

July 28, 2017

Valdis Lazdins
Director, Department of Planning and Zoning
George Howard Building
3430 Court House Drive
Ellicott City, MD 21043

Re: Initial Community Enhancement Floating (CEF-M) District Submission
Erickson at Limestone Valley
Erickson Living Properties II, LLC

On behalf of the development team of Erickson Living Properties II, LLC (the “Applicant”), the following narrative and plans are submitted for the purpose of proposing a Community Enhancement Floating District – M (“CEF District”) for the properties located in Clarksville, Howard County, Maryland (Map 34, Parcel 185; p/o Map 28, Parcel 100; and Map 35, Parcel 259) (collectively, the “Site”). The purpose of this CEF proposal is to seek zoning approval for a continuing care retirement community and to permit the expansion/relocation and architectural enhancement of the existing Freestate Gasoline Service Station currently located on Parcel 259.

In accordance with Howard County Zoning Regulations (the “Regulations”) Section 121.0.I, a CEF District may be established at a particular location if the following criteria are met:

- 1. The proposed CEF District is located within the planned service area for both public water and sewer service.**

The Site abuts and adjoins the existing boundary of the Planned Service Area (“PSA”) along the Route 108 corridor, but is not located within such PSA for public water and sewer service at the time of this initial CEF District submission. Applicant’s proposed CEF District shall require an amendment to the General Plan of Howard County, Plan Howard 2030 (the “General Plan”), to extend the PSA to allow for public water and sewer service to the Site as a condition precedent to final approval. Applicant’s proposed CEF District is consistent with the General Plan and fulfills the criteria set forth in Chapter 6 relating to the expansion of the PSA. As such, the Applicant is reasonably confident that an appropriate expansion of the PSA will be adopted.

- 2. A proposed CEF-M District shall have frontage on and access to an arterial or collector roadway, or a local road if access to the local road is safe based on road conditions and accident history and the local road is not internal to a residential development**

As a development consisting of a mix of residential and commercial uses, the subject Site falls under the criteria for a CEF-M District. The Site has frontage and direct access onto Route 108 which is designated as a minor arterial roadway in the General Plan. *See, PlanHoward 2030 Map 7-3.* The Site is also proposed to feature a secondary public access road extending from Route 108 along the western boundary of the proposed CEF District.

- 3. For all properties, the minimum development size for any CEF District shall be five acres.**

The Site is approximately 62.709 acres and therefore, it meets this criteria.

- 4. The proposed CEF District is not located in an existing M-2, TOS, NT, MXD, or PGCC District.**

The properties comprising the Site are currently zoned RC-DEO (Map 34, Parcel 185; p/o Map 28, Parcel 100) and B-2 (Map 35, Parcel 259).

- 5. The proposed CEF District is not permitted within the interior of a neighborhood comprising only single-family detached dwellings.**

The properties comprising the Site are not within the interior of a neighborhood comprising only single-family dwellings.

- 6. A CEF development at the proposed location shall be compatible with surrounding residential neighborhoods, existing land uses in the vicinity of the site in terms of providing a transitional use between different zoning districts and/or land uses and the scale, height, mass and architectural detail of proposed structures.**

The Applicant's proposed CEF District shall consist of an integrated continuing care retirement community ("CCRC") composed of 1,200 independent living units and 240 health care units, consisting of assisted living, memory care, and skilled nursing facilities, resident accessory spaces and buildings, and accessory uses necessary for the operation of the community or for the benefit or convenience of the residents and their guests (See Applicant's Initial Submission Development Concept Plan (the "Plan") attached hereto).

The primary purpose of the proposed CCRC is to provide housing and continuing care for people over the age of 62. As shown and depicted on the Plan, the Applicant's proposed CCRC is sited in 2 development "neighborhoods" upon the eastern and western portions of the Site, each consisting of a series of 1 story to 5 story buildings with underground parking and accessory spaces with private internal roadways and enclosed pedestrian connections throughout. The Site, itself, is bordered to the southwest by a mix of B-1 and B-2 commercial properties, undeveloped RC-DEO agricultural land under preservation easements to the west and north, single-family dwellings across Sheppard Lane to the northeast, and the existing River Hill Garden and Landscape Design Center and the Linden-Linthicum United Methodist Church to the immediate east. A section of the Village of River Hill developed as single-family detached dwellings is located to the east and

