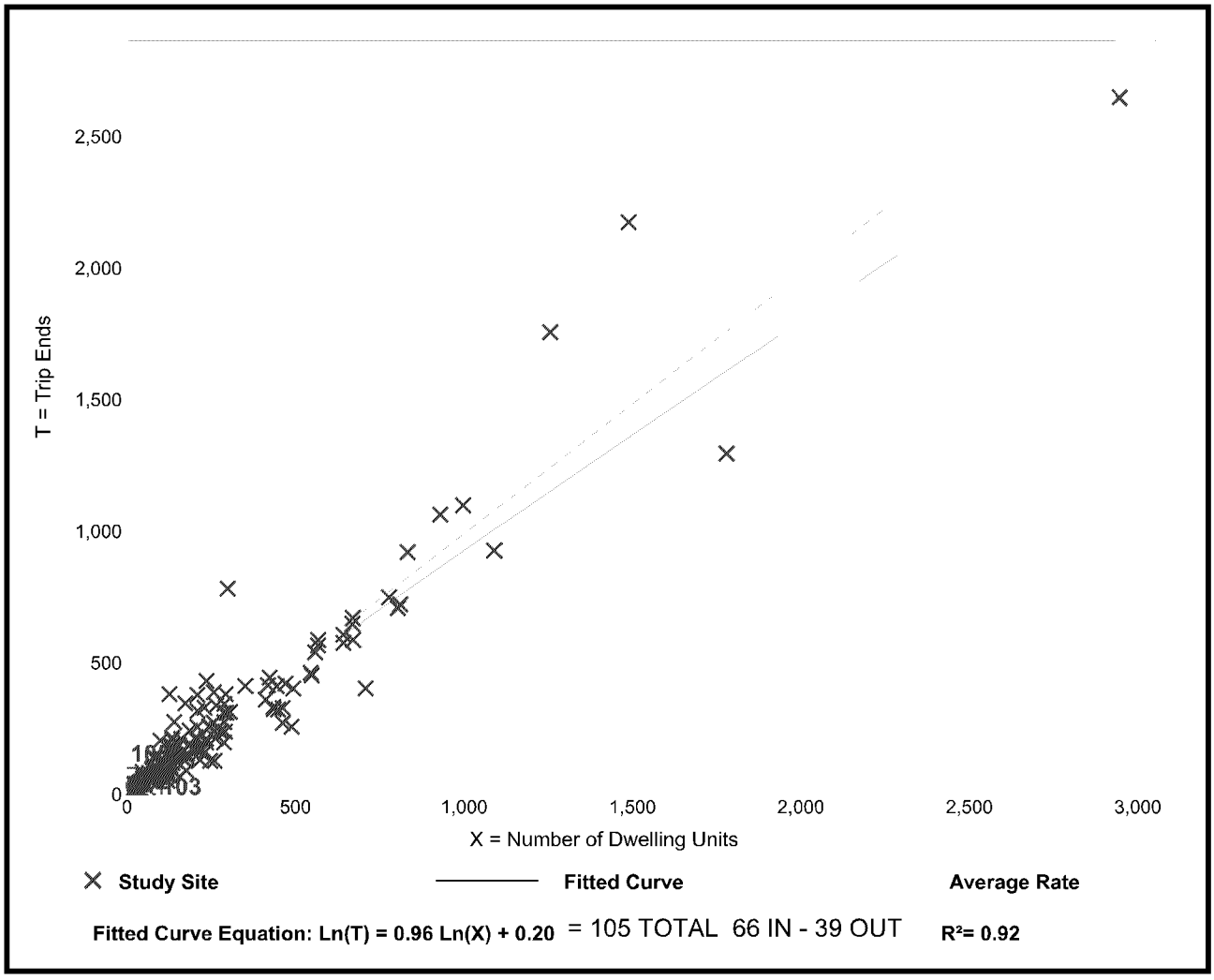
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

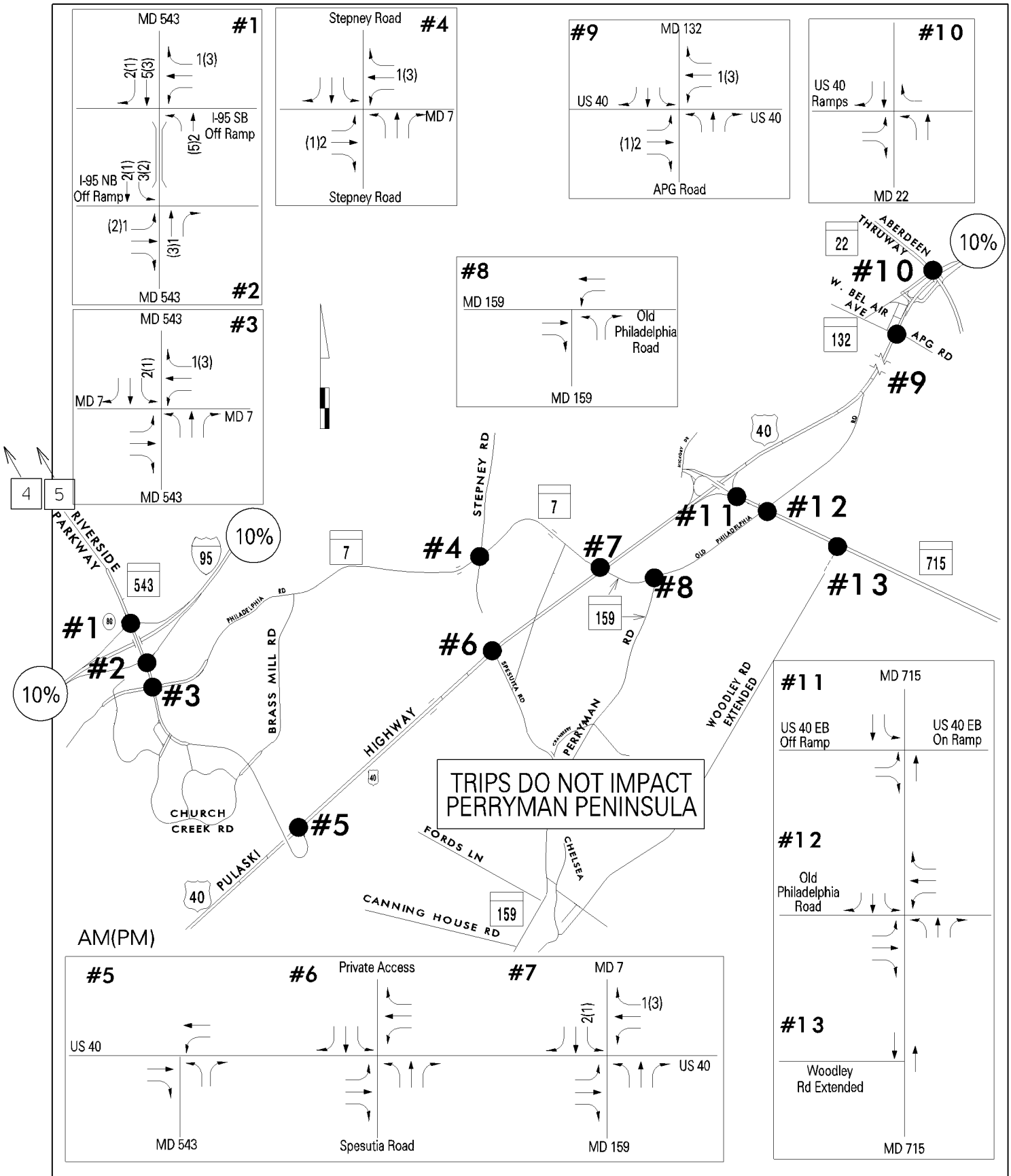
Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 = 105 TOTAL 66 IN - 39 OUT **R^2= 0.92**



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BACKGROUNDS 4 & 5

Monarch Glen; Redlief Run

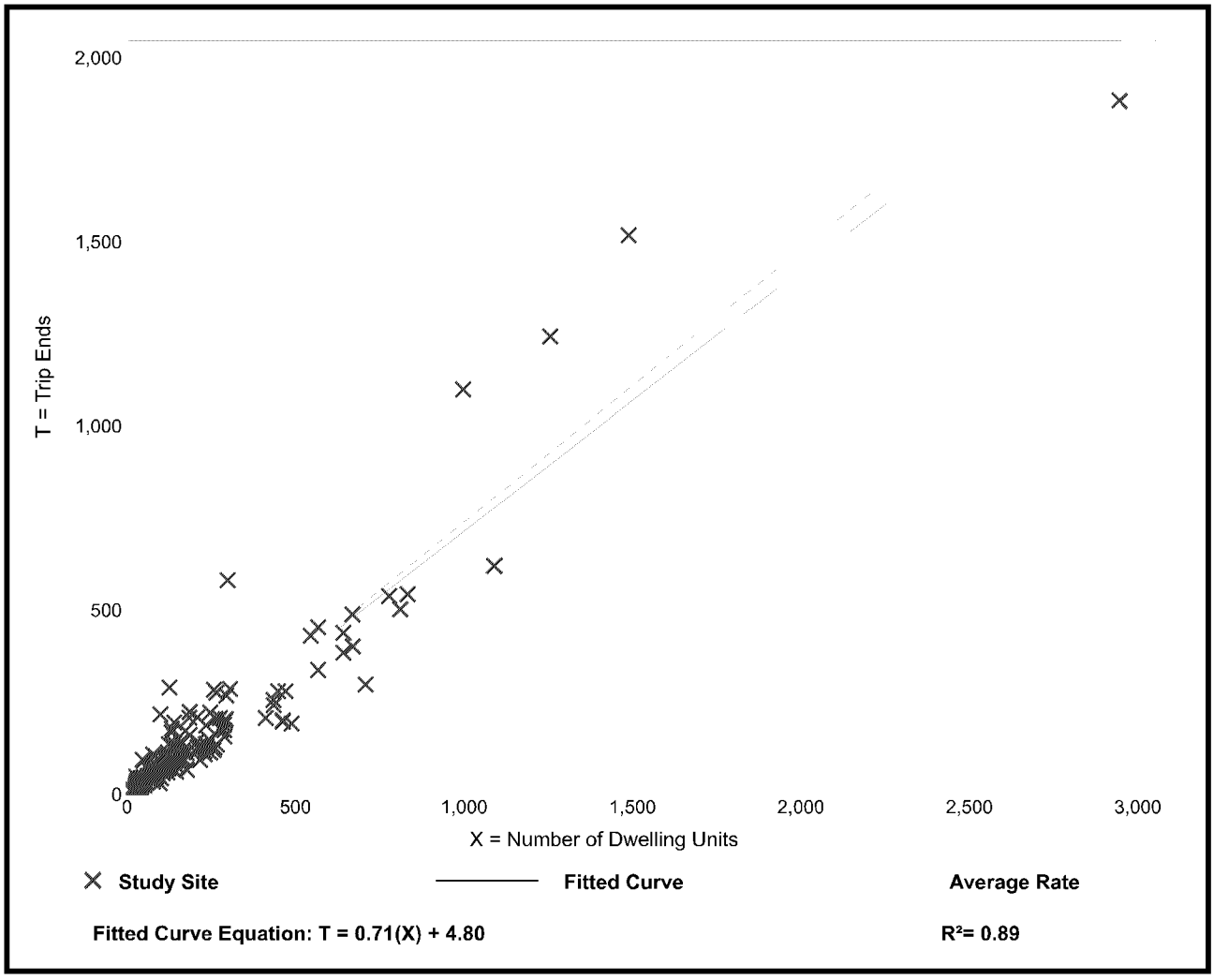
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



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= 1 TOTAL 0 IN - 1 OUT

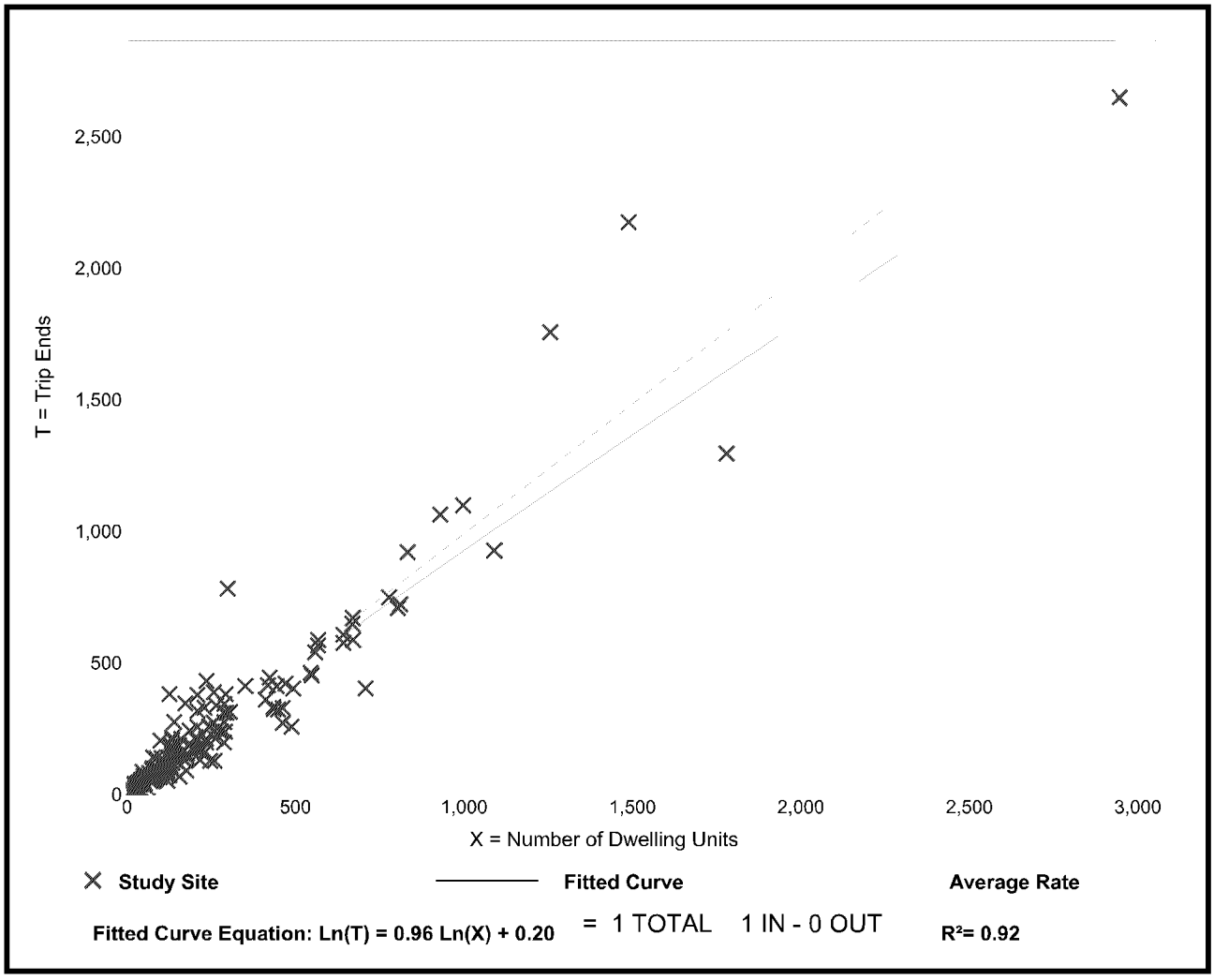
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 = 1 TOTAL 1 IN - 0 OUT **R^2= 0.92**

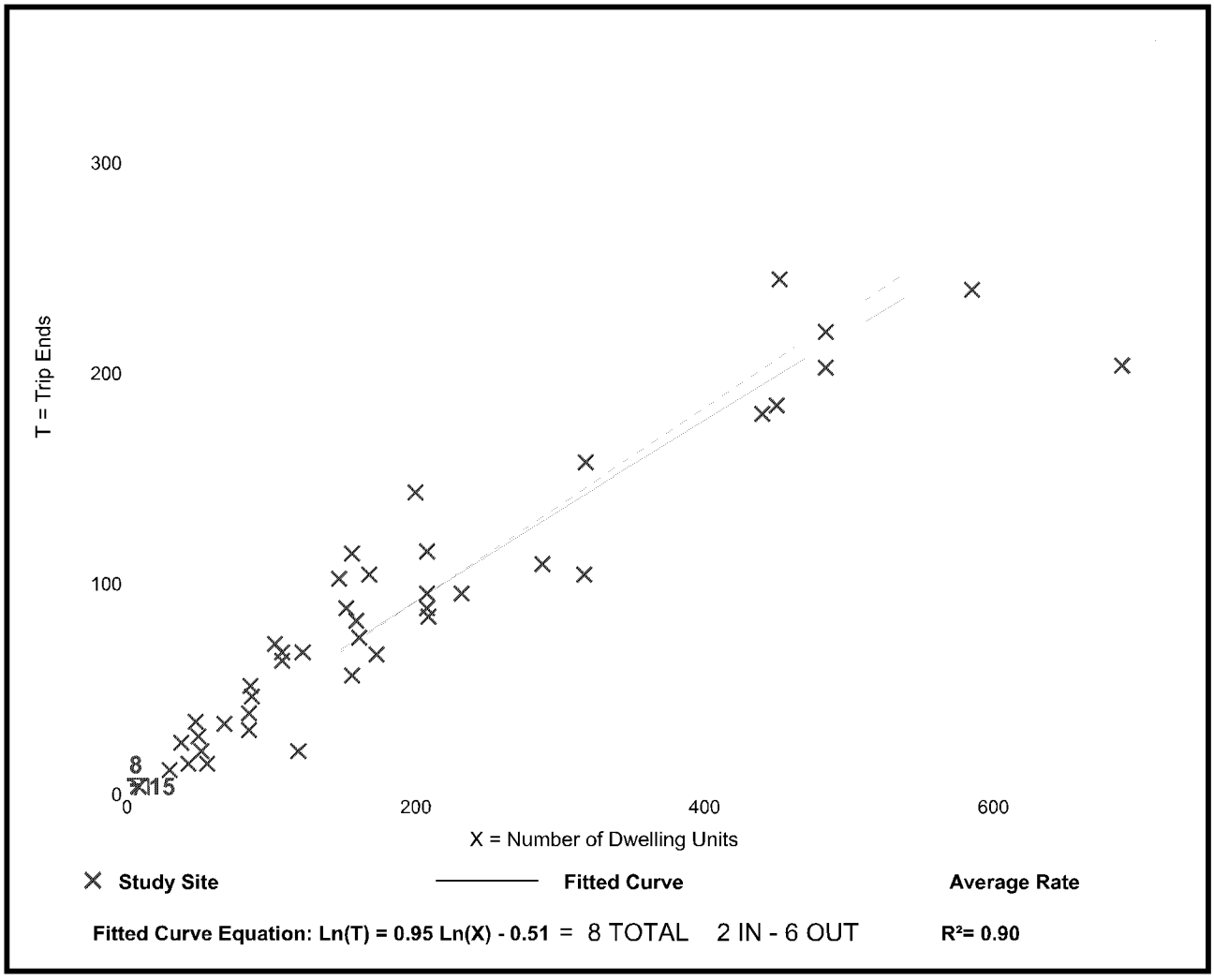
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



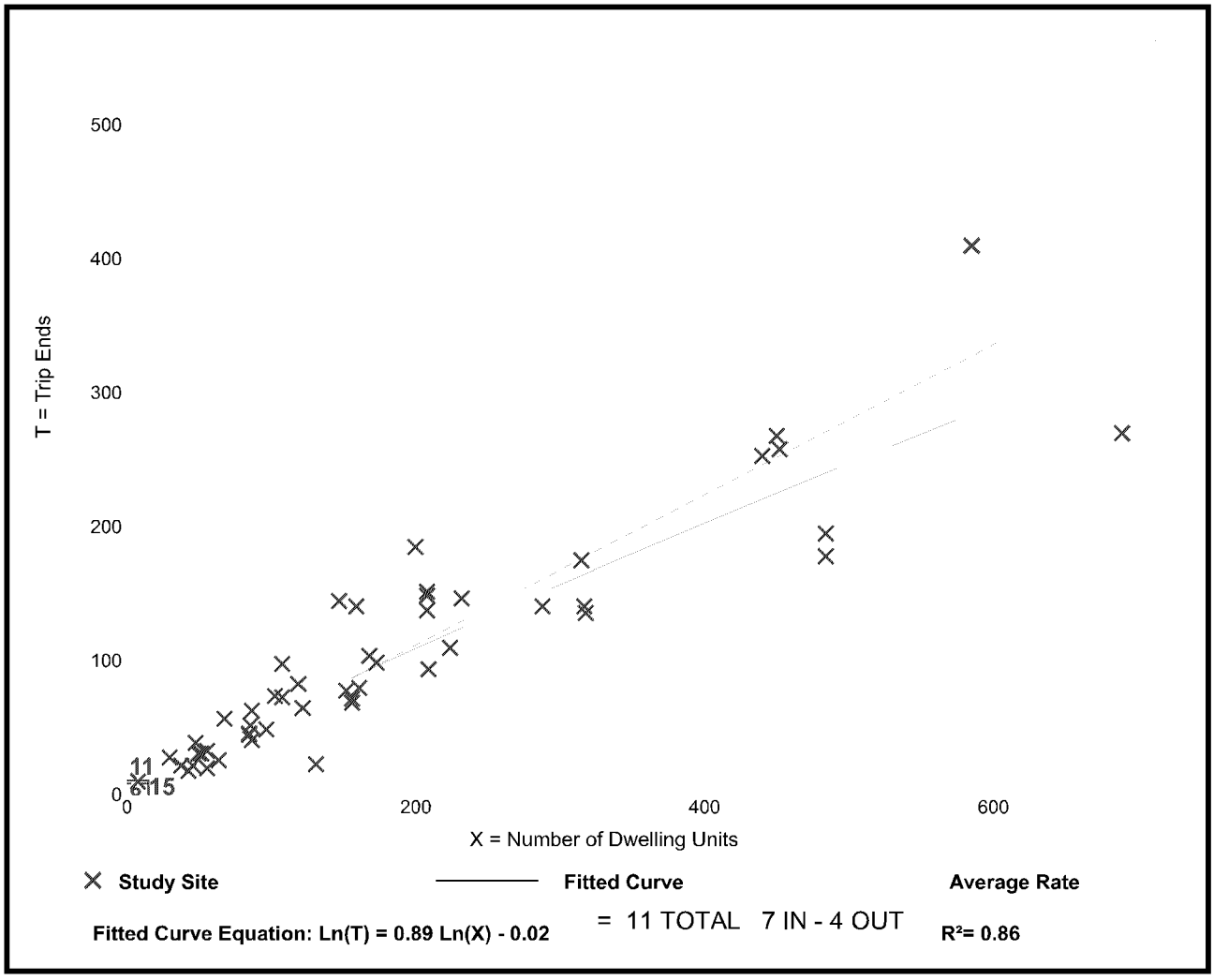
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



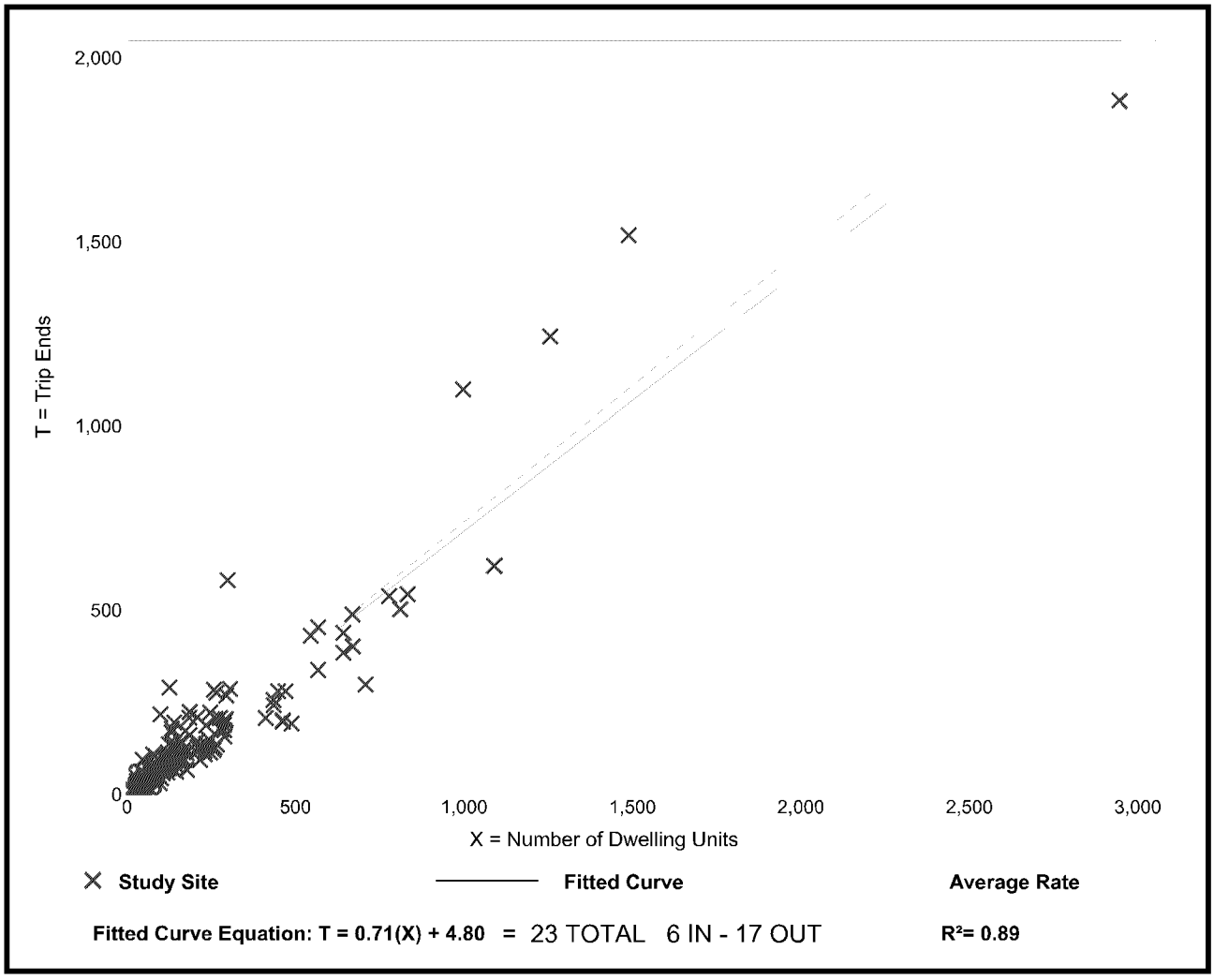
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



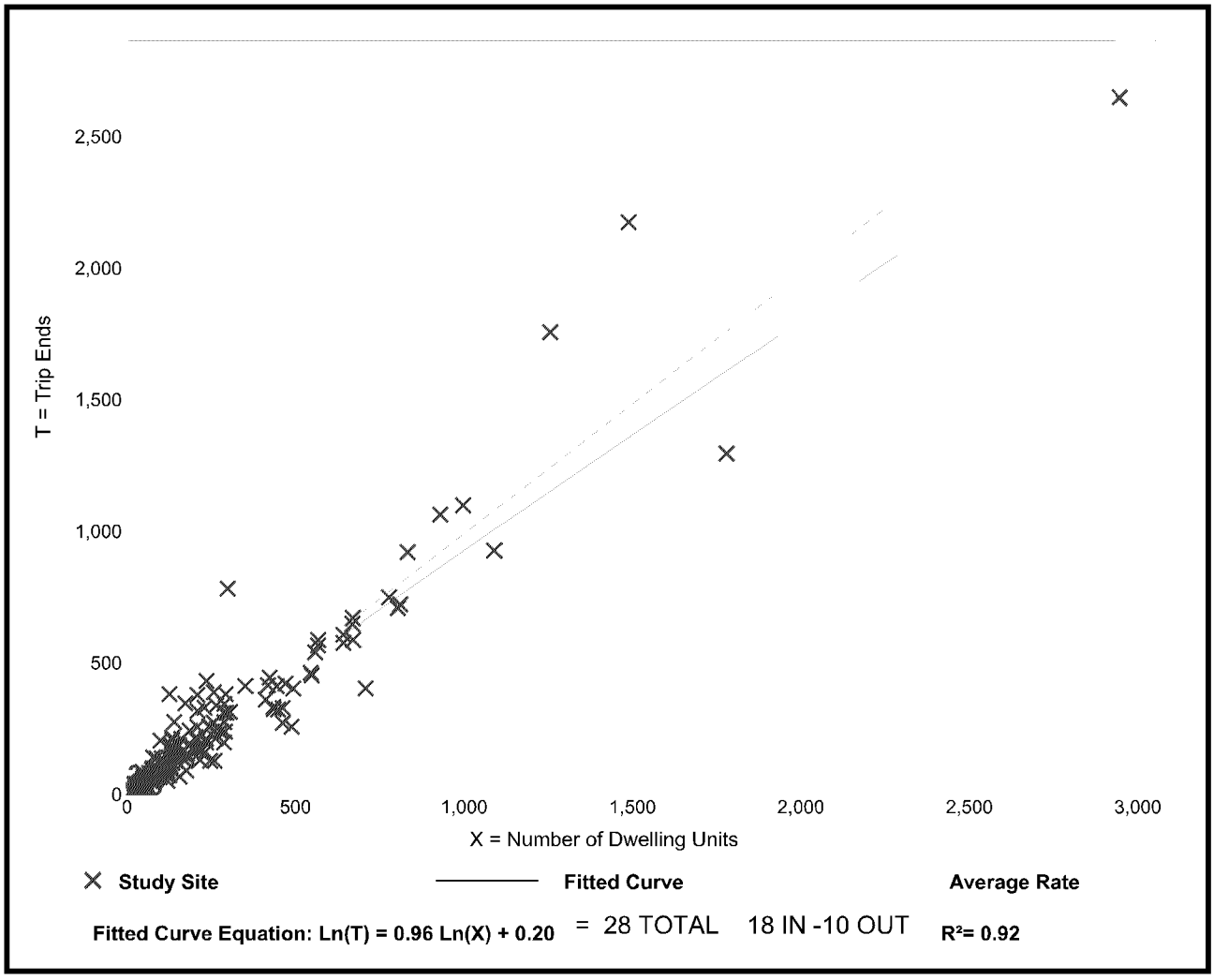
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

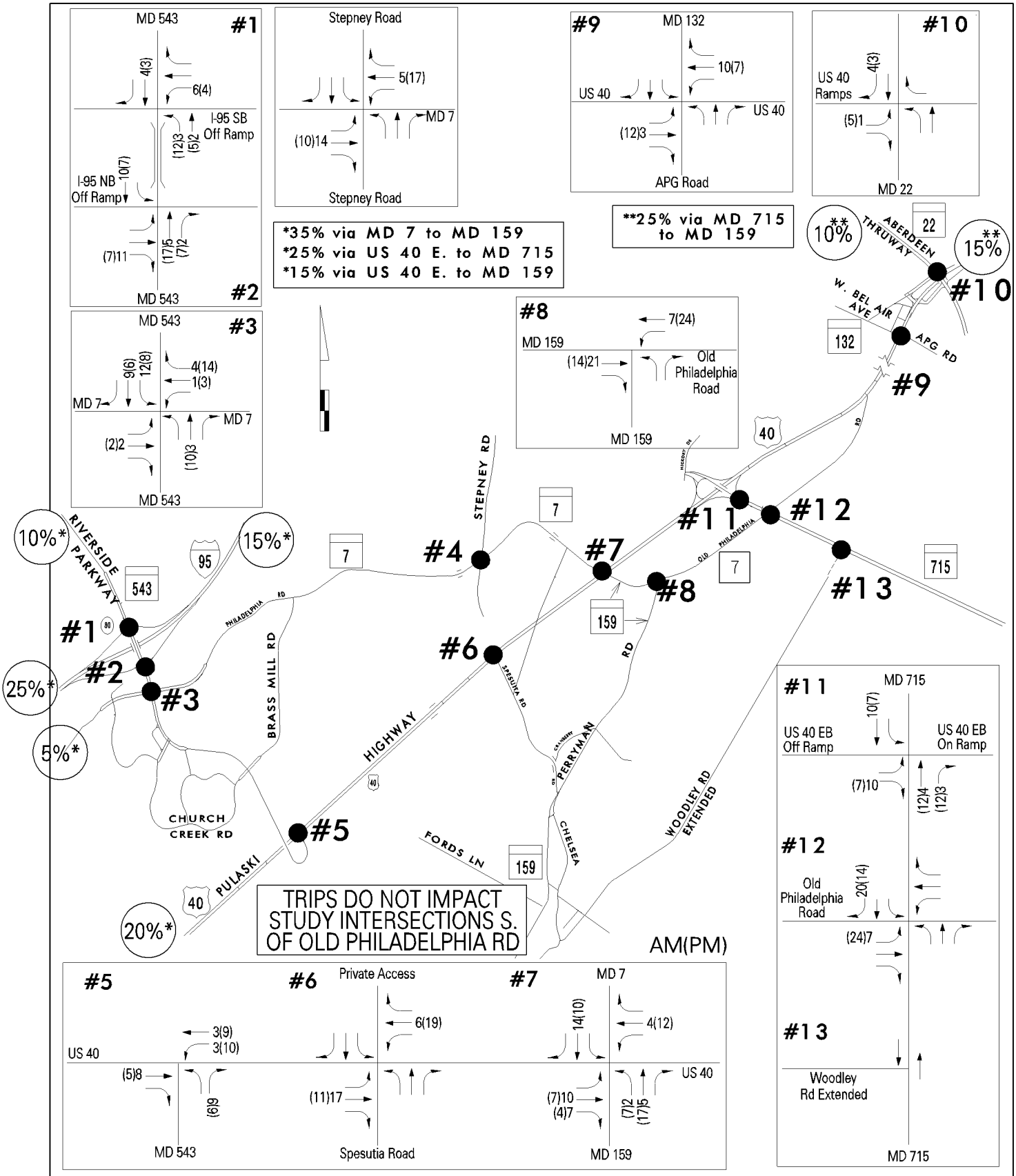
Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 = 28 TOTAL 18 IN -10 OUT **R^2= 0.92**



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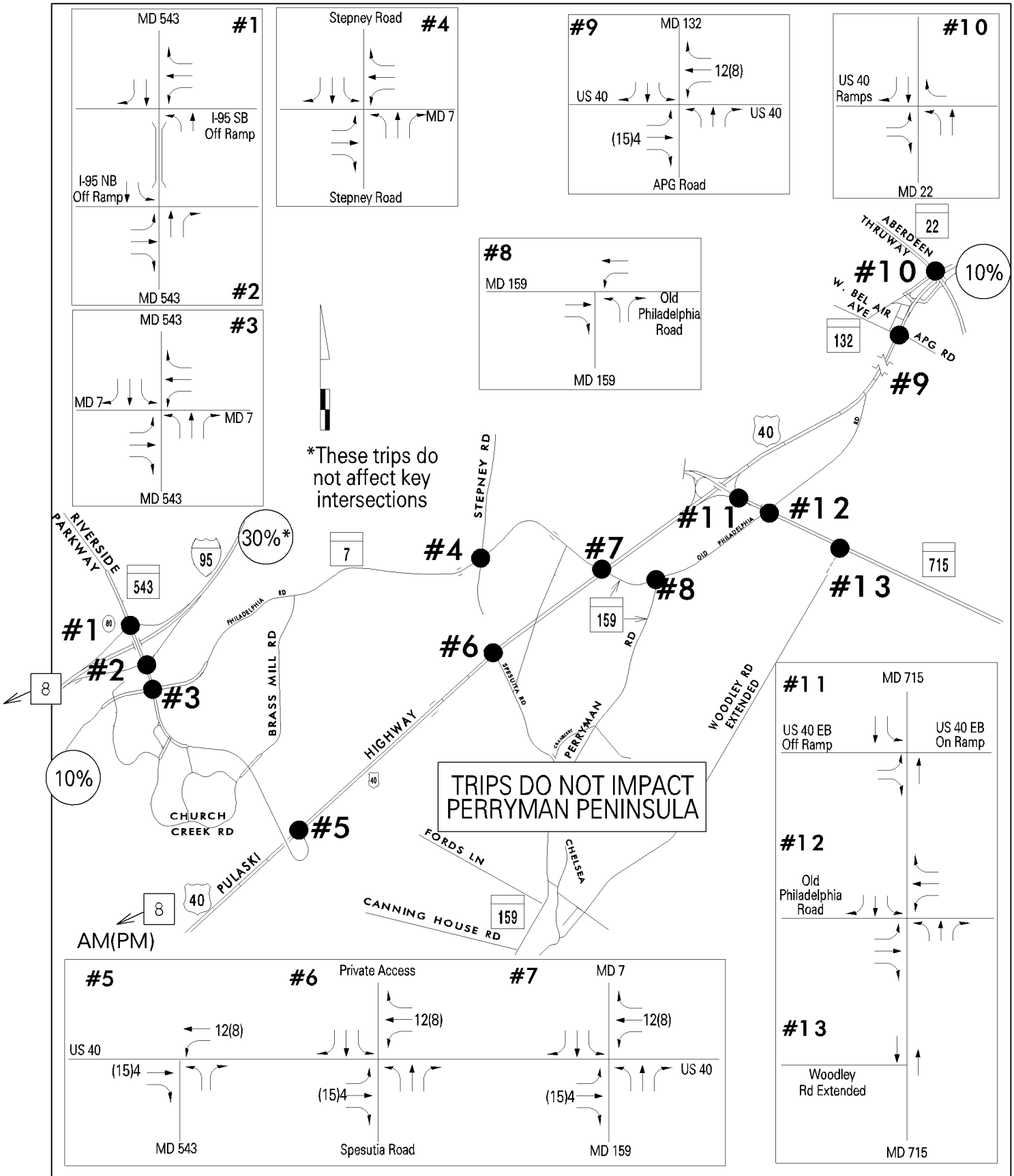
BACKGROUND 7

999-1041 Old Philadelphia Rd



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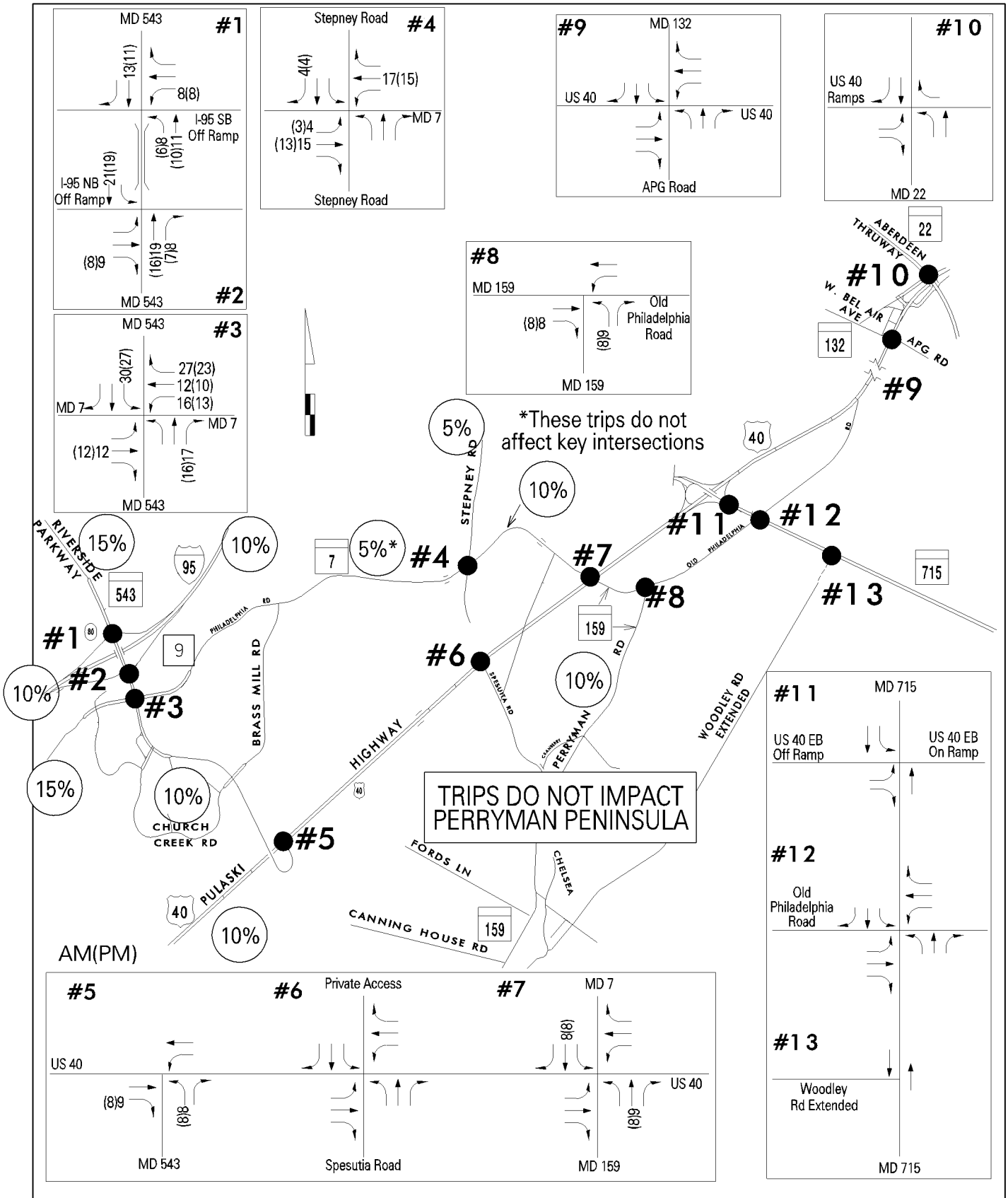
BACKGROUND 8

Abingdon Business Park (Lots 1-3)



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BACKGROUND 9

Belcamp Commercial - Lots 1 & 2
(New Trips)

NOTE: COPIED FROM APPROVED BELCAMP COMMERCIAL TIS DATED 2016 (HIGHER TRIPS THAN CURRENT PLAN)

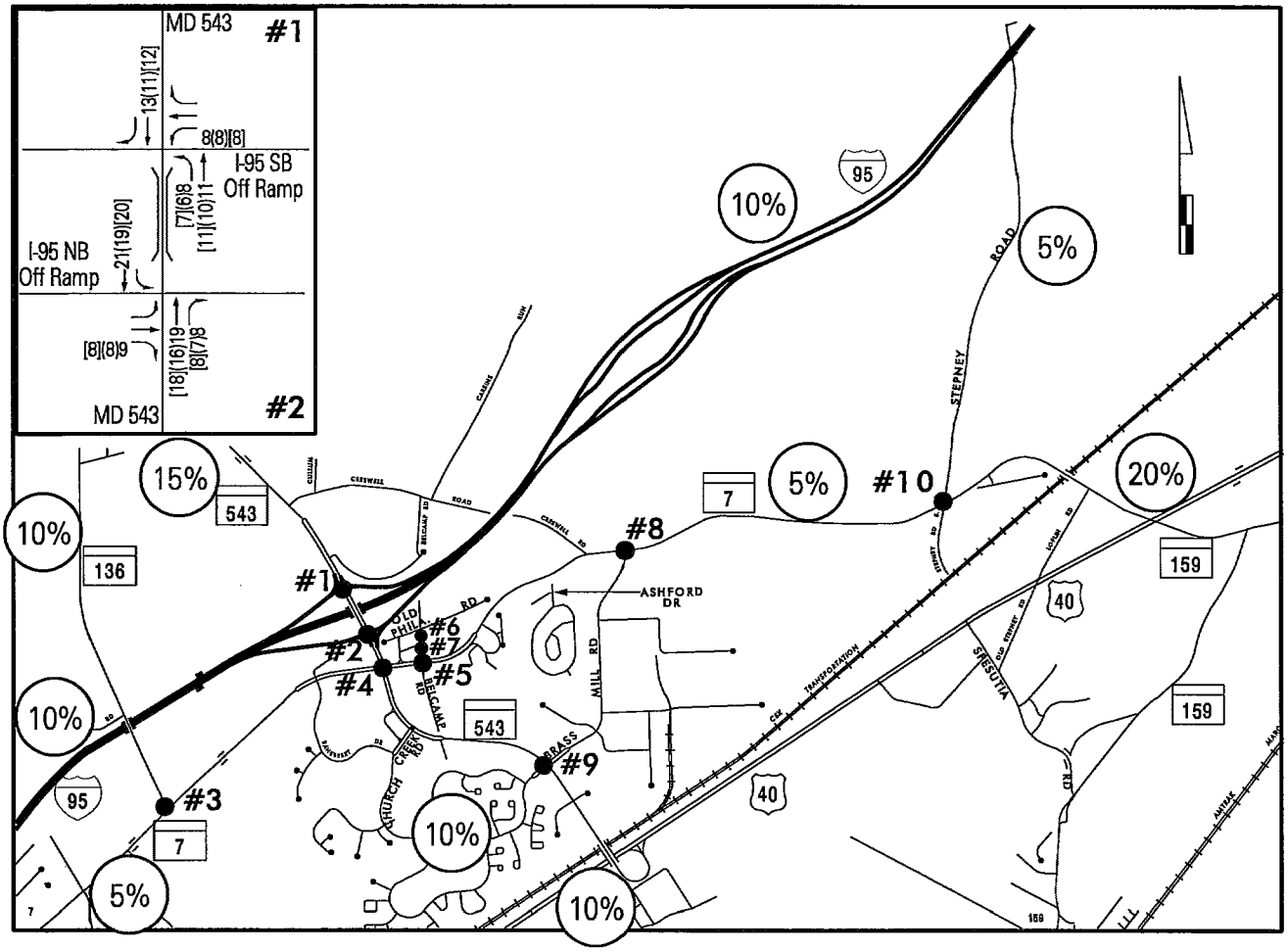
FUTURE CONDITION

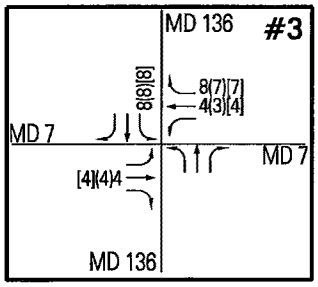
This final analysis determines the peak hour trips generated by the proposed development and calculates the level of service at the key intersections using the total future traffic volumes. The proposed Riverside East Property plan includes a 5,371 gross square foot (gsf) convenience market with gas sales, a 5,600 gsf high turnover sit-down restaurant, and a 1,400 gsf car wash (1 stall). We have consulted the Institute of Transportation Engineers', Trip Generation Manual, 9th Edition to determine trip generation rates for this development, with the following results:

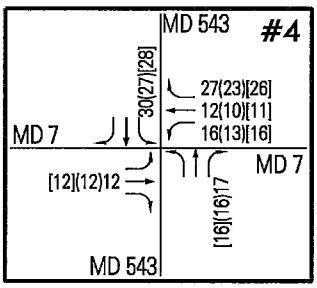
	AM		PM		SAT	
	IN	OUT	IN	OUT	IN	OUT
Convenience Market with Gas Sales						
ITE Land Use Code 853						
5.371 ksf	110	110	137	136	126	121
Less Pass-by Trips*	- 69	- 69	- 90	- 90	- 79	- 76
Net New Trips	41	41	47	46	47	45
High Turnover Sit-Down Restaurant						
ITE Land Use Code 932						
5.6 ksf	34	27	33	22	42	37
Less Pass-by Trips*			- 12	- 12	- 18	- 16
Net New Trips	34	27	21	10	24	21
Car Wash – 1 stall						
ITE Land Use Code 948 **						
1.4 ksf	10	10	10	10	10	10
Total New Trips	**85**	**78**	**78**	**66**	**81**	**76**
Total Pass-by Trips	**69**	**69**	**102**	**102**	**97**	**92**

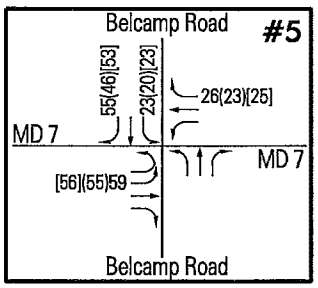
* These pass-by trips do not affect the key intersections. Since ITE does not provide Saturday pass-by data for this use, Harford County allows the use of PM pass-by rates to determine the Saturday trips.

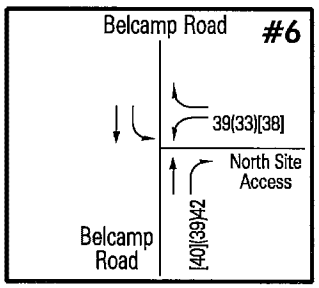
** Since the ITE Manual does not provide AM rates for this use, the PM trip rates were substituted.

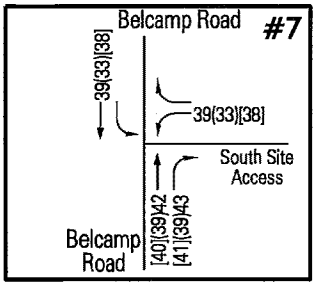


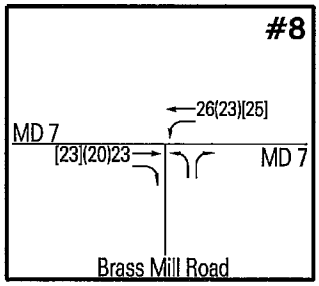


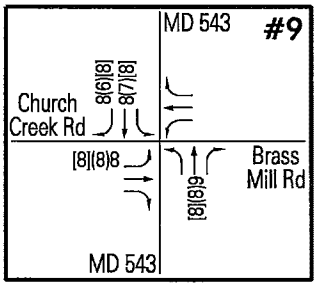


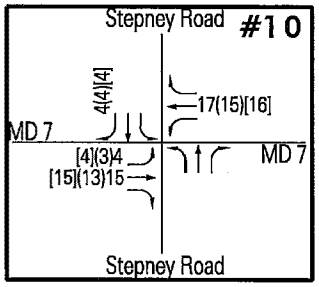












● - Intersection Studied

AM(PM)[SAT]

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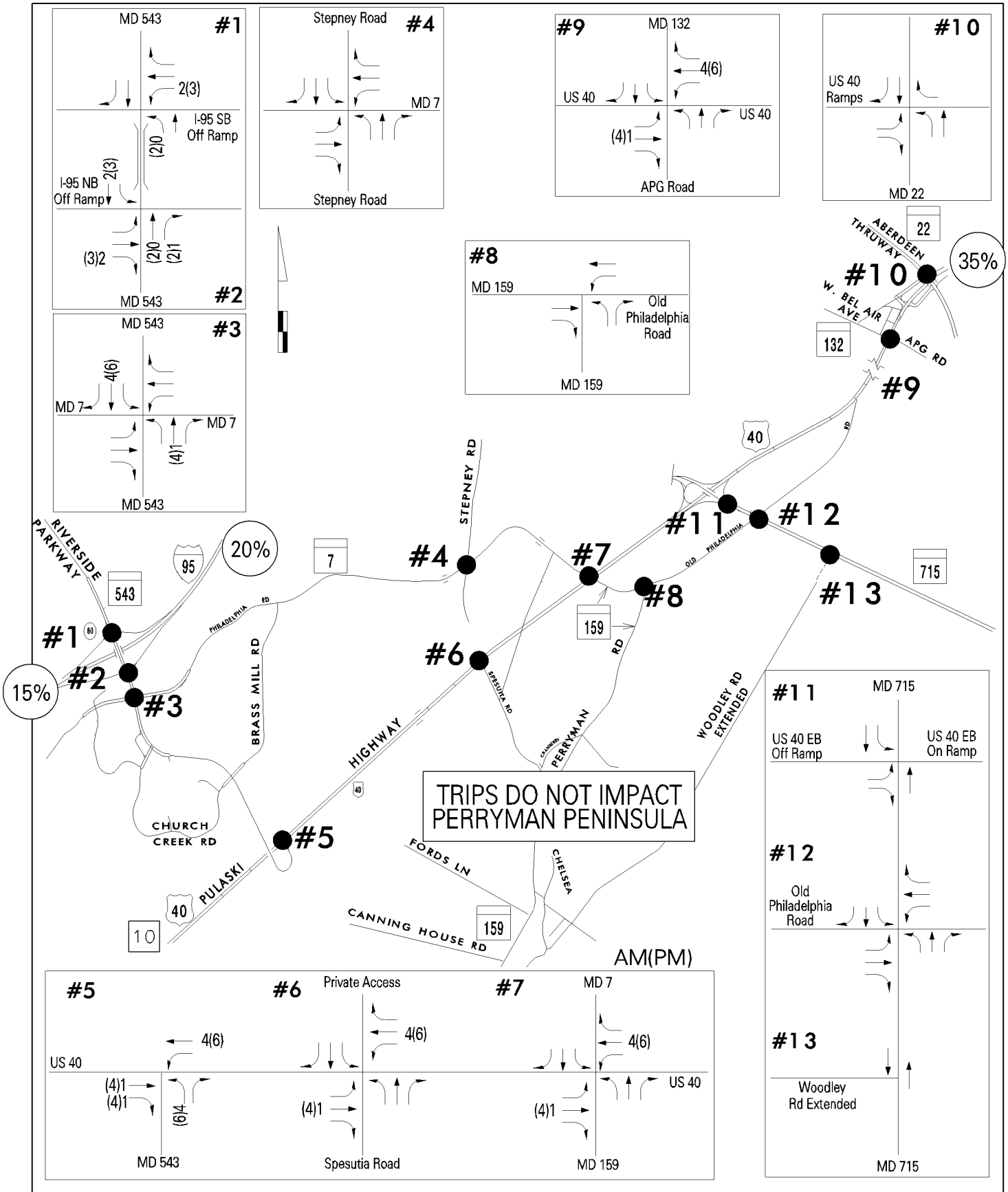
EXHIBIT 8

Site Generated Traffic - New Trips

NOTE: COPIED FROM APPROVED BELCAMP COMMERCIAL TIS DATED 2016



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BACKGROUND 10

Capital Exports

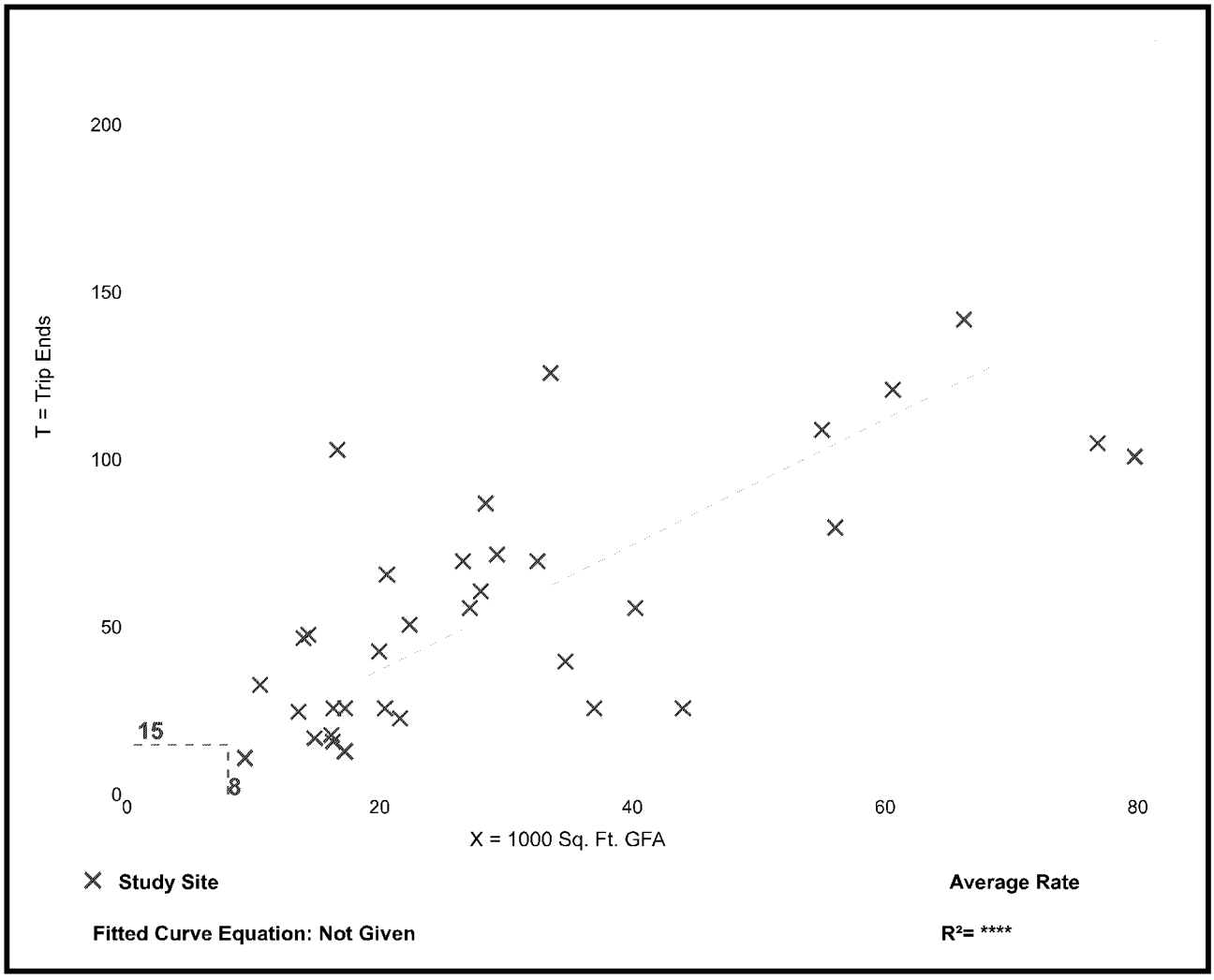
Automobile Sales (New)
(840)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 31
Directional Distribution: 73% entering, 27% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.87	0.59 - 6.17	0.95

Data Plot and Equation



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= 15 TOTAL 11 IN - 4 OUT

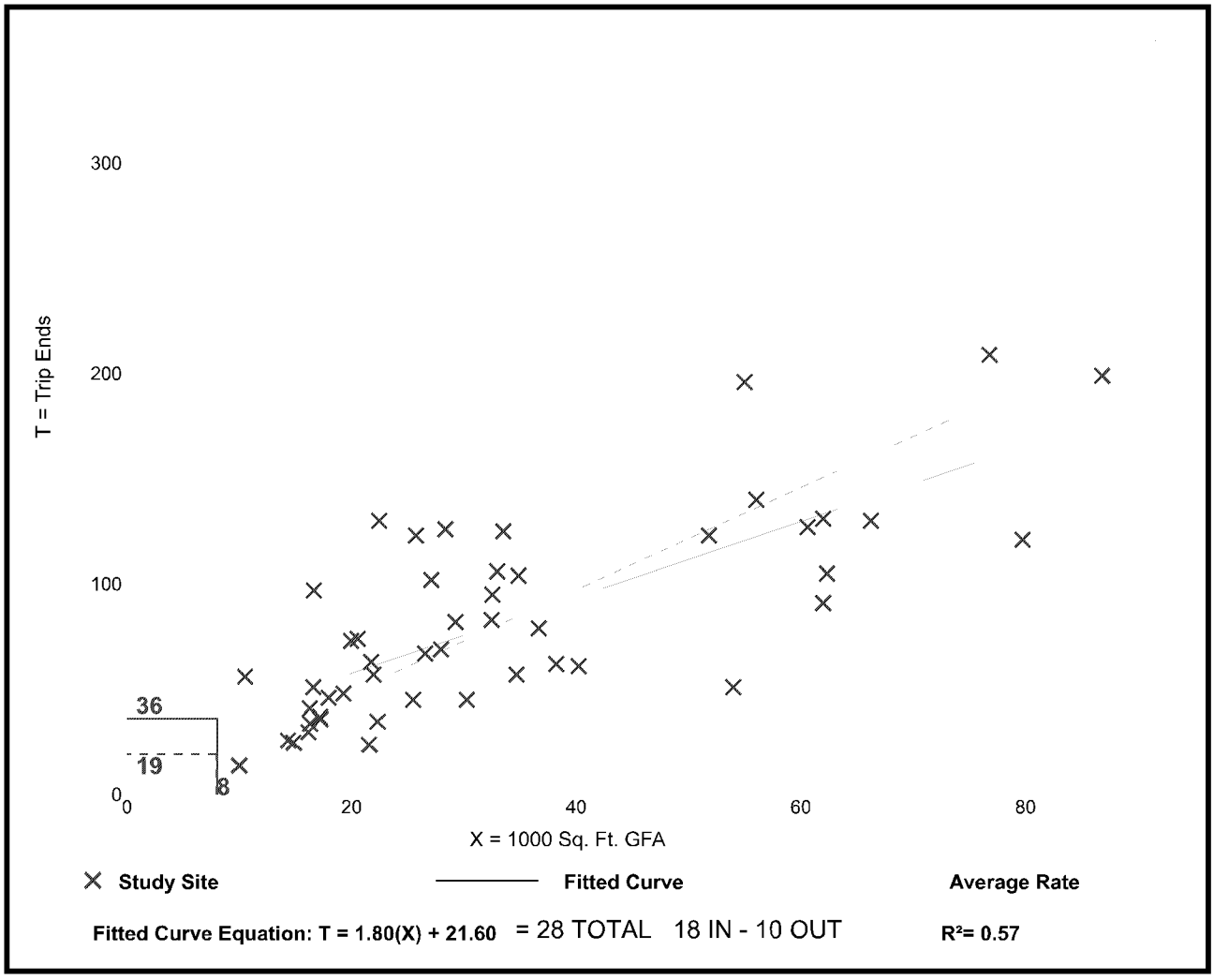
Automobile Sales (New)
(840)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 49
Avg. 1000 Sq. Ft. GFA: 34
Directional Distribution: 40% entering, 60% exiting

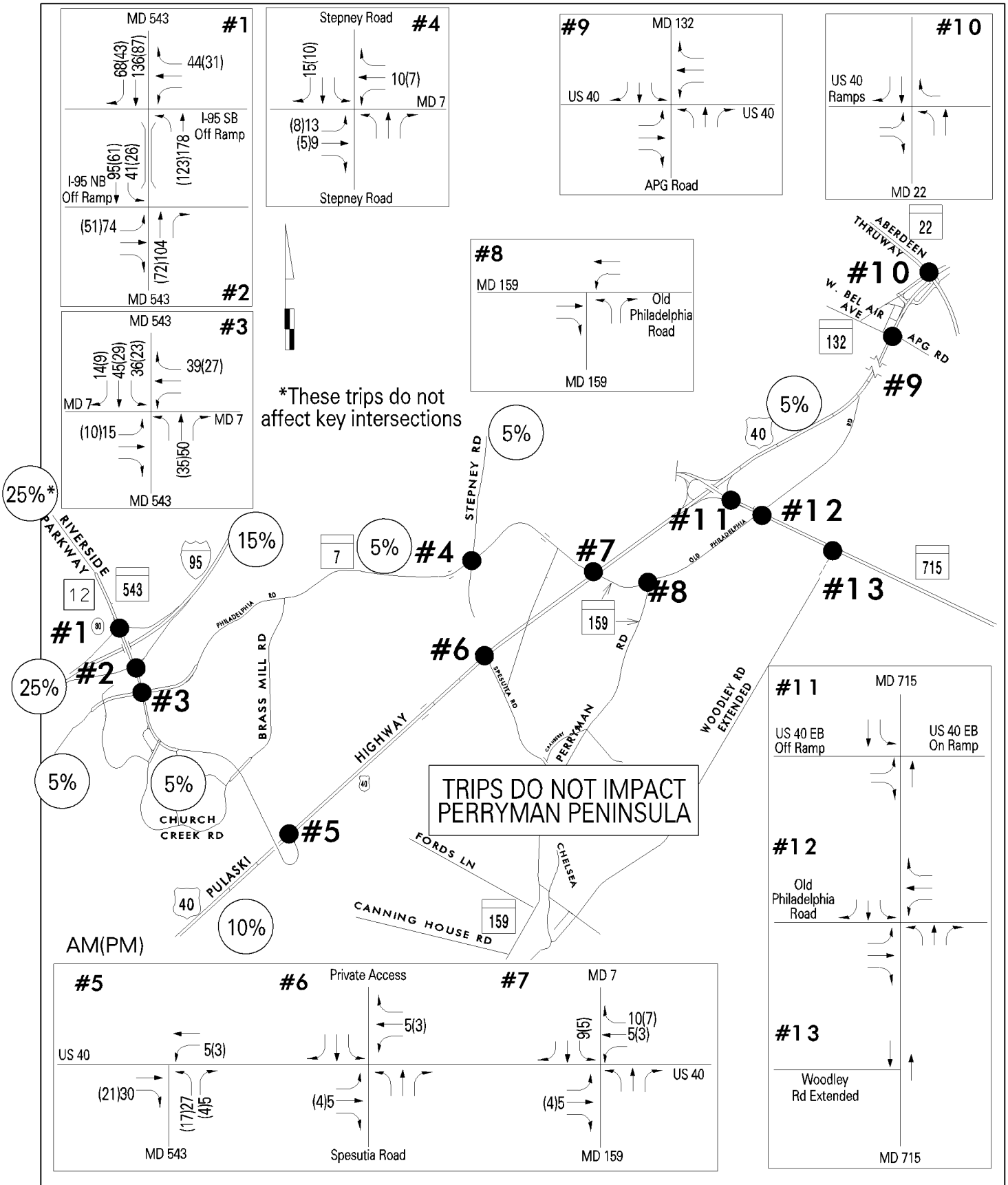
Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.43	0.94 - 5.81	0.99

Data Plot and Equation



Fitted Curve Equation: T = 1.80(X) + 21.60 = 28 TOTAL 18 IN - 10 OUT **R^2= 0.57**



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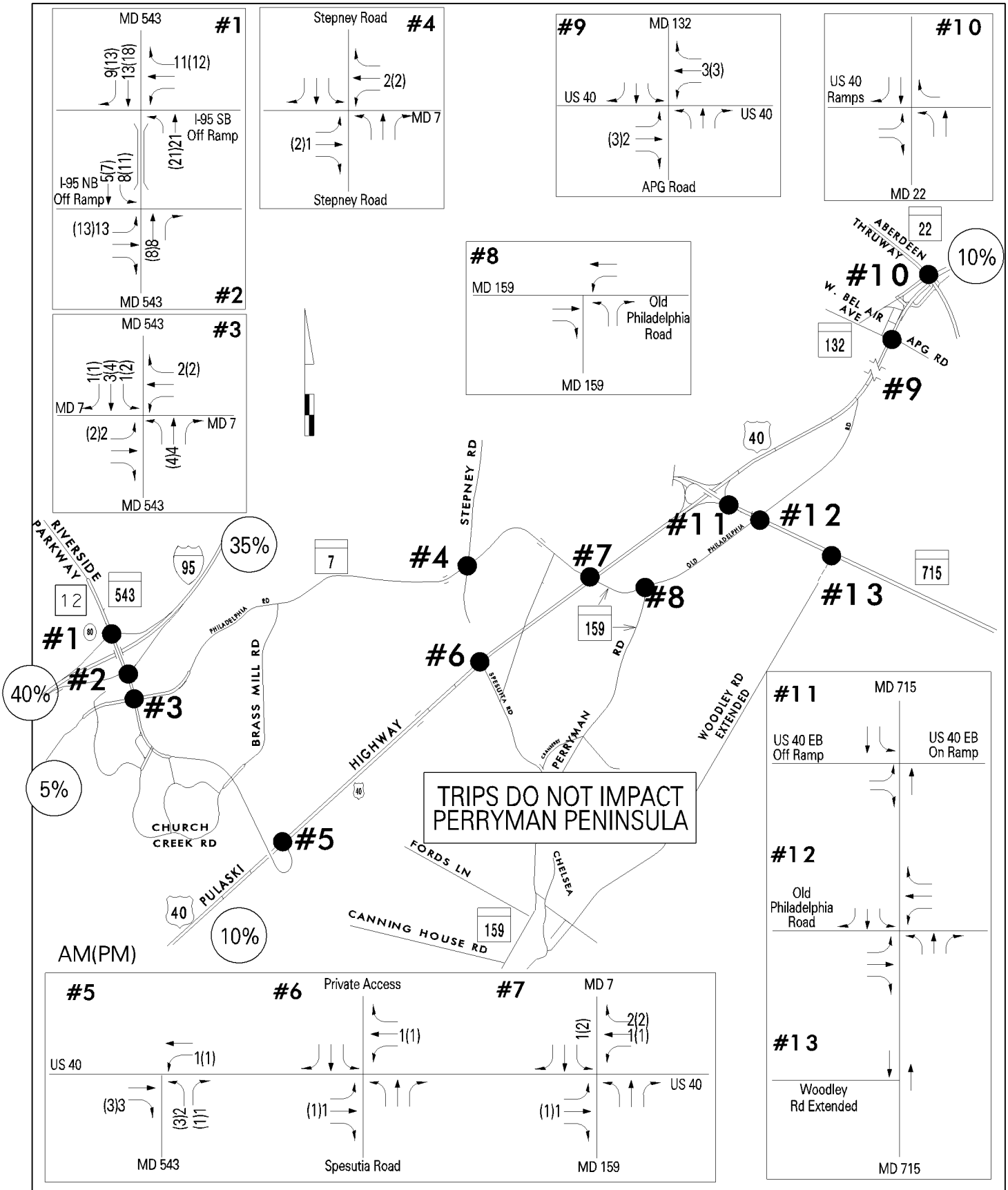
BACKGROUND 12

James Run - Retail New Trips



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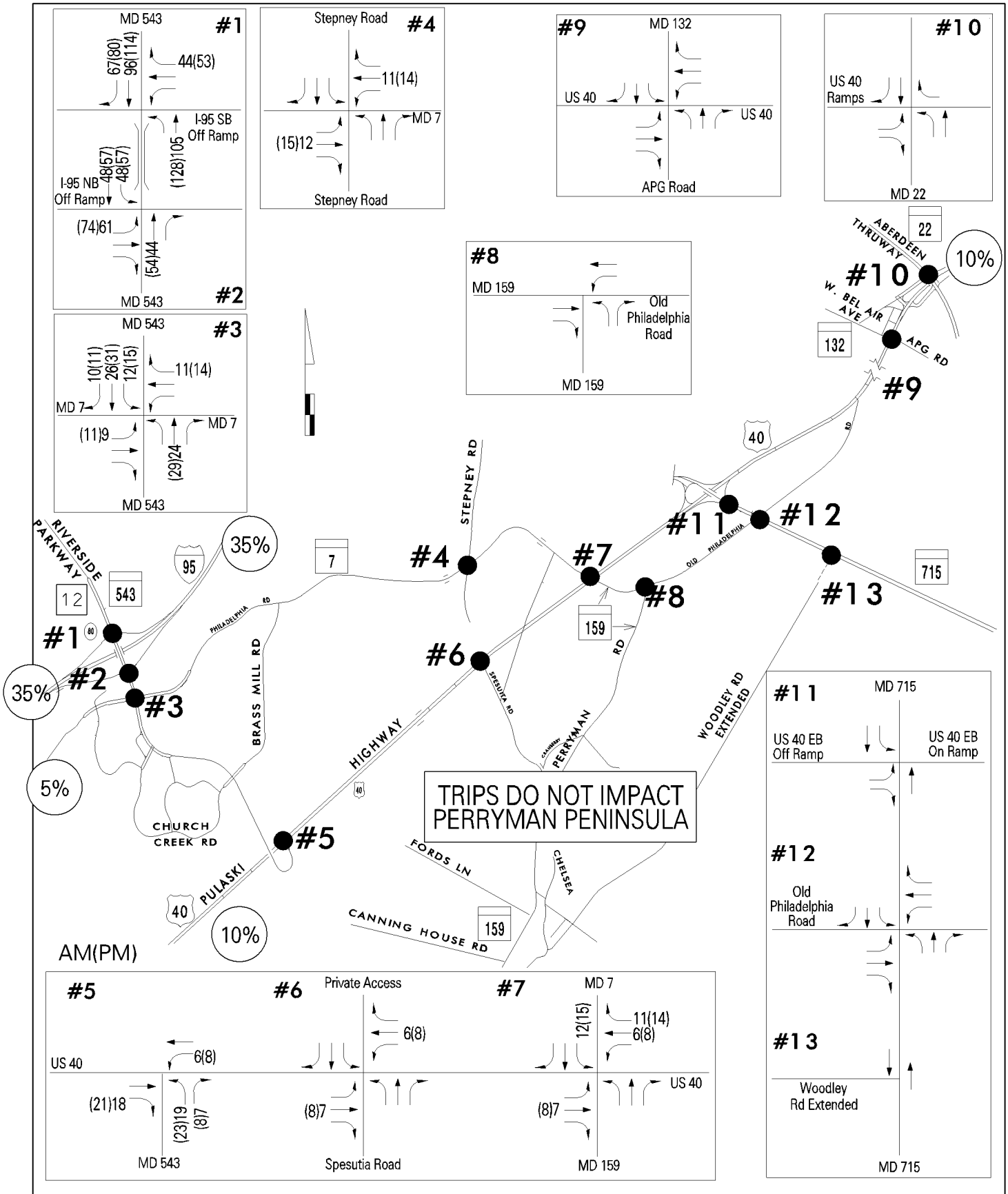
BACKGROUND 12

James Run - Hotel Trips



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BACKGROUND 12

James Run - Office & Residential Trips

NOTE: TRIPS APPROVED FOR JAMES RUN TIS & MITIGATION PLAN

SITE TRIPS

	AM		PM		SAT	
	IN	OUT	IN	OUT	IN	OUT
Retail/Service						
Super Convenience Market/ Gas Station						
ITE Land Use Code 960						
6.2 ksf	294	293	215	215	223	222
Less 10%~~12%~~ Internal Capture	-29 ~~35~~	-29-~~35~~	-22-~~26~~	-22-~~26~~	-22-~~27~~	-22-~~27~~
External Trips	265 ~~259~~	264 ~~258~~	193~~189~~	193~~189~~	201~~196~~	200-~~195~~
Less Pass-by Trips* (63% AM;66% PM & SAT)	-167~~163~~	-166~~163~~	-127~~125~~	-127~~125~~	-133~~129~~	-132~~129~~
Net New Trips	98 ~~96~~	98 ~~95~~	66 ~~64~~	66 ~~64~~	68 ~~67~~	68 ~~66~~
Fast Food Restaurant With Drive-thru						
ITE Land Use Code 934						
8.6 ksf	176	170	146	135	241	231
Less10%~~12%~~ Internal Capture	-18-~~21~~	-17-~~20~~	-15-~~18~~	-14-~~16~~	-24-~~29~~	-23-~~28~~
External Trips	158~~155~~	153~~150~~	131~~128~~	121~~119~~	217~~212~~	208~~203~~
Less Pass-by Trips* (49% AM;50% PM & SAT)	-77-~~76~~	-75-~~74~~	-66-~~64~~	-61-~~60~~	-109~~106~~	-104~~102~~
Net New Trips	81 ~~79~~	78 ~~76~~	65 ~~64~~	60 ~~59~~	108 ~~106~~	104 ~~101~~
High Turnover Restaurant						
ITE Land Use Code 932						
24.0 ksf	131	108	145	89	137	132
Less10%~~12%~~ Internal Capture	-13-~~16~~	-11-~~13~~	-15-~~17~~	-9-~~11~~	-14-~~16~~	-13-~~16~~
External Trips	118~~115~~	97~~95~~	130~~128~~	80~~78~~	123~~121~~	119~~116~~
Less Pass-by Trips* (0% AM; 43% PM & SAT)			-56-~~55~~	-34-~~34~~	-53-~~52~~	-51-~~50~~
Net New Trips	118 ~~115~~	97 ~~95~~	74 ~~73~~	46 ~~44~~	70 ~~69~~	68 ~~66~~
Total Retail New Trips:	297 **~~290~~**	273 **~~266~~**	205 **~~201~~**	172 **~~167~~**	246 **~~242~~**	240 **~~233~~**
Total Retail Pass-by Trips:	244 **~~239~~**	241 **~~237~~**	249 **~~244~~**	222 **~~219~~**	295 **~~287~~**	287 **~~281~~**
Hotel						
ITE Land Use Code 310						
125 rooms	34	23	35	33	51	40
Less 5%~~12%~~ Internal Capture	-2-~~4~~	-1-~~3~~	-2-~~4~~	-2-~~4~~	-3-~~6~~	-2-~~5~~
External Hotel Trips	32 **~~30~~**	22 **~~20~~**	33 **~~31~~**	31 **~~29~~**	48 **~~49~~**	38 **~~35~~**

* Saturday pass-by ITE data is not available for this use. Harford County has approved substituting the PM pass-by rates for these uses.

NOTE: TRIPS APPROVED FOR JAMES RUN TIS & MITIGATION PLAN

SITE TRIPS (CONTINUED)

	AM		PM		SAT	
	IN	OUT	IN	OUT	IN	OUT
Office						
Business Park						
ITE Land Use Code 770*						
70.0 ksf	86	15	28	79	31	26
Less 5%~~12%~~ Internal Capture	-4-~~10~~	-1-~~2~~	-1-~~3~~	-4-~~9~~	-2-4	-1-~~3~~
External Trips	82~~76~~	14~~13~~	27~~25~~	75~~70~~	29~~27~~	25~~23~~
Medical Office						
ITE Land Use Code 720						
20.0 ksf	41	12	20	50	27	21
Less 5%~~12%~~ Internal Capture	-2-~~5~~	-1	-1-~~2~~	-3-~~6~~	-1-~~3~~	-1-~~3~~
External Trips	39~~36~~	11	19~~18~~	47~~44~~	26~~24~~	20~~18~~
Residential						
ITE Land Use Code 221						
300 units	26	74	77	50	65	68
Less10%~~12%~~ Internal Capture	-3	-7-~~9~~	-8-~~9~~	-5-~~6~~	-7-~~8~~	-7-~~8~~
External Trips	23	67~~65~~	69~~68~~	45~~44~~	58~~57~~	61~~60~~
278 units	29	97	93	54	131	136
Less10%~~12%~~ Internal Capture	-3	-10-~~12~~	-9-~~11~~	-5-~~6~~	-13-~~16~~	-14-~~16~~
External Trips	26	87~~85~~	84~~82~~	49~~48~~	118~~115~~	122~~120~~
Senior Housing – Attached						
ITE Land Use Code 252						
100 units	7	13	14	12	20	13
Less10%~~12%~~ Internal Capture	-1	-1-~~2~~	-1-~~2~~	-1	-2	-1-~~2~~
External Trips	6	12~~11~~	13~~12~~	11	18	12~~11~~
Total Office & Residential – External Trips	176 ~~167~~	191 ~~185~~	212 ~~205~~	227 ~~217~~	249 ~~241~~	240 ~~232~~

* Only the daily Saturday rates are available for this use. Therefore, we used the General Office data (ITE LUC 710) to determine the Saturday peak hour trips. Since 24% of daily Saturday general office trips occur during the peak hour of the generator, 24% of the Saturday business park trips were included as Saturday peak hour trips.

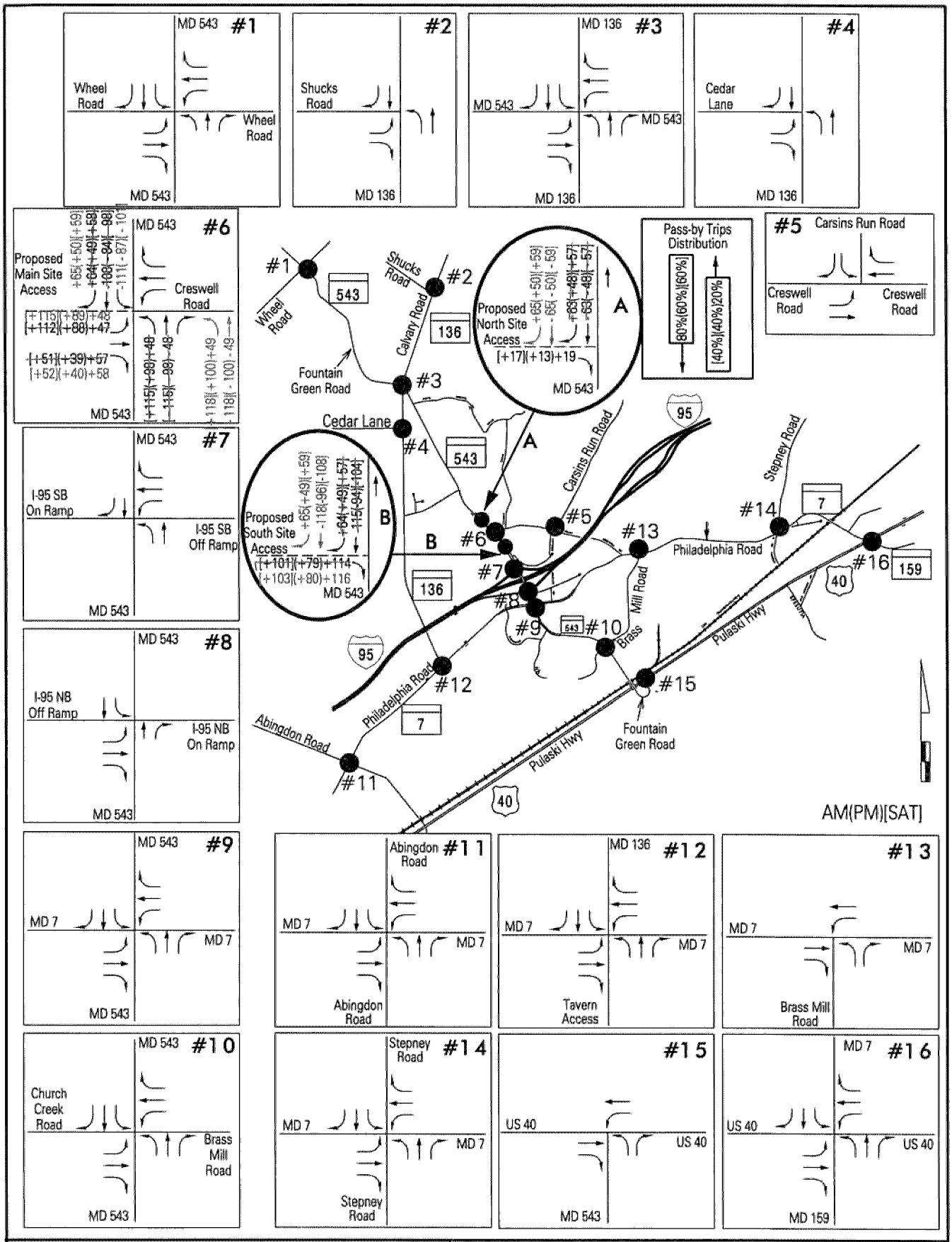

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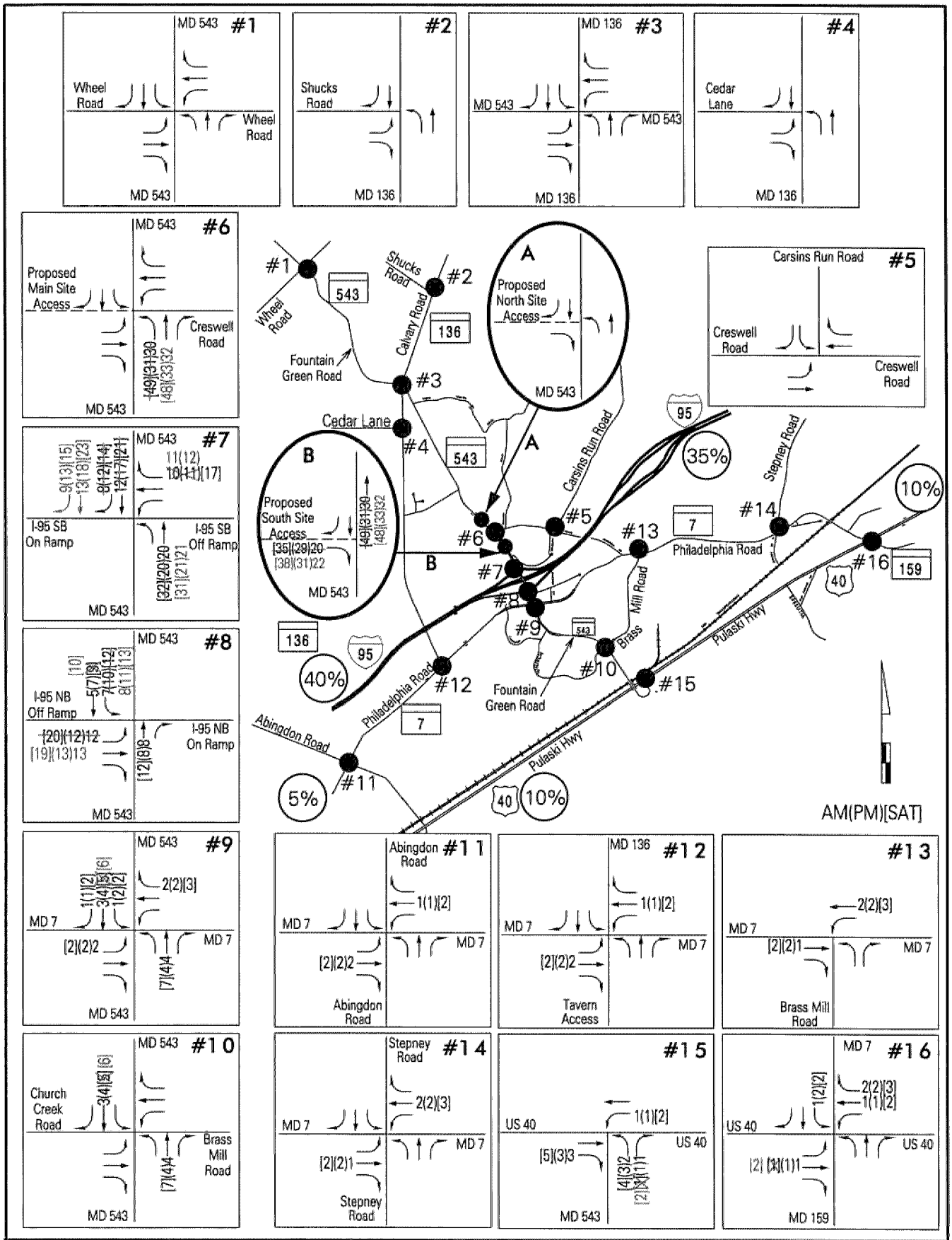
EXHIBIT 8

Site Generated Traffic - Pass-by Trips

NOTE: COPIED FROM APPROVED JAMES RUN TIS & MITIGATION PLAN



TRAFFIC CONCEPTS, INC. 7525 Connelly Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 9 Site Generated Traffic - Hotel Trips