southeast of the River Hill Garden and Landscape Design Center and Linden-Linthicum United Methodist Church properties approximately 400' from the boundary of the Site. The Applicant has intentionally sited buildings of 1 to 3 stories along the portions of the Site adjoining Sheppard Lane and buildings of 4 or fewer stories along Route 108 to limit the visual impact of the proposed CCRC community on the surrounding area. The architecture of the CCRC buildings is proposed to acknowledge the traditional and diverse nature of the neighborhood aesthetic and will complement the surrounding residential and commercial uses. (See the Applicant's Plan attached hereto). The location of the CCRC buildings and uses throughout the Site and the compatible architectural designs proposed by the Applicant hereunder allow for an appropriate transition between the surrounding mix of commercial, institutional, residential, and agricultural uses in terms of scale, height, mass, and architectural detail.

As set forth in greater detail on the Plan, the Applicant's proposed CEF District shall also include the existing motor vehicle fueling facility located at Tax Map 35, Parcel 259. The motor vehicle fueling facility site currently consists of eight double-sided fuel pumps and one standalone diesel pump and kerosene dispenser, lighted canopy overhang, and accessory convenience store. The inclusion of the site within the proposed CEF District will allow (i) the motor vehicle fueling facility to be redeveloped under architecturally enhanced standards (including, but not limited to, recessed lighting fixtures, environmental controls, and enhanced circulation and pedestrian safety features) with enhanced landscaping and streetscape features which would otherwise not occur absent this proposed CEF District and (ii) relocate the existing motor vehicle fueling facility to allow for the secondary public access road (see Section 7 below) serving as a potential connection to the adjoining commercial properties to the west of the Site along with signalized access to such properties.

7. The proposed CEF District shall include enhancements as provided in Section 121.0.G. Enhancements shall be proportionate to the scale of the CEF development.

As set forth above and shown in greater detail on the Plan, the Applicant's proposed CEF District provides a variety of Community Enhancements under Section 121.0.G, all of which are beneficial to the community and the County as a whole and far exceed those which would be required to be provided under the current development standards applicable to the several properties constituting the Site were they to be developed independently of each other.

The Site consists of an existing motor vehicle fueling facility and two undeveloped RC-DEO parcels located along Route 108. Each of the RC-DEO parcels is currently outside of the PSA and, alone, neither would satisfy the criteria for the expansion of public water and sewer services. As such, these RC-DEO zoned parcels would remain within the Tier IV growth tier for development purposes and would be limited to a single minor residential subdivision upon each property. Under such a limited scheme of development, the road improvements required under either SHA design standards or Howard County's Adequate Public Facilities Ordinance would be limited to nominal fee-in-lieu payments and would not result in any immediate relief from traffic congestion to the residents of the area. In addition, the development of these parcels independent of each other would drastically limit the potential to present a unified streetscape presence in full conformity with the Clarksville Pike Streetscape Plan and Design Manual.

Under the Applicant's proposed CEF District, all of these underutilized subject properties are aggregated and integrated into a single connected design which allows for these sites to be developed to a more appropriate and socially beneficial use while simultaneously allowing the Applicant to provide Community Enhancements under Section 121.0.G far in excess of those which would be possible without the implementation of the flexible standards of the CEF District. Specifically, the Applicant is proposing the following as Community Enhancements:

Streetscape Enhancements:

- Streetscape enhancements along the entire frontage of Route 108 in accordance with the Clarksville Pike Streetscape Plan and Design Manual, including, but not limited to, a multi-use pathway with connecting crosswalks, seating areas, and flowering and shade trees.