NOTE: COPIED FROM APPROVED JAMES RUN TIS & MITIGATION PLAN

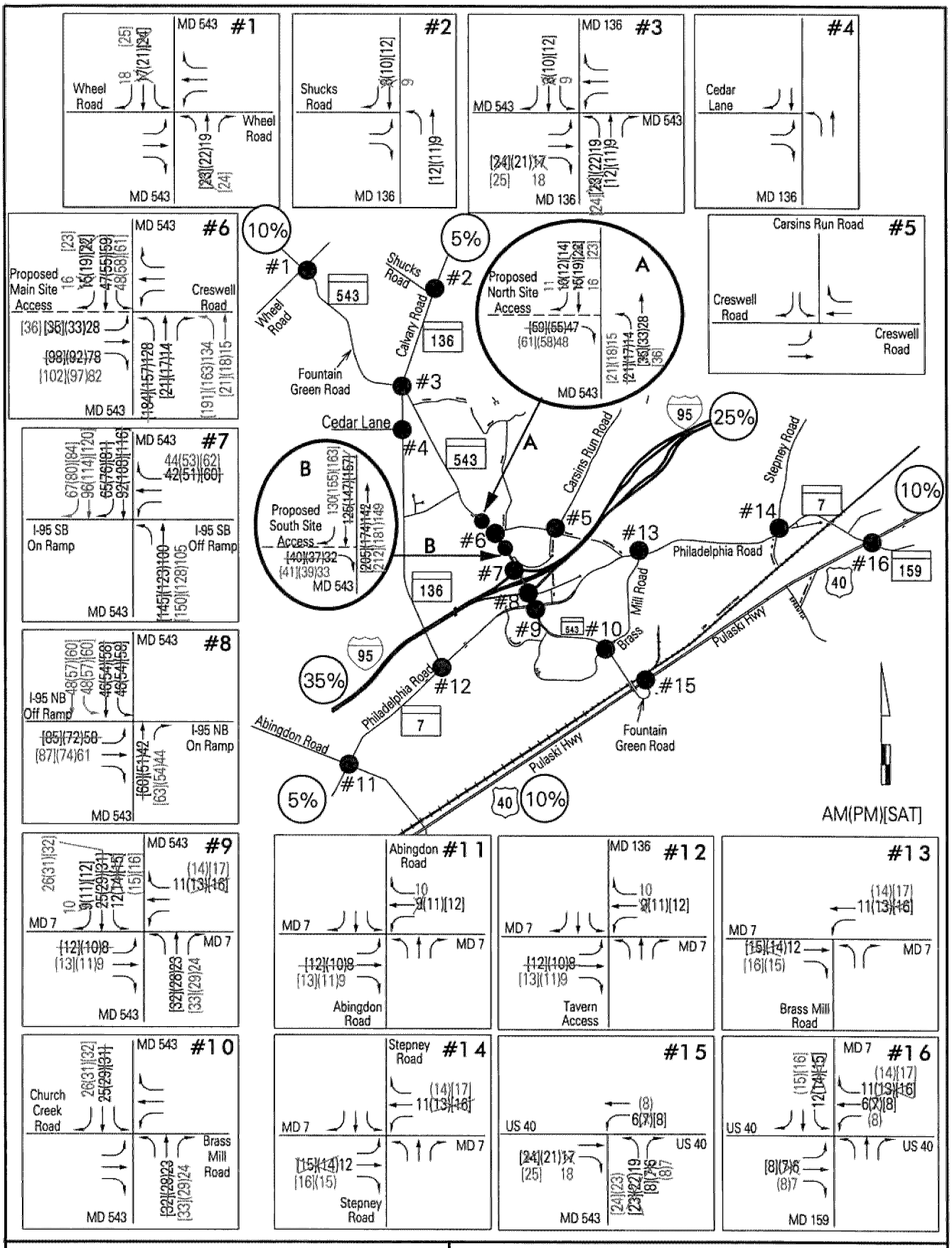


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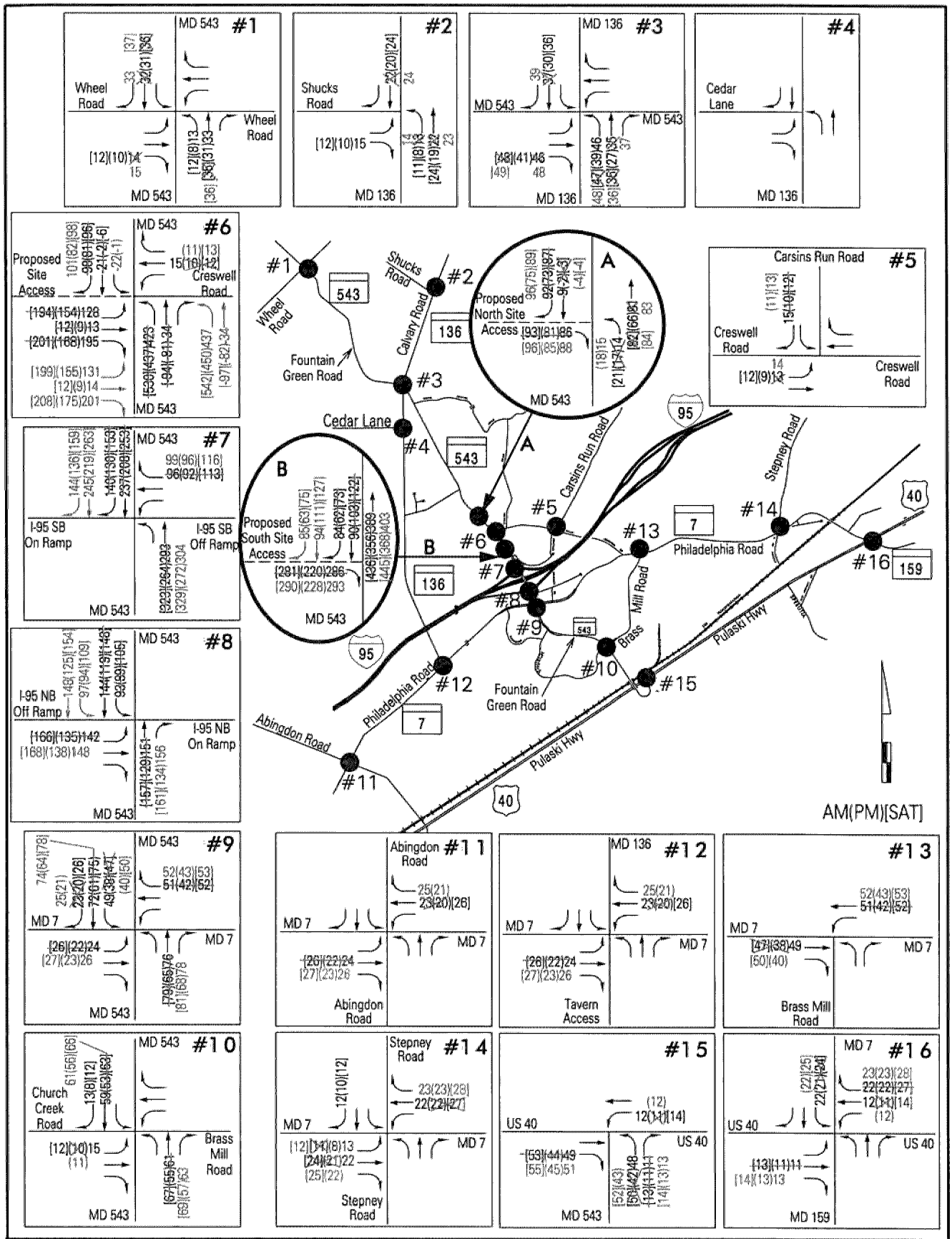
EXHIBIT 10
Site Generated Traffic -
Office & Residential Trips

NOTE: COPIED FROM APPROVED JAMES RUN TIS & MITIGATION PLAN



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7525 Connelly Drive
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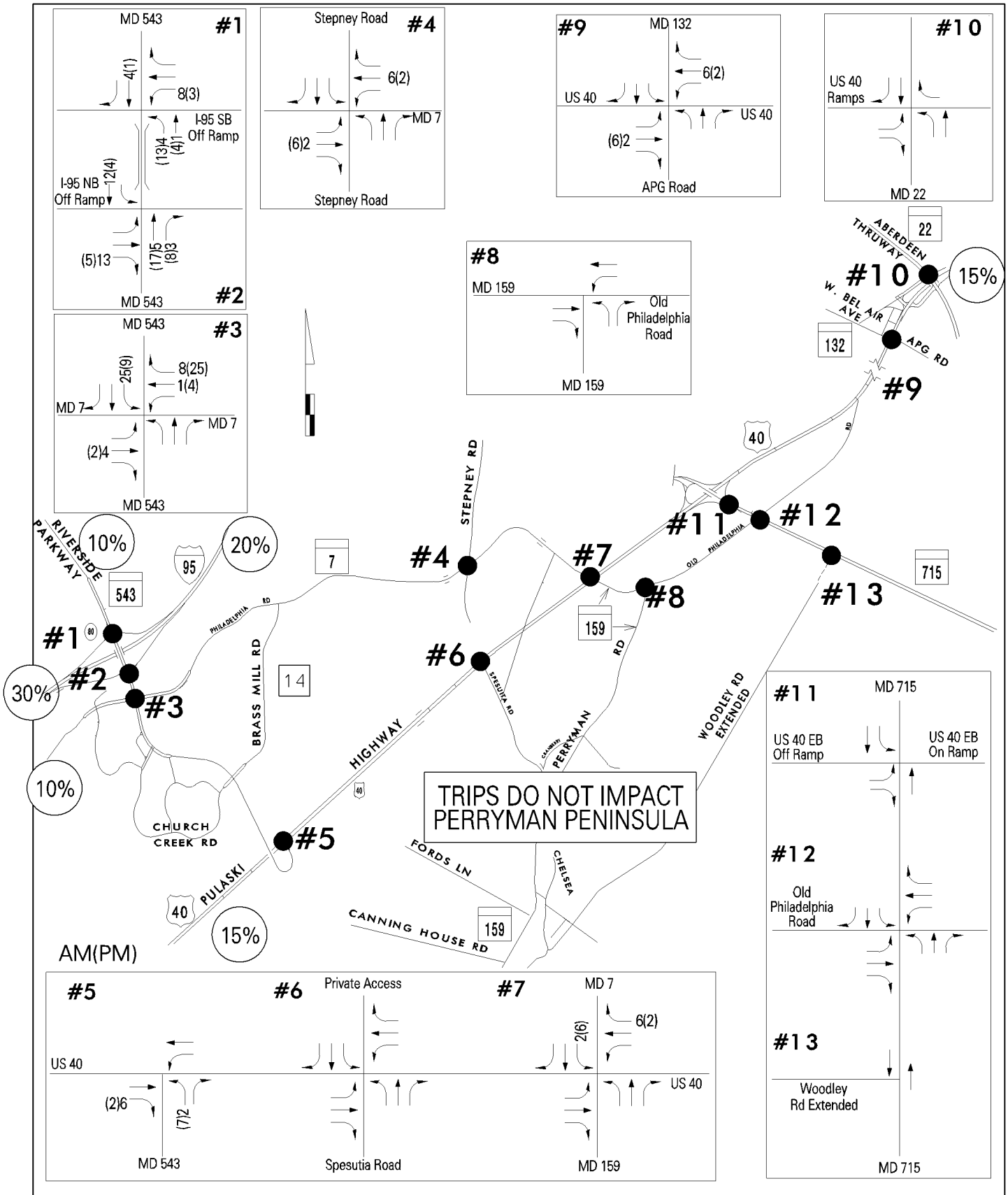
EXHIBIT 11

Site Generated Traffic - Combined Trips

NOTE: COPIED FROM APPROVED JAMES RUN TIS & MITIGATION PLAN



TRAFFIC CONCEPTS, INC.
7525 Connelly Drive
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410-760-2911

BACKGROUND 14

Riverside Business Park - Lot 36

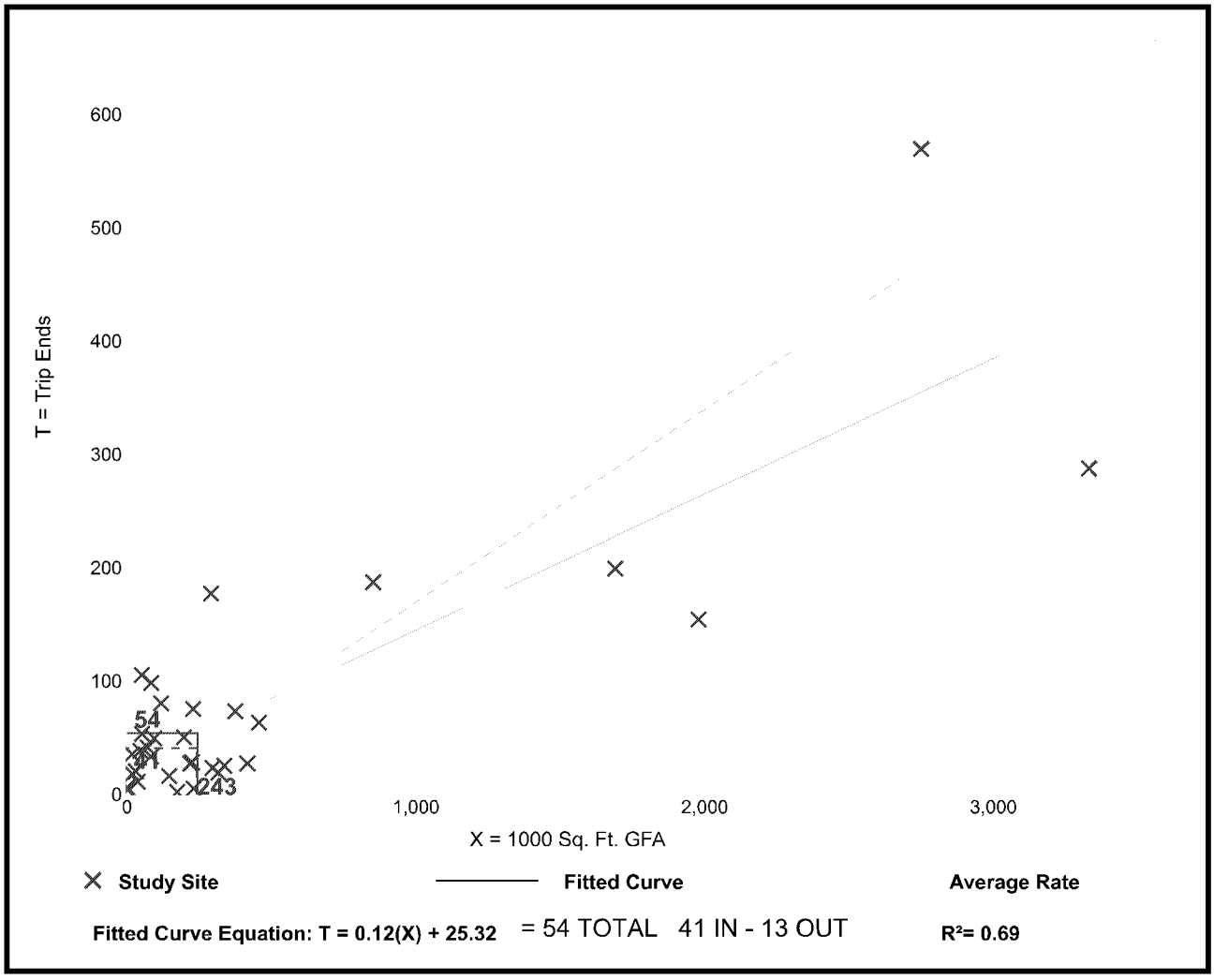
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 451
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.20

Data Plot and Equation



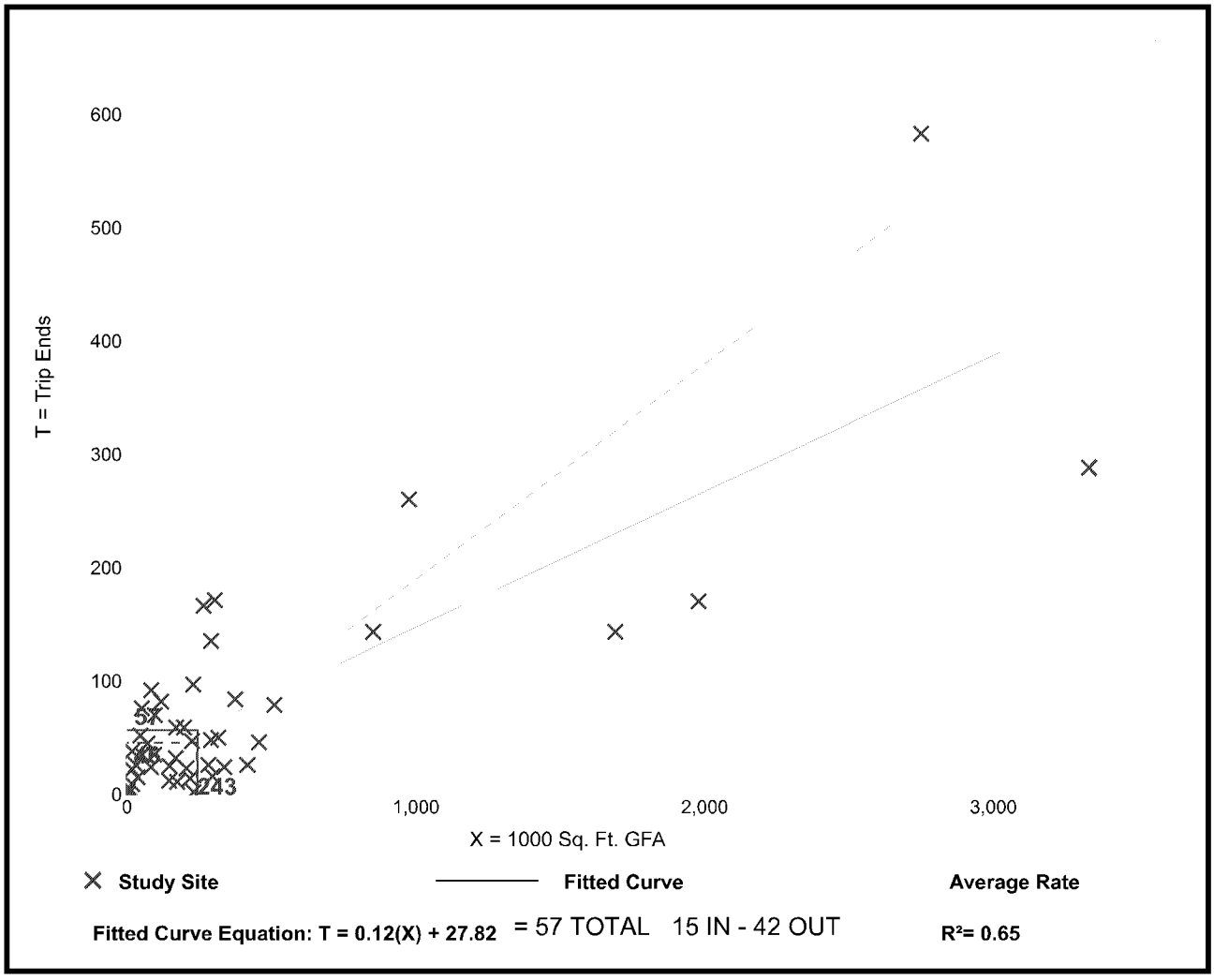
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 47
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 27% entering, 73% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.19	0.01 - 1.80	0.18

Data Plot and Equation



Fitted Curve Equation: T = 0.12(X) + 27.82 = 57 TOTAL 15 IN - 42 OUT **R^2= 0.65**

APPENDIX III

TRAFFIC COUNT INFORMATION

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 543 @ I-95 SB RAMP **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	MD 543 NORTHBOUND				MD 543 SOUTHBOUND				EASTBOUND			I-95 SB OFF RAMP WESTBOUND			
TIME	LEFT	THRU		UTRN		THRU	RIGHT	UTRN				LEFT	THRU	UTRN	TOTAL
AM															
6:00-6:15	165	18		0		84	79	0				18	4	4	372
6:15-6:30	177	32		0		85	125	0				21	2	6	448
6:30-6:45	165	36		0		112	98	0				28	1	10	450
6:45-7:00	149	55		0		112	119	0				35	0	9	479
7:00-7:15	182	108		0		111	86	0				25	0	15	527
7:15-7:30	157	96		0		138	123	0				39	0	14	567
7:30-7:45	168	118		0		138	76	0				34	2	6	542
7:45-8:00	160	117		0		166	95	0				48	0	7	593
8:00-8:15	144	95		0		138	78	0				44	1	17	517
8:15-8:30	132	77		0		144	80	0				44	0	17	494
8:30-8:45	192	94		0		127	64	0				29	1	9	516
8:45-9:00	126	80		0		98	65	0				42	3	8	422
9:00-9:15	131	88		0		103	49	0				24	1	9	405
9:15-9:30	108	72		0		80	28	0				18	1	9	316
PEAK HR 7:00-8:00 TOTALS	**667**	**439**		**0**		**553**	**380**	**0**				**146**	**2**	**42**	**PHF 0.94**
PM															
3:00-3:15	177	143		0		74	31	0				32	0	17	474
3:15-3:30	176	172		0		86	34	0				38	0	17	523
3:30-3:45	220	221		0		69	32	0				36	0	10	588
3:45-4:00	213	181		0		87	24	0				43	0	14	562
4:00-4:15	177	231		1		96	28	0				29	0	15	577
4:15-4:30	181	272		0		79	34	0				40	0	13	619
4:30-4:45	186	259		0		86	22	0				49	1	16	619
4:45-5:00	182	247		0		90	17	0				27	0	12	575
5:00-5:15	200	248		0		60	46	0				47	0	16	617
5:15-5:30	168	214		0		94	32	0				28	0	24	560
5:30-5:45	154	205		0		110	37	0				34	0	14	554
5:45-6:00	161	175		0		102	26	0				28	0	17	509
6:00-6:15	142	158		0		91	31	0				24	0	22	468
6:15-6:30	135	160		0		86	27	0				21	0	16	445
PEAK HR 4:15-5:15 TOTALS	**749**	**1026**		**0**		**315**	**119**	**0**				**163**	**1**	**57**	**PHF 0.98**

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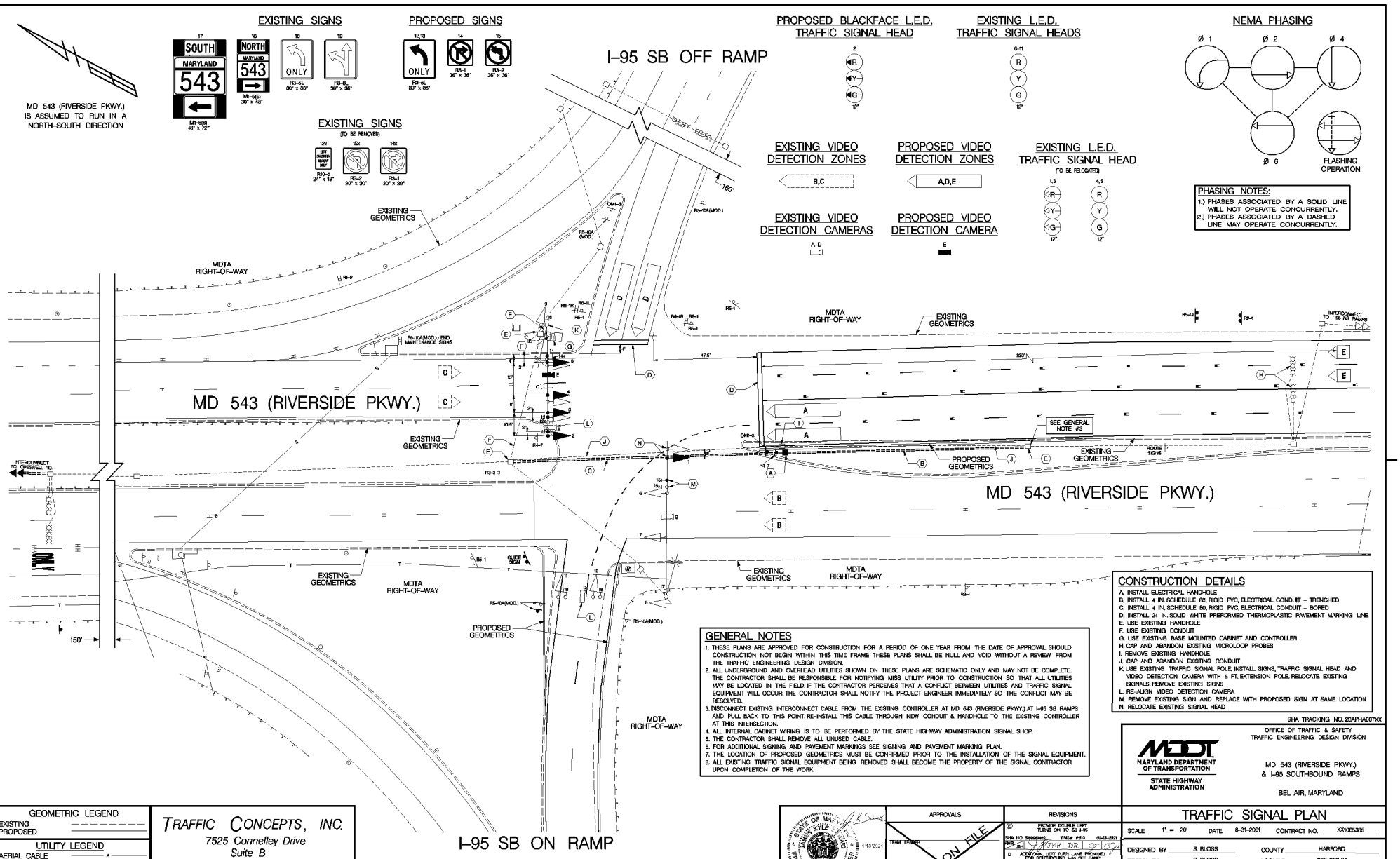
M:\ENTER JC



GENERAL NOTES

1. THESE PLANS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL. SHOULD CONSTRUCTION NOT BEGIN WITHIN THIS TIME FRAME THESE PLANS SHALL BE NULL AND VOID WITHOUT A REVIEW FROM THE TRAFFIC ENGINEERING DESIGN DIVISION.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND TRAFFIC SIGNAL EQUIPMENT WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THE CONFLICT MAY BE RESOLVED.
3. DISCONNECT EXISTING INTERCONNECT CABLE FROM THE EXISTING CONTROLLER AT MD 543 (RIVERSIDE PKWY.) AT I-95 SB RAMPS AND PULL BACK TO THIS POINT. RE-INSTALL THIS CABLE THROUGH NEW CONDUIT & HANDHOLE TO THE EXISTING CONTROLLER AT THIS INTERSECTION.
4. ALL INTERNAL CABINET WIRING IS TO BE PERFORMED BY THE STATE HIGHWAY ADMINISTRATION SIGNAL SHOP.
5. THE CONTRACTOR SHALL REMOVE ALL UNUSED CABLE.
6. FOR ADDITIONAL SIGNING AND PAVEMENT MARKINGS SEE SIGNING AND PAVEMENT MARKING PLAN.
7. THE LOCATION OF PROPOSED GEOMETRICS MUST BE CONFIRMED PRIOR TO THE INSTALLATION OF THE SIGNAL EQUIPMENT.
8. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT BEING REMOVED SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE WORK.

CONSTRUCTION DETAILS

A. INSTALL ELECTRICAL HANDHOLE
B. INSTALL 4 IN. SCHEDULE 80, RIGID PVC, ELECTRICAL CONDUIT – TRENCHED
C. INSTALL 4 IN. SCHEDULE 80, RIGID PVC, ELECTRICAL CONDUIT – BORED
D. INSTALL 24 IN. SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINE
E. USE EXISTING HANDHOLE
F. USE EXISTING CONDUIT
G. USE EXISTING BASE MOUNTED CABINET AND CONTROLLER
H. CAP AND ABANDON EXISTING MICROLOOP PROBES
I. REMOVE EXISTING HANDHOLE
J. CAP AND ABANDON EXISTING CONDUIT
K. USE EXISTING TRAFFIC SIGNAL POLE, INSTALL SIGNS, TRAFFIC SIGNAL HEAD AND VIDEO DETECTION CAMERA WITH 5 FT. EXTENSION POLE. RELOCATE EXISTING SIGNALS. REMOVE EXISTING SIGNS
L. RE-ALIGN VIDEO DETECTION CAMERA
M. REMOVE EXISTING SIGN AND REPLACE WITH PROPOSED SIGN AT SAME LOCATION
N. RELOCATE EXISTING SIGNAL HEAD

SHA TRACKING NO. 20APHA0070X

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 543 (RIVERSIDE PKWY.) & I-95 SOUTHBOUND RAMPS

BEL AIR, MARYLAND

GEOMETRIC LEGEND
EXISTING
PROPOSED

UTILITY LEGEND
AERIAL CABLE — A
ELECTRICAL — E
TELEPHONE — T
GAS — G
SEWER — S
WATER — W
CABLE TV — TV

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APPROVALS
TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR
ORIGINAL ON FILE

REVISIONS

E	PROVIDE DOUBLE LEFT TURNS ON TO SB I-95					
SHA NO. XX0164182	TMS# P313	01-15-2021				
AUG	JAH					
D	ADDITIONAL LEFT TURN LANE PROVIDED FOR SOUTHBOUND I-95 OFF RAMP					
SHA NO. XX0164182	TMS# CH13	09-30-2019				
AUG	JAH	WM	DJD	DR	MD	CJW
C	UPGRADE CABINET TO INCLUDE UPS BATTERY BACKUP					
SHA NO. XX0164182	TMS# P660	08-2018				
		JT	DJD	DR	JT	CJW

TRAFFIC SIGNAL PLAN

SCALE	1" = 20'	DATE	8-31-2001
CONTRACT NO.	XX1065355		
DESIGNED BY	S. BLOSS	COUNTY	HARFORD
DRAWN BY	S. BLOSS	LOG/MILE	120/0430/1.84
CHECKED BY	N. LEARY	TIMS NO.	E678
MDE/PRD	–	TOD NO.	
TS NO. 4129E	DRAWING SG-01	OF 02	SHEET NO. OF

PLOTTED: Wednesday, January 13, 2021 AT 02:56 PM
FILE: M:\01\00\01\00219\Sig\sat\2020-05-19.dgn

BORDER REV DATE: SEPTEMBER 6, 2017
DRILL HOLES
BY: Max

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 543 @ I-95 NB RAMP **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	MD 543 NORTHBOUND			MD 543 SOUTHBOUND				I-95 NB OFF RAMP EASTBOUND							
TIME		THRU	RIGHT	UTRN	LEFT	THRU		UTRN	LEFT	THRU	SIGNAL RIGHT	FREE RIGHT				TOTAL
AM																
6:00-6:15		180	27		8	89		0	11	1	24	101				441
6:15-6:30		211	14		7	90		0	31	0	33	100				486
6:30-6:45		162	15		10	91		0	30	2	40	109				459
6:45-7:00		177	28		9	92		0	33	3	25	78				445
7:00-7:15		252	35		22	92		0	38	1	30	81				551
7:15-7:30		220	19		12	103		0	43	3	27	91				518
7:30-7:45		251	19		20	119		0	54	2	40	93				598
7:45-8:00		226	14		12	138		0	48	4	39	115				596
8:00-8:15		191	35		17	152		0	51	1	46	123				616
8:15-8:30		196	21		13	141		0	50	1	36	111				569
8:30-8:45		248	12		12	129		0	37	2	30	85				555
8:45-9:00		155	14		13	106		0	47	1	34	93				463
9:00-9:15		178	27		9	110		0	41	1	35	89				490
9:15-9:30		157	16		7	101		0	31	1	28	90				431
PEAK HR 7:30-8:30 TOTALS		**864**	**89**		**62**	**550**		**0**	**203**	**8**	**161**	**442**				**PHF 0.97**
PM																
3:00-3:15		244	47		19	78		0	90	0	25	76				579
3:15-3:30		262	29		11	124		0	101	1	37	112				677
3:30-3:45		303	48		6	128		0	134	0	30	90				739
3:45-4:00		317	31		16	99		0	116	0	27	87				693
4:00-4:15		297	21		24	91		0	114	0	30	87				664
4:15-4:30		356	38		18	95			115	1	29	93				745
4:30-4:45		340	46		11	104		0	101	0	37	92				731
4:45-5:00		301	53		17	98		0	113	0	33	100				715
5:00-5:15		353	47		11	93		0	106	0	35	108				753
5:15-5:30		293	38		9	101		0	119	2	20	103				685
5:30-5:45		250	31		9	121		0	119	0	30	93				653
5:45-6:00		212	18		11	118		0	124	0	35	112				630
6:00-6:15		190	22		6	124		0	110	0	30	88				570
6:15-6:30		207	24		6	109		0	99	0	32	86				563
PEAK HR 4:15-5:15 TOTALS		**1350**	**184**		**57**	**390**		**0**	**435**	**1**	**134**	**416**				**PHF 0.98**

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M:\ENTER JC

BORDER REV. DATE: SEPTEMBER 8, 2017

DRILL HOLES

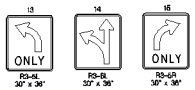
DRILL HOLES

DRILL HOLES

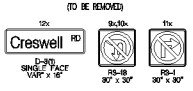
BY: Max

MD 543 (RIVERSIDE PKWY.)
IS ASSUMED TO RUN IN A
NORTH-SOUTH DIRECTION

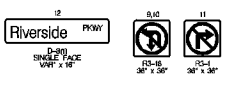
EXISTING SIGNS



EXISTING SIGNS
(TO BE REMOVED)



PROPOSED SIGNS



PROPOSED VIDEO DETECTION CAMERA

C

EXISTING VIDEO DETECTION CAMERAS

A,B,D

PROPOSED VIDEO DETECTION ZONES

A,C

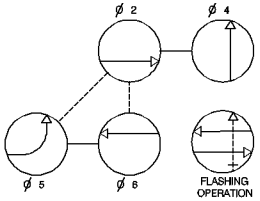
EXISTING VIDEO DETECTION ZONES

B,D

EXISTING BLACKFACE L.E.D. TRAFFIC SIGNAL HEADS



NEMA PHASING

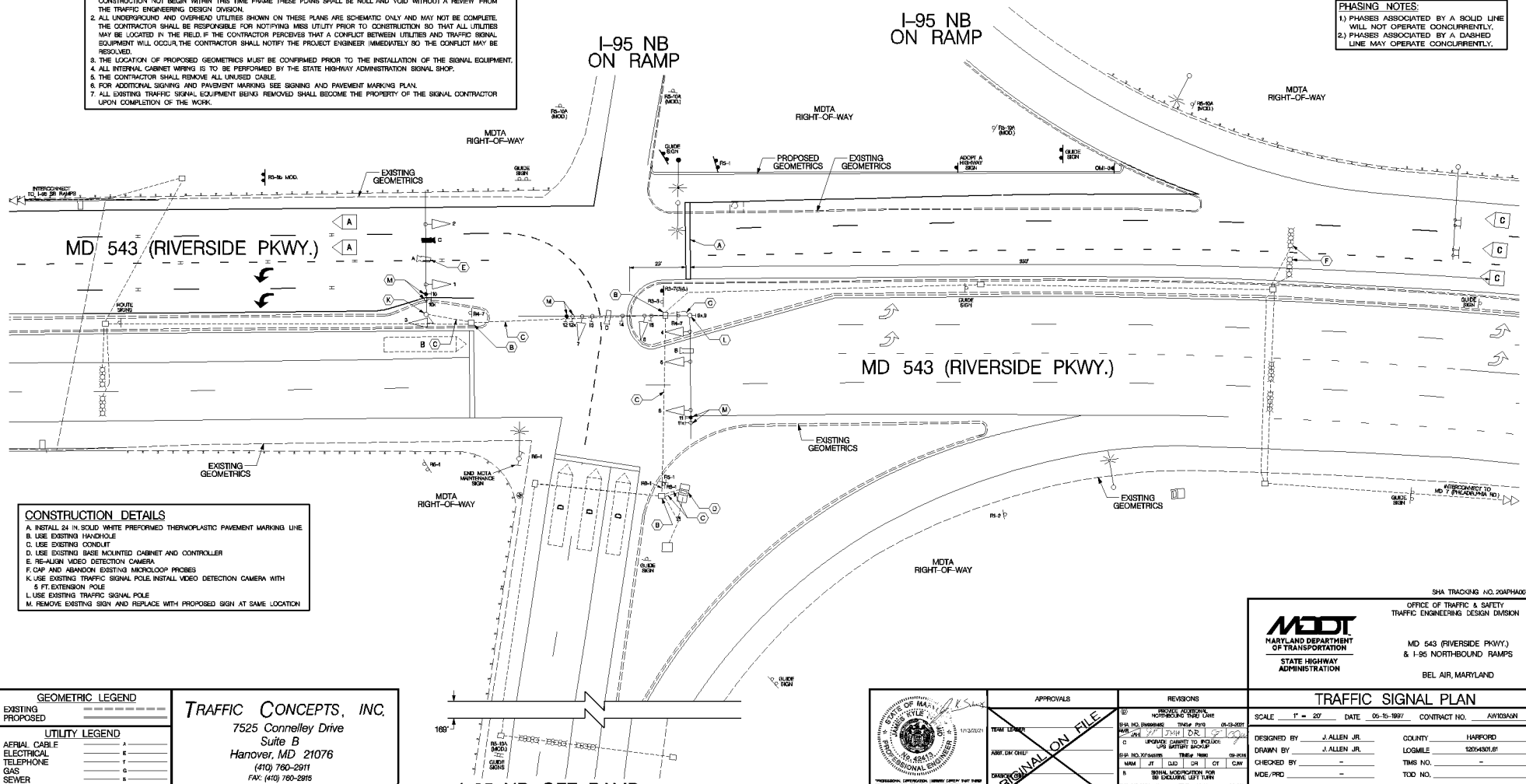


GENERAL NOTES

1. THESE PLANS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL. SHOULD CONSTRUCTION NOT BEGIN WITHIN THIS TIME FRAME THESE PLANS SHALL BE NULL AND VOID WITHOUT A REVIEW FROM THE TRAFFIC ENGINEERING DESIGN DIVISION.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND TRAFFIC SIGNAL EQUIPMENT WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THE CONFLICT MAY BE RESOLVED.
3. THE LOCATION OF PROPOSED GEOMETRICS MUST BE CONFIRMED PRIOR TO THE INSTALLATION OF THE SIGNAL EQUIPMENT.
4. ALL INTERNAL CABINET WIRING IS TO BE PERFORMED BY THE STATE HIGHWAY ADMINISTRATION SIGNAL SHOP.
5. THE CONTRACTOR SHALL REMOVE ALL UNUSED CABLE.
6. FOR ADDITIONAL SIGNING AND PAVEMENT MARKING SEE SIGNING AND PAVEMENT MARKING PLAN.
7. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT BEING REMOVED SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE WORK.

PHASING NOTES:

1.) PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.
2.) PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.



CONSTRUCTION DETAILS

A. INSTALL 24 IN. SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINE
B. USE EXISTING HANDHOLE
C. USE EXISTING CONDUIT
D. USE EXISTING BASE MOUNTED CABINET AND CONTROLLER
E. RE-ALIGN VIDEO DETECTION CAMERA
F. CAP AND ABANDON EXISTING MICROLOOP PROBES
K. USE EXISTING TRAFFIC SIGNAL POLE. INSTALL VIDEO DETECTION CAMERA WITH 5 FT. EXTENSION POLE
L. USE EXISTING TRAFFIC SIGNAL POLE
M. REMOVE EXISTING SIGN AND REPLACE WITH PROPOSED SIGN AT SAME LOCATION

GEOMETRIC LEGEND

EXISTING
PROPOSED

UTILITY LEGEND

AERIAL CABLE	A
ELECTRICAL	E
TELEPHONE	T
GAS	G
SEWER	S
WATER	W
CABLE TV	TV

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, MD 21076
(410) 760-2911
FAX: (410) 760-2915
EMAIL: TRAFFIC@TRAFFIC-CONCEPTS.COM

STATE OF MARYLAND — JAMES K. KYLE — No. 42613 — PROFESSIONAL ENGINEER — 1/13/2021

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. _____, EXPIRATION DATE: 9.1.2020."

APPROVALS

TEAM LEADER

ASST. DIV. CHIEF

DIVISION CHIEF

OFFICE DIRECTOR

ORIGINAL ON FILE

REVISIONS

12	REVISE ADDITIONAL NORTHBOUND THRU LANE					
	SHA NO. EW0004402	TIMS# 7910		01-13-2021		
	MJB	WH	JWH	DR		
11	UPGRADE CABINET TO INCLUDE UPS BATTERY BACK-UP					
	SHA NO. XX1640ZS	TIMS# N/AS		09-2018		
	MRM	JT	DJD	DR	DT	CJW
9	SIGNAL MODIFICATION FOR SB EXCLUSIVE LEFT TURN					
	SHA NO. XX1640ZS	TIMS# N/AS		06-2014		
		SJW	WH	DJD	DR	FN

TRAFFIC SIGNAL PLAN

SCALE 1" = 20' DATE 06-15-1997 CONTRACT NO. AW103A9N

DESIGNED BY J. ALLEN JR.
DRAWN BY J. ALLEN JR.
CHECKED BY -
MDE/PRD -

COUNTY HARFORD
LOG/MILE 120\4301.61
TIMS NO. -
TOD NO.

TS NO. 3644 D | DRAWING SG-01 | OF 02 | SHEET NO. | OF

SHA TRACKING NO. 20APHA0070X

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 543 (RIVERSIDE PKWY.)
& I-95 NORTHBOUND RAMPS

BEL AIR, MARYLAND

PLOTTED: Wednesday, January 13, 2021 AT 02:39 PM
FILE: M:\0100\0100\0100sgn\sht2020-06-15.dgn

BORDER REV. DATE: SEPTEMBER 6, 2017

DRILL HOLES

DRILL HOLES

DRILL HOLES

BY: Max

EQUIPMENT LIST

EQUIPMENT TO BE FURNISHED AND INSTALLED BY CONTRACTOR. ALL EQUIPMENT SHALL HAVE CATALOG CUTS SUBMITTED TO THE OFFICE OF TRAFFIC AND SAFETY FOR APPROVAL PRIOR TO INSTALLATION.

QUANTITY	DESCRIPTION
LS	MAINTENANCE OF TRAFFIC
2 CY	TEST PIT EXCAVATION
200 LF	FURNISH AND INSTALL NO. 6 AWG STRANDED BARE COPPER WIRE
2 EA	FURNISH AND INSTALL GROUND ROD 3/4 IN. DIAMETER X 10 FT. LENGTH
1 EA	RELOCATE 40 FT. LIGHT STRUCTURE, LIGHTING ARM AND LED ROADWAY LUMINAIRE
1 EA	RELOCATE BREAKAWAY BASE SUPPORT SYSTEM FOR LIGHTING STRUCTURE
2 EA	FURNISH AND INSTALL CONNECTOR KIT – TYPE 1
2 EA	FURNISH AND INSTALL CONNECTOR KIT – TYPE 2
380 LF	FURNISH AND INSTALL CABLE – 1 CONDUCTOR, NO. 6 A.W.G., 600 V
2.1 CY	FURNISH AND INSTALL CONCRETE FOR LIGHTING FOUNDATION
1 EA	FURNISH AND INSTALL ELECTRIC MANHOLE
180 LF	FURNISH AND INSTALL 4 IN. SCHEDULE 80 RIGID ELECTRICAL PVC CONDUIT – TRENCHED

SCHEDULE OF PANEL

CIRCUIT NUMBER	EQUIPMENT SERVED	CONNECTED LOAD KW	CONNECTED LOAD AMPS	PHASE AND VOLTS	BRANCH CIRCUIT BREAKERS NO. OF POLES	BRANCH CIRCUIT BREAKERS FRAME SIZE	BRANCH CIRCUIT BREAKERS TRIP SIZE	WIRING NO.	WIRING SIZE	REMARKS
2	P1	0.31	1.3	1 / 240	2	100A	20A	2	8	1 – LED
–	–	–	–	– / –	–	–	–	–	–	
	TOTALS	.31 KW	1.3 AMPS							

LEGEND

HANDHOLE TAG

HANDHOLE I.D. NUMBER

HHP

STATION

– –

OF INLINE SPLICES – TYPE 1 | # OF Y-SPLICES – TYPE 4

LIGHTING TAG

TYPE 1 TYPE 2 TYPE 3 TYPE 4

NUMBER OF CONNECTOR KITS

# # # #

STATION — STATION NUMBER

POLE NUMBER — P# | MH&AL | CIR — CIRCUIT NUMBER

MOUNTING HEIGHT x MAST ARM LEGNETH

EXISTING MANHOLE — UTILITY POLE

PROPOSED MANHOLE — GROUND ROD

PROPOSED LED ROADWAY LUMINAIRE ON GROUND MOUNT LIGHTING STRUCTURE

EXISTING LED ROADWAY LUMINAIRE ON GROUND MOUNT LIGHTING STRUCTURE

4 INCH SCHEDULE 80 RIGID POLYVINYL CHLORIDE ELECTRICAL CONDUIT – BURIED

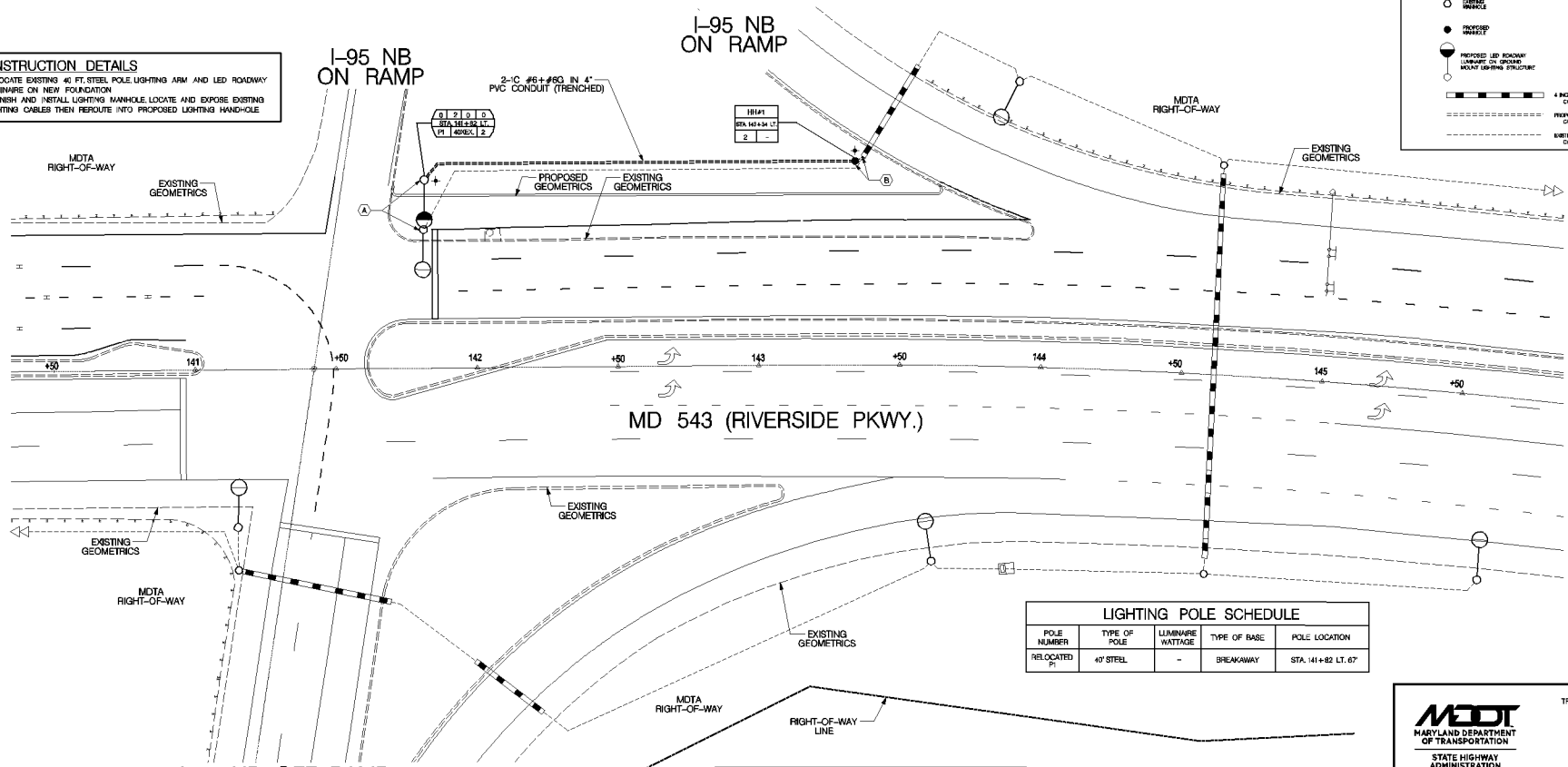
PROPOSED 4 INCH SCHEDULE 80 RIGID POLYVINYL CHLORIDE ELECTRICAL CONDUIT – TRENCHED

EXISTING 4 INCH SCHEDULE 80 RIGID POLYVINYL CHLORIDE ELECTRICAL CONDUIT – TRENCHED

CONSTRUCTION DETAILS

A. RELOCATE EXISTING 40 FT. STEEL POLE, LIGHTING ARM AND LED ROADWAY LUMINAIRE ON NEW FOUNDATION

B. FURNISH AND INSTALL LIGHTING MANHOLE, LOCATE AND EXPOSE EXISTING LIGHTING CABLES THEN REROUTE INTO PROPOSED LIGHTING HANDHOLE



LIGHTING POLE SCHEDULE

POLE NUMBER	TYPE OF POLE	LUMINAIRE WATTAGE	TYPE OF BASE	POLE LOCATION
RELOCATED P1	40' STEEL	–	BREAKAWAY	STA. 141+82 LT. 67'

GENERAL NOTES

1. ALL LIGHTING FIXTURES SHALL BE INSTALLED WITH PHOTO-CELL CONTROLS.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.

GEOMETRIC LEGEND

EXISTING

PROPOSED

UTILITY LEGEND

AERIAL CABLE	A
ELECTRICAL	E
TELEPHONE	T
GAS	G
SEWER	S
WATER	W
CABLE TV	TV

TRAFFIC CONCEPTS, INC.
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EMAIL: TRAFFIC@TRAFFIC-CONCEPTS.COM

STATE OF MARYLAND — JAMES KYLE — 49413 — PROFESSIONAL ENGINEER — 1/13/2021

"I HEREBY CERTIFY, AS PROFESSIONAL ENGINEER, THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 49413, EXPIRATION DATE: 9.13.2022."

APPROVALS		REVISIONS
Dustin Hennessy	1/15/2021	
TEAM LEADER		
Dean Randolph	1/19/2021	
ASST. DIV. CHIEF		
Qalyn Tran	3/3/2021	
DIVISION CHIEF		
Cedric Ward	3/4/21	
OFFICE DIRECTOR		

PLOTTED: Wednesday, January 13, 2021 AT 02:40 PM
FILE: N:\2020\p\081\2020\Signal\2020-06-18.dgn

SHA TRACKING NO. 20APHA007XX

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 543 (RIVERSIDE PKWY.)
& I–95 NORTHBOUND RAMPS

BEL AIR, MARYLAND

INTERSECTION LIGHTING PLAN

SCALE 1"=20' DATE 01-13-2021 CONTRACT NO. BW9595M52

DESIGNED BY A. M. ROSEN COUNTY HARFORD
DRAWN BY A. M. ROSEN LOGMILE 12054301.61
CHECKED BY J. HENKEL T.I.M.S. NO. P310
F.A.P. NO. – TOD NO.

DRAWING NO. L-1 SHEET NO. OF

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 7 @ MD 543 **COUNTY:** HARFORD

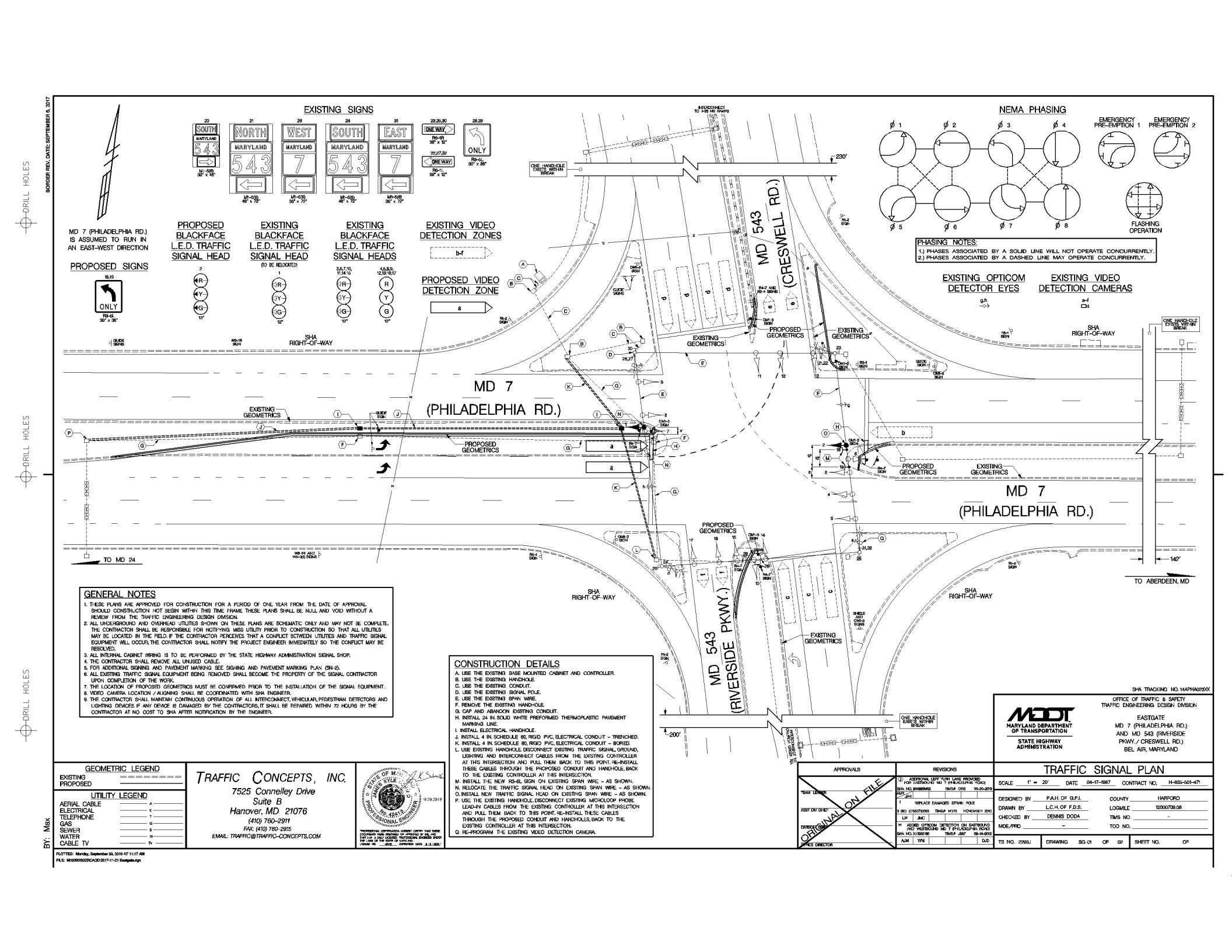
COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	MD 543 NORTHBOUND				MD 543 SOUTHBOUND				MD 7 EASTBOUND				MD 7 WESTBOUND				
TIME	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	TOTAL
AM																	
6:00-6:15	7	84	7	0	69	139	8	0	19	26	13	0	2	16	89	0	479
6:15-6:30	3	110	12	0	65	174	19	0	16	27	20	0	3	14	73	0	536
6:30-6:45	7	118	17	0	72	223	22	0	33	40	23	0	5	19	66	0	645
6:45-7:00	10	112	8	0	60	198	17	0	26	33	22	0	2	15	94	0	597
7:00-7:15	9	142	13	0	60	159	9	0	47	45	20	0	2	24	123	0	653
7:15-7:30	10	114	9	0	65	199	12	0	35	51	22	0	5	23	100	0	645
7:30-7:45	12	112	11	0	71	173	12	0	39	51	13	0	3	34	92	0	623
7:45-8:00	10	138	12	0	97	207	17	0	29	30	15	0	5	28	95	0	683
8:00-8:15	7	98	11	0	102	203	16	0	35	39	19	0	5	25	95	0	655
8:15-8:30	14	103	8	0	92	193	10	0	28	53	18	0	23	29	77	0	648
8:30-8:45	23	147	19	0	68	154	12	0	16	29	16	0	27	21	85	0	617
8:45-9:00	18	85	19	0	79	161	16	0	11	28	19	0	25	29	65	0	555
9:00-9:15	7	92	8	0	56	114	19	0	16	35	12	0	4	32	85	0	480
9:15-9:30	4	88	8	0	61	70	14	0	17	40	17	0	3	40	64	0	426
PEAK HR 7:30-8:30 TOTALS	**43**	**451**	**42**	**0**	**362**	**776**	**55**	**0**	**131**	**173**	**65**	**0**	**36**	**116**	**359**	**0**	**PHF 0.95**
PM																	
3:00-3:15	24	172	5	0	56	117	15	0	27	31	32	0	13	34	101	0	627
3:15-3:30	34	123	13	0	76	158	21	0	31	42	26	0	12	66	132	0	734
3:30-3:45	49	167	28	0	78	159	12	0	39	30	24	0	10	64	169	0	829
3:45-4:00	39	186	36	0	88	147	18	0	24	38	22	0	15	46	135	1	795
4:00-4:15	47	158	22	0	83	131	20	0	27	47	12	0	8	87	176	0	818
4:15-4:30	36	165	12	0	59	148	18	0	41	34	14	0	5	90	194	0	816
4:30-4:45	40	192	17	0	74	140	11	0	42	35	13	0	10	70	186	0	830
4:45-5:00	30	158	20	0	100	134	19	0	45	49	21	0	9	72	165	0	822
5:00-5:15	50	156	18	0	93	112	11	0	40	37	15	0	10	70	184	1	797
5:15-5:30	28	151	14	0	76	141	15	0	36	45	35	0	6	55	162	0	764
5:30-5:45	26	117	12	0	96	173	40	1	39	55	31	0	8	57	123	0	778
5:45-6:00	21	109	16	0	88	160	27	0	17	56	24	2	8	49	119	0	696
6:00-6:15	24	110	19	0	79	144	31	0	31	33	18	0	9	54	89	0	641
6:15-6:30	24	120	15	0	68	136	23	0	29	46	17	0	7	45	84	0	614
PEAK HR 4:00-5:00 TOTALS	**153**	**673**	**71**	**0**	**316**	**553**	**68**	**0**	**155**	**165**	**60**	**0**	**32**	**319**	**721**	**0**	**PHF 0.99**

TRAFFIC CONCEPTS, INC.
7525 CONNELLEY DRIVE, SUITE B
HANOVER, MARYLAND 21076
410 760 2911 (FAX) 410 760 2915
E-MAIL TRAFFIC@TRAFFIC-CONCEPTS.COM

M:\3762



GENERAL NOTES

1. THESE PLANS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL. SHOULD CONSTRUCTION NOT BEGIN WITHIN THIS TIME FRAME THESE PLANS SHALL BE NULL AND VOID WITHOUT A REVIEW FROM THE TRAFFIC ENGINEERING DESIGN DIVISION.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN UTILITIES AND TRAFFIC SIGNAL EQUIPMENT WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THE CONFLICT MAY BE RESOLVED.
3. ALL INTERNAL CABINET WIRING IS TO BE PERFORMED BY THE STATE HIGHWAY ADMINISTRATION SIGNAL SHOP.
4. THE CONTRACTOR SHALL REMOVE ALL UNUSED CABLE.
5. FOR ADDITIONAL SIGNING AND PAVEMENT MARKING SEE SIGNING AND PAVEMENT MARKING PLAN (SN-2).
6. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT BEING REMOVED SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE WORK.
7. THE LOCATION OF PROPOSED GEOMETRICS MUST BE CONFIRMED PRIOR TO THE INSTALLATION OF THE SIGNAL EQUIPMENT.
8. VIDEO CAMERA LOCATION / ALIGNING SHALL BE COORDINATED WITH SHA ENGINEER.
9. THE CONTRACTOR SHALL MAINTAIN CONTINUOUS OPERATION OF ALL INTERCONNECT, VEHICULAR, PEDESTRIAN DETECTORS AND LIGHTING DEVICES. IF ANY DEVICE IS DAMAGED BY THE CONTRACTORS, IT SHALL BE REPAIRED WITHIN 72 HOURS BY THE CONTRACTOR AT NO COST TO SHA AFTER NOTIFICATION BY THE ENGINEER.

CONSTRUCTION DETAILS

A. USE THE EXISTING BASE MOUNTED CABINET AND CONTROLLER.
B. USE THE EXISTING HANDHOLE.
C. USE THE EXISTING CONDUIT.
D. USE THE EXISTING SIGNAL POLE.
E. USE THE EXISTING SPAN WIRE.
F. REMOVE THE EXISTING HANDHOLE.
G. CAP AND ABANDON EXISTING CONDUIT.
H. INSTALL 24 IN. SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINE.
I. INSTALL ELECTRICAL HANDHOLE.
J. INSTALL 4 IN. SCHEDULE 80, RIGID PVC, ELECTRICAL CONDUIT – TRENCHED.
K. INSTALL 4 IN. SCHEDULE 80, RIGID PVC, ELECTRICAL CONDUIT – BORED.
L. USE EXISTING HANDHOLE. DISCONNECT EXISTING TRAFFIC SIGNAL, GROUND, LIGHTING AND INTERCONNECT CABLES FROM THE EXISTING CONTROLLER AT THIS INTERSECTION AND PULL THEM BACK TO THIS POINT. RE-INSTALL THESE CABLES THROUGH THE PROPOSED CONDUIT AND HANDHOLE, BACK TO THE EXISTING CONTROLLER AT THIS INTERSECTION.
M. INSTALL THE NEW R3-6L SIGN ON EXISTING SPAN WIRE – AS SHOWN.
N. RELOCATE THE TRAFFIC SIGNAL HEAD ON EXISTING SPAN WIRE – AS SHOWN.
O. INSTALL NEW TRAFFIC SIGNAL HEAD ON EXISTING SPAN WIRE – AS SHOWN.
P. USE THE EXISTING HANDHOLE. DISCONNECT EXISTING MICROLOOP PROBE LEAD-IN CABLES FROM THE EXISTING CONTROLLER AT THIS INTERSECTION AND PULL THEM BACK TO THIS POINT. RE-INSTALL THESE CABLES THROUGH THE PROPOSED CONDUIT AND HANDHOLES, BACK TO THE EXISTING CONTROLLER AT THIS INTERSECTION.
Q. RE-PROGRAM THE EXISTING VIDEO DETECTION CAMERA.

GEOMETRIC LEGEND

EXISTING
PROPOSED

UTILITY LEGEND

AERIAL CABLE	A
ELECTRICAL	E
TELEPHONE	T
GAS	G
SEWER	S
WATER	W
CABLE TV	TV

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STATE OF MARYLAND — JAMES K. KYLE — No. 42413 — PROFESSIONAL ENGINEER — 9/30/2019

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. ____, EXPIRATION DATE: 9/3/2021."

APPROVALS

"TEAM LEADER"
ASST. DIV. CHIEF
DIVISION CHIEF
PROJECT DIRECTOR

ORIGINAL ON FILE

REVISIONS

4	ADDITIONAL LEFT TURN LANE PROVIDED FOR EASTBOUND MD 7 (PHILADELPHIA ROAD)		
SHA NO. MM6604H2	TR/S# 0113	09-30-2019	
AWS	4H1		
1	REPLACE DAMAGED STRAIN POLE		
S 810 2783STE093	TR#S# M370	NOVEMBER 2018	
LW	JMC		
H	ACCESS OPTICOM DETECTION ON EASTBOUND AND WESTBOUND MD 7 (PHILADELPHIA ROAD)		
SHA NO. XY6601B0	TR#S# J557	08-14-2012	
AJM	WM	DJD	

SHA TRACKING NO. 14APHA023XX

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

EASTGATE
MD 7 (PHILADELPHIA RD.)
AND MD 543 (RIVERSIDE PKWY./ CRESWELL RD.)
BEL AIR, MARYLAND

TRAFFIC SIGNAL PLAN

SCALE	1" = 20'	DATE	04-17-1987
CONTRACT NO.	H-803-501-471		
DESIGNED BY	P.A.H. OF G.P.I.	COUNTY	HARFORD
DRAWN BY	L.C.H. OF F.D.S.	LOGMILE	12000709.08
CHECKED BY	DENNIS DODA	TIMS NO.	--
MDE/PRD	--	TOD NO.	

TS NO. 2703J | DRAWING SG-01 OF 02 | SHEET NO. OF

PLOTTED: Monday, September 30, 2019 AT 11:17 AM
FILE: M:\2019\19023\CADD\2017-11-21 Eastgate.dgn

BY: Max

BORDER REV. DATE: SEPTEMBER 6, 2017

DRILL HOLES
DRILL HOLES
DRILL HOLES

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 7 @ STEPNEY RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	STEPNEY RD NORTHBOUND			STEPNEY RD SOUTHBOUND			MD 7 EASTBOUND			MD 7 WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	0	0	0	16	0	18	6	80	0	0	71	3	194
6:15-6:30	1	0	0	20	0	17	6	84	0	0	62	4	194
6:30-6:45	0	0	1	18	0	13	9	102	0	0	62	6	211
6:45-7:00	0	0	0	19	0	27	10	132	0	0	78	6	272
7:00-7:15	0	0	0	13	0	20	13	79	0	0	85	10	220
7:15-7:30	0	0	0	12	1	33	12	108	0	0	80	9	255
7:30-7:45	0	0	0	15	0	19	16	121	0	0	82	10	263
7:45-8:00	1	0	0	15	0	31	22	140	0	0	80	5	294
8:00-8:15	0	0	0	19	0	20	10	103	0	0	112	9	273
8:15-8:30	0	0	0	11	0	24	9	102	0	0	85	5	236
8:30-8:45	0	0	1	10	0	26	20	123	0	0	75	7	262
8:45-9:00	0	0	0	20	0	15	13	107	0	0	78	7	240
9:00-9:15	0	0	0	10	0	22	12	78	0	0	89	7	218
9:15-9:30	0	0	0	14	0	25	12	70	1	0	82	11	215
PEAK HR 7:15-8:15 TOTALS	**1**	**0**	**0**	**61**	**1**	**103**	**60**	**472**	**0**	**0**	**354**	**33**	**PHF 0.92**
PM													
3:00-3:15	0	0	1	9	0	27	25	102	1	0	145	22	332
3:15-3:30	0	0	2	6	1	24	31	85	0	0	170	25	344
3:30-3:45	0	0	0	4	0	21	21	97	3	0	195	28	369
3:45-4:00	0	0	0	9	0	28	27	81	0	0	179	27	351
4:00-4:15	0	0	0	13	0	22	31	91	0	0	221	30	408
4:15-4:30	0	0	0	9	0	32	28	80	1	0	225	30	405
4:30-4:45	0	1	1	12	0	24	31	94	0	1	210	28	402
4:45-5:00	1	0	0	4	0	25	24	77	0	0	206	30	367
5:00-5:15	1	0	1	7	0	28	36	87	0	0	213	29	402
5:15-5:30	1	0	1	7	0	30	28	86	2	0	176	19	350
5:30-5:45	0	0	0	13	0	23	27	77	1	0	150	18	309
5:45-6:00	2	0	0	6	0	32	24	93	0	1	131	12	301
6:00-6:15	0	0	0	10	0	24	30	74	0	0	102	14	254
6:15-6:30	0	0	0	6	2	15	31	63	0	0	108	16	241
PEAK HR 4:00-5:00 TOTALS	**1**	**1**	**1**	**38**	**0**	**103**	**114**	**342**	**1**	**1**	**862**	**118**	**PHF 0.97**

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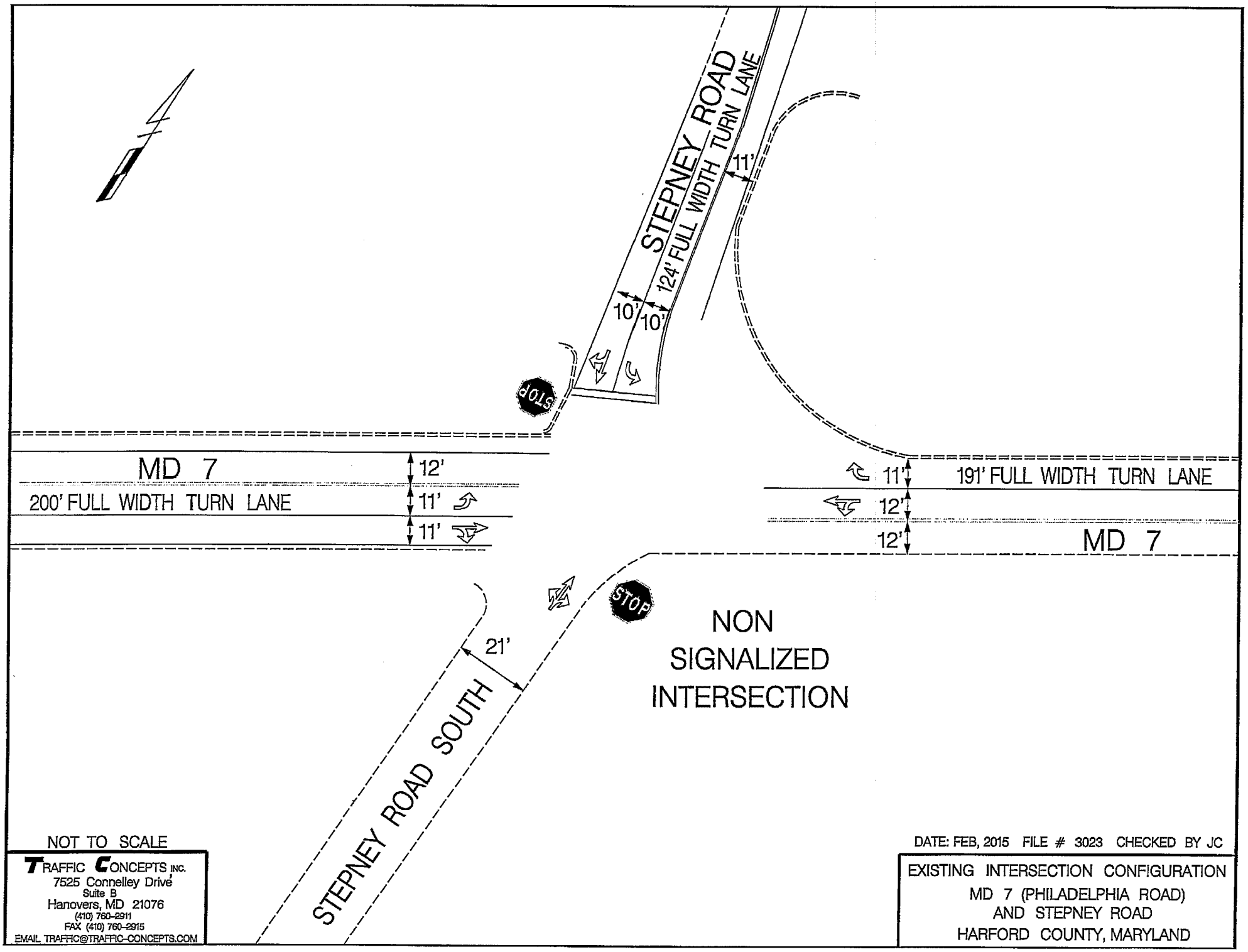

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DATE: FEB, 2015 FILE # 3023 CHECKED BY JC

EXISTING INTERSECTION CONFIGURATION
MD 7 (PHILADELPHIA ROAD)
AND STEPNEY ROAD
HARFORD COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: US 40 @ MD 543 **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	MD 543 NORTHBOUND			SOUTHBOUND			US 40 EASTBOUND				US 40 WESTBOUND				
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	TOTAL
AM															
6:00-6:15	14		106					126	17	0	31	100		0	394
6:15-6:30	13		160					154	16	0	42	107		0	492
6:30-6:45	17		180					208	32	0	40	122		0	599
6:45-7:00	21		192					183	33	0	47	92		0	568
7:00-7:15	32		130					141	23	0	46	109		0	481
7:15-7:30	30		150					150	34	0	36	115		0	515
7:30-7:45	30		144					156	30	0	41	118		0	519
7:45-8:00	47		128					183	38	0	43	121		0	560
8:00-8:15	45		166					133	28	0	34	145		0	551
8:15-8:30	52		131					121	30	0	57	103		0	494
8:30-8:45	40		165					135	28	0	37	124		0	529
8:45-9:00	44		142					152	34	0	35	122		0	529
9:00-9:15	21		81					119	34	0	43	129		0	427
9:15-9:30	40		77					99	33	0	37	91		0	377
PEAK HR 6:30-7:30 TOTALS	**100**		**652**					**682**	**122**	**0**	**169**	**438**			**PHF 0.90**
PM															
3:00-3:15	42		97					123	32	0	76	170		0	540
3:15-3:30	31		92					143	54	0	86	186		0	592
3:30-3:45	77		115					124	60	0	99	196		0	671
3:45-4:00	60		126					173	58	0	80	210		0	707
4:00-4:15	47		101					119	46	0	90	220		0	623
4:15-4:30	34		73					138	50	0	97	205		0	597
4:30-4:45	37		76					204	58	0	88	221		0	684
4:45-5:00	26		87					157	51	0	94	208		0	623
5:00-5:15	35		79					166	36	0	102	202		0	620
5:15-5:30	24		97					186	55	0	85	214		0	661
5:30-5:45	21		82					145	56	0	53	170		0	527
5:45-6:00	31		87					157	45	0	57	128		0	505
6:00-6:15	20		82					136	47	0	43	106		0	434
6:15-6:30	20		99					110	31	0	46	92		0	398
PEAK HR 3:45-4:45 TOTALS	**178**		**376**					**634**	**212**	**0**	**355**	**856**			**PHF 0.92**

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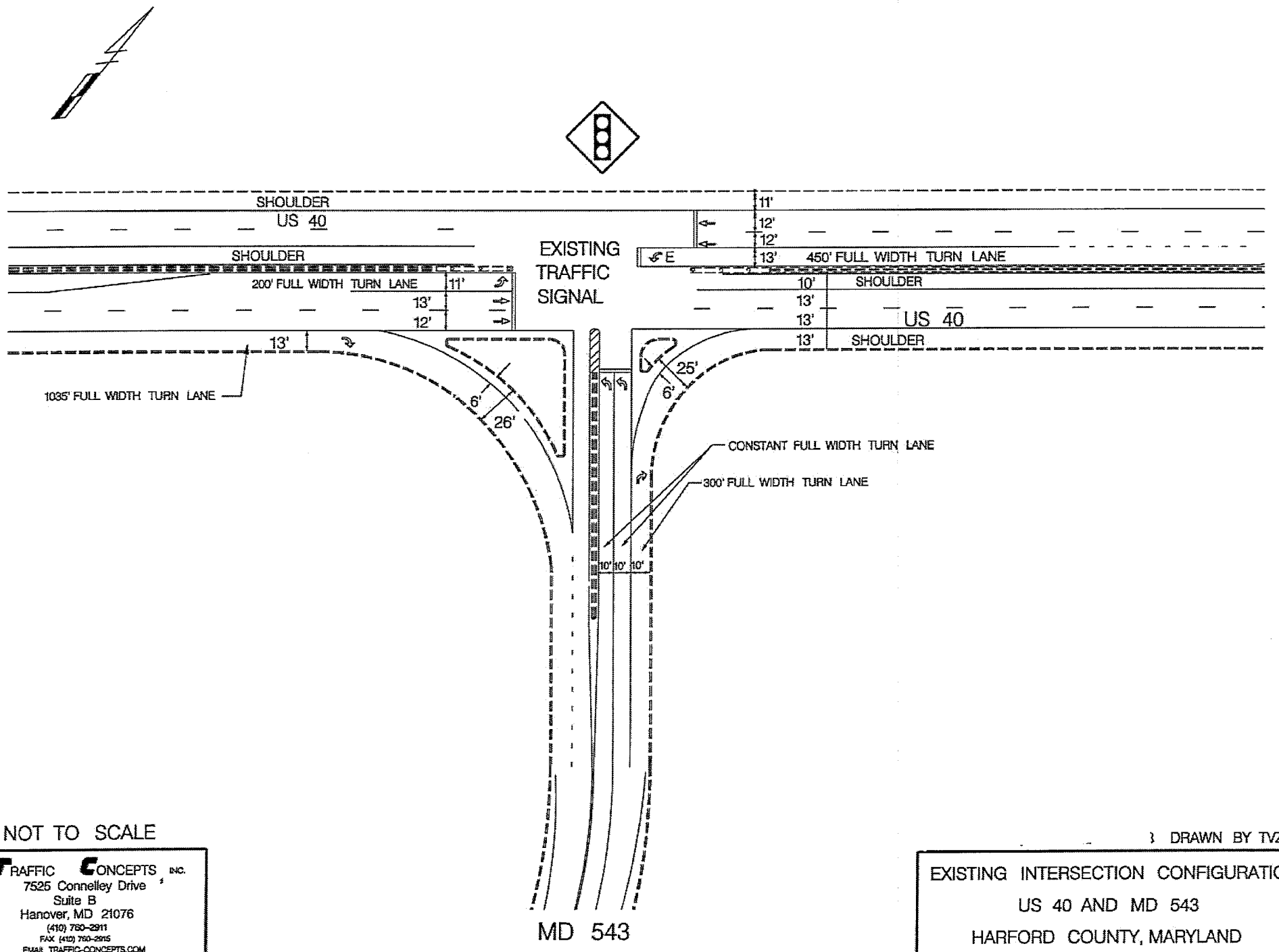

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EXISTING INTERSECTION CONFIGURATION
US 40 AND MD 543
HARFORD COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: US 40 @ SPESUTIA RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	SPESUTIA RD NORTHBOUND			ACCESS SOUTHBOUND			US 40 EASTBOUND				US 40 WESTBOUND				
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	TOTAL
AM															
6:00-6:15	52	0	2	0	0	0	4	119	104	0	7	89	2	1	380
6:15-6:30	41	0	6	0	0	4	0	171	130	0	7	83	0	0	442
6:30-6:45	54	0	5	0	0	1	1	179	160	0	15	89	0	0	504
6:45-7:00	62	0	7	0	0	3	2	242	183	0	10	88	3	0	600
7:00-7:15	53	0	1	0	0	0	0	200	37	0	2	97	0	0	390
7:15-7:30	45	0	5	0	0	0	1	213	36	0	8	111	0	0	419
7:30-7:45	44	0	6	0	0	1	0	268	34	1	8	134	0	0	496
7:45-8:00	38	0	3	0	0	0	0	245	41	1	5	123	0	0	456
8:00-8:15	26	0	7	0	0	0	0	240	37	1	2	125	3	0	441
8:15-8:30	31	0	9	0	0	0	0	206	30	0	6	106	0	0	388
8:30-8:45	16	0	8	0	0	0	0	206	36	1	5	136	0	1	409
8:45-9:00	23	0	8	0	0	0	0	198	54	1	7	150	0	0	441
9:00-9:15	13	0	7	0	0	0	0	165	22	0	7	130	0	0	344
9:15-9:30	18	0	3	1	0	0	0	173	21	1	10	155	0	0	382
PEAK HR 6:15-7:15 TOTALS	**210**	**0**	**19**	**0**	**0**	**8**	**3**	**792**	**510**	**0**	**34**	**357**	**3**	**0**	**PHF 0.81**
PM															
3:00-3:15	90	0	12	0	0	0	1	160	54	0	14	199	0	0	530
3:15-3:30	99	0	6	1	0	1	1	157	57	0	10	194	0	0	526
3:30-3:45	122	0	10	2	0	0	1	178	73	2	20	177	0	0	585
3:45-4:00	94	0	6	1	0	0	2	175	94	1	15	158	0	0	546
4:00-4:15	60	0	9	2	0	0	2	163	45	3	11	188	1	0	484
4:15-4:30	80	0	12	1	0	3	0	162	45	1	9	238	2	0	553
4:30-4:45	63	0	9	2	0	2	1	182	52	1	9	225	0	0	546
4:45-5:00	50	0	5	1	0	0	1	184	44	3	4	234	0	0	526
5:00-5:15	92	0	6	1	0	0	0	148	38	2	12	178	0	0	477
5:15-5:30	41	0	6	0	0	0	0	170	41	2	12	193	0	0	465
5:30-5:45	41	0	6	0	0	0	0	148	48	0	9	139	0	0	391
5:45-6:00	30	0	9	0	0	0	0	168	62	0	7	125	0	0	401
6:00-6:15	37	0	10	1	0	0	0	143	49	5	9	127	0	0	381
6:15-6:30	37	0	7	2	0	0	0	144	38	0	10	125	2	0	365
PEAK HR 3:00-4:00 TOTALS	**405**	**0**	**34**	**4**	**0**	**1**	**5**	**670**	**278**	**3**	**59**	**728**	**0**	**0**	**PHF 0.93**

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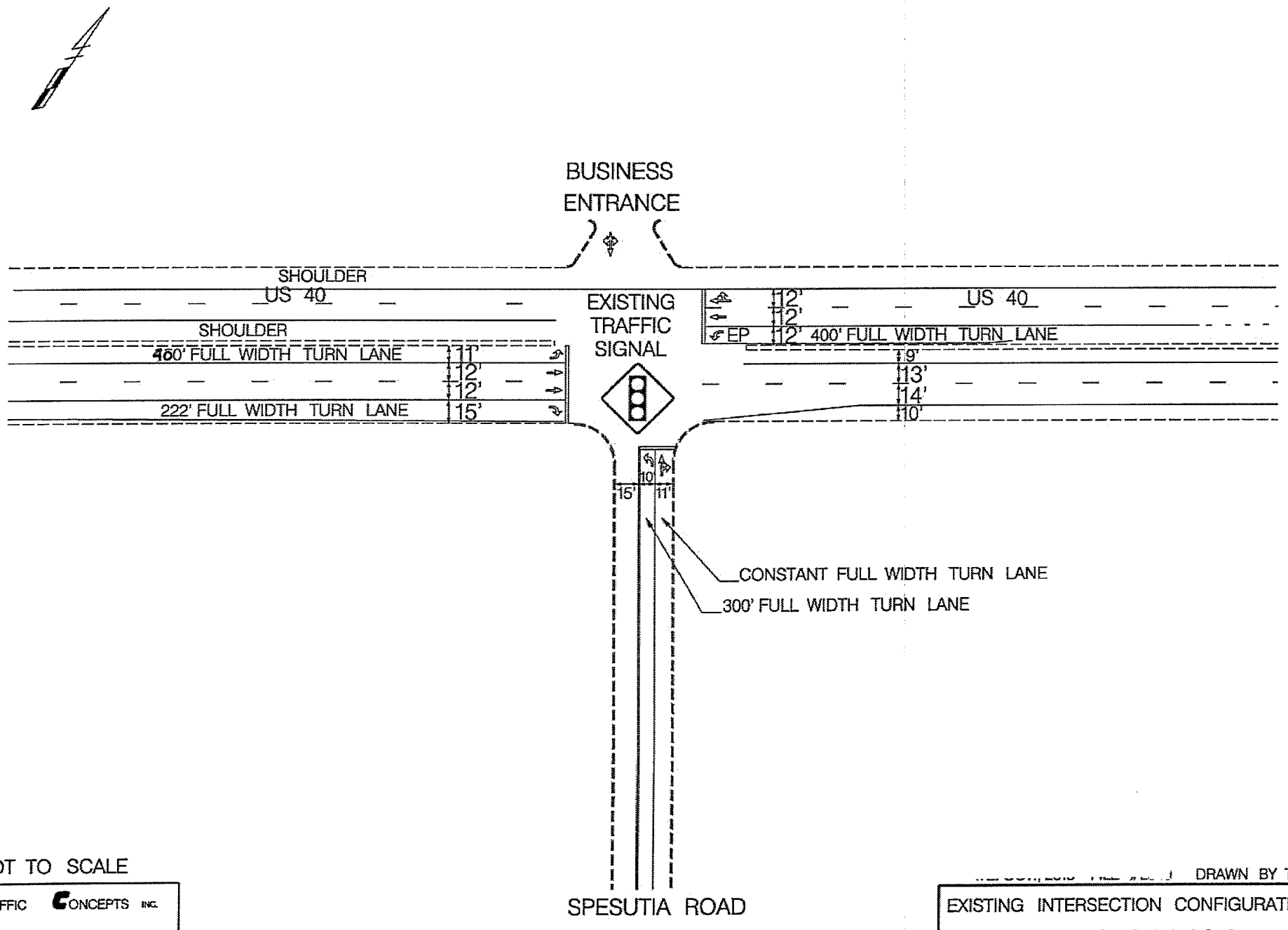

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TRAFFIC CONCEPTS INC.

EMAIL TRAFFIC-CONCEPTS.COM

EXISTING INTERSECTION CONFIGURATION
US 40 AT SPESUTIA ROAD
HARFORD COUNTY, MARYLAND

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: US 40 @ MD 7/MD 159 (OLD PHILADELPHIA RD) **COUNTY:** HARFORD

COUNT BY: B. SMITH; M. ROSEN **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	MD 159 NORTHBOUND			MD 7 SOUTHBOUND			US 40 EASTBOUND				US 40 WESTBOUND				
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	TOTAL
AM															
6:00-6:15	12	6	2	64	18	6	0	112	14	1	12	89	74	3	413
6:15-6:30	9	6	2	96	14	4	2	185	25	0	6	111	45	1	506
6:30-6:45	11	7	7	99	21	4	2	170	16	0	10	99	50	0	496
6:45-7:00	4	6	4	144	26	4	5	268	28	0	11	130	58	1	689
7:00-7:15	7	11	6	93	10	6	0	192	14	0	8	113	71	0	531
7:15-7:30	7	7	3	100	8	7	3	252	10	0	6	134	76	1	614
7:30-7:45	9	13	4	124	7	8	1	277	20	0	5	155	70	0	693
7:45-8:00	8	6	3	183	12	8	4	246	29	0	6	127	68	0	700
8:00-8:15	5	13	2	147	10	3	5	232	12	0	10	153	87	1	680
8:15-8:30	4	7	2	143	12	6	2	202	11	0	5	100	82	2	578
8:30-8:45	9	6	6	130	7	2	6	226	7	3	10	155	70	1	638
8:45-9:00	10	8	1	116	29	10	3	221	26	1	6	192	80	3	706
9:00-9:15	11	10	6	88	11	3	3	188	12	0	6	162	79	5	584
9:15-9:30	17	3	1	65	11	8	9	146	15	1	7	193	81	0	557
PEAK HR 7:15-8:15 TOTALS	**29**	**39**	**12**	**554**	**37**	**26**	**13**	**1007**	**71**	**0**	**27**	**569**	**301**	**2**	**PHF 0.96**
PM															
3:00-3:15	23	28	5	86	9	14	5	160	15	1	5	238	160	0	749
3:15-3:30	15	24	9	82	5	9	20	183	12	0	13	255	186	2	815
3:30-3:45	18	37	10	72	9	8	7	138	13	0	8	243	216	3	782
3:45-4:00	15	16	7	74	10	12	10	210	19	0	8	246	228	0	855
4:00-4:15	14	28	4	74	8	5	6	209	12	2	6	228	224	0	820
4:15-4:30	18	14	2	52	9	6	8	206	7	2	3	266	219	0	812
4:30-4:45	10	18	9	87	8	5	7	195	4	2	14	230	257	5	851
4:45-5:00	19	17	5	58	4	7	7	198	15	2	17	232	177	0	758
5:00-5:15	16	16	2	68	1	10	7	198	13	1	6	203	243	0	784
5:15-5:30	15	11	7	61	6	6	13	198	7	0	4	182	146	1	657
5:30-5:45	8	12	6	80	6	8	13	179	10	0	6	153	158	1	640
5:45-6:00	5	6	4	71	7	6	6	193	7	0	5	180	130	3	623
6:00-6:15	13	9	9	63	8	5	5	141	11	0	8	144	116	1	533
6:15-6:30	11	9	4	54	6	5	6	168	15	0	10	150	101	3	542
PEAK HR 3:45-4:45 TOTALS	**57**	**76**	**22**	**287**	**35**	**28**	**31**	**820**	**42**	**6**	**31**	**970**	**928**	**5**	**PHF 0.98**

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US 40 at MD 7/MD 159 Phase 2 Intersection Improvement

PROJECT NEWSLETTER • SPRING/SUMMER 2015

Intersection Improvement Project Moves Forward; Public Meeting Scheduled

The Maryland State Highway Administration (SHA) will begin Phase 2 of the US 40 at MD 7/MD 159 Intersection Improvement Project in the fall of 2015. This Harford County project plans to widen US 40 with additional lanes in each direction at its intersection with MD 7 and MD 159. The project will be in construction through the spring of 2018 and **will not involve a detour.**

For additional information, you are invited to attend a public meeting on Thursday, May 28, 2015, from 6:30pm to 8:30pm. The informational meeting will acquaint the public with the project and provide attendees an opportunity to inform SHA of their project-related concerns. The project team will display the current project design and will be available to answer project-related questions. **No formal presentation will be given. You may arrive at any time during meeting hours and walk through the display area at your own pace.** *(See back of flier for meeting details.)*

Questions & Answers

Why is this work necessary?

Within the study area, US 40 experiences significant traffic congestion. As a result of the Base Realignment and Closure (BRAC) initiative, Aberdeen Proving Ground has gained additional military and civilian positions that have increased traffic through the US 40/MD 7/MD 159 intersection. This project will upgrade the intersection to improve current traffic conditions.

How will traffic be impacted by construction activities?

During construction, SHA will keep two lanes open for traffic on US 40 during peak hours. No full roadway closures or detours are expected.

What will the work involve?

- Widening US 40 and MD 159
- Widening the US 40 Bridge over Cranberry Run
- Replacing the concrete median on US 40
- Resurfacing pavement throughout the project limits
- Installing stormwater management facilities and drainage features
- Relocating utilities
- Upgrading traffic signs and signals
- Landscaping

What is the project schedule?

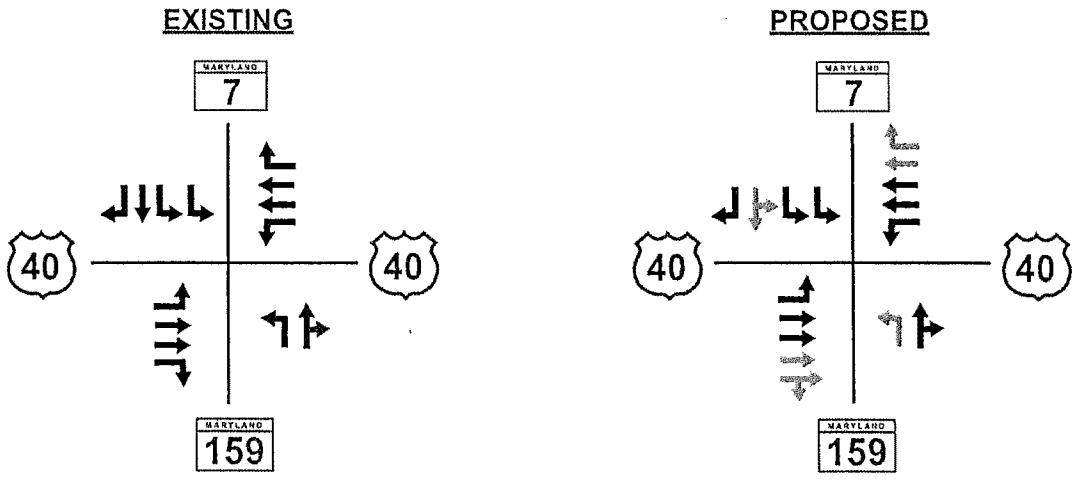
SHA will make every effort to complete this project as quickly as possible while minimizing impacts on local residents and motorists. Construction is scheduled to begin in the fall of 2015 and to be completed by spring 2018, weather permitting.