Transportation Enhancements:

- Route 108 Corridor, west of Linden-Linthicum Lane
 - (i) Construct Public Access Road with the potential ability to connect to adjoining commercial properties to the west of the Site to provide a signalized access to such properties to Route 108.
- Linden Linthicum Lane at intersection with Route 108
 - (i) Provide funding for signalization at intersection with Route 108 when approved by SHA;
 - (ii) Convert the eastbound and westbound turn lanes to a shared thru/right lanes;
 - (iii) Provide additional lanes on east side of the intersection.
- Access to Site
 - (i) Install a separate dedicated left turn lane from Route 108 into Site;
 - (ii) Provide an acceleration lane for vehicles exiting west from site onto Route 108;
 - (iii) Install a channelization to restrict exiting left turns from the Site onto Route 108;
 - (iv) Install a deceleration lane for traffic entering the Site from the east;
- Sheppard Lane
 - (i) Provide continuous eastbound left turn lane on Route 108;
 - (ii) Realign intersection at Route 108 to improve safety;
 - (iii) Widen Sheppard Lane to provide 2 lanes at the approach to Route 108;
 - (iv) Widen the westbound approach to provide two thru lanes and a right turn lane along Route 108;
 - (v) Provide traffic signal interconnection from Sheppard Lane to the Route 32 interchange.

These proposed Community Enhancements provide much needed infrastructure improvements aimed at alleviating existing issues relating to traffic congestion, signalization, and safety along this section of the Route 108 corridor. The Community Enhancements set forth above would not be possible but for the implementation of the integrated design proposal set for in the Applicant's proposed CEF District and are proportionate to the scale of the development proposed by the Applicant hereunder.

8. The proposed CEF District shall meet the criteria of the purpose statement.

Under the Regulations, the CEF District was established to encourage the creative development and redevelopment of commercial and residential properties through flexible zoning so that the proposed development complements and enhances the surrounding uses and creates a more coherent, connected development.

The Applicant's proposed CEF District is intended to provide a truly integrated continuing care retirement community experience within Howard County for people over the age of 62. As stated above, the CCRC proposed by the Applicant would result in 1,200 much needed independent living units and 240 health care units, consisting of assisted living, memory care, and skilled nursing facilities, resident amenity spaces and buildings, and accessory uses necessary for the operation of the community or for the benefit or convenience of the residents and their guests.

The development of the Site in accordance with Applicant's proposed CEF District fulfills a number of stated land use policies within the General Plan and satisfies a growing and documented need for a continuing care retirement community within Howard County for people over the age of 62. The presence of such a CCRC will allow the County's aging population the flexibility to age in place within the County.

Chapter 6 (Growth) of the Howard County General Plan notes the following:

[w]hereas the total U.S. population grew by 9.7% from 2000 to 2010, those entering the 45 to 64 year age cohort, the approximate ages of the baby boomers, increased by 31.5% during that time period. Baby boomers currently make up about 29% of the countywide population and are starting to move into the 65-plus age cohort.

PlanHoward, Chapter 6 (Growth), pg. 66

Furthermore, the Howard County General Plan makes the pertinent finding that

[w]hereas the overall County population increased by 16%, those 65 and over increased by 57%. There are now 10,577 more residents 65 and older compared to ten years ago – 29,045 total in 2010 compared to 18,468 in 2000. Almost 27% of the total increase of 39,243 residents over the decade was comprised of those aged 65 and older. The very old, 85 and over, increased by 47%. This trend will continue as the baby boomers continue to age.

PlanHoward, Chapter 6 (Growth), pg. 66

As such, Policy 9.4 of the Howard County General Plan aims to “expand housing options to accommodate the County’s senior population who prefer to age in place and people with special needs.” In support of that Policy Goal, the Howard County General Plan finds that the

County’s housing stock should support the aging population and will need to continue General Plan 2000 policies to promote diverse senior housing for those that wish or need to downsize to more easily maintained units as they age. The policies should also continue to support seniors who choose to age in place in their own homes or in their own communities...The County also recognizes that as older residents’ ability to live independently diminishes, they often need to move to housing that provides support services. There are both nursing and assisted living options for seniors in the County, offering a continuum of services, from acute care to congregate and group housing to in-home services. In order to accommodate the projected 19% of residents age 65 or older by 2030, the County’s support of continuing care housing and services must be maintained.