Project Background & Description

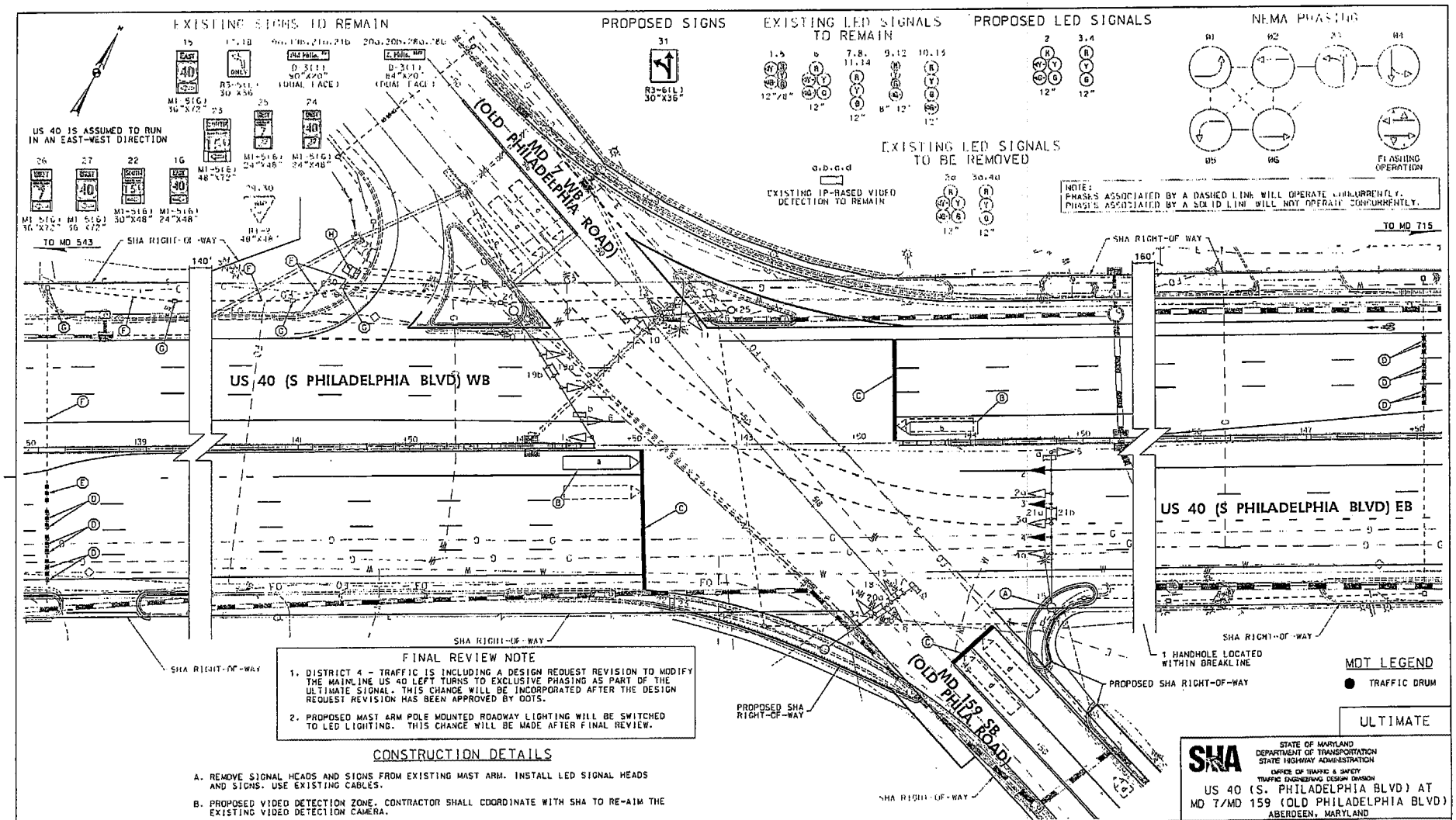
In 2009, SHA developed the US 40 Intersection Improvement Project to support the Base Realignment and Closure (BRAC) program by increasing the capacity of the roadway network in the area near the Aberdeen Proving Ground. Funding constraints led the project team to split the US 40/MD 7/MD 159 intersection into two phases:

- Phase 1 (improvements to MD 7) was completed in February 2015
- Phase 2 (improvements to US 40 and MD 159) will complement the improvements constructed during Phase 1

Phase 2 of the project plans to widen US 40 with additional lanes in each direction at its intersection with MD 7 and MD 159. The west side of the US 40 project will begin at Loflin Rd. The additional eastbound lanes will connect with the US 40 at MD 715 interchange project completed in November 2014. MD 159 will be slightly widened to extend the left-turn lane to provide more space for vehicles and allow them to queue without blocking the through lane. (See diagram)



SHA appreciates the patience and cooperation of the community and apologizes for any inconvenience. SHA reminds motorists to "Think Orange" when driving through work zones by staying alert and slowing down. Always buckle up, and please drive safely.



FINAL REVIEW NOTE

1. DISTRICT 4 - TRAFFIC IS INCLUDING A DESIGN REQUEST REVISION TO MODIFY THE MAINLINE US 40 LEFT TURNS TO EXCLUSIVE PHASING AS PART OF THE ULTIMATE SIGNAL. THIS CHANGE WILL BE INCORPORATED AFTER THE DESIGN REQUEST REVISION HAS BEEN APPROVED BY OOTS.
2. PROPOSED MAST ARM POLE MOUNTED ROADWAY LIGHTING WILL BE SWITCHED TO LED LIGHTING. THIS CHANGE WILL BE MADE AFTER FINAL REVIEW.

CONSTRUCTION DETAILS

A. REMOVE SIGNAL HEADS AND SIGNS FROM EXISTING MAST ARM. INSTALL LED SIGNAL HEADS AND SIGNS. USE EXISTING CABLES.

B. PROPOSED VIDEO DETECTION ZONE. CONTRACTOR SHALL COORDINATE WITH SHA TO RE-AIM THE EXISTING VIDEO DETECTION CAMERA.

C. INSTALL 24 INCH WHITE HEAT APPLIED THERMOPLASTIC PAVEMENT MARKING LINE.

D. RELOCATE EXISTING NON-INVASIVE MICROLOOP PROBE SET TO BE CENTERED IN TRAVEL LANE.

E. INSTALL NON-INVASIVE MICROLOOP PROBE SET WITH LEAD-IN CABLE. INSTALL CENTERED IN TRAVEL LANE.

F. USE EXISTING CONDUIT.

G. USE EXISTING HANDHOLE.

H. USE EXISTING CABINET.

GEOMETRIC LEGEND
EXISTING
PROPOSED

UTILITY LEGEND
STORM DRAIN
GAS MAIN
WATER MAIN
SEWER MAIN
ELECTRIC CABLES
AERIAL CABLES
TELEPHONE CABLES
FIBER-OPTIC

NOT FINAL

NOT FOR BIDDING PURPOSES

BY: BJG

RK&K
Hummel, Klepper & Kahl, LLP
Engineers Construction Managers Planners Scientists

APPROVALS
TEAM LEADER
ASSISTANT CHIEF
DIVISION CHIEF
OFFICE DIRECTOR

ORIGINAL ON FILE

REVISIONS
E SIGNAL RECONSTRUCTION 09-2012 DUE TO GEOMETRIC IMPROVEMENTS SHA NO.HA3485170, TIMS NO. J531
D MODIFY SIGNAL DUE TO NO 7 APPROACH WIDENING SHA NO.HA3485270, TIMS NO. J531 08-2011
C UPGRADE TO LED SIGNAL HEADS, MODIFY SPLIT PHASING SHA NO.XX45S185, TIMS NO. K991 08-2011

SHA
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 40 (S. PHILADELPHIA BLVD) AT MD 7/MD 159 (OLD PHILADELPHIA BLVD)
ABERDEEN, MARYLAND

TRAFFIC SIGNAL PLAN

SCALE 1"=20' DATE 07-19-1972 CONTRACT NO. H618-007-470

DESIGNED BY H. KILLIAN COUNTY HARFORD
DRAWN BY L. TOWNSEND LOGMILE 12004010.71
CHECKED BY TMS NO.
FAP NO. TCU NO.

TS NO. 629E DRAWING SP-9 OF 10 SHEET NO. 160 OF 178

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: US 40 @ MD 132 **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: CLEAR **DAY:** TUESDAY

	APG RD NORTHBOUND			MD 132 SOUTHBOUND			US 40 EASTBOUND				US 40 WESTBOUND				
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	TOTAL
AM															
6:00-6:15	15	1	2	8	1	29	12	58	7	0	1	150	2	1	287
6:15-6:30	9	3	12	4	2	35	13	78	6	0	1	165	9	1	338
6:30-6:45	19	2	7	10	1	43	11	102	5	0	1	220	4	0	425
6:45-7:00	17	2	5	22	0	48	21	104	4	1	1	160	5	0	390
7:00-7:15	12	9	13	15	4	56	22	98	5	0	1	166	4	0	405
7:15-7:30	22	5	15	11	4	35	24	108	4	1	3	166	5	0	403
7:30-7:45	18	8	11	20	4	43	27	100	2	1	0	165	14	2	415
7:45-8:00	21	8	9	27	4	49	33	111	5	0	4	131	15	3	420
8:00-8:15	16	3	11	10	7	47	22	87	11	2	3	195	11	1	426
8:15-8:30	18	7	10	17	2	48	26	90	6	0	7	135	7	1	374
8:30-8:45	21	10	11	18	6	38	25	123	4	1	2	153	13	0	425
8:45-9:00	17	7	8	23	3	32	35	126	10	1	1	129	20	0	412
9:00-9:15	17	3	14	22	5	55	19	101	12	1	4	144	8	1	406
9:15-9:30	16	7	7	14	2	47	31	96	10	1	4	135	9	1	380
PEAK HR 7:15-8:15 TOTALS	**77**	**24**	**46**	**68**	**19**	**174**	**106**	**406**	**22**	**4**	**10**	**657**	**45**	**6**	**PHF 0.98**
PM															
3:00-3:15	22	3	7	32	6	54	63	223	26	0	3	210	23	4	676
3:15-3:30	28	12	3	38	9	59	49	200	18	0	7	171	17	0	611
3:30-3:45	32	10	4	39	10	56	53	196	20	0	5	192	14	2	633
3:45-4:00	22	16	10	45	12	48	50	224	13	1	2	183	12	0	638
4:00-4:15	22	21	6	36	9	65	74	197	35	3	6	153	11	2	640
4:15-4:30	17	13	8	29	6	74	62	191	16	0	6	169	15	2	608
4:30-4:45	19	9	2	33	16	71	57	215	24	0	4	152	13	0	615
4:45-5:00	25	9	2	44	15	74	67	224	14	0	4	199	32	2	711
5:00-5:15	21	8	7	25	17	64	52	241	14	1	7	185	12	0	654
5:15-5:30	21	10	10	46	13	77	48	196	18	0	3	180	16	0	638
5:30-5:45	28	14	10	24	11	74	42	180	18	1	5	167	17	1	592
5:45-6:00	13	7	5	23	6	53	53	186	14	0	7	173	14	1	555
6:00-6:15	18	11	12	14	10	56	51	187	17	0	3	124	12	3	518
6:15-6:30	21	3	7	12	9	56	44	198	24	1	8	133	17	2	535
PEAK HR 4:30-5:30 TOTALS	**86**	**36**	**21**	**148**	**61**	**286**	**224**	**876**	**70**	**1**	**18**	**716**	**73**	**2**	**PHF 0.92**

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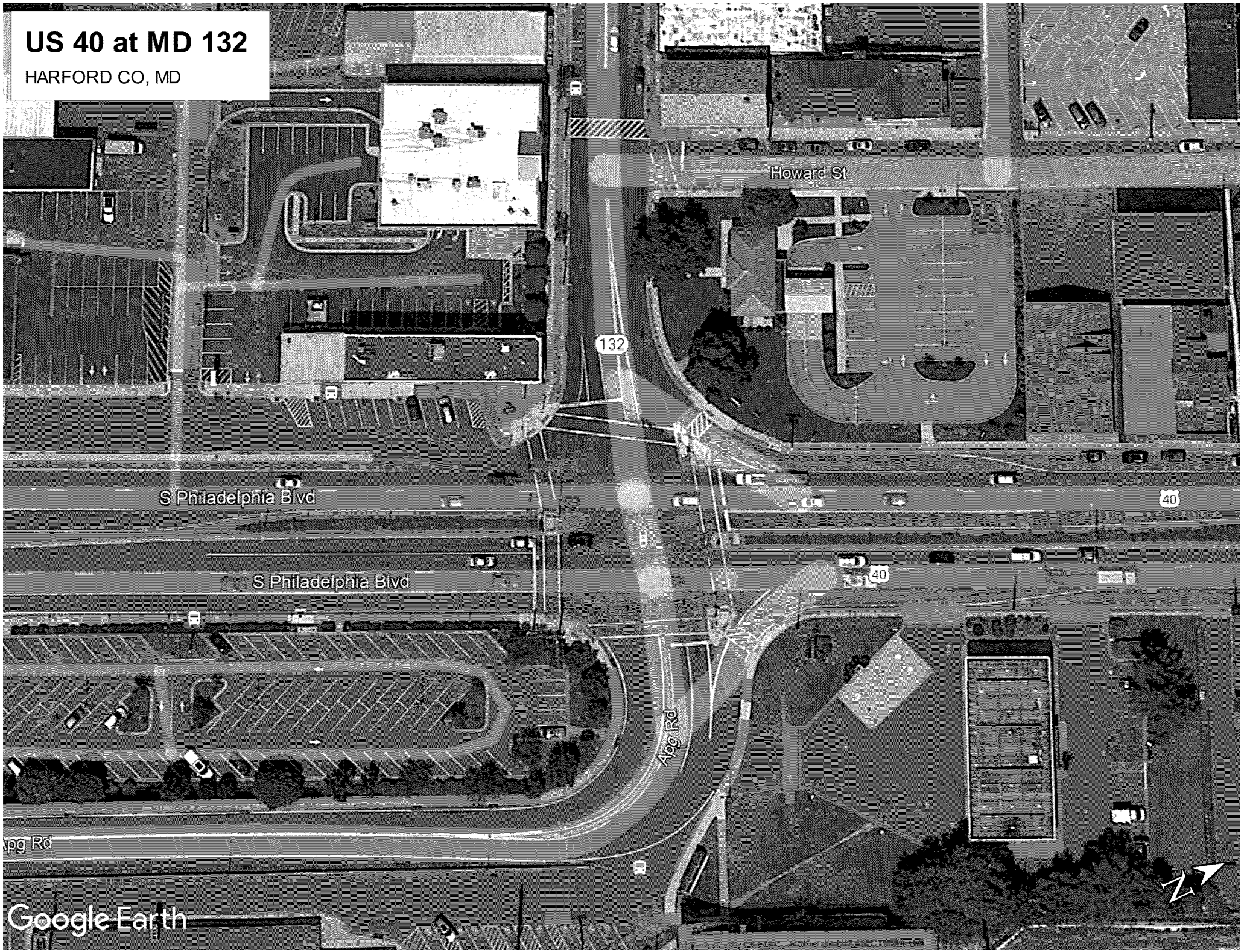
US 40 at MD 132

HARFORD CO, MD



PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 22 @ US 40 RAMPS (SIGNALIZED) **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 29, 2022

WEATHER: OVERCAST **DAY:** TUESDAY

	MD 22 NORTHBOUND			MD 22 SOUTHBOUND			N. ROGERS ST EASTBOUND			US 40 RAMPS WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	18	42			171	8	8		21			48	316
6:15-6:30	10	31			243	19	12		16			60	391
6:30-6:45	9	46			291	30	29		25			70	500
6:45-7:00	20	57			273	35	29		29			66	509
7:00-7:15	10	48			235	50	24		24			74	465
7:15-7:30	17	52			239	32	28		26			73	467
7:30-7:45	17	66			298	33	35		28			80	557
7:45-8:00	18	59			344	57	15		26			98	617
8:00-8:15	17	32			224	48	24		20			62	427
8:15-8:30	20	47			206	43	18		9			66	409
8:30-8:45	25	84			216	44	34		19			60	482
8:45-9:00	16	76			199	51	35		23			88	488
9:00-9:15	20	41			141	45	41		16			85	389
9:15-9:30	18	51			130	51	36		12			66	364
PEAK HR 7:00-8:00 TOTALS	**62**	**225**			**1116**	**172**	**102**		**104**			**325**	**PHF 0.85**
PM													
3:00-3:15	28	131			152	63	66		16			101	557
3:15-3:30	22	118			137	60	74		12			90	513
3:30-3:45	21	185			145	45	51		19			87	553
3:45-4:00	38	228			125	44	66		12			106	619
4:00-4:15	19	278			152	68	65		14			98	694
4:15-4:30	29	239			155	47	58		23			95	646
4:30-4:45	32	322			139	44	53		18			91	699
4:45-5:00	23	245			138	41	77		20			92	636
5:00-5:15	25	216			130	50	77		29			98	625
5:15-5:30	20	174			129	37	58		8			104	530
5:30-5:45	23	114			126	40	62		14			78	457
5:45-6:00	28	115			148	34	52		6			92	475
6:00-6:15	13	43			132	54	48		7			83	380
6:15-6:30	10	38			121	52	64		13			74	372
PEAK HR 4:00-5:00 TOTALS	**103**	**1084**			**584**	**200**	**253**		**75**			**376**	**PHF 0.96**

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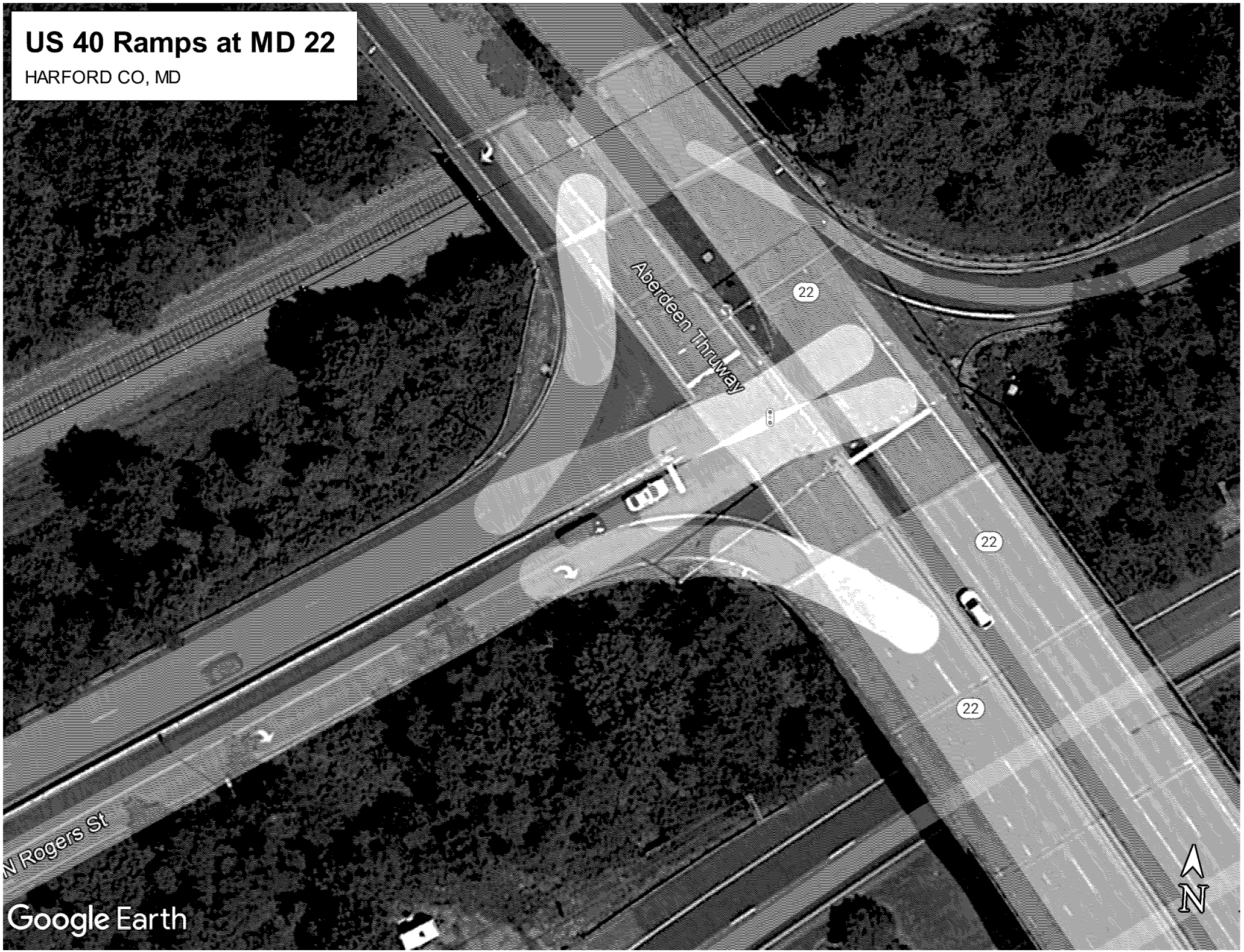
US 40 Ramps at MD 22
HARFORD CO, MD
Aberdeen Thruway
22
22
22
N Rogers St
Google Earth
N

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 715 @ US 40 EB RAMP **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** TUESDAY

	MD 715 NORTHBOUND			MD 715 SOUTHBOUND			US 40 EB OFF RAMP EASTBOUND			WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15		21	12	21	14		13		80				161
6:15-6:30		13	7	4	15		31		136				206
6:30-6:45		25	6	1	32		38		115				217
6:45-7:00		17	7	4	29		38		200				295
7:00-7:15		27	18	14	13		12		148				232
7:15-7:30		18	16	6	17		9		153				219
7:30-7:45		36	15	6	27		15		181				280
7:45-8:00		27	10	3	23		14		209				286
8:00-8:15		42	8	7	25		15		175				272
8:15-8:30		36	16	10	21		20		153				256
8:30-8:45		57	13	7	19		29		138				263
8:45-9:00		34	13	9	8		26		131				221
PEAK HR 7:30-8:30 TOTALS		**141**	**49**	**26**	**96**		**64**		**718**				**PHF 0.96**
PM													
3:00-3:15		0	0	0	0		0		0				0
3:15-3:30		114	21	5	13		2		21				176
3:30-3:45		181	28	14	7		5		25				260
3:45-4:00		137	29	4	8		7		36				221
4:00-4:15		222	22	12	5		3		24				288
4:15-4:30		228	19	12	5		2		27				293
4:30-4:45		265	17	6	10		6		27				331
4:45-5:00		219	18	7	5		6		15				270
5:00-5:15		207	18	11	11		9		19				275
5:15-5:30		152	5	5	4		6		23				195
5:30-5:45		149	16	3	7		19		25				219
5:45-6:00		102	14	6	10		20		25				177
PEAK HR 4:00-5:00 TOTALS		**934**	**76**	**37**	**25**		**17**		**93**				**PHF 0.89**

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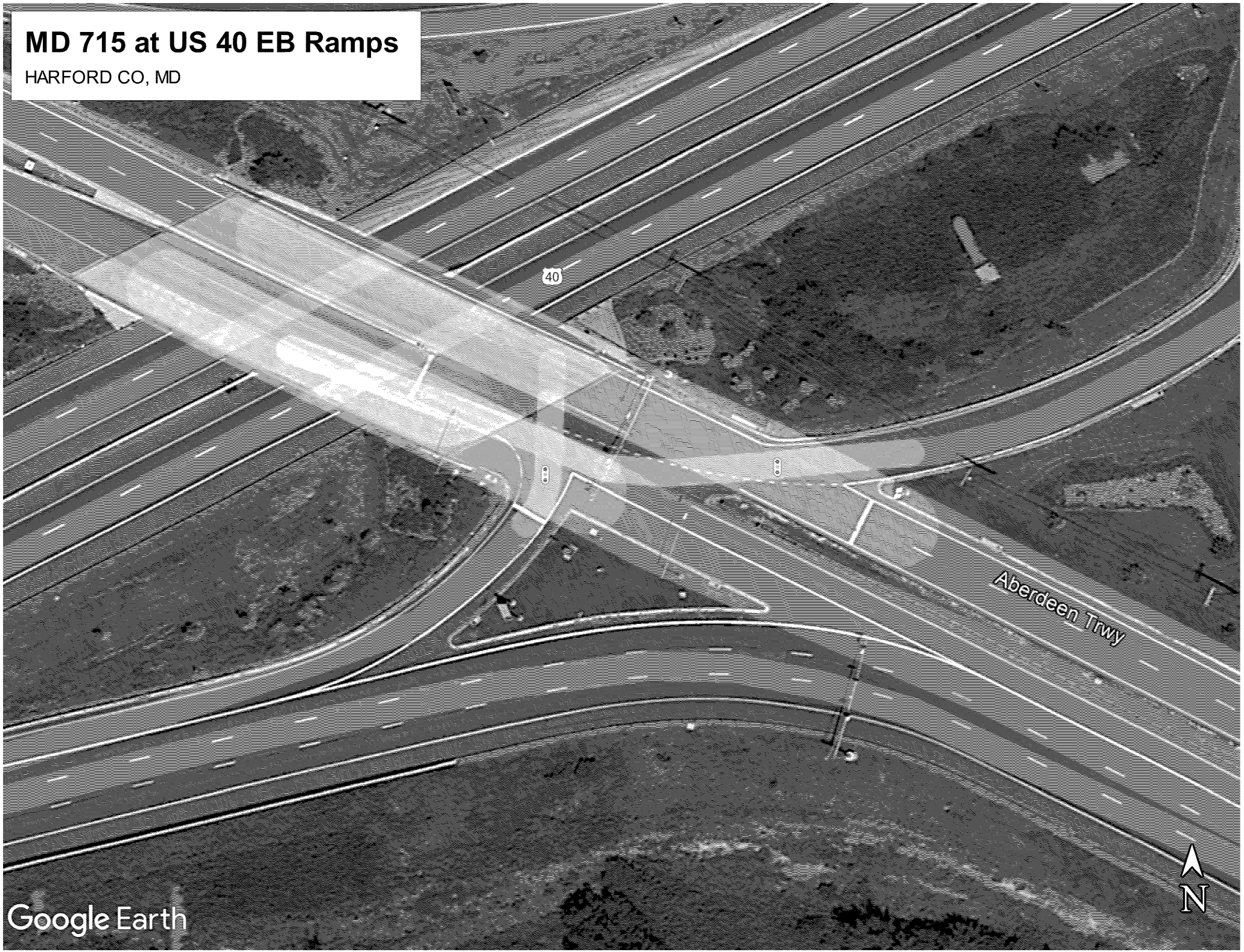
MD 715 at US 40 EB Ramps
HARFORD CO, MD
40
Aberdeen Trwy
N
Google Earth

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 715 @ OLD PHILADELPHIA RD **COUNTY:** HARFORD

COUNT BY: CAMERA (B.SMITH) **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

CAM

	MD 715 NORTHBOUND				MD 715 SOUTHBOUND				OLD PHILA RD EASTBOUND			OLD PHILA RD WESTBOUND			
TIME	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	UTRN	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM															
6:00-6:15	1	19	12	0	1	76	4	0	6	25	8	9	45	4	190
6:15-6:30	3	10	4	0	2	144	3	0	8	35	11	26	58	2	293
6:30-6:45	1	8	3	0	3	124	13	0	8	33	7	19	69	14	293
6:45-7:00	0	13	4	0	3	210	7	0	7	26	9	26	55	7	354
7:00-7:15	0	28	3	0	5	145	3	0	9	34	11	36	40	4	290
7:15-7:30	1	16	4	0	5	152	4	0	7	18	4	27	28	6	255
7:30-7:45	1	34	7	0	4	172	1	0	7	36	2	31	23	8	291
7:45-8:00	1	18	7	0	17	191	5	0	7	22	8	52	29	3	341
8:00-8:15	1	37	8	0	5	186	8	0	5	10	9	32	20	3	286
8:15-8:30	4	34	8	0	7	156	8	0	7	25	7	42	16	6	282
8:30-8:45	5	51	15	0	2	148	5	0	7	19	8	18	34	7	263
8:45-9:00	6	28	7	0	5	133	0	0	4	20	6	16	26	10	227
9:00-9:15	2	32	12	0	2	100	3	0	9	23	3	18	19	4	193
9:15-9:30	2	25	8	0	2	96	3	0	6	15	3	25	23	8	189
PEAK HR 6:15-7:15 TOTALS	**4**	**59**	**14**	**0**	**13**	**623**	**26**	**0**	**32**	**128**	**38**	**107**	**222**	**27**	**PHF 0.87**
PM															
3:00-3:15	2	147	21	0	5	38	3	0	11	55	5	2	35	7	331
3:15-3:30	7	120	20	0	1	26	4	0	10	63	10	6	47	11	325
3:30-3:45	7	178	30	0	3	22	4	0	9	57	5	3	43	11	372
3:45-4:00	4	135	18	0	1	25	3	0	8	58	1	3	46	15	317
4:00-4:15	9	244	24	0	3	23	2	0	6	32	1	8	23	16	391
4:15-4:30	7	215	37	0	4	22	5	0	6	36	0	9	27	12	380
4:30-4:45	8	262	29	0	2	25	3	0	7	40	2	3	30	8	419
4:45-5:00	4	193	21	0	7	30	2	0	7	32	2	5	33	19	355
5:00-5:15	7	184	34	0	2	25	5	0	7	31	1	17	28	11	352
5:15-5:30	4	135	17	0	3	28	3	0	4	22	0	11	29	15	271
5:30-5:45	11	88	14	0	3	24	2	0	2	39	4	18	26	9	240
5:45-6:00	7	80	27	0	2	27	1	0	0	17	1	22	27	1	212
6:00-6:15	4	96	22	0	3	17	2	0	6	19	2	16	32	5	224
6:15-6:30	3	84	28	0	3	23	2	0	4	31	4	20	28	13	243
PEAK HR 4:00-5:00 TOTALS	**28**	**914**	**111**	**0**	**16**	**100**	**12**	**0**	**26**	**140**	**5**	**25**	**113**	**55**	**PHF 0.92**

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M:\ 3762

MD 715 at Old Philadelphia Rd

HARFORD CO, MD



PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 159 @ FORDS LN **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	MD 159 NORTHBOUND			MD 159 SOUTHBOUND			FORDS LN EASTBOUND			WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	0	28			2	1	0		1				32
6:15-6:30	0	28			6	2	1		0				37
6:30-6:45	0	34			7	0	0		0				41
6:45-7:00	0	28			2	0	0		0				30
7:00-7:15	0	37			7	0	0		0				44
7:15-7:30	0	34			6	0	0		0				40
7:30-7:45	0	38			7	0	2		0				47
7:45-8:00	0	30			15	0	2		0				47
8:00-8:15	0	24			10	0	0		0				34
8:15-8:30	0	28			11	0	1		0				40
8:30-8:45	0	16			15	0	1		0				32
8:45-9:00	0	23			23	1	0		0				47
9:00-9:15	0	14			16	1	0		0				31
9:15-9:30	1	21			15	1	2		0				40
PEAK HR 7:00-8:00 TOTALS	**0**	**139**			**35**	**0**	**4**		**0**				**PHF 0.95**
PM													
3:00-3:15	0	16			23	1	3		0				43
3:15-3:30	0	25			35	0	0		0				60
3:30-3:45	0	10			29	0	0		1				40
3:45-4:00	1	16			34	0	0		0				51
4:00-4:15	0	16			29	1	1		1				48
4:15-4:30	0	18			24	0	0		0				42
4:30-4:45	0	17			27	1	0		0				45
4:45-5:00	1	15			23	1	2		0				42
5:00-5:15	0	25			41	0	2		0				68
5:15-5:30	0	19			32	1	0		0				52
5:30-5:45	0	17			32	0	0		0				49
5:45-6:00	0	24			49	1	1		0				75
6:00-6:15	0	17			30	1	0		0				48
6:15-6:30	0	14			17	0	0		0				31
PEAK HR 5:00-6:00 TOTALS	**0**	**85**			**154**	**2**	**3**		**0**				**PHF 0.81**

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MD 159 at Fords Lane
HARFORD CO, MD
159
Fords Ln
Fords Ln
Perryman Rd
N
Google Earth

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 159 @ CANNING HOUSE RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	MD 159 NORTHBOUND			MD 159 SOUTHBOUND			CANNINGHOUSE RD EASTBOUND			WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	0	21			3	0	7		0				31
6:15-6:30	0	23			4	2	6		0				35
6:30-6:45	0	20			5	2	13		0				40
6:45-7:00	0	21			0	1	8		0				30
7:00-7:15	0	22			4	3	13		0				42
7:15-7:30	0	25			5	2	12		0				44
7:30-7:45	0	23			4	1	10		0				38
7:45-8:00	0	22			10	6	10		0				48
8:00-8:15	0	15			7	2	6		0				30
8:15-8:30	0	24			6	4	4		0				38
8:30-8:45	0	11			5	4	3		0				23
8:45-9:00	0	14			5	5	4		0				28
9:00-9:15	1	10			8	5	4		0				28
9:15-9:30	0	11			8	3	8		0				30
PEAK HR 7:00-8:00 TOTALS	**0**	**92**			**23**	**12**	**45**		**0**				**PHF 0.90**
PM													
3:00-3:15	0	7			20	4	6		0				37
3:15-3:30	0	14			25	4	9		0				52
3:30-3:45	1	7			20	15	3		0				46
3:45-4:00	0	10			22	7	6		0				45
4:00-4:15	0	9			17	11	5		0				42
4:15-4:30	0	10			14	6	1		0				31
4:30-4:45	1	13			19	8	6		0				47
4:45-5:00	0	10			16	9	4		0				39
5:00-5:15	0	17			27	11	6		0				61
5:15-5:30	0	12			18	12	6		0				48
5:30-5:45	0	9			21	10	7		0				47
5:45-6:00	0	17			26	18	4		0				65
6:00-6:15	0	8			20	8	2		0				38
6:15-6:30	0	10			18	1	1		0				30
PEAK HR 5:00-6:00 TOTALS	**0**	**55**			**92**	**51**	**23**		**0**				**PHF 0.85**

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MD 159 at Canning House Rd

HARFORD CO, MD



PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 159 @ SPESUTIA RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	MD 159 NORTHBOUND			MD 159 SOUTHBOUND			SPESUTIA RD EASTBOUND			ACCESS WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	33	36	0	5	53	2	7	3	103	0	0	7	249
6:15-6:30	37	27	0	1	50	3	12	3	108	0	0	4	245
6:30-6:45	35	35	0	8	69	12	14	1	165	0	0	2	341
6:45-7:00	56	28	0	12	65	7	19	5	153	0	0	1	346
7:00-7:15	36	40	0	6	21	5	7	9	31	0	1	7	163
7:15-7:30	38	25	0	7	25	2	4	4	30	1	0	6	142
7:30-7:45	39	31	0	9	23	4	4	6	26	0	0	6	148
7:45-8:00	25	31	0	8	25	8	7	3	28	0	1	9	145
8:00-8:15	22	20	0	10	24	1	4	4	28	0	0	6	119
8:15-8:30	28	26	0	4	13	0	2	3	26	0	0	7	109
8:30-8:45	10	26	0	4	23	2	5	7	20	0	0	3	100
8:45-9:00	28	24	0	10	30	1	6	5	41	0	0	15	160
9:00-9:15	15	21	0	3	21	2	4	2	21	0	0	6	95
9:15-9:30	19	24	0	4	30	2	0	2	25	0	0	3	109
PEAK HR 6:00-7:00 TOTALS	**161**	**126**	**0**	**26**	**237**	**24**	**52**	**12**	**529**	**0**	**0**	**14**	**PHF 0.85**
PM													
3:00-3:15	87	64	0	5	33	26	3	0	46	0	0	11	275
3:15-3:30	78	56	0	3	42	8	1	0	57	0	0	8	253
3:30-3:45	135	67	0	8	30	7	3	0	72	0	0	5	327
3:45-4:00	44	45	0	8	46	6	3	2	95	0	0	8	257
4:00-4:15	69	35	1	4	25	8	1	0	57	0	1	17	218
4:15-4:30	67	33	0	2	25	5	2	2	42	0	3	4	185
4:30-4:45	63	36	0	11	24	6	6	1	35	0	4	10	196
4:45-5:00	47	32	1	7	30	6	2	0	33	0	3	1	162
5:00-5:15	68	30	0	7	29	11	5	1	38	0	0	6	195
5:15-5:30	27	25	0	8	24	4	2	6	34	1	4	9	144
5:30-5:45	35	23	1	4	24	7	3	4	42	0	2	9	154
5:45-6:00	35	14	1	7	30	4	2	10	61	0	0	4	168
6:00-6:15	35	34	0	4	25	3	3	6	40	0	3	13	166
6:15-6:30	38	33	0	4	18	4	1	2	34	0	0	4	138
PEAK HR 3:00-4:00 TOTALS	**344**	**232**	**0**	**24**	**151**	**47**	**10**	**2**	**270**	**0**	**0**	**32**	**PHF 0.85**

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7525 CONNELLEY DRIVE, SUITE B
HANOVER, MARYLAND 21076
410 760 2911 (FAX) 410 760 2915
E-MAIL TRAFFIC@TRAFFIC-CONCEPTS.COM

M:\3657


MD 159 at Spesutia Rd
HARFORD CO, MD
MD-159 & Spesutia Rd
N
Google Earth

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 159 @ CHELSEA RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** MARCH 31, 2022

WEATHER: OVERCAST **DAY:** THURSDAY

	CHELSEA RD NORTHBOUND			MD 159 SOUTHBOUND			MD 159 EASTBOUND			WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
6:00-6:15	0	41			140	6	23		1				211
6:15-6:30	0	40			133	7	27		0				207
6:30-6:45	1	36			220	10	32		0				299
6:45-7:00	0	57			231	7	28		0				323
7:00-7:15	0	32			45	10	46		0				133
7:15-7:30	0	26			44	10	37		0				117
7:30-7:45	0	24			36	12	46		0				118
7:45-8:00	0	28			37	17	33		0				115
8:00-8:15	1	17			35	15	24		0				92
8:15-8:30	0	19			30	10	33		0				92
8:30-8:45	0	20			23	20	16		0				79
8:45-9:00	0	24			44	26	28		0				122
9:00-9:15	0	18			25	18	17		0				78
9:15-9:30	0	26			39	18	19		0				102
PEAK HR 6:00-7:00 TOTALS	**1**	**174**			**724**	**30**	**110**		**1**				**PHF 0.80**
PM													
3:00-3:15	0	135			48	31	19		1				234
3:15-3:30	0	105			64	32	27		0				228
3:30-3:45	1	190			83	28	16		0				318
3:45-4:00	0	70			97	42	25		0				234
4:00-4:15	1	72			45	37	33		0				188
4:15-4:30	1	74			28	36	24		1				164
4:30-4:45	0	72			27	35	26		0				160
4:45-5:00	1	59			39	27	21		1				148
5:00-5:15	2	71			23	45	27		0				168
5:15-5:30	0	31			27	32	20		1				111
5:30-5:45	1	40			26	42	20		1				130
5:45-6:00	0	27			35	56	22		3				143
6:00-6:15	1	43			30	32	27		0				133
6:15-6:30	0	54			34	21	17		0				126
PEAK HR 3:00-4:00 TOTALS	**1**	**500**			**292**	**133**	**87**		**1**				**PHF 0.80**

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M:\3657


MD 159 at Chelsea Rd
HARFORD CO, MD
MD-159 & Chelsea Rd
159
Chelsea Rd
N
Google Earth

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: CHELSEA RD @ WOODLEY RD **COUNTY:** HARFORD

COUNT BY: CAMERA **DATE:** SEPTEMBER 30, 2021

WEATHER: CLEAR **DAY:** THURSDAY

CAM

	CHELSEA RD NORTHBOUND			**CHELSEA RD** SOUTHBOUND			EASTBOUND			**WOODLEY RD** WESTBOUND			
TIME	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL
AM													
7:00-7:15		22	0	8	25					0		8	63
7:15-7:30		24	0	9	25					0		3	61
7:30-7:45		15	0	7	28					0		0	50
7:45-8:00		16	0	8	30					0		4	58
8:00-8:15		13	1	5	18					1		3	41
8:15-8:30		7	0	9	16					0		7	39
8:30-8:45		20	0	9	18					2		8	57
8:45-9:00		16	0	7	26					0		9	58
PEAK HR 7:00-8:00 TOTALS		**77**	**0**	**32**	**108**					**0**		**15**	**PHF 0.92**
PM													
4:00-4:15		53	0	12	19					0		10	94
4:15-4:30		50	0	5	22					0		8	85
4:30-4:45		35	0	4	39					0		8	86
4:45-5:00		42	0	3	36					0		4	85
5:00-5:15		126	1	6	37					0		3	173
5:15-5:30		98	0	5	27					0		6	136
5:30-5:45		21	0	4	20					0		15	60
5:45-6:00		26	0	0	31					0		11	68
PEAK HR 4:30-5:30 TOTALS		**301**	**1**	**18**	**139**					**0**		**21**	**PHF 0.69**

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M:\3762


Chelsea Rd at Woodley Rd
HARFORD CO, MD
Woodley Rd
Woodley Rd
Woodley Rd
Chelsea Rd
Google Earth
N

APPENDIX IV

SCOPING LETTER

Gmail

Jama Carey <jcarey@traffic-concepts.com>

Mitchell Property TIS -site trips

2 messages

Jama Carey <jcarey@traffic-concepts.com> Thu, May 12, 2022 at 9:49 AM
To: alex rawls <aarawls@harfordcountymd.gov>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>

Hi Alex,

Based on the following MDOT SHA comment, we modified the site distribution and wanted to get concurrence from the County. The overall distribution was not changed; however, the route of travel (MD 7 vs. MD 543) was changed. As suggested by SHA, ALL trucks were shifted from MD 7 to MD 543. For the passenger cars, 25% of trips (instead of 35%) use MD 7 via MD 159.

> 11. We question the percentage of vehicles (especially trucks) the developer assigns to the MD 543 to MD 7 to MD 159 route. There are three roundabouts along MD 7, so it seems unlikely that large trucks would choose that route. Also, two different navigation applications were used and neither recommended using MD 7, but instead, recommended continuing south along MD 543 to US 40. Please provide additional information (i.e. travel time runs) supporting this routing and/or consider revising the trip distribution to have all trucks, and possibly additional passenger cars to/from the northwest, utilize the MD 543 to US 40 to MD 159 route.

Also, as required by the County the attached trips were revised with ITE Land Use 155 (30% trucks approved by County)

High Cube Fulfillment Center Warehouse - ITE LUC 155

	AM		PM	
	IN	OUT	IN	OUT
5,200,000 gsf	632	148	324	508
Trucks Trips (30%)	**190**	**44**	**97**	**152**
Passenger Vehicles (70%)	**442**	**104**	**227**	**356**

Thanks,
Jama Carey
Traffic Concepts, Inc.
7525 Connelley Drive, Suite B
Hanover, MD 21076

Office: 410-760-2911 - Ext 1300
Direct Office Line: 410-450-3179
Fax: 410-760-2915

2 attachments

Ex 8 A - Truck Trips.pdf
158K

Ex 9 A - Cars.pdf
171K

rawls, alex <aarawls@harfordcountymd.gov> Mon, May 16, 2022 at 11:37 AM
To: Jama Carey <jcarey@traffic-concepts.com>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>

Good morning Jama. We concur with the modified distribution, but also confirm concurrence with SHA because the comment was based on their review.

Alex

From: Jama Carey <jcarey@traffic-concepts.com>
Sent: Thursday, May 12, 2022 9:49 AM
To: rawls, alex <aarawls@harfordcountymd.gov>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>; stratmeyer, jeff <jmstratmeyer@harfordcountymd.gov>
Subject: Mitchell Property TIS -site trips

[EXTERNAL SENDER]

Hi Alex,

Based on the following MDOT SHA comment, we modified the site distribution and wanted to get concurrence from the County. The overall distribution was not changed; however, the route of travel (MD 7 vs. MD 543) was changed. As suggested by SHA, ALL trucks were shifted from MD 7 to MD 543. For the passenger cars, 25% of trips (instead of 35%) use MD 7 via MD 159.

11. We question the percentage of vehicles (especially trucks) the developer assigns to the MD 543 to MD 7 to MD 159 route. There are three roundabouts along MD 7, so it seems unlikely that large trucks would choose that route. Also, two different navigation applications were used and neither recommended using MD 7, but instead, recommended continuing south along MD 543 to US 40. Please provide additional information (i.e. travel time runs) supporting this routing and/or consider revising the trip distribution to have all trucks, and possibly additional passenger cars to/from the northwest, utilize the MD 543 to US 40 to MD 159 route.

[Quoted text hidden]

DATE: 07/07/2021

HARFORD COUNTY GOVERNMENT
DEPARTMENT OF PLANNING AND ZONING

PRELIMINARY TRAFFIC ANALYSIS INFORMATION

Project Name: Lands of F.O. Mitchell & Brothers
Project Description: 4,674,000 sq. ft. warehouse/distribution/e-commerce
Project Location: Perryman Road

Study Area: 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1197, 1198, 1199, 1220

The following intersections will be analyzed and queuing analysis will be required for all turning movements at signalized intersections utilizing the HCM Back-of Queue methodology:

Proposed Site Access Points @ Canning House Road	MD 543 @ MD 7
Proposed Access Road @ Perryman Road	MD 543 @ I-95 Ramps (NB/SB)
Perryman Road @ Fords Lane	MD 7 @ Stepney Road
Proposed Access Road @ Chelsea Road	US 40 @ MD 7
Perryman Road @ Canning House Road	Perryman Road @ Old Philadelphia Road
Perryman Road @ Chelsea Road	MD 715 @ Old Philadelphia Road
Chelsea Road @ Woodley Road	MD 715 @ Woodley Road Extended
Perryman Road @ Spesutia Road	US 40 @ MD 715
US 40 @ Spesutia Road	US 40 @ MD 132/Bel Air Avenue
US 40 @ MD 543	US 40 @ MD 22

Design Year: _____

Growth Rate Utilized: 2.2%

Pass By Percentage: N/A

Background Traffic:
Other approved preliminary plans in the vicinity

DATE: 07/07/2021

RESIDENTIAL	
1. Abingdon Addition – 20 single family units remaining	4. Monarch Glen – 1 single family unit remaining and 15 townhouse units remaining
2. Beech Creek Estates – 15 townhouse units remaining	5. Redleif Run – construct 26 single family units
3. Hollywoods – 250 condominium units remaining	6. Woodlawn – construct 103 single family units
NON-RESIDENTIAL	
7. 999-1041 Old Philadelphia Road (aka Cranberry Run Phase II) – construct 691,600 sq. ft. distribution center/warehouse buildings	11. Crossroads Community Church (Ayers Property) – construct a 13,718 sq. ft. house of worship
8. Abingdon Business Park (Lots 1-3) – construct 2,064,800 sq. ft. distribution center/warehouse buildings	12. James Run – Develop a Mixed Office Project with a 74,052 sq. ft. EMS facility, a 125-room hotel, 14,000 sq. ft. high turnover sit-down restaurant, 44,000 sq. ft. office, 4,275 sq. ft. fast food restaurant with drive thru, 5,000 sq. ft. convenience store with fuel pumps and car wash, 5,000 sq. ft. retail, 304-unit apartment and 100 bed assisted living facility
9. Belcamp Commercial (Lots 1 & 2) – construct a 4,070 sq. ft. convenience store with fuel pumps and a 991 sq. ft. car wash and a 96-room hotel	13. LEMS Contracting Company, Inc. – construct an 8,800 sq. ft. retail trade service with outdoor storage
10. Capital Exports – construct an 8,000 sq. ft. motor vehicle exports commercial building	14. Riverside Business Park, Lot 36 – construct a 242,940 sq. ft. warehouse/distribution center

Trip Generation Rates for peak hours:

Weekday: AM 7:00 – 9:00 PM 4:00 – 6:00

Weekend: hours:

Daily Trip Generation Rates:

Weekday: x Weekend:

DATE: 07/07/2021

Other approved Capital projects to be included in analysis:

1. _____

2. _____

3. _____

4. _____

5. _____

Transit Routes (within the Study Area):

Harford LINK:

- Route 3
- Route 5
- Route 7

MTA Commuter:

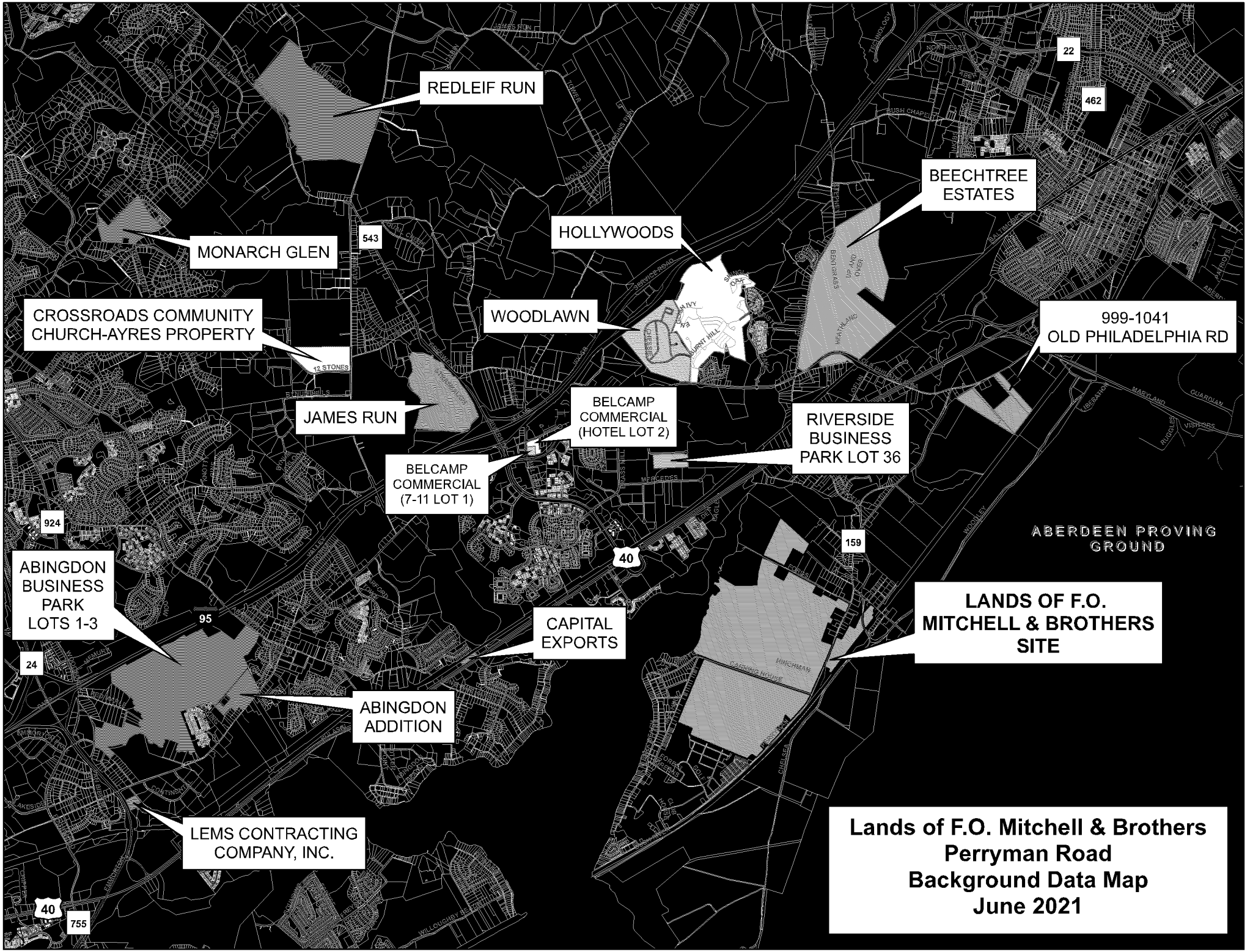
- Route 420

Enclosed map identifies location of other approved plans. Please provide site directional distribution prior to submitting TIA.

Please submit one (1) digital copy of the TIA to Harford County Department of Planning and Zoning and the appropriate number of paper copies of the TIA for distribution.

Pending Projects Traffic:
Non-committed projects in the vicinity

RESIDENTIAL	
NON-RESIDENTIAL	


REDLEIF RUN
MONARCH GLEN
CROSSROADS COMMUNITY CHURCH-AYRES PROPERTY
JAMES RUN
ABINGDON BUSINESS PARK LOTS 1-3
ABINGDON ADDITION
LEMS CONTRACTING COMPANY, INC.
HOLLYWOODS
WOODLAWN
BELCAMP COMMERCIAL (HOTEL LOT 2)
BELCAMP COMMERCIAL (7-11 LOT 1)
CAPITAL EXPORTS
BEECHTREE ESTATES
999-1041 OLD PHILADELPHIA RD
RIVERSIDE BUSINESS PARK LOT 36
LANDS OF F.O. MITCHELL & BROTHERS SITE
ABERDEEN PROVING GROUND
22
462
543
924
95
24
40
159
755
Lands of F.O. Mitchell & Brothers
Perryman Road
Background Data Map
June 2021

Mitchell Farm TIS - site truck/commuter trips and Perryman Peninsula Growth rates

4 messages

Jama Carey <jcarey@traffic-concepts.com> Fri, Aug 20, 2021 at 12:42 PM
To: alex rawls <aarawls@harfordcountymd.gov>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>

Hi Alex,

According to the ITE Handbook, during peak hours, distribution centers generate at most 30% heavy truck traffic. Most truck trips occur during off-peak hours. Therefore, we plan to analyze 70% commuter and 30% heavy truck traffic during peak hours. If you would like, we can send you the ITE data to support this.

Also, we recommend no growth in traffic during the build-out (5 years total) for the Perryman Peninsula (south of Old Philadelphia Road) for several reasons:

- The peninsula is currently an enclosed road system that does not incur commuter through traffic. Any trips generated by approved planned developments in the scoping letter that would impact the peninsula are included and any future proposed developments would conduct a TIS.
- The existing traffic now includes Eastgate trips that will be diverted to MD 715 with the extension of Woodley Road. Therefore, growth rates would inflate existing traffic that will be eliminated before the site builds out.
- I checked SHA I-TMS data at three locations including Spesutia Road (South of US 40), and along Old Philadelphia Road (East and West of the MD 159 roundabout). All three locations shows no growth trend in AADT since 2017. (See the attached historical data)

Although the data shows no growth along Old Philadelphia Rd, we planned to project growth in through traffic along Old Philadelphia Road at the Perryman Road roundabout. However, we think it is unreasonable to project long-term growth rates to roadways in the Perryman Peninsula including Spesutia Road, Perryman Road and Chelsea Road.

Please let me know if more information would be helpful.

Thank you,
Jama Carey
Traffic Concepts, Inc.
7525 Connelley Drive, Suite B
Hanover, MD 21076

Office: 410-760-2911 - Ext 1300
Direct Office Line: 410-450-3179
Fax: 410-760-2915

3 attachments

MD 159 - 0.3 MI S of US 40 - StationHist_B2379 (1).pdf
17K

Spesutia Rd - 0.10 MI S of US 40 - StationHist_B120033.pdf
17K

Old Philadelphia Rd - W of MD 715 - StationHist_S2000120036 (3).pdf
17K

rawls, alex <aarawls@harfordcountymd.gov> Mon, Aug 23, 2021 at 4:39 PM
To: Jama Carey <jcarey@traffic-concepts.com>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, "hebel, glen" <gchebel@harfordcountymd.gov>

Jama

We agree with the 70/30 commuter/heavy truck split during the peak hour. We also agree that the 2.2% growth rate can be eliminated from the intersections within the peninsula only. Just so that I understand your last paragraph correctly, you will apply the growth rate to the Old Philadelphia Road @ Perryman Road roundabout; but not the other intersections within the peninsula?

From: Jama Carey <jcarey@traffic-concepts.com>
Sent: Friday, August 20, 2021 12:42 PM
To: rawls, alex <aarawls@harfordcountymd.gov>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>
Subject: Mitchell Farm TIS - site truck/commuter trips and Perryman Peninsula Growth rates

[EXTERNAL SENDER]

[Quoted text hidden]

Jama Carey <jcarey@traffic-concepts.com> Tue, Aug 24, 2021 at 11:54 AM
To: "rawls, alex" <aarawls@harfordcountymd.gov>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, "hebel, glen" <gchebel@harfordcountymd.gov>

Hi Alex,
At the roundabout , we would project growth in through traffic along Old Philadelphia Road (No growth to/from Perryman Road)
[Quoted text hidden]

--

[Quoted text hidden]

---

rawls, alex <aarawls@harfordcountymd.gov> Tue, Aug 24, 2021 at 1:13 PM
To: Jama Carey <jcarey@traffic-concepts.com>
Cc: Mark Keeley <mkeeley@traffic-concepts.com>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, "hebel, glen" <gchebel@harfordcountymd.gov>

Jama we concur with 70/30 split and with how you propose to apply the growth rate

[Quoted text hidden]

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

County:	HARFORD	Municipality:	NONE		
Prefix:	MD	Route NO:	159	Suffix:	Mile Point: 4.43
Location:	MD159-.30 MI S OF US40				
Begin Sect:	0	End Sect:	4.73		
Station Desc:	ROAD END TO US 40				
Func Class:	16-URBAN MINOR ARTERIAL	Location ID:	B2379		

Year	AADT	AAWDT	Single Unit	Combination Unit	K Factor	D Factor	North East Split	South West Split	Peak Hour Direction
2020	4,345	4,695	11	25	8.09	60.61	47.21	52.79	NORTH
2019	5,194	5,514	12	20	8.09	60.61	47.21	52.79	NORTH
2018	5,193	5,563	12	20	8.09	60.61	47.21	52.79	NORTH
2017	5,232	5,602	14	19	8.09	60.61	47.21	52.79	NORTH
2016	5,111	5,471	14	19	8.09	60.61	47.21	52.79	NORTH
2015	5,010	5,360	14	19	8.09	60.61	47.21	52.79	NORTH
2014	4,995	5,355	17	11	9.19	76.48	40.7	59.3	NORTH
2013	5,004	5,404	17	11	9.19	76.48	40.7	59.3	NORTH
2012	4,993	5,393	14	14	9.19	76.48	40.7	59.3	NORTH
2011	5,032	5,442	14	14	9.19	76.48	40.7	59.3	NORTH

Note

AADT: Annual Average Daily Traffic is the number of vehicles expected to pass a given location on an average day of the year.

AAWDT: Annual Average Weekday Traffic is the number of vehicles expected to pass a given location on an average Weekday (Monday – Friday).

Single Unit: Percentage of Trucks (FHWA Classes 4 -7).

Combination Unit: Percentage of Trucks (FHWA Classes 8-13).

K Factor: Proportion of Annual Average Daily Traffic occurring in the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

D Factor: Percentage of traffic moving in the peak direction during the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

North East Split: Percentage of traffic in the North or East Direction.

South West Split: Percentage of traffic in the South or West Direction.

Peak Hour Direction: The direction with largest volume in the peak hour.

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

County:	HARFORD			Municipality:	ABERDEEN
Prefix:	MU	Route NO:	1050	Suffix:		Mile Point:	0.5
Location:	Old Philadelphia Rd west of MD 715				
Begin Sect:	0			End Sect:	0.69
Station Desc:	OLD PHILADELPHIA RD TO SHORT LANE (MD 715)				
Func Class:	17-URBAN COLLECTOR			Location ID:	S2000120036

Year	AADT	AAWDT	Single Unit	Combination Unit	K Factor	D Factor	North East Split	South West Split	Peak Hour Direction
2020	6,003	6,483			8.96	60.88	54.25	45.75	WEST
2019	7,182	7,902			8.96	60.88	54.25	45.75	WEST
2018	7,181	7,611			8.96	60.88	54.25	45.75	WEST
2017	7,240	7,670			8.96	60.88	54.25	45.75	WEST
2016	7,245	7,765			10.78	88.68	59.31	40.69	WEST
2015	7,104	7,604			10.78	88.68	59.31	40.69	WEST
2014	6,923	7,413			10.78	88.68	59.31	40.69	WEST
2013	6,942	7,502			10.78	88.68	59.31	40.69	WEST
2012	6,921	7,481			10.78	88.68	59.31	40.69	WEST
2011	6,980	7,540			10.78	88.68	59.31	40.69	WEST

Note

AADT: Annual Average Daily Traffic is the number of vehicles expected to pass a given location on an average day of the year.

AAWDT: Annual Average Weekday Traffic is the number of vehicles expected to pass a given location on an average Weekday (Monday – Friday).

Single Unit: Percentage of Trucks (FHWA Classes 4 -7).

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North East Split: Percentage of traffic in the North or East Direction.

South West Split: Percentage of traffic in the South or West Direction.

Peak Hour Direction: The direction with largest volume in the peak hour.

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

County:	HARFORD	Municipality:	NONE		
Prefix:	CO	Route NO: 426	Suffix:	Mile Point:	0.1
Location:	SPESUTIA RD-.10 MI S OF US40				
Begin Sect:	0	End Sect:	0.78		
Station Desc:	US 40 TO MD 159				
Func Class:	17-URBAN COLLECTOR	Location ID:	B120033		

Year	AADT	AAWDT	Single Unit	Combination Unit	K Factor	D Factor	North East Split	South West Split	Peak Hour Direction
2020	4,822	5,212	4		11.3	64.46	49.45	50.55	SOUTH
2019	5,771	6,351	4		11.3	64.46	49.45	50.55	SOUTH
2018	5,770	6,120	4		11.3	64.46	49.45	50.55	SOUTH
2017	5,972	6,332	3		14	72.61	49.34	50.66	SOUTH
2016	5,831	6,241	3		14	72.61	49.34	50.66	SOUTH
2015	5,720	6,120	3		14	72.61	49.34	50.66	SOUTH
2014	4,882	5,222	4		10.13	59.4	52.5	47.5	SOUTH
2013	4,891	5,281	4		10.13	59.4	52.5	47.5	SOUTH
2012	4,880	5,270	4		10.13	59.4	52.5	47.5	SOUTH
2011	4,271	4,611			9.65	61.49	50.65	49.35	SOUTH

Note

AADT: Annual Average Daily Traffic is the number of vehicles expected to pass a given location on an average day of the year.

AAWDT: Annual Average Weekday Traffic is the number of vehicles expected to pass a given location on an average Weekday (Monday – Friday).

Single Unit: Percentage of Trucks (FHWA Classes 4 -7).

Combination Unit: Percentage of Trucks (FHWA Classes 8-13).

K Factor: Proportion of Annual Average Daily Traffic occurring in the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

D Factor: Percentage of traffic moving in the peak direction during the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

North East Split: Percentage of traffic in the North or East Direction.

South West Split: Percentage of traffic in the South or West Direction.

Peak Hour Direction: The direction with largest volume in the peak hour.

Gmail Jama Carey <jcarey@traffic-concepts.com>

Lands of FO Mitchell & Bros - TIS Distributions

3 messages

Jama Carey <jcarey@traffic-concepts.com> Thu, Jul 22, 2021 at 4:28 PM
To: alex rawls <aarawls@harfordcountymd.gov>
Cc: "hebel, glen" <gchebel@harfordcountymd.gov>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, Mark Keeley <mkeeley@traffic-concepts.com>, Ken Schmid <kschmid@traffic-concepts.com>

Hi Alex,

Please find the attached package of trip distributions for the FO Mitchell & Bros TIS, for review. All of the trip distributions are copied from previously approved studies. The proposed site has the same distribution pattern that was approved for the Eastgate distribution center.

Based on the minimal trips generated by some of the sites (due to location, use, etc.), the impacts would be accounted for by the projected growth in traffic over the build-out (I noted each on the attached scoping letter).

Thanks!
Jama Carey
Traffic Concepts, Inc.
7525 Connelley Drive, Suite B
Hanover, MD 21076

Office: 410-760-2911 - Ext 1300
Direct Office Line: 410-450-3179
Fax: 410-760-2915

Lands of FO Mitchell & Bros - TIS Distributions.pdf
8587K

Jama Carey <jcarey@traffic-concepts.com> Tue, Aug 3, 2021 at 1:07 PM
To: alex rawls <aarawls@harfordcountymd.gov>
Cc: "hebel, glen" <gchebel@harfordcountymd.gov>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, Mark Keeley <mkeeley@traffic-concepts.com>

Hi Alex,
Do you have any comments regarding the TIS trip distribution package?
Thanks,
[Quoted text hidden]
--
[Quoted text hidden]

rawls, alex <aarawls@harfordcountymd.gov> Tue, Aug 10, 2021 at 12:26 PM
To: Jama Carey <jcarey@traffic-concepts.com>
Cc: "hebel, glen" <gchebel@harfordcountymd.gov>, "stratmeyer, jeff" <jmstratmeyer@harfordcountymd.gov>, Mark Keeley <mkeeley@traffic-concepts.com>

Jeff and I reviewed the distribution and offer the following comments:

- Proposed Site Distribution – Revise the trips accessing this site. Vehicles will not travel past MD 159/Perryman Road, turn onto MD 715 and backtrack to the site from Road A. We do not believe based on distance and travel time that any trips will use Road A/Woodley Road to access the site. The trips accessing the site via MD 7 and US 40 should use Spesutia Road and MD 159/Perryman Road
- Monarch Glen – we disagree that these trips should be picked up with growth rates. They need to show the same distribution that was shown in the Monarch Glen traffic study which assigned 20% of the trips onto MD 543
- Capital Exports – we disagree that these trips should be picked up with growth rates. This shows up in background in the Chelsea Road Distribution Center/Warehouse TIA that was just submitted. They need to

show 35% on MD 543 and 35% along US 40 traveling into the study area
- James Run – The 100 unit senior housing project was replaced with a 160 bed congregate care facility

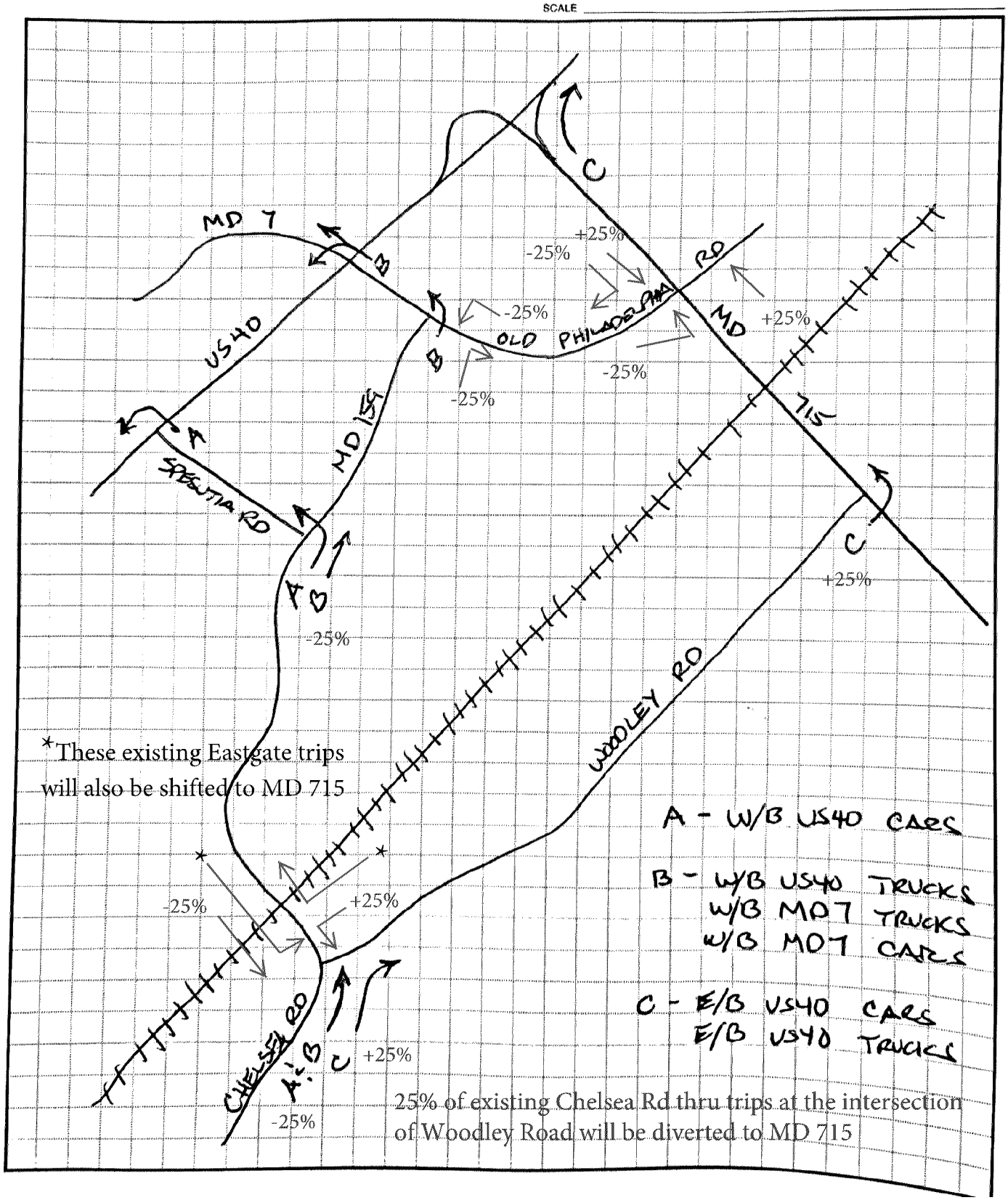
From: Jama Carey <jcarey@traffic-concepts.com>
Sent: Tuesday, August 3, 2021 1:07 PM
To: rawls, alex <aarawls@harfordcountymd.gov>
Cc: hebel, glen <gchebel@harfordcountymd.gov>; stratmeyer, jeff <jmstratmeyer@harfordcountymd.gov>; Mark Keeley <mkeeley@traffic-concepts.com>
Subject: Re: Lands of FO Mitchell & Bros - TIS Distributions

[EXTERNAL SENDER]

[Quoted text hidden]

HARFORD COUNTY, MARYLAND
Department of Public Works
212 South Bond Street Third Floor
Bel Air, MD 21014
(410) 638-3509

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____



DATE: 07/07/2021

HARFORD COUNTY GOVERNMENT
DEPARTMENT OF PLANNING AND ZONING

PRELIMINARY TRAFFIC ANALYSIS INFORMATION

Project Name: Lands of F.O. Mitchell & Brothers
Project Description: 4,674,000 sq. ft. warehouse/distribution/e-commerce
Project Location: Perryman Road

Study Area: 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1197, 1198, 1199, 1220

The following intersections will be analyzed and queuing analysis will be required for all turning movements at signalized intersections utilizing the HCM Back-of Queue methodology:

Proposed Site Access Points @ Canning House Road	MD 543 @ MD 7
Proposed Access Road @ Perryman Road	MD 543 @ I-95 Ramps (NB/SB)
Perryman Road @ Fords Lane	MD 7 @ Stepney Road
Proposed Access Road @ Chelsea Road	US 40 @ MD 7
Perryman Road @ Canning House Road	Perryman Road @ Old Philadelphia Road
Perryman Road @ Chelsea Road	MD 715 @ Old Philadelphia Road
Chelsea Road @ Woodley Road	MD 715 @ Woodley Road Extended
Perryman Road @ Spesutia Road	US 40 @ MD 715
US 40 @ Spesutia Road	US 40 @ MD 132/Bel Air Avenue
US 40 @ MD 543	US 40 @ MD 22

Design Year: PH I - 2024 | PH II 2026

Growth Rate Utilized: 2.2%

Pass By Percentage: N/A

Background Traffic:
Other approved preliminary plans in the vicinity

DATE: 07/07/2021

RESIDENTIAL	
1. Abingdon Addition – 20 single family units remaining	4. Monarch Glen – 1 single family unit remaining and 15 townhouse units remaining *
2. Beech Creek Estates – 15 townhouse units remaining	5. Redleif Run – construct 26 single family units
3. Hollywoods – 250 condominium units remaining	6. Woodlawn – construct 103 single family units
NON-RESIDENTIAL	
7. 999-1041 Old Philadelphia Road (aka Cranberry Run Phase II) – construct 691,600 sq. ft. distribution center/warehouse buildings	11. Crossroads Community Church (Ayers Property) – construct a 13,718 sq. ft. house of worship *
8. Abingdon Business Park (Lots 1-3) – construct 2,064,800 sq. ft. distribution center/warehouse buildings	12. James Run – Develop a Mixed Office Project with a 74,052 sq. ft. EMS facility, a 125-room hotel, 14,000 sq. ft. high turnover sit-down restaurant, 44,000 sq. ft. office, 4,275 sq. ft. fast food restaurant with drive thru, 5,000 sq. ft. convenience store with fuel pumps and car wash, 5,000 sq. ft. retail, 304-unit apartment and 100 bed assisted living facility
9. Belcamp Commercial (Lots 1 & 2) – construct a 4,070 sq. ft. convenience store with fuel pumps and a 991 sq. ft. car wash and a 96-room hotel	13. LEMS Contracting Company, Inc. – construct an 8,800 sq. ft. retail trade service with outdoor storage *
* 10. Capital Exports – construct an 8,000 sq. ft. motor vehicle exports commercial building	14. Riverside Business Park, Lot 36 – construct a 242,940 sq. ft. warehouse/distribution center

Trip Generation Rates for peak hours:

Weekday: AM 7:00 – 9:00 PM 4:00 – 6:00

Weekend: hours:

Daily Trip Generation Rates:

Weekday: x Weekend:

* MINIMAL WEEKDAY TRIPS GENERATED WILL BE ACCOUNTED FOR WITH GROWTH RATES APPLIED OVER THE BUILD-OUT OF SITE

See 3023

DATE: 07/07/2021

Other approved Capital projects to be included in analysis:

1. _____

2. _____

3. _____

4. _____

5. _____

Transit Routes (within the Study Area):

Harford LINK:

- Route 3
- Route 5
- Route 7

MTA Commuter:

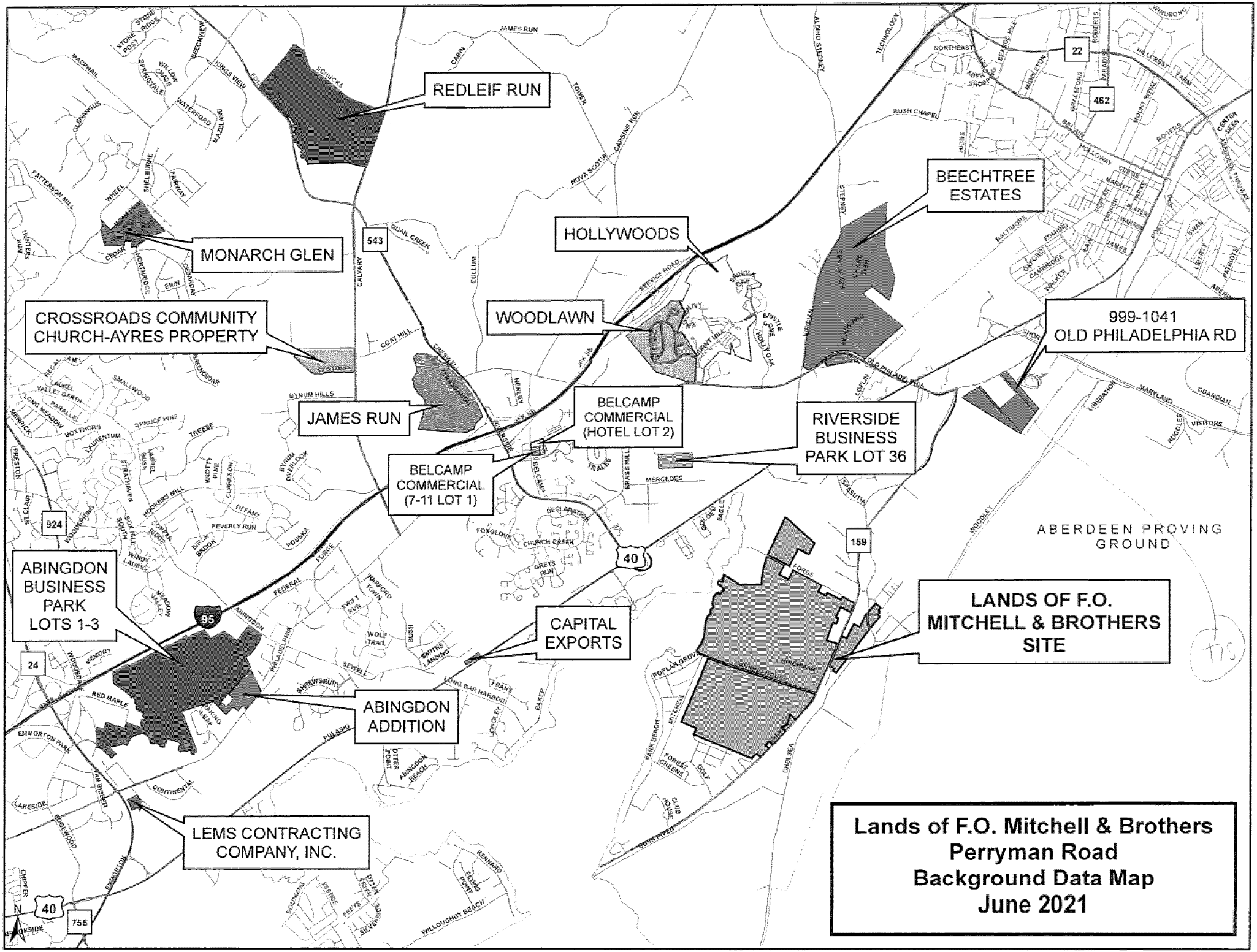
- Route 420

Enclosed map identifies location of other approved plans. Please provide site directional distribution prior to submitting TIA.

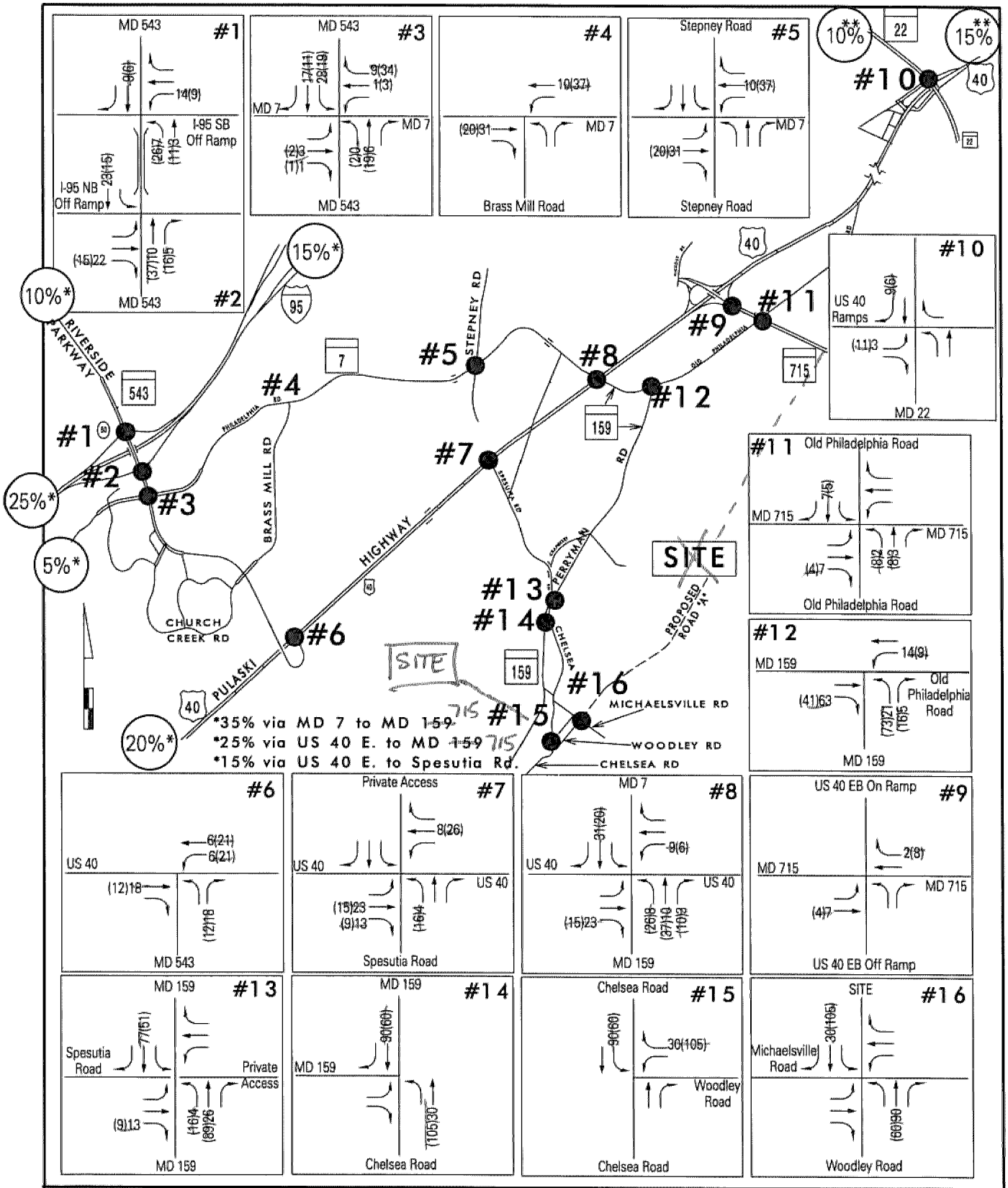
Please submit one (1) digital copy of the TIA to Harford County Department of Planning and Zoning and the appropriate number of paper copies of the TIA for distribution.