PlanHoward, Chapter 9 (Housing), pp. 130-131

A. Allow greater design flexibility and a broader range of development alternatives than the existing zoning district.

As stated above, the Site consists of an existing motor vehicle fueling facility and two undeveloped RC-DEO parcels located along Route 108. Each of the RC-DEO parcels is currently outside of the PSA and, alone, neither would be capable of satisfying the criteria for the expansion of public water and sewer services under the General Plan. As such, these RC-DEO zoned parcels would remain within the Tier IV growth tier for development purposes and would be limited to a single minor residential subdivision on each such property. Under the Applicant’s proposed CEF District, all of these underutilized properties are aggregated and integrated into a single connected design which fulfills a stated land use policy goal of the General Plan and allows for these sites to be developed to their highest and best uses while simultaneously allowing the Applicant to provide Community Enhancements under Section 121.0.G far in excess of those which would be possible without the implementation of the flexible standards of the CEF District.

B. Provide features and enhancements which are beneficial to the community in accordance with Section 121.0.G.

As set forth above and shown in greater detail on the Plan, and in addition to those public benefits noted elsewhere herein, the Applicant’s proposed CEF District shall provide those

Community Enhancements under Section 121.0.G stated in Section 7 above, all of which are beneficial to the community and the County as a whole.

C. Provide a higher quality of site design and amenities than is possible to achieve under the standard provisions of existing zoning district requirements.

The Applicant's proposed CEF District will result in an integrated CCRC providing much needed independent living units, 240 health care units, consisting of assisted living, memory care, and skilled nursing facilities, resident amenity spaces and buildings, and accessory uses necessary for the operation of the community or for the benefit or convenience of the residents and their guests, all in a well-developed and coordinated campus setting (See Applicant's Plan attached hereto). The site design proposed by the Applicant hereunder utilizes the entire Site and takes advantage of the existing topography and environmental features to create a vibrant interconnected senior community which would not be possible under the underlying zoning. In addition, the inclusion of the existing motor vehicle fueling facility within the Site, will allow this use to be redeveloped under modern standards (including, but not limited to, recessed lighting fixtures, environmental controls, and enhanced circulation and pedestrian safety features) with enhanced landscaping and streetscape features which would otherwise not be possible under the underlying zoning.

The development of the Site as an integrated design under the Applicant's proposed CEF District allows for the creation of amenity spaces and buildings, walkways and bike paths, gardens, and open space areas throughout the project on a scale which would not be possible under the underlying zoning.

D. Encourage creative architectural design with the most favorable arrangement of site features, based on physical site characteristics and contextual sensitivity to surrounding developments.

As shown and depicted on the Plan, the Applicant's proposed CCRC is sited in 2 development "neighborhoods" upon the eastern and western portions of the Site, each consisting of series of 1-5 story buildings and amenity spaces with internal roadways throughout. The separation of the improved areas of the Site into these 2 development areas integrates those stream and wetland features and buffers located through the middle of the Site as well as those specimen trees located throughout while simultaneously limiting the disturbance of those features in the development of the CCRC.

Furthermore, by providing underground parking in each of these two development areas for the vast majority of the parking needs of the residents as well as guests and employees, the Applicant proposed CEF District takes an unprecedented approach to reducing impervious surfaces on site resulting from surface parking.

The architecture of the CCRC buildings is proposed to acknowledge the traditional and diverse nature of the neighborhood aesthetic and will complement the surrounding residential and commercial uses.

E. Serve as a transitional area by providing a mix of uses compatible with the surrounding community.

As stated above, the Site, itself, is bordered to the southwest by a mix of B-1 and B-2 commercial properties, undeveloped RC-DEO agricultural land under preservation easements to the west and north, single-family dwellings across Sheppard Lane to the northeast, and the existing River Hill Garden and Landscape Design Center and Linden-Linthicum United Methodist Church to the immediate east. A section of the Village of River Hill developed as single-family detached dwellings is located to the east of the River Hill Garden and Landscape Design Center and Linden-Linthicum United Methodist Church properties approximately 400' from the boundary of the Site. The Applicant has intentionally sited buildings of 1 to 3 stories along the portions of the Site adjoining Sheppard Lane and buildings of 4 or fewer stories along Route 108 to limit the visual impact on proposed CCRC community on the surrounding area. The proposed use of the Site under this CEF District provides a mix of commercial and residential uses in a campus-like setting which serves as an appropriate transition between the surrounding mix of commercial, institutional, residential, and agricultural uses in terms of scale, height, mass, and architectural detail.

F. Encourage aggregation of underutilized properties.

See Section 8(A) above.

9. The proposed CEF Development does not comprise parcels which were added to the Planned Service Area to achieve Bay Restoration goals articulated in the Plan Howard 2030.

The proposed Sites does not comprise such parcels.

NEIGHBORHOOD BOUNDARY

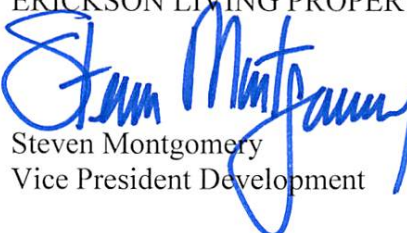
The boundary of the neighborhood consists of the neighboring commercial, institutional, residential, and agricultural uses surrounding the Site and is composed of a mix of B-1, B-2, NT, R-20, and RC-DEO properties (See Applicant's Plan attached hereto). As set forth above, the Applicant's proposed CEF-M District includes properties within the RC-DEO and B-2 zoning districts. The limits of the neighborhood as set forth above reflect the mix of commercial, institutional, residential, and agricultural development in the surrounding area northeast of Route 32 along the Route 108 corridor (See Applicant's Plan, Neighborhood Boundary).

CONCLUSION

Erickson Living's network of communities has been providing an unparalleled lifestyle to seniors for over 30 years. With 19 communities across 11 states, over 24,000 seniors now call our communities home. As one of the nation's most respected leaders in building and managing continuing care retirement communities, we've perfected our approach to helping seniors enjoy their independence and live a longer, happier, and healthier life. We are very excited about the

opportunity to bring our decades of experience in this industry to Howard County and look forward to working with community stakeholders and the Zoning Board through this CEF development process to make Erickson Living at Limestone Valley a reality.

Best Regards,
ERICKSON LIVING PROPERTIES II, LLC



Steven Montgomery
Vice President Development

Enclosure: Initial Submission Development Concept
Adequate Road Facilities Test Evaluation and Traffic Study



PROPOSED COMMUNITY AT LIMESTONE VALLEY CLARKSVILLE, MARYLAND

INITIAL SUBMISSION
DEVELOPMENT CONCEPT PLAN

APPLICANT: ERICKSON LIVING PROPERTIES II, LLC
JULY 28, 2017

APPLICANT	ERICKSON LIVING PROPERTIES II, LLC 701 MADDEN CHOICE LANE BALTIMORE, MD 21228
LAND USE ATTORNEY	OFFIT KURMAN 8171 MAPLE LAWN BOULEVARD, SUITE 200 MAPLE LAWN, MD 20759
CIVIL ENGINEER AND LANDSCAPE ARCHITECT	BOHLER ENGINEERING 901 DULANEY VALLEY ROAD, SUITE 801 TOWSON, MD 21204
ARCHITECT	MARKS THOMAS 1414 KEY HIGHWAY, 2ND FLOOR BALTIMORE, MD 21230
TRAFFIC CONSULTANT	THE TRAFFIC GROUP 9900 FRANKLIN SQUARE DRIVE, SUITE H BALTIMORE, MD 21236
PUBLIC RELATIONS	THE CARPLAN GROUP 5054 DORSEY HALL DRIVE, SUITE 205 ELLCOTT CITY, MD 21042
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DGP-3	DEVELOPMENT CONCEPT PLAN
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DGP-5	PROPOSED DEVELOPMENT STANDARDS AND SIGN DETAILS
DGP-6	ILLUSTRATIVE SITE PLAN
DGP-7	COMMUNITY CHARACTER
DGP-8	ARCHITECTURAL CHARACTER
DGP-9	ENVIRONMENTAL BUFFER EXHIBIT
DGP-10	CONCEPTUAL LANDSCAPE PLAN
DGP-11	COMMUNITY ENHANCEMENTS: CONCEPTUAL STREETSCAPE PLAN
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NEIGHBORHOOD BOUNDARY PLAN



Clarksville Pike near proposed entry



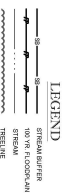
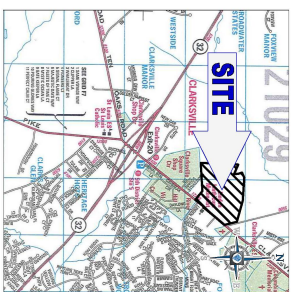
Clarksville Pike along edge of campus