Pending Projects Traffic:
Non-committed projects in the vicinity

RESIDENTIAL	
NON-RESIDENTIAL	


REDLEIF RUN
MONARCH GLEN
CROSSROADS COMMUNITY CHURCH-AYRES PROPERTY
HOLLYWOODS
WOODLAWN
BEECHTREE ESTATES
999-1041 OLD PHILADELPHIA RD
JAMES RUN
BELCAMP COMMERCIAL (HOTEL LOT 2)
BELCAMP COMMERCIAL (7-11 LOT 1)
RIVERSIDE BUSINESS PARK LOT 36
ABINGDON BUSINESS PARK LOTS 1-3
CAPITAL EXPORTS
LANDS OF F.O. MITCHELL & BROTHERS SITE
ABINGDON ADDITION
LEMS CONTRACTING COMPANY, INC.
ABERDEEN PROVING GROUND
Lands of F.O. Mitchell & Brothers
Perryman Road
Background Data Map
June 2021

~~*25%~~ ~~**15% via MD 715 to MD 159~~ (SITE)
~~**10% via US 40 W. to MD 159~~



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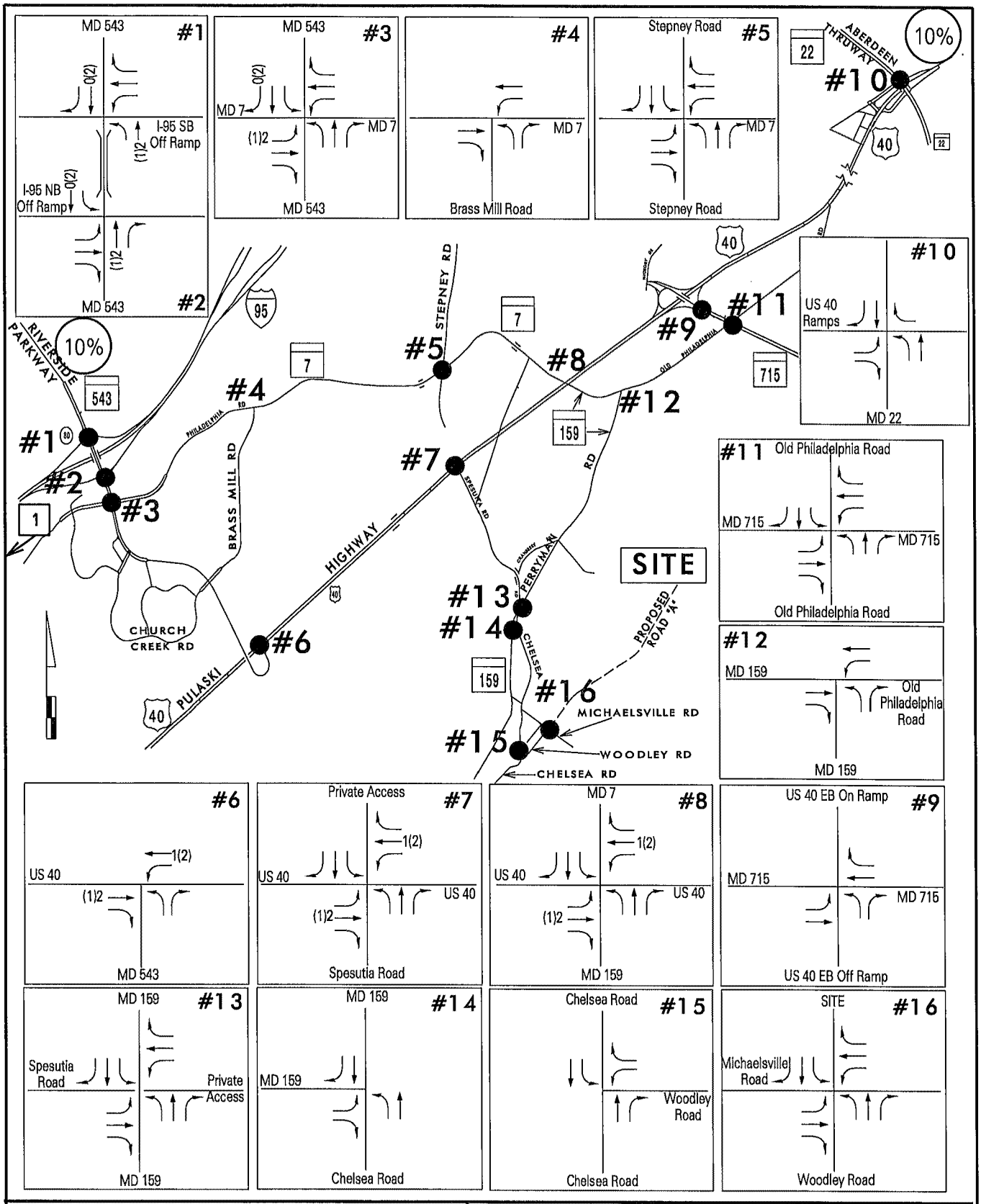
Suite B
Hanover, Maryland 21076
410-760-2911

EXHIBIT 11

Site Generated Traffic - ~~Phase 2~~ PROPOSED DISTRIBUTION CTR

(PREVIOUSLY APPROVED FOR EASTGATE DISTRIBUTION CENTER)



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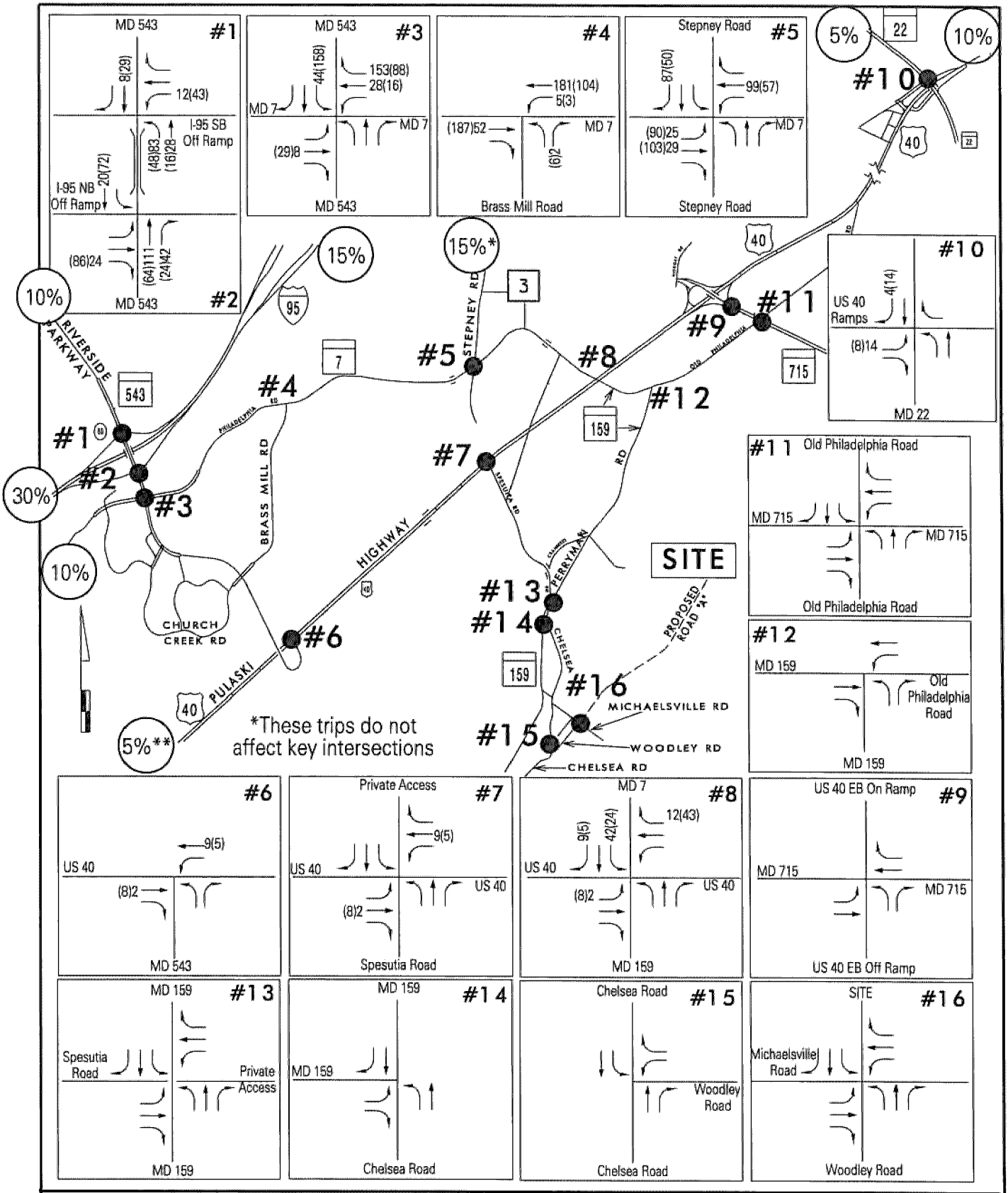
BACKGROUND 1

Abingdon Addition



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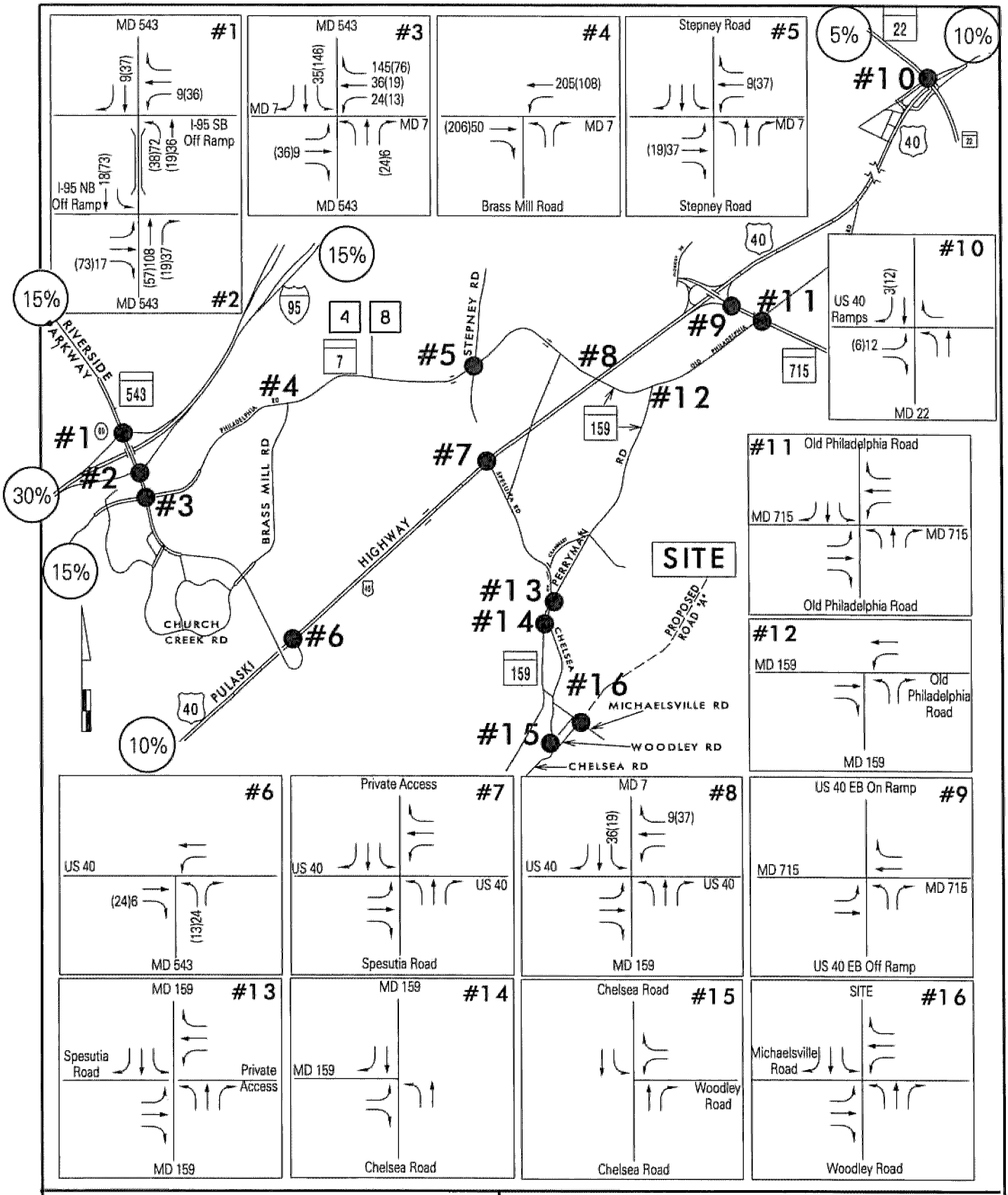
BACKGROUND 3 #2

Beechtree Estates



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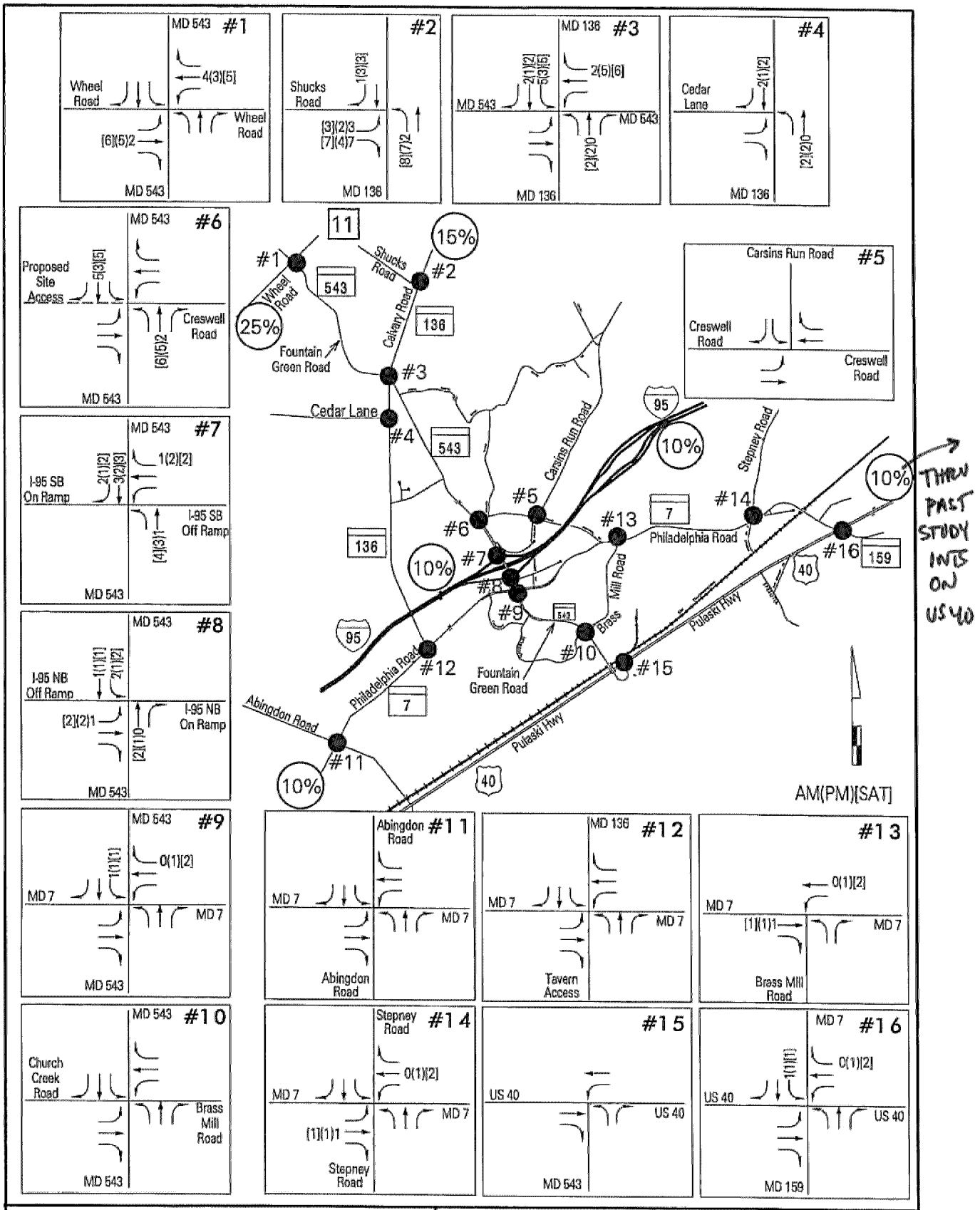
BACKGROUNDS 4 & 8 #3 & #6

Berkshire Manor & Hollywoods



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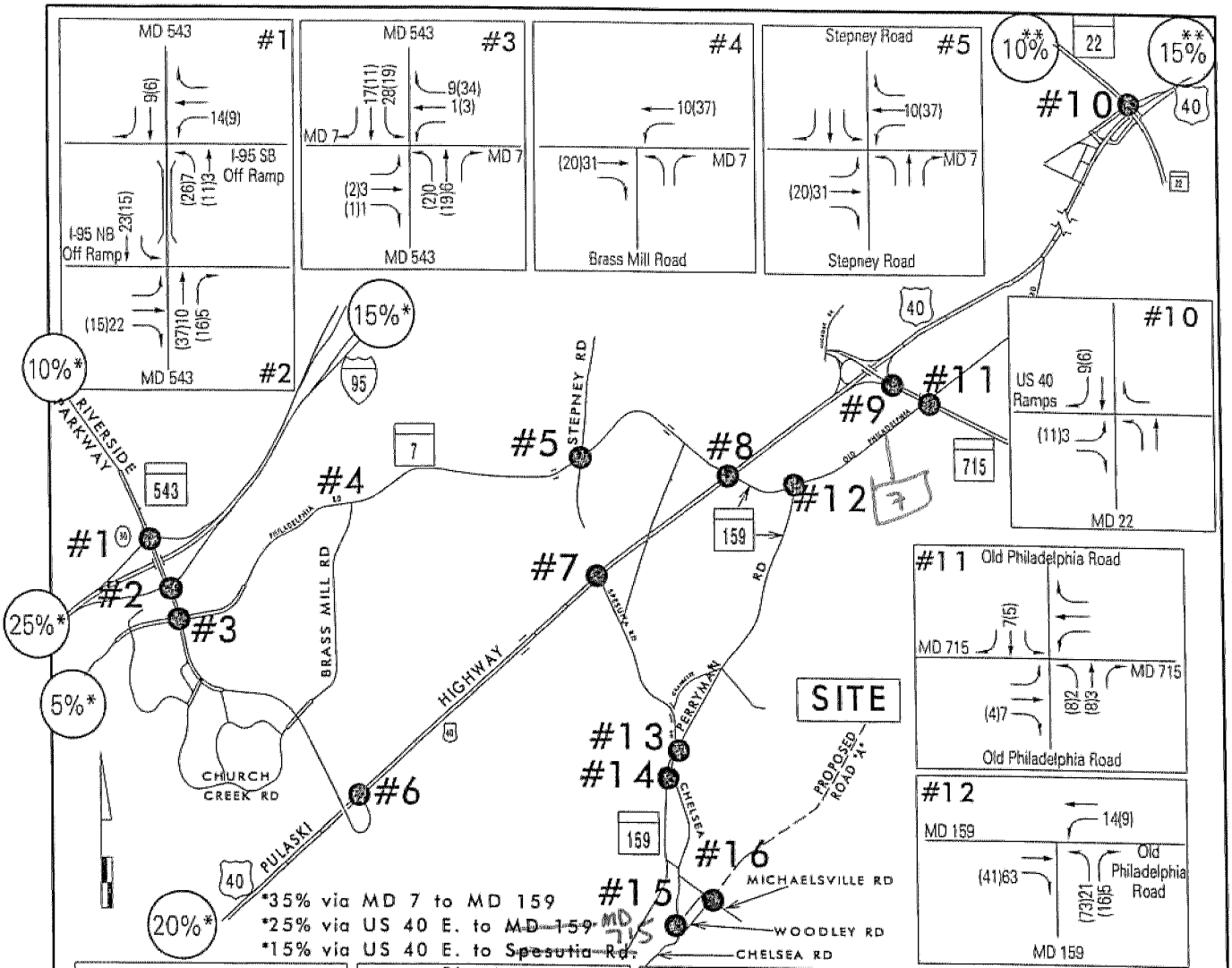
BACKGROUND 11

#5

Redlief Run

* 25% **~~15%~~ via MD 715 to MD 159
**~~10% via US 40 W. to MD 159~~



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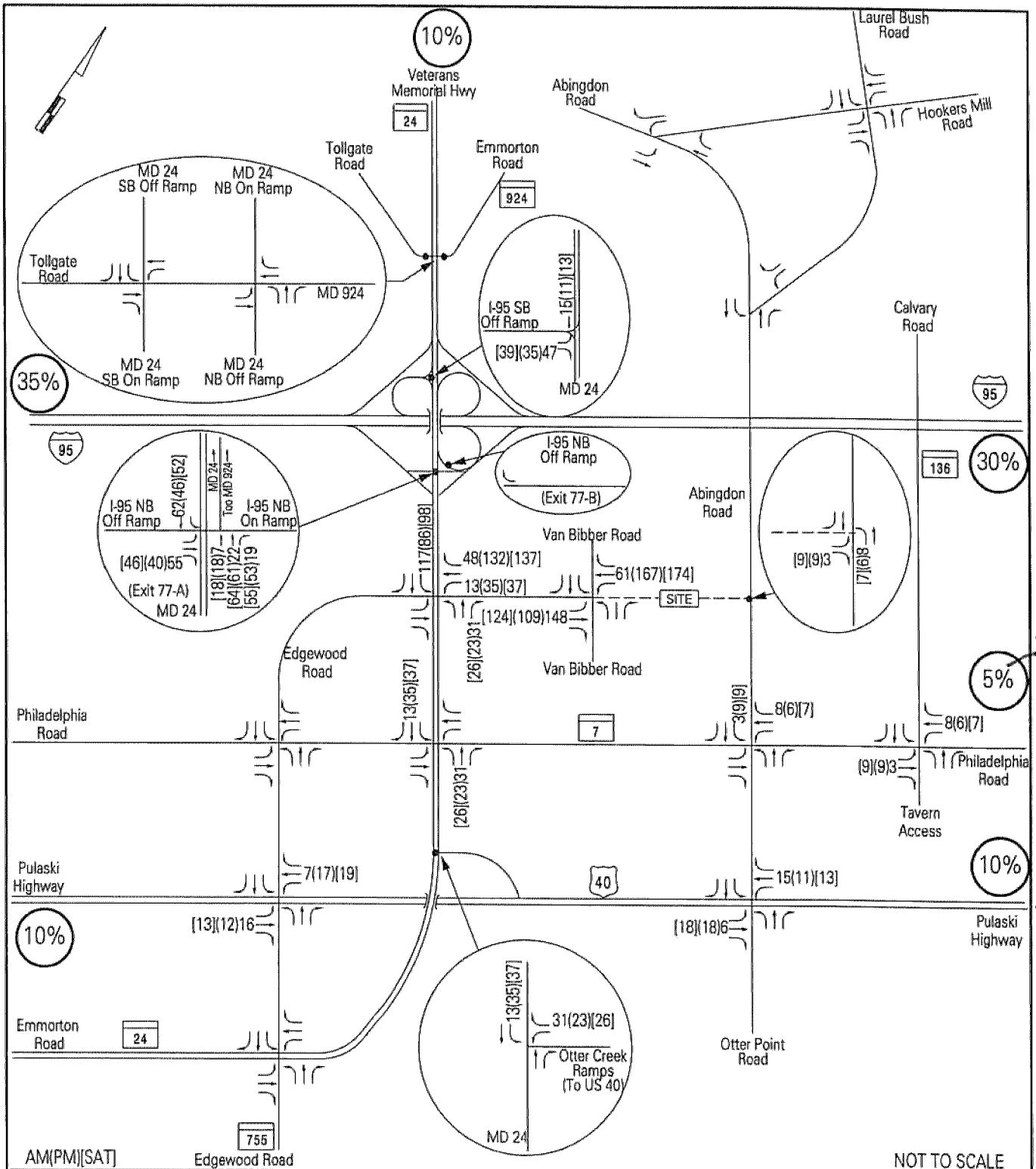
~~EXHIBIT 11~~

Site Generated Traffic - Phase 2

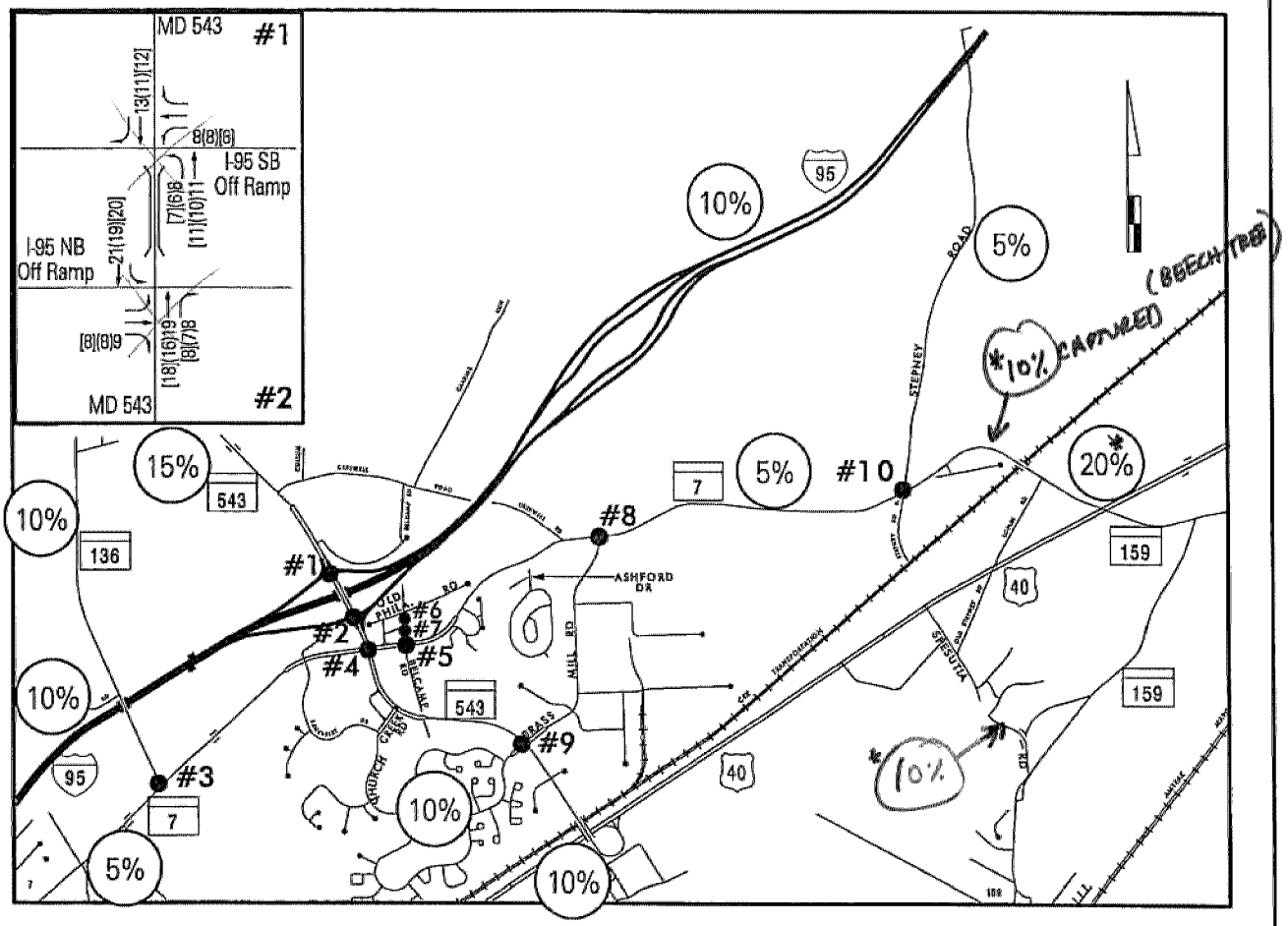
BACKGROUND #7

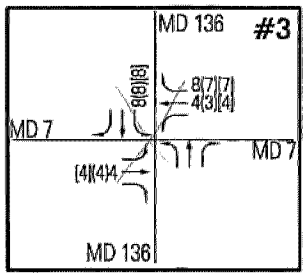
DISTRIBUTION CENTER

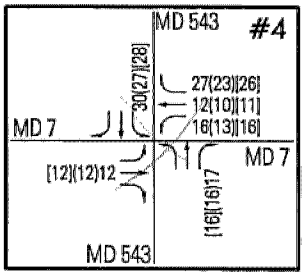


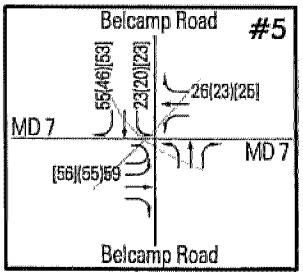
TRAFFIC CONCEPTS, INC. 7525 Connelley Drive Suite B Hanover, Maryland 21076 410-760-2911	EXHIBIT 8 BACKGROUND 8 Lots 1 - 3 & ~~Lot 4 (Building #7)~~ Distribution Center & ~~Hotel~~

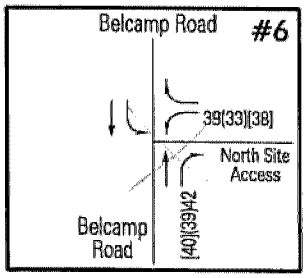
ABINGDON BUSINESS PARK (LOTS 1-3)

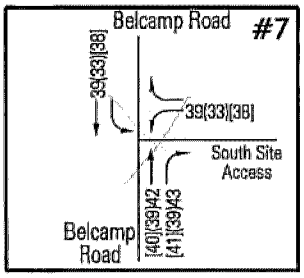


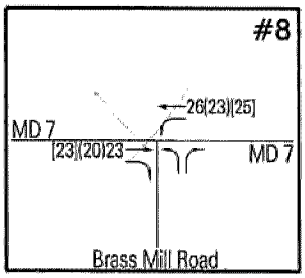


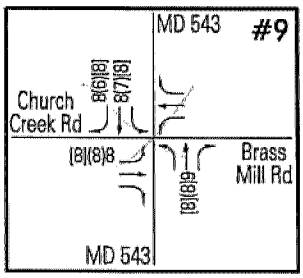


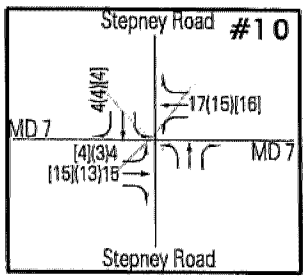












● - Intersection Studied

AM(PM)[SAT]

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911

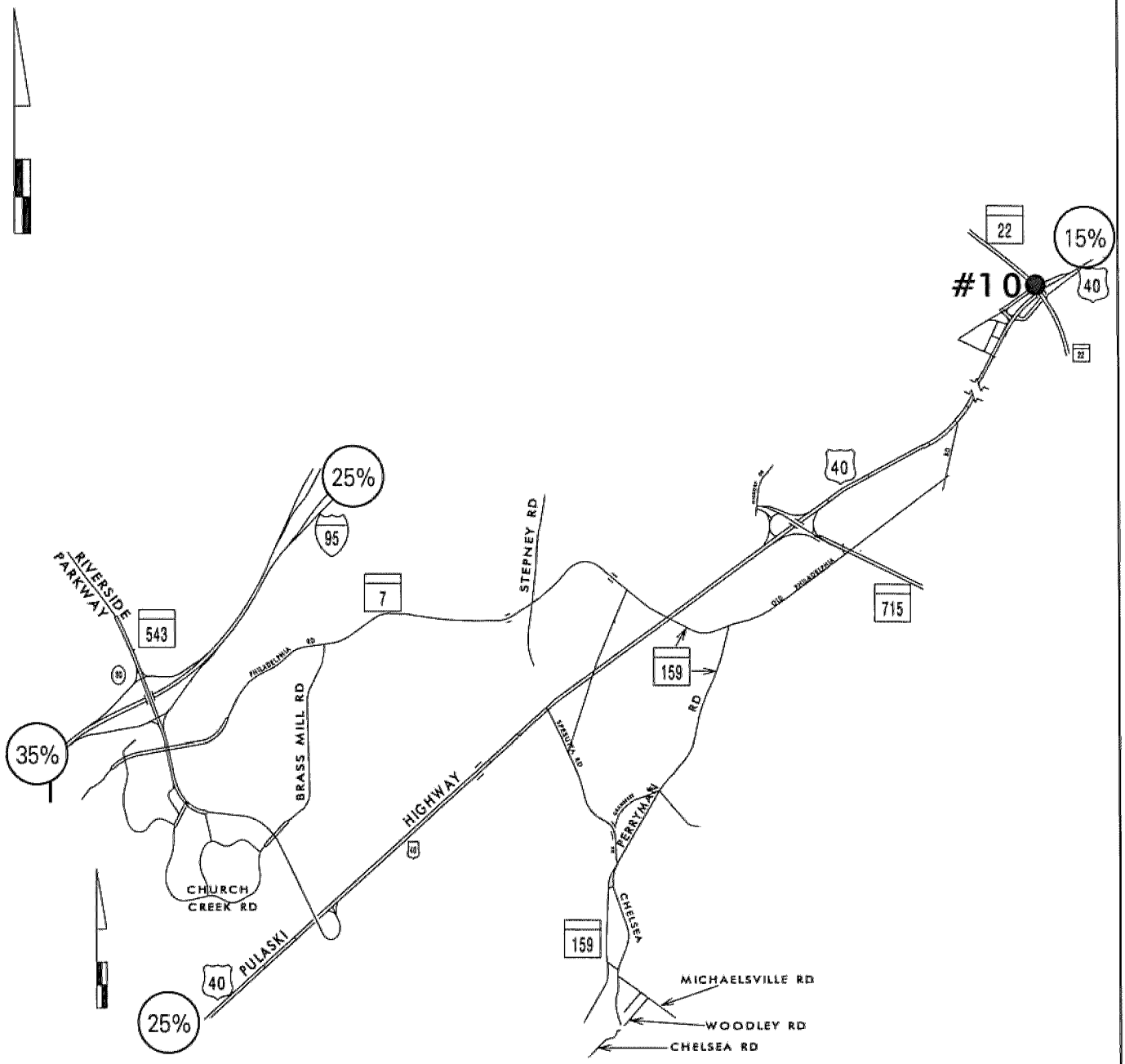
B#9

EXHIBIT 8

Site Generated Traffic - New Trips

BELCAMP RD -

(CONVENIENCE STORE W/ GAS + CAR WASH)



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Suite B
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410-760-2911

Bld 9

BELCAMP COMMERCIAL

HOTEL

From
JAMES RUN TIS
B412

SITE TRIPS

	AM		PM		SAT	
	IN	OUT	IN	OUT	IN	OUT
Retail/Service						
Super Convenience Market/ Gas Station						
ITE Land Use Code 960						
6.2 ksf	294	293	215	215	223	222
Less 12% Internal Capture	-35	-35	-26	-26	-27	-27
External Trips	259	258	189	189	196	195
Less Pass-by Trips*						
(63% AM;66% PM & SAT)	-163	-163	-125	-125	-129	-129
Net New Trips	96	95	64	64	67	66
Fast Food Restaurant With Drive-thru						
ITE Land Use Code 934						
8.6 ksf	176	170	146	135	241	231
Less 12% Internal Capture	-21	-20	-18	-16	-29	-28
External Trips	155	150	128	119	212	203
Less Pass-by Trips*						
(49% AM;50% PM & SAT)	-76	-74	-64	-60	-106	-102
Net New Trips	79	76	64	59	106	101
High Turnover Restaurant						
ITE Land Use Code 932						
24.0 ksf	131	108	145	89	137	132
Less 12% Internal Capture	-16	-13	-17	-11	-16	-16
External Trips	115	95	128	78	121	116
Less Pass-by Trips*						
(0% AM; 43% PM & SAT)			-55	-34	-52	-50
Net New Trips	115	95	73	44	69	66
Total Retail New Trips:	**290**	**266**	**201**	**167**	**242**	**233**
Total Retail Pass-by Trips:	**239**	**237**	**244**	**219**	**287**	**281**
Hotel						
ITE Land Use Code 310						
125 rooms	34	23	35	33	51	40
Less 12% Internal Capture	-4	-3	-4	-4	-6	-5
External Hotel Trips	**30**	**20**	**31**	**29**	**49**	**35**

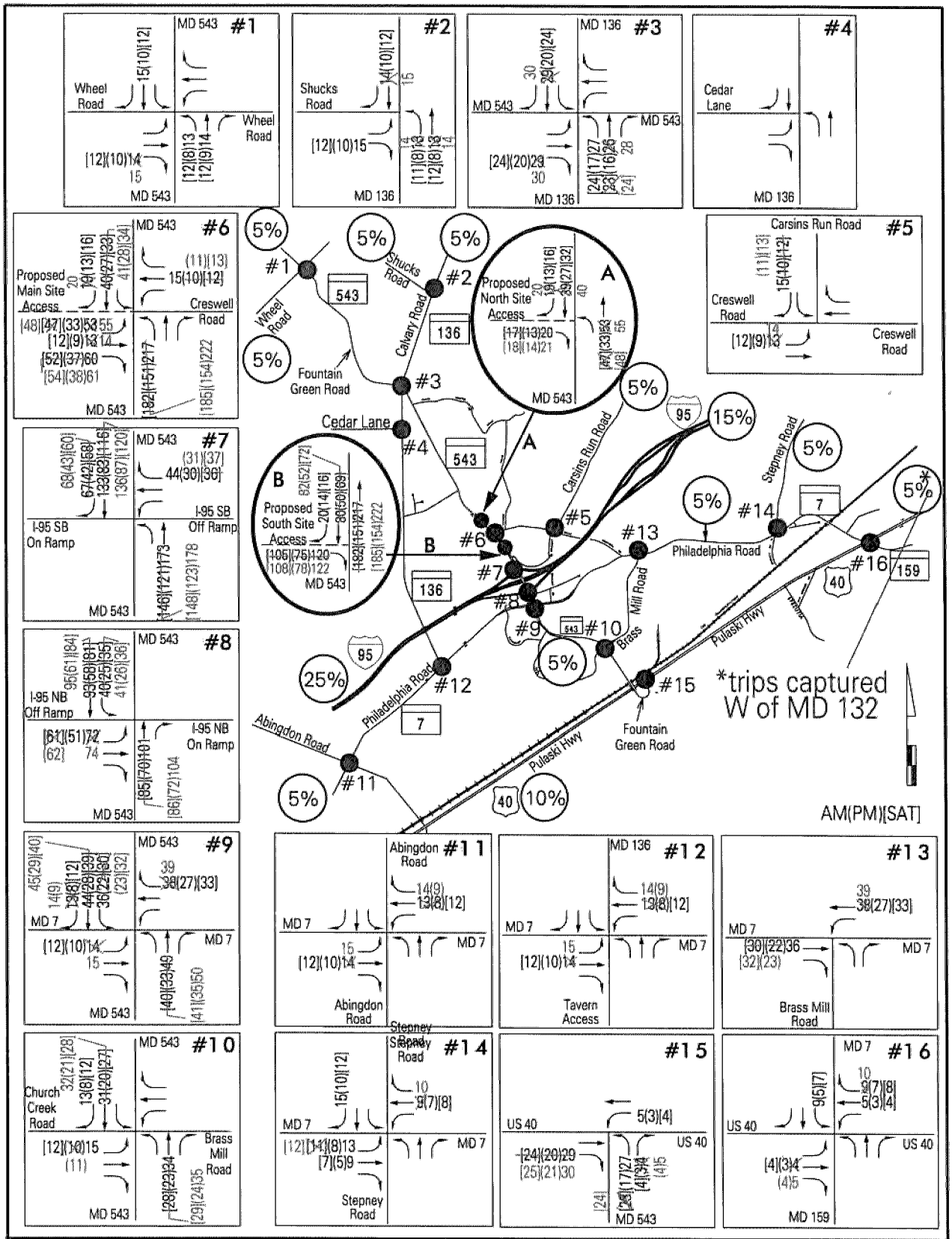
* Saturday pass-by ITE data is not available for this use. Harford County has approved substituting the PM pass-by rates for these uses.

From
James Run TIS

B#12

	AM		PM		SAT	
	IN	OUT	IN	OUT	IN	OUT
Office						
Business Park						
ITE Land Use Code 770*						
70.0 ksf	86	15	28	79	31	26
Less 12% Internal Capture	-10	-2	-3	-9	-4	-3
External Trips	76	13	25	70	27	23
Medical Office						
ITE Land Use Code 720						
20.0 ksf	41	12	20	50	27	21
Less 12% Internal Capture	-5	-1	-2	-6	-3	-3
External Trips	36	11	18	44	24	18
Residential						
Multi-family Mid-Rise						
ITE Land Use Code 221						
300 units	26	74	77	50	65	68
Less 12% Internal Capture	-3	-9	-9	-6	-8	-8
External Trips	23	65	68	44	57	60
Multi-family Low-Rise						
ITE Land Use Code 220						
278 units	29	97	93	54	131	136
Less 12% Internal Capture	-3	-12	-11	-6	-16	-16
External Trips	26	85	82	48	115	120
Senior Housing – Attached						
ITE Land Use Code 252						
100 units	7	13	14	12	20	13
Less 12% Internal Capture	-1	-2	-2	-1	-2	-2
External Trips	6	11	12	11	18	11
Total Office & Residential – External Trips	**167**	**185**	**205**	**217**	**241**	**232**

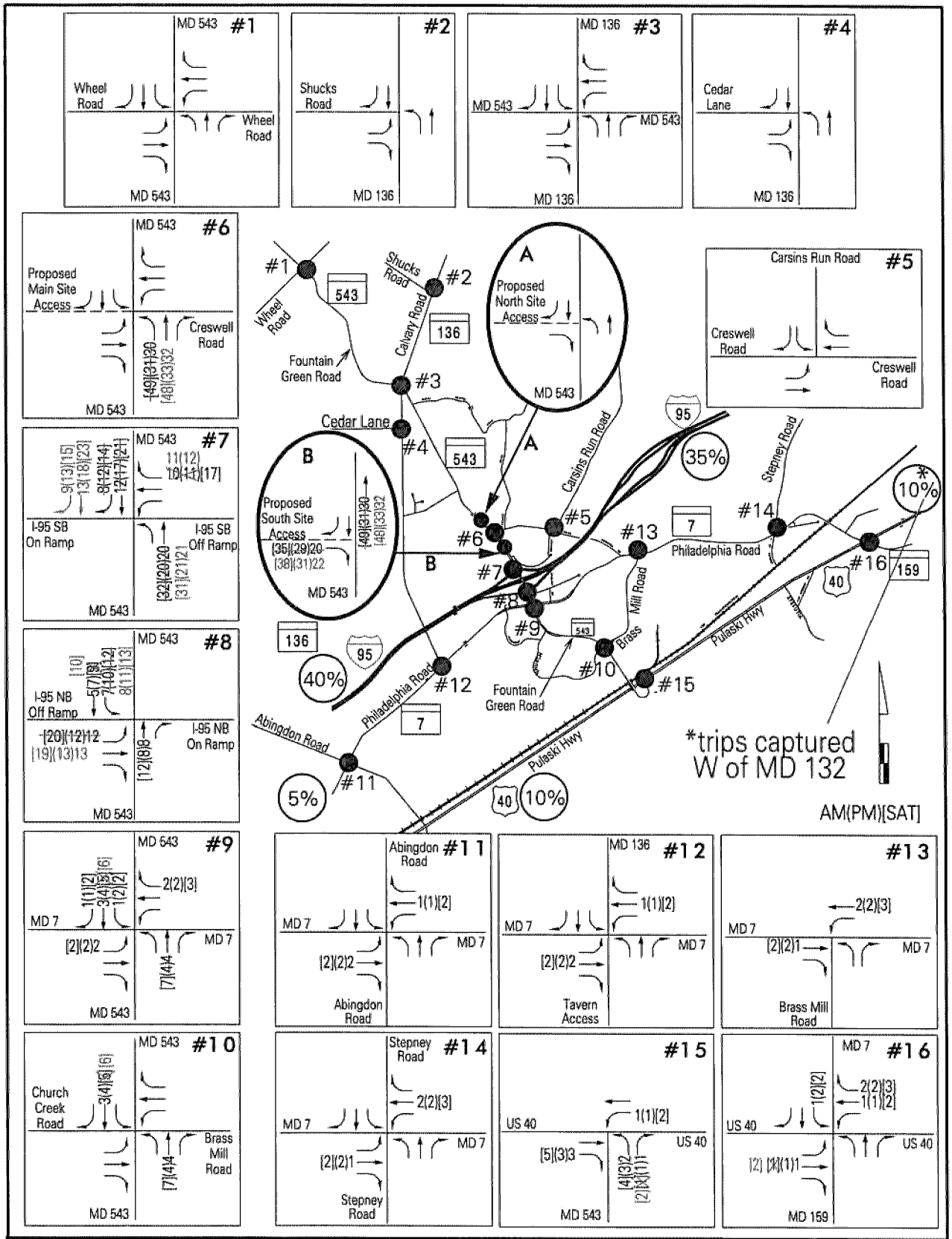
* Only the daily Saturday rates are available for this use. Therefore, we used the General Office data (ITE LUC 710) to determine the Saturday peak hour trips. Since 24% of daily Saturday general office trips occur during the peak hour of the generator, 24% of the Saturday business park trips were included as Saturday peak hour trips.



TRAFFIC CONCEPTS, INC.
7525 Connelly Drive
Suite B
Hanover, Maryland 21076
410-760-2911

EXHIBIT 7
Site Generated Traffic - Retail New Trips

BACKGROUND #12
James Run



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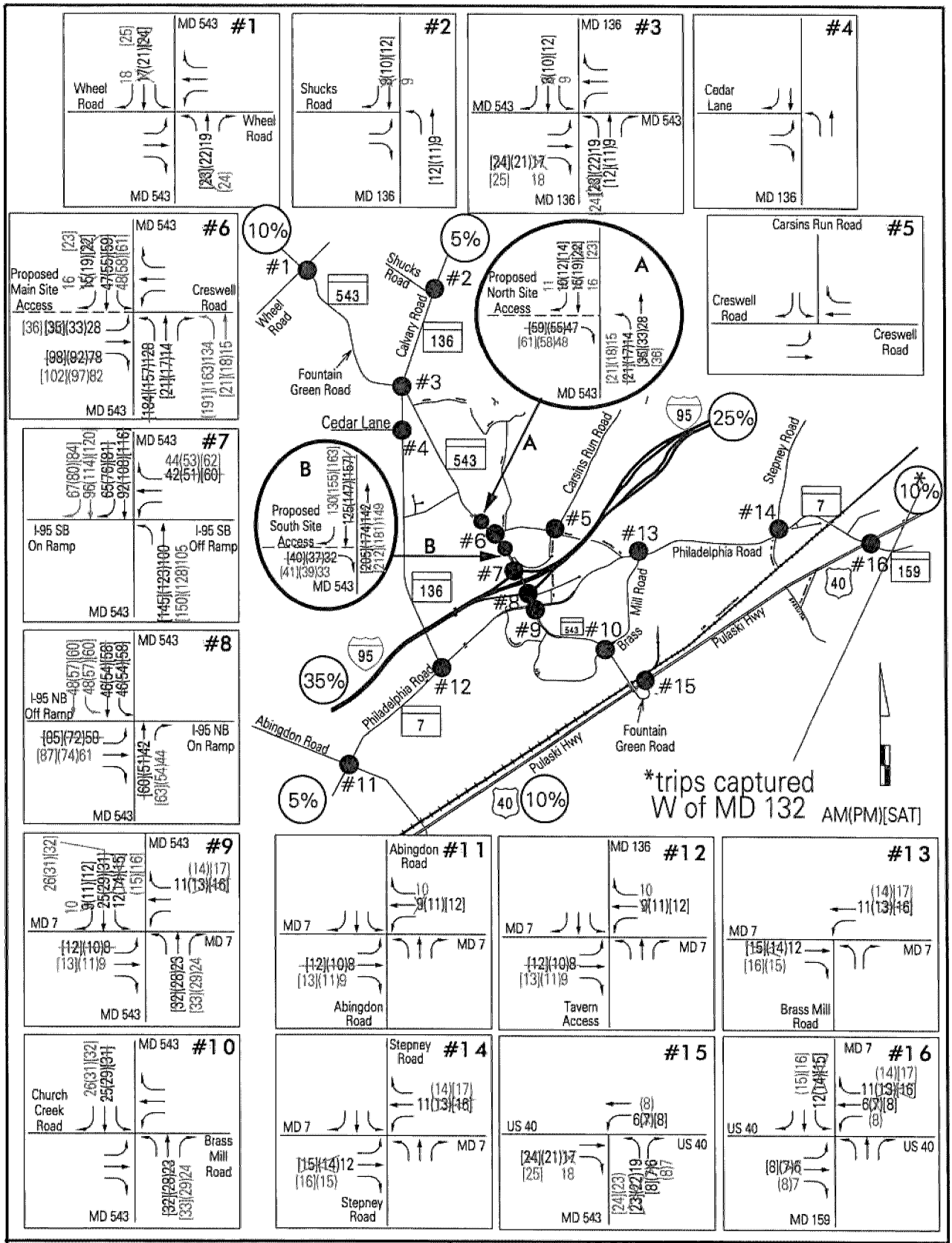
Suite B
Hanover, Maryland 21076
410-760-2911

EXHIBIT 9

Site Generated Traffic - Hotel Trips

BACKGROUND #12
James Run



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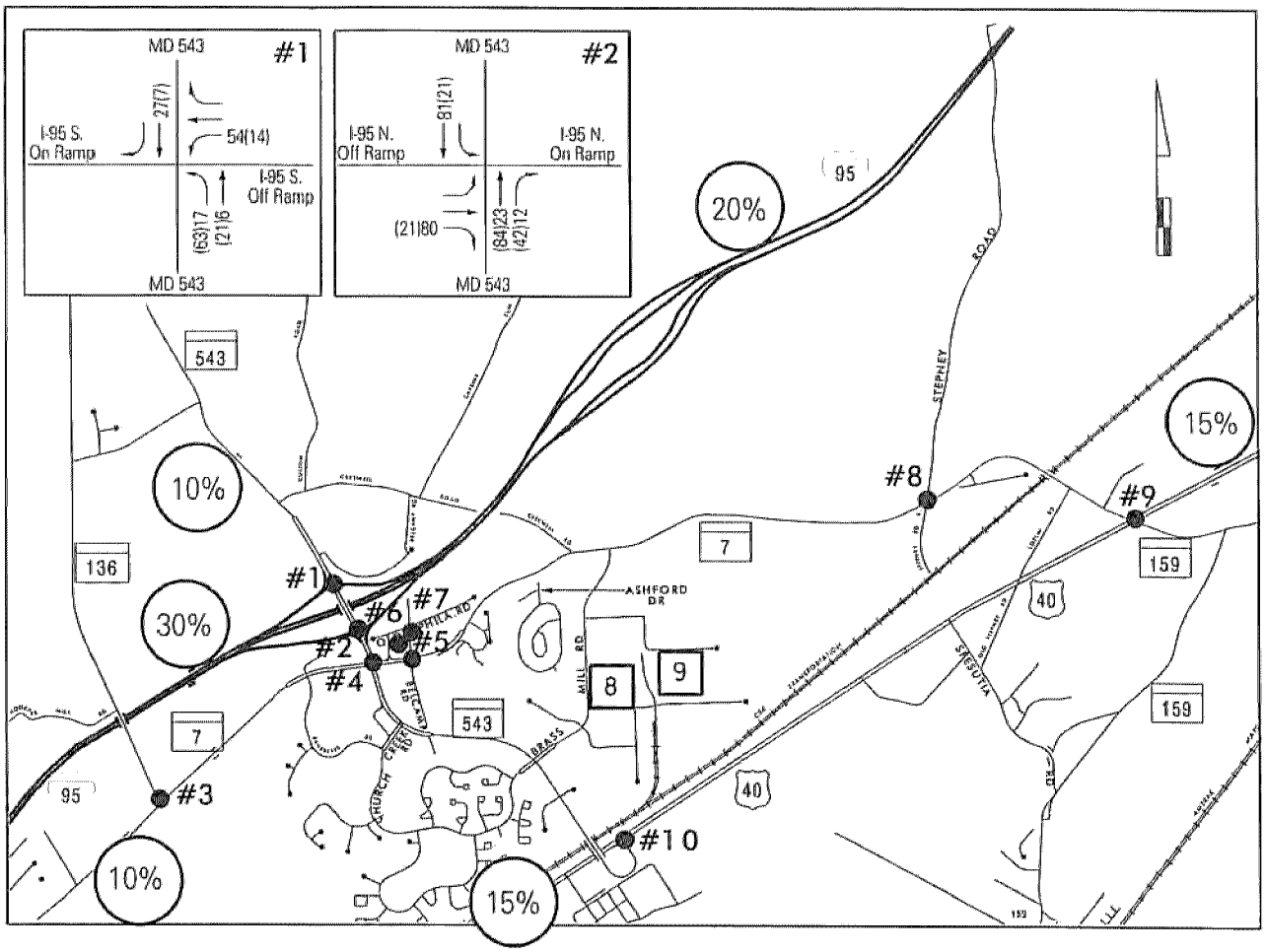
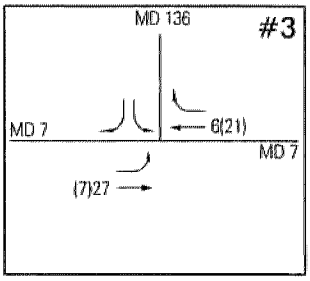
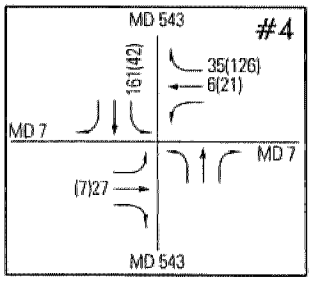
Hanover, Maryland 21076
410-760-2911

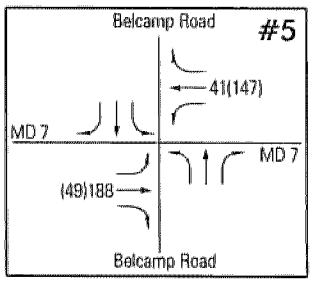
EXHIBIT 10
Site Generated Traffic -
Office & Residential Trips

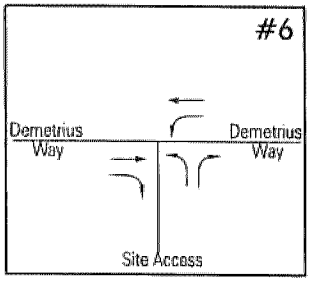
BACKGROUND #12
James Run

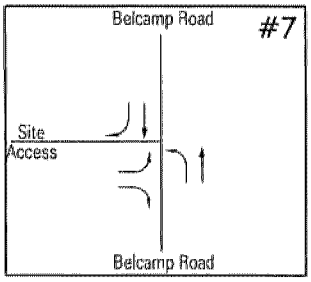


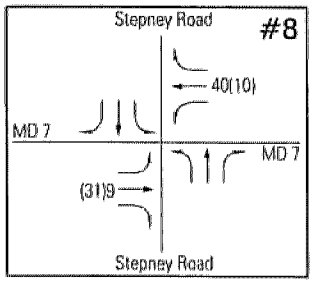


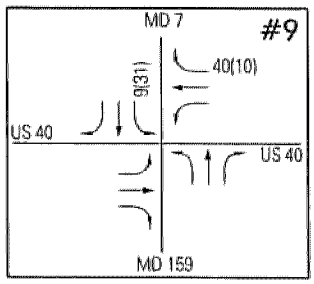


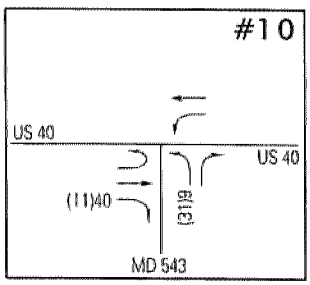












AM(PM)

TRAFFIC CONCEPTS, INC.
325 Gambrills Road
Suite E
Gambrills, Maryland 21054
410-923-7101

#14

BACKGROUNDS 8 - 9

Riverside Business Park - Lots 1B & 36

APPENDIX V

SITE TRIP
DATA & PLAN

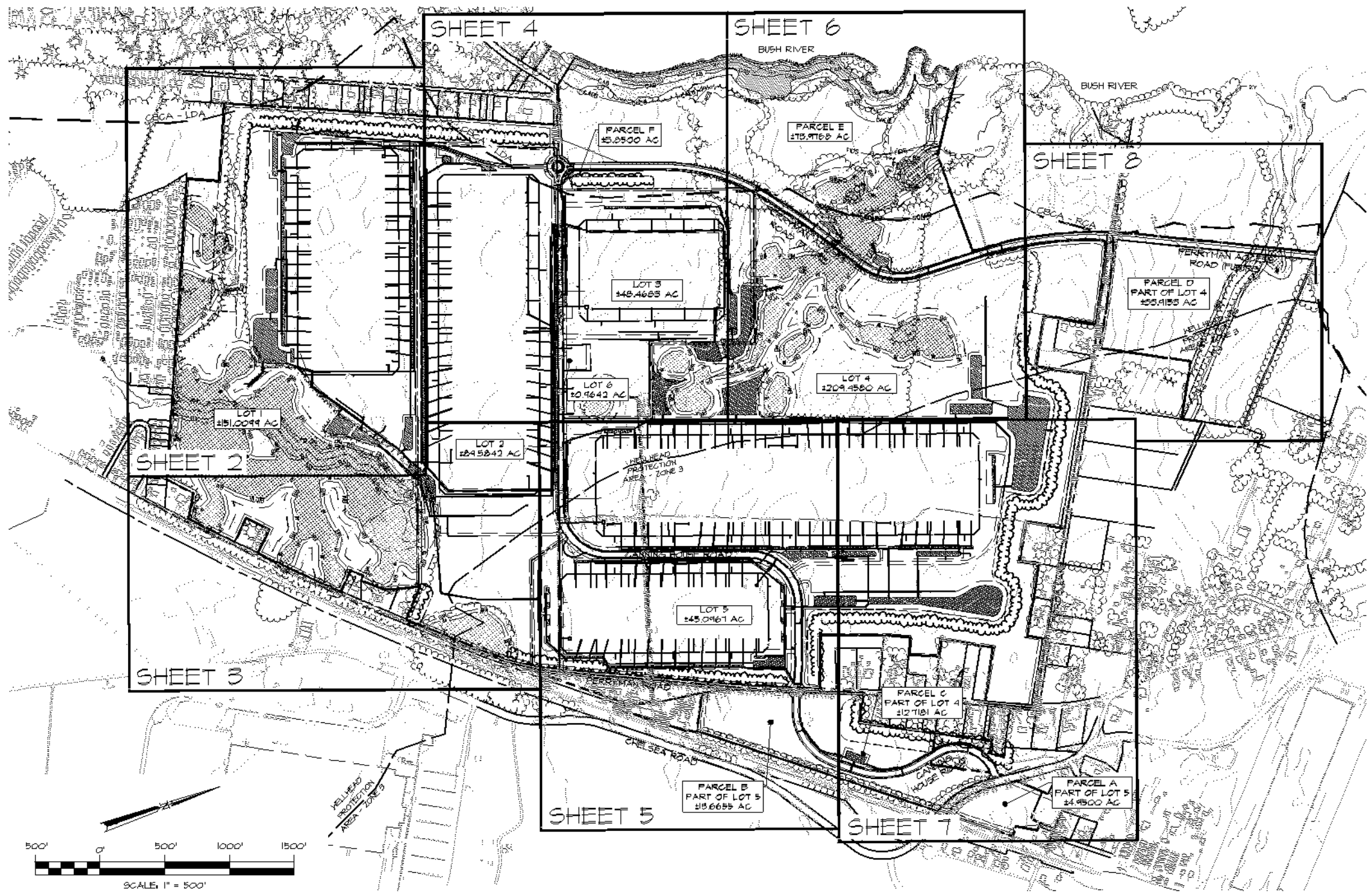
SERIES 2
PRELIMINARY PLAN
MITCHELL PROPERTY DEVELOPMENT
HARFORD COUNTY, MARYLAND

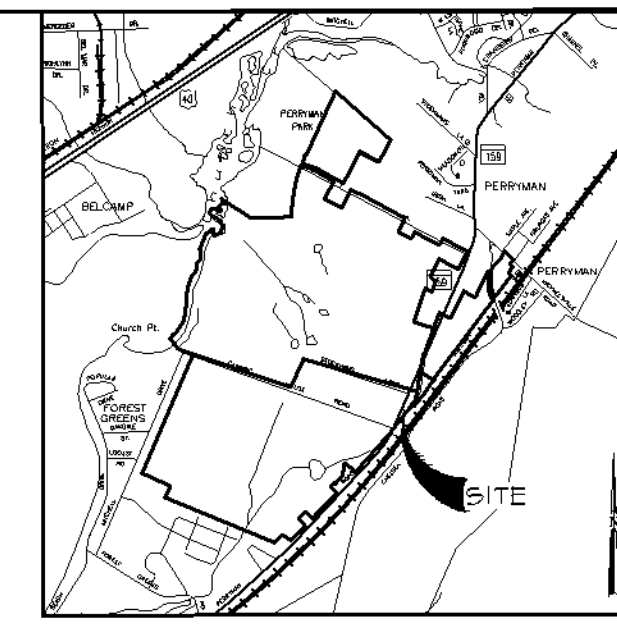
LEGEND

- RIGHT OF WAY LINE
- PROPERTY LINE
- EX EASEMENT
- EX CONTOURS
- EX TREELINE
- EX EDGE OF PAVING
- EX OVERHEAD LINES
- EX SANITARY LINES
- EX WATER LINES
- EX STORM DRAIN LINES
- EX WETLAND
- 25' WETLAND BUFFER
- 75' NATURAL RESOURCE DISTRICT BUFFER
- WELLHEAD PROTECTION ZONE - ZONE 3
- CHESAPEAKE BAY CRITICAL AREA
- SOIL LINES
- PROP CONTOUR
- PROP STORM DRAIN LINES
- PROP SETBACK
- PROP LANDSCAPE BUFFER
- PROP EASEMENT
- EX BUILDING
- PROP BUILDING
- PROP SANITARY LINE
- PROP WATER LINE
- REGULATED STREAM
- 75' STREAM BUFFER
- 50' FLOOD PROTECTION SETBACK
- FOREST INTERIOR DWELLING SPECIES HABITAT
- CRITICAL AREA EXPANDED BUFFER
- MEAN HIGH WATER (OFFSET FOR CLARITY)
- 100 YEAR FEMA FLOODPLAIN
- 15 - 24.9% EXISTING SLOPES
- ≥25% EXISTING SLOPES
- PROP TREELINE
- PROP PAVING
- PROP SIDEWALK
- PROP STORMWATER
- PROP PARKING SPACE QUANTITY PER ROW
- PROP. LIGHT POLE AND FIXTURE
- EX UTILITY POLE
- PROP UTILITY POLE
- EX SIGN
- PROP SIGN
- HANDICAP PARKING
- EX FIRE HYDRANT
- PROP FIRE HYDRANT
- EX MANHOLE
- PROP MANHOLE
- PROP INLET
- EX WATER VALVE
- PROP WATER VALVE

GENERAL NOTES

1. PARCEL BOUNDARY FIELD SURVEYED BY FWA IN SEPTEMBER 2006.
2. THE FINAL LOCATION FOR FIRE HYDRANTS, VALVES, WATER LINES, SEWER LINES, PUMP STATIONS, ETC. SHALL BE DETERMINED DURING FINAL ENGINEERING.
3. GRADING PERMIT WILL BE REQUIRED, SEDIMENT CONTROLS TO BE DETAILED AT FINAL DESIGN.
4. STORM WATER MANAGEMENT SHALL BE DESIGNED IN ACCORDANCE WITH THE UPDATED MDE DESIGN MANUAL.
5. ROAD IMPROVEMENTS TO PERRYMAN ROAD AND CANNING HOUSE ROAD TO BE DESIGNED AND CONSTRUCTED PER HARFORD COUNTY D.P.W. RECOMMENDATIONS.
6. FOREST STAND DELINEATION PERFORMED BY HOLLY OAK CONSULTING, LLC AND SUBMITTED ON DECEMBER 1, 2021 AND APPROVED ON MAY 11, 2022.
7. A LANDSCAPE PLAN, LIGHTING PLAN, FOREST CONSERVATION PLAN WILL BE SUBMITTED AS SEPARATE PLAN SETS. A FINAL LANDSCAPE & LIGHTING PLAN MUST BE APPROVED PRIOR TO THE RELEASE OF THE BUILDING PERMIT.
8. ANY EXISTING UTILITY RELOCATION TO BE COORDINATED THROUGH APPROPRIATE UTILITY OWNER AND HARFORD COUNTY D.P.W.
9. ALL PROPOSED SIGNAGE SHALL CONFORM TO THE HARFORD COUNTY SIGN CODE. SIGN PERMITS SHALL BE OBTAINED FROM THE HARFORD COUNTY DEPARTMENT OF PLANNING AND ZONING. ALL SIGNS WILL BE LOCATED WITHIN A SIGN EASEMENT. EXACT LOCATIONS TO BE DETERMINED DURING FINAL ENGINEERING.
10. LIGHTING SHALL BE DESIGNED AND CONTROLLED SO THAT ANY LIGHT SHALL BE SHADED, SHIELDED OR DIRECTED SO THAT THE LIGHT INTENSITY OR BRIGHTNESS SHALL NOT ADVERSELY AFFECT THE OPERATION OF VEHICLES OR REFLECT ONTO RESIDENTIAL LOTS OR BUILDINGS.
11. HEAVY AND LIGHT DUTY PAVING SECTION DESIGN TO BE DETERMINED DURING ENGINEERING PHASE.
12. THE SITE LAYS PARTIALLY WITHIN ZONE AE 95SPECIAL FLOOD HAZARD AREAS INUNDATED BY THE 100 YEAR FLOODPLAIN, ZONE X 9ARAES OF 500 YEAR FLOODPLAIN) AND ZONE X UNSHADED (AREA OF MINIMAL FLOOD HAZARD) PER FEMA FLOOD INSURANCE RATE MAPS 24025C0276E, 24025C0277E, 24025C0278E, AND 24025C0279E 9EFF. 4/19/2016).
13. THE PROPERTY IS WITHIN THE CHESAPEAKE BAY CRITICAL AREA. ±13.11 ACRES ARE WITHIN THE RESOURCE CONSERVATION AREA (RCA) AND ±5.88 ACRES ARE WITHIN THE LIMITED DEVELOPMENT AREA (LCA) OF THE CHESAPEAKE BAY CRITICAL AREA.
14. THERE ARE ± 225.14 ACRES OF THE PROPERTY THAT FALL WITHIN THE WELLHEAD PROTECTION AREA - ZONE 3. EXISTING WELLHEAD REFERENCE INFORMATION WAS OBTAINED FROM PERRYMAN, MARYLAND WELLFIELD WELL HEAD PROTECTION PLAN. SOURCE WATER ASSESSMENT FOR PERRYMAN WELL FIELD PREPARED BY MDE OCTOBER, 2000.
15. WATER METERS TO BE PROVIDED INSIDE BUILDINGS IN UTILITY ROOMS.
16. PER HARFORD COUNTY ZONING CODE SECTION 267-27 ACCESSORY USES AND STRUCTURES, "RETAIL SALES IN INDUSTRIAL DISTRICTS SHALL BE PERMITTED, PROVIDED THAT THE GOODS SOLD ARE MANUFACTURED OR PRODUCED ON SITE.
17. THE SITE IS LOCATED INSIDE THE PRIORITY FUNDING AREA.
18. NO RARE, THREATENED, OR ENDANGERED SPECIES WERE OBSERVED DURING THE FIELD INVESTIGATIONS. THE MARYLAND DEPARTMENT OF NATURAL RESOURCES (DNR) RESPONDED TO A REQUEST FOR RECORDS OF RARE, THREATENED, AND ENDANGERED SPECIES ON SEPTEMBER 13, 2021 STATING THAT THERE ARE NO RECORDS OF RARE, THREATENED, OR ENDANGERED SPECIES WITHIN THE BOUNDARY OF THE SITE.
19. HANDICAP RAMPS SHALL BE PROVIDED AT THE INTERSECTIONS OF PUBLIC ROADS. TO BE SHOWN AT FINAL DESIGN.





VICINITY MAP
1"=2000'

SOILS CHART

SYMBOL	UNIT NAME	ERODIBILITY	HYDRIC	K-VALUE	HYDRIC GROUP
BeA	BELTSVILLE SILT LOAM 0% - 2% SLOPES	-	-	0.37	C
BeB	BELTSVILLE SILT LOAM 2% - 5% SLOPES	-	-	0.37	C
BeC	BELTSVILLE SILT LOAM 5% - 10% SLOPES	-	-	0.43	C
ChB2	CHILLUM SILT LOAM 2% - 5% SLOPES	-	-	0.32	C
CkC2	CHILLUM-NESHAMINY SILT LOAM 5% - 10% SLOPES	-	-	0.49	B
Cx	CUT AND FILL LAND	-	-	-	-
DeA	DELANCO SILT LOAM 0% - 3% SLOPES	-	-	0.37	C
DeB	DELANCO SILT LOAM 3% - 5% SLOPES	-	-	0.37	C
Eh	ELKTON SILT LOAM	-	X	0.43	D
EsA	ELSINBORO LOAM 0% - 2% SLOPES	-	-	0.49	B
EsB2	ELSINBORO LOAM 2% - 5% SLOPES	-	-	0.49	B
EsC2	ELSINBORO LOAM 5% - 10% SLOPES	-	-	0.49	B
EvC	EVESBORO LOAMY SAND 5% - 15% SLOPES	-	-	0.05	A
FgaA	FALLSINGTON LOAMS 0% - 2% SLOPES	-	X	-	D
HtA	HATBORO-CODORUS COMPLEX 0% - 3% SLOPES	-	X	0.49	D
JpB	JOPPA GRAVELLY SANDY LOAM 2% - 5% SLOPES	-	-	0.17	A
JpC	JOPPA GRAVELLY SANDY LOAM 5% - 10% SLOPES	-	-	0.17	A
KpA	KEYPORT SILT LOAM 0% - 2% SLOPES	-	-	0.49	D
KpB	KEYPORT SILT LOAM 2% - 5% SLOPES	-	-	0.49	D
Lr	LEONARDTOWN SILT LOAM	-	X	0.37	D
MkA	MATAPEAKE SILT LOAM 0% - 2% SLOPES	-	-	0.49	C
MkB	MATAPEAKE SILT LOAM 2% - 5% SLOPES	-	-	0.49	C
MtA	MATAPEX SILT LOAM 0% - 2% SLOPES	-	-	0.49	C
MtB	MATAPEX SILT LOAM 2% - 5% SLOPES	-	-	0.49	C
Ot	OTHELLO SILT LOAM 0% - 2% SLOPES	-	X	0.43	D
RuD	RUSSETT FINE SANDY LOAM 5% - 15% SLOPES	-	-	0.32	C
RuE	RUSSETT FINE SANDY LOAM 15% - 30% SLOPES	-	-	0.32	C
Sg	SAND AND GRAVEL PITS	-	-	-	-
ShB	SASSAFRAS SAND LOAM 2% - 5% SLOPES	-	-	0.20	B
ShC	SASSAFRAS SAND LOAM 5% - 10% SLOPES	-	-	0.20	B
SlB2	SASSAFRAS LOAM 2% - 5% SLOPES	-	-	0.32	B
SlC2	SASSAFRAS LOAM 5% - 10% SLOPES	-	-	0.32	B
SsD	SASSAFRAS AND JOPPA 10% - 15% SLOPES	-	-	0.32	B
SsE	SASSAFRAS AND JOPPA 15% - 30% SLOPES	-	-	0.32	B
Sw	SWAMP	-	X	0.02	D
Tm	TIDAL MARSH	-	X	0.02	D
W	WATER	-	-	-	-
WoB	WOODSTOWN LOAM 2% - 5% SLOPES	-	-	0.37	C

SITE DEVELOPMENT DATA

1. PROPERTY ADDRESS: 1714 PPERRYMAN ROAD, PERRYMAN, MD 21130
2. OWNER: F.O. MITCHELL & BRO., P.O. BOX 36, PERRYMAN, MARYLAND 21130 (PARCEL 1, 2, 3, 4A, & 4B)

   CHARLES A MASLIN III, 100 SOUTH WASHINGTON STREET, HAVRE DE GRACE, MARYLAND 21078

PARCEL 1 - PARK FARM NORTH
- TAX MAP 63, GRID 2B, PARCEL 53
- TAX ACCOUNT NO.: 02-060833
- ADDRESS: 1714 PERRYMAN ROAD, ABERDEEN, MARYLAND 21001-4219
- DEED REFERENCE: CGH 2174/633
- PRESENT ZONING: LI - LIGHT INDUSTRIAL
- AREA: ±357.8324 ACRES

PARCEL 2 - PARK FARM SOUTH
- TAX MAP 63, GRID 3B, PARCEL 53
- TAX ACCOUNT NO.: 02-098343
- ADDRESS: PERRYMAN ROAD, PERRYMAN, MARYLAND 21130
- DEED REFERENCE: CGH 2174/633
- PRESENT ZONING: LI - LIGHT INDUSTRIAL
- AREA: ±280.5230 ACRES

PARCEL 3 - FORDS LANE COUNTY SWAP
- TAX MAP 63, GRID 1B, PARCEL 306
- TAX ACCOUNT NO.: 02-095734
- ADDRESS: FORDS LANE, ABERDEEN, MARYLAND 21001
- DEED REFERENCE: CGH 2256/404
- PRESENT ZONING: LI - LIGHT INDUSTRIAL
- AREA: ±36.0809 ACRES

PARCEL 4A - LEE FIELD, SOUTH PART
- TAX MAP 63, GRID 2C, PARCEL 62
- TAX ACCOUNT NO.: 02-060868
- ADDRESS: 1625 PERRYMAN ROAD, ABERDEEN, MARYLAND 21001-4216
- DEED REFERENCE: CGH 2174/633
- PRESENT ZONING: GI - GENERAL INDUSTRIAL
- AREA: ±23.9054 ACRES

PARCEL 4B - LEE FIELD, NORTH PART
- TAX MAP 63, GRID 2D, PARCEL 62
- TAX ACCOUNT NO.: 02-060868
- ADDRESS: MICHAELSVILLE ROAD, PERRYMAN, MARYLAND 21130
- DEED REFERENCE: CGH 2174/633
- PRESENT ZONING: LI - LIGHT INDUSTRIAL
- AREA: ±5.4436 ACRES

PARCEL 216 - TO BE ACQUIRED FROM CHARLES MASLIN
- TAX MAP 63, GRID 2C, PARCEL 216
- TAX ACCOUNT NO.: 02-059711
- ADDRESS: 1607 PERRYMAN ROAD, PERRYMAN, MARYLAND 21130
- DEED REFERENCE: 10661/448
- PRESENT ZONING: AG & RI
- AREA: ±4.6310 ACRES

2. TOTAL GROSS AREA (PER BOUNDARY SURVEY): ±708.4223 AC

LOT 1:	TOTAL LOT AREA:	±151.0099 ACRES
LOT 2:	NET LOT AREA =	±89.5842 ACRES
	RIGHT OF WAY FOR PERRYMAN ROAD:	±1.4841 ACRES
	TOTAL LOT AREA =	±91.0733 ACRES
LOT 3:	TOTAL LOT AREA:	±48.4683 ACRES
LOT 4:	NET LOT AREA:	±209.4580 ACRES
	RIGHT OF WAY FOR FORDS LANE:	±1.3413 ACRES
	RIGHT OF WAY FOR CANNING HOUSE ROAD:	±1.5317 ACRES
	PARCEL C PART OF LOT 4:	±12.7181 ACRES
	PARCEL D PART OF LOT 4	±33.9153 ACRES
	TOTAL LOT AREA =	±268.9709 ACRES
LOT 5:	NET LOT AREA:	±43.0967 ACRES
	PARCEL A PART OF LOT 5	±4.9500 ACRES
	PARCEL B PART OF LOT 5:	±13.6655 ACRES
	TOTAL LOT AREA =	±61.7122 ACRES
LOT 6:	TOTAL LOT AREA =	±0.9642 ACRES
PARCEL E:	TOTAL LOT AREA =	±73.9768 ACRES
PARCEL F:	TOTAL LOT AREA =	±3.8500 ACRES
RIGHT OF WAY TO BE DEDICATED TO HARFORD COUNTY FOR TRANSPORTATION PLAN PERRYMAN ACCESS ROAD (FUTURE):		±8.3967 ACRES
TOTAL ACREAGE:		±708.4223 ACRES

3. ZONING:
   - PARCELS: 1, 2, & 3 — LI (LIGHT INDUSTRIAL DISTRICT)
   - PARCELS: 4A — GI (GENERAL INDUSTRIAL DISTRICT)
   - PARCEL: 4B — LI (LIGHT INDUSTRIAL DISTRICT)
   - PARCEL: 216 (±4.3475 AC) — AG (AGRICULTURAL)
   - PARCEL: 216 (±1.3375 AC) — RI (URBAN RESIDENTIAL)
4. USE:
   - EXISTING: AGRICULTURAL
   - PROPOSED: WAREHOUSE WITH AN ACCESSORY USE OF RETAIL/ SERVICE USE NOT TO EXCEED 2,000 SF AND TO BE INTEGRATED INTO THE OVERALL PROJECT
5. PRINCIPAL USE MINIMUM LOT SIZE = 20,000 SF
   MAX ALLOWABLE BUILDING HEIGHT: 40 FT
   PROPOSED BUILDING HEIGHT FOR BUILDING 1, 2, 3, 4, & 5: 40 FT

   ACCESSORY USE MINIMUM LOT SIZE = 10,000 SF
   MAX ALLOWABLE BUILDING HEIGHT: 36 FT
   PROPOSED BUILDING HEIGHT FOR ACCESSORY RETAIL/ SERVICE BUILDING: 36 FT
6. MAXIMUM BUILDING COVERAGE = 55.00%
   - A. LOT 1: BLDG 1: 954,680 SF (21.9164 AC±); 21.9164 AC/ 151.0099 AC = 14.51% BLDG COVERAGE
   - B. LOT 2: BLDG 2: 1,379,240 SF (31.6047 AC±); 31.6047 AC/ 91.0733 AC = 34.17% BLDG COVERAGE
   - C. LOT 3: BLDG 3: 583,480 SF (13.3949 AC±); 13.3949 AC/ 48.4683 AC = 27.64% BLDG COVERAGE
   - D. LOT 4: BLDG 4: 1,664,600 SF (38.2140 AC±); 38.2140 AC/ 268.97040 AC = 14.21% BLDG COVERAGE
   - E. LOT 5: BLDG 5: 615,000 SF (14.1185 AC±); 14.1185 AC/ 61.7122 AC = 22.88% BLDG COVERAGE
   - F. LOT 6: RETAIL/ SERVICE 2,000 SF (0.0459 AC±); 0.0459 AC/ 0.9642 AC = 4.76% BLDG COVERAGE
7. MAXIMUM IMPERVIOUS COVERAGE = 85.00%
   - A. LOT 1: TOTAL IMPERVIOUS COVERAGE = 44.9539 AC; 44.7011 AC/ 151.0099 AC = 29.60% IMPERVIOUS COVERAGE
   - B. LOT 2: TOTAL IMPERVIOUS COVERAGE = 61.6359 AC; 61.6892 AC/ 91.0733 AC = 67.74% IMPERVIOUS COVERAGE
   - C. LOT 3: TOTAL IMPERVIOUS COVERAGE = 28.7677 AC; 28.7677 AC/ 48.4683 AC = 59.35% IMPERVIOUS COVERAGE
   - D. LOT 4: TOTAL IMPERVIOUS COVERAGE = 79.6830 AC; 79.6830 AC/ 268.9709 AC = 29.63% IMPERVIOUS COVERAGE
   - E. LOT 5: TOTAL IMPERVIOUS COVERAGE = 29.3082 AC; 29.3082 AC/ 61.7122 AC = 47.49% IMPERVIOUS COVERAGE
   - F. LOT 6: TOTAL IMPERVIOUS COVERAGE = 0.1977 AC; 0.1977 AC/ 0.9642 AC = 20.50% IMPERVIOUS COVERAGE
8. CHESAPEAKE BAY CRITICAL AREA:
   - TOTAL AREA OF PROPERTY WITHIN THE CHESAPEAKE BAY CRITICAL AREA= ±18.99 AC
   - TOTAL AREA OF PROPERTY IN THE RESOURCE CONSERVATION AREA (RCA)= ±13.11 AC
   - ALLOWABLE PERCENTAGE OF IMPERVIOUS SURFACE ALLOWED IN RCA= 0%
   - PROPOSED ROUND ABOUT ON CANNING HOUSE ROAD (PUBLIC ROAD): 0.64 AC
   - PROPOSED PERRYMAN WEST ROAD (PUBLIC ROAD): 1.56 AC
   - TOTAL PROP. IMPERVIOUS SURFACE FOR PUBLIC ROAD WITHIN RCA= 2.22 AC (3.04%)
   - TOTAL AREA OF PROPERTY IN THE LIMITED DEVELOPMENT AREA (LDA)=±5.88 AC
   - ALLOWABLE PERCENTAGE OF IMPERVIOUS SURFACE ALLOWED IN LDA= 15%
   - PROPOSED IMPERVIOUS SURFACE WITHIN LDA (LOT 1 & 2)= 0.76 (12.93%)
9. MAX. IMPERVIOUS AREA FOR WELLHEAD PROTECTION ZONE (WPZ)-ZONE 3: 50.00%
   TOTAL AREA WITHIN THE WELLHEAD PROTECTION ZONE = 225.1443 AC

LOT 2 IMPERVIOUS WITHIN WPZ =	1.9225 AC
LOT 4 IMPERVIOUS WITHIN WPZ =	68.9523 AC
LOT 5 IMPERVIOUS WITHIN WPZ =	29.3082 AC
TOTAL IMPERVIOUS COVER = 100.1830 AC/ 225.1443 AC =	44.50 %
LOT 2 (INCLUDING RIGHT OF WAY FOR PERRYMAN ROAD)	
AREA WITHIN WPZ =	12.9614 AC
IMPERVIOUS WITHIN WPZ =	1.9225 AC
TOTAL IMPERVIOUS COVER = 1.9225 AC /13.3894 AC =	14.83%
LOT 4 (INCLUDING PARCEL C & D PART OF LOT 4)	
AREA WITHIN WPZ =	150.4702 AC
IMPERVIOUS WITHIN WPZ =	68.9523 AC
TOTAL IMPERVIOUS AREA = 68.9523 AC/ 139.9057 AC =	45.82%
LOT 5 (INCLUDING PARCEL A & B PART OF LOT 5)	
AREA WITHIN WPZ =	61.7122 AC
IMPERVIOUS WITHIN WPZ =	29.3082 AC
TOTAL IMPERVIOUS AREA = 32.4821 AC/ 65.5866 AC =	47.49%

10. TOTAL FOREST AREA ON SITE: ±116.06 AC
    PROPOSED FOREST COVER TO BE REMOVED: ±12.05 AC
11. MINIMUM REQUIRED BUILDING SETBACKS FOR LI ZONE BASED ON PROPOSED WAREHOUSE USE:
    - MINIMUM SETBACK FROM ADJACENT RESIDENTIAL ZONING: 50'
    - MINIMUM FRONT YARD: 25'
    - MINIMUM SIDE YARD: 15'
    - MINIMUM REAR YARD: 25'
    - MINIMUM LOT WIDTH AT BUILDING LINE: 50'

    BASED ON PROPOSED SERVICE USE:
    - MINIMUM SETBACK FROM ADJACENT RESIDENTIAL ZONING: 25'
    - MINIMUM FRONT YARD: 25'
    - MINIMUM SIDE YARD: 10'
    - MINIMUM REAR YARD: 35'
    - MINIMUM LOT WIDTH AT BUILDING LINE: 50'
12. PARKING REQUIRED
    ON-SITE PARKING AS NECESSARY TO ACCOMMODATE TRAFFIC GENERATED BY THE USE AND THE LARGEST EMPLOYEE SHIFT
    - BLDG 1: 647 PARKING SPACES (INCLUDING 13 HANDICAP SPACES)
    - BLDG 2: 867 PARKING SPACES (INCLUDING 20 HANDICAP SPACES)
    - BLDG 3: 444 PARKING SPACES (INCLUDING 9 HANDICAP SPACES)
    - BLDG 4: 764 PARKING SPACES (INCLUDING 16 HANDICAP SPACES)
    - BLDG 5: 378 PARKING SPACES (INCLUDING 8 HANDICAP SPACES)
    - TOTAL WAREHOUSE PARKING= 3,100 PARKING SPACES (INCLUDING 66 HANDICAP SPACES)

    ON-SITE PARKING FOR RETAIL SERVICES 1 PARKING SPACE PER 200 SF.
    - REQUIRED: 2000 SF / 200 SF = 10 PARKING SPACES
    - PROPOSED: 11 PARKING SPACES (INCLUDING 1 HANDICAP SPACE)

    TOTAL ON-SITE PARKING: 3,111 PARKING SPACES (INCLUDING 67 HANDICAP SPACES)
13. PROPOSED EMPLOYEES AT LARGEST SHIFT
    - BLDG 1: 498 EMPLOYEES
    - BLDG 2: 667 EMPLOYEES
    - BLDG 3: 342 EMPLOYEES
    - BLDG 4: 588 EMPLOYEES
    - BLDG 5: 291 EMPLOYEES
    - RETAIL/ SERVICE: 3 EMPLOYEES
14. TRAILER PARKING (12' X 60')
    - BLDG 1: 340 TRAILER SPACES
    - BLDG 2: 373 TRAILER SPACES
    - BLDG 3: 224 TRAILER SPACES
    - BLDG 4: 778 TRAILER SPACES
    - BLDG 5: 145 TRAILER SPACES
    - TOTAL TRAILER SPACES: 1,860 TRAILER PARKING SPACES
15. REQUIRED BUFFER YARDS
    - ADJACENT PROPERTIES ZONED EITHER LI OR GI DO NOT REQUIRE A BUFFER YARD.
    - ADJACENT PROPERTIES ZONED AG REQUIRE A TYPE 'B' BUFFER YARD (MIN. 15' WIDE).
    - ADJACENT PROPERTIES ZONED RI REQUIRE A TYPE 'D' BUFFER YARD (MIN. 30' WIDE).
16. NATURAL RESOURCE AREAS:
    - EXISTING FOREST COVER: ±116.06 AC
    - EXISTING AFFORESTATION EASEMENTS: ±5.87 AC
    - EXISTING NATURAL RESOURCE DISTRICT AREA: ±113.26 AC
17. WATER SUPPLY: PUBLIC- CONTRACT #6352 & #6377
    SEWER SUPPLY: PUBLIC- CONTRACT #6692-A & #5020

REV#	DATE	DESCRIPTION

REVISIONS

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ARCHITECTS
ENGINEERS
PLANNERS
SURVEYORS
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frederickward.com
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OWNER/DEVELOPER
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1343 ASHTON ROAD
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ATTN: MR. WHIT MACCUAIG
PHONE: 410-925-0953

SERIES 2
PRELIMINARY PLAN
MITCHELL PROPERTY DEVELOPMENT
2ND ELECTION DISTRICT HARFORD COUNTY, MD

DATE:	05/24/2?
SCALE:	NTS
DESIGNED BY:	KFP
DRAWN BY:	KFP
CHECKED BY:	GHP
DRAWING NO:	PP01
SHEET	1 OF 8
FWA JOB NUMBER:	2081139.10

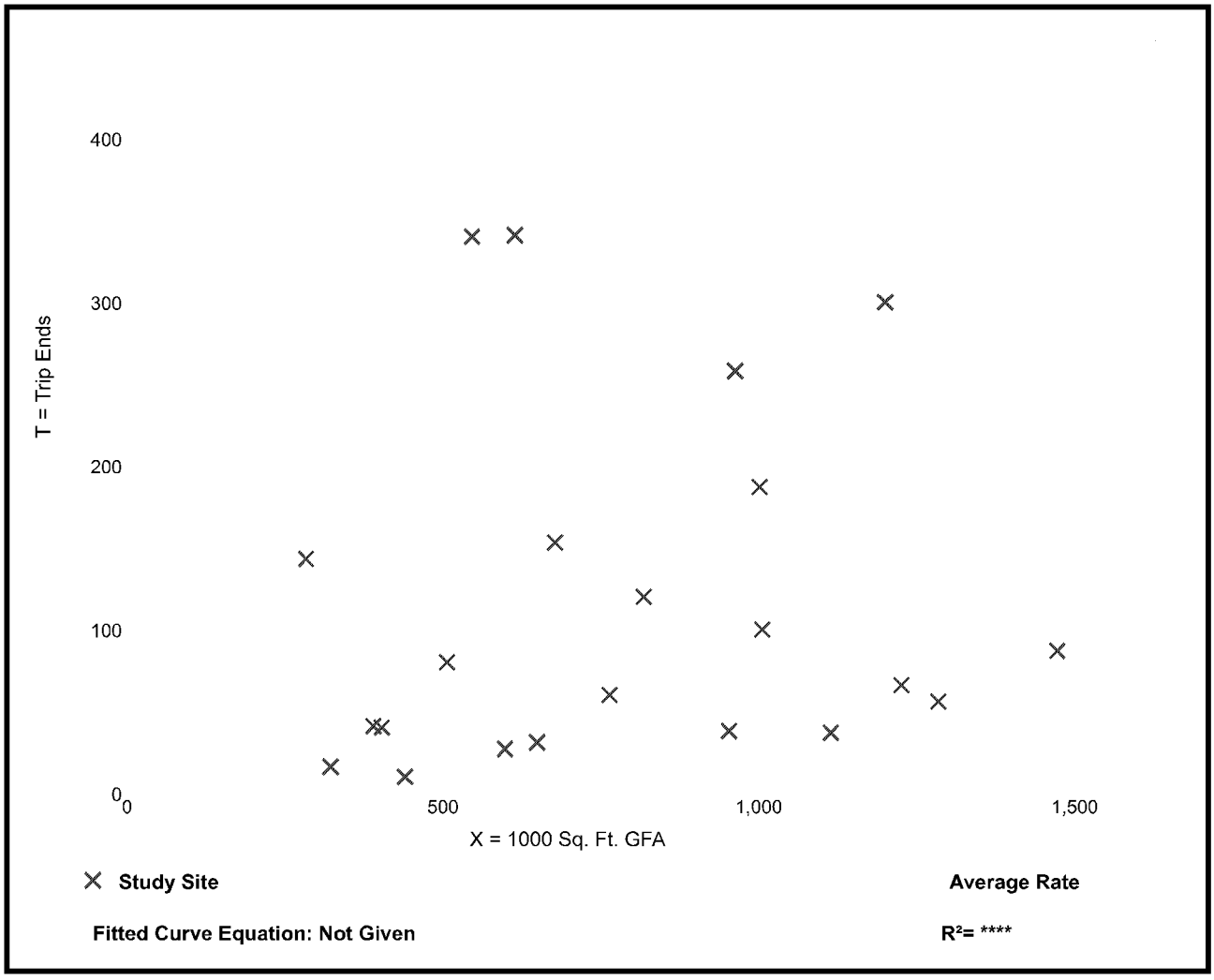
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. 1000 Sq. Ft. GFA: 783
Directional Distribution: 81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.03 - 0.62	0.15

Data Plot and Equation



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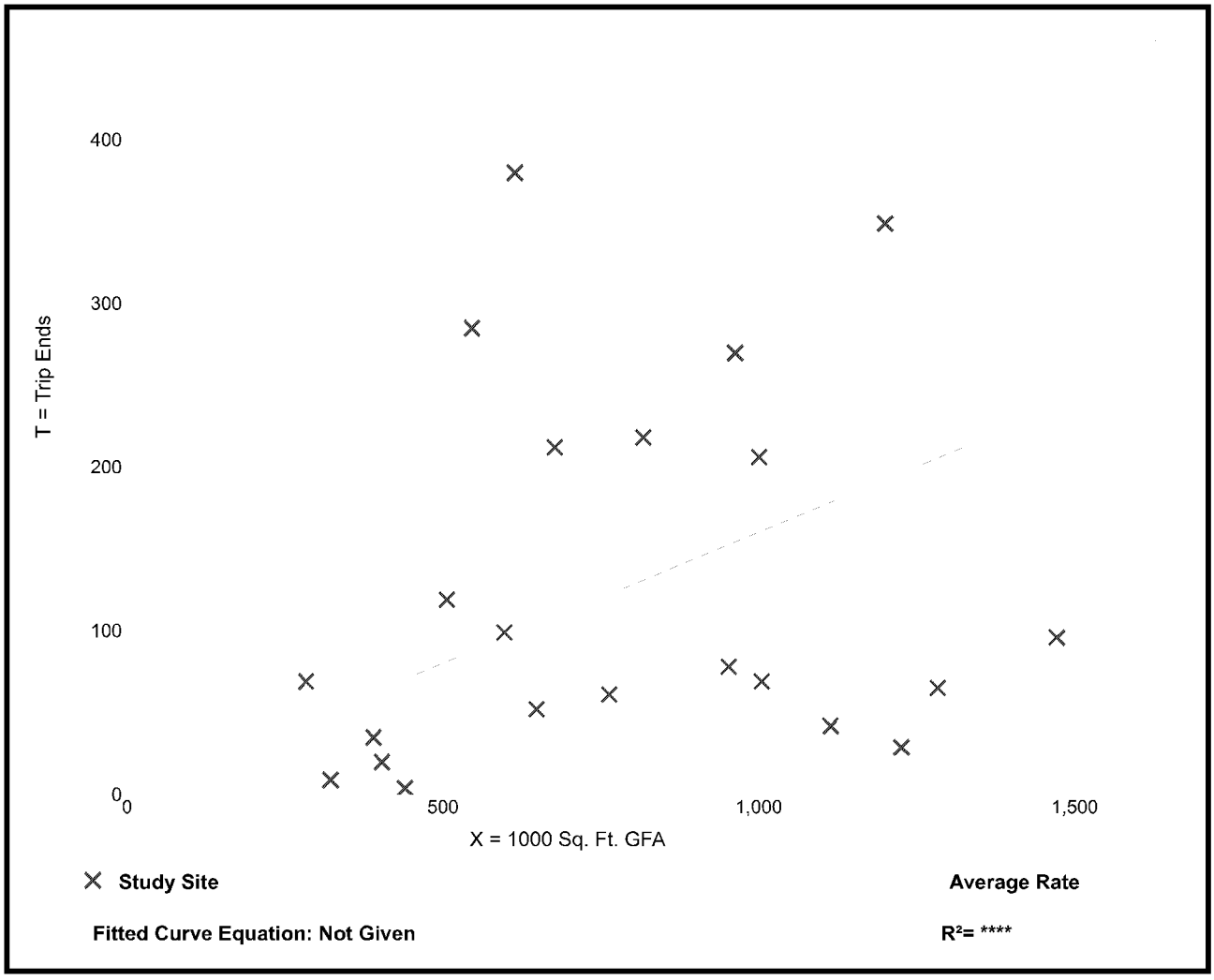
High-Cube Fulfillment Center Warehouse - Non-Sort
(155)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. 1000 Sq. Ft. GFA: 783
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.16	0.01 - 0.62	0.15

Data Plot and Equation



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