Existing gas station



DEVELOPMENT CONCEPT PLAN



SITE DATA

APPLICANT	ERICKSON LIVING INVESTMENTS, LLC
OWNER	THE WALKER GROUP, LLC LIMESTONE VALLEY PARK CONDOMINIUM ASSOCIATION SERVING, LLC POTOMAC, MD 20854 P.O. BOX 117 GREENBELT, MD 20818 630-300-1177
MAP	FULLY PROFESSIONAL MAPMENT TO WITHIN THE PLANNED SERVICE AREA, AS SHOWN
WATERWAYS	WATERWAYS
WETLANDS	WETLANDS
CORRIDOR	CORRIDOR
PROPOSED ZONING	RESIDENTIAL MEDIUM DENSITY
PROPOSED USES	RESIDENTIAL MEDIUM DENSITY
PREVIOUS SALE NUMBERS	NONE
NEIGHBORHOOD	700 INDEPENDENT LIVING UNITS
PARKING	200 INDEPENDENT LIVING UNITS
NEIGHBORHOOD 2	400 INDEPENDENT LIVING UNITS
NEIGHBORHOOD 3	600 INDEPENDENT LIVING UNITS
NET ACCREMENTS	200' x 400' x 400'
CIVIC ACCREMENTS	200' x 400' x 400'
UNITS	700 INDEPENDENT LIVING UNITS
DATE	2017.07.28
SCALE	1"=200'

Note: Shaded areas indicate proposed development. Not to scale.

NOTES

1. BUILDING FOOTPRINTS SHOWN ON THIS PLAN DO NOT INCLUDE SHOWN EXTENSIONS BEYOND THE EXTERIOR WALLS. THE EXTERIOR WALLS SHALL BE CONSTRUCTED TO THE EXTERIOR WALL OF THE HOUSING COUNTY ZONING REGULATIONS.
2. THE EXACT TYPERS AND LOCATION OF PARKING SPACES IS SUBJECT TO FINAL APPROVAL BY THE HOUSING COUNTY ZONING DEPARTMENT.
3. CONCEPTUAL PLANNING AND DESIGN OF LANDSCAPE, INFRASTRUCTURE AND UTILITIES WILL BE PROVIDED THROUGHOUT THE CONCEPT PLAN.

NOTE

CONCEPTUAL PLAN SUBJECT TO FINAL ENGINEERING AND ARCHITECTURAL REVISIONS

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PROJECT: ERICKSON LIVING AT LIMESTONE VALLEY

DATE: 2017.07.28

SCALE: 1"=200'

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PROJECT: ERICKSON LIVING AT LIMESTONE VALLEY

DATE: 2017.07.28

SCALE: 1"=200'

PROJECT: ERICKSON LIVING AT LIMESTONE

ILLUSTRATIVE SITE PLAN

Note: conceptual plan subject to final engineering and architectural refinement. Refer to detailed Development Concept Plan, Conceptual Landscape Plan, Conceptual Streetscape Plan, and Proposed Traffic Improvements for proposed site improvements (roadways, pedestrian walkways, landscaping).

SITE DATA

NEIGHBORHOOD 1
INDEPENDENT LIVING UNITS 730
CCRC ACCESSORY SPACE: 68,000SF +/-
PARKING
700 GARAGE:
190 SURFACE

NEIGHBORHOOD 2
INDEPENDENT LIVING UNITS 470
CCRC ACCESSORY SPACE: 40,000SF +/-
PARKING
680 GARAGE:
110 SURFACE

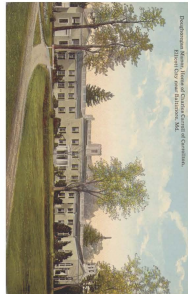
CARE CENTER
(assisted living, memory care, skilled nursing)
240 UNITS +/-

TOTALS
INDEPENDENT LIVING UNITS 1,200
CARE CENTER UNITS 200 +/-
CCRC ACCESSORY SPACE: 108,000SF +/-
PARKING
1,380 GARAGE:
300 SURFACE
1,680 TOTAL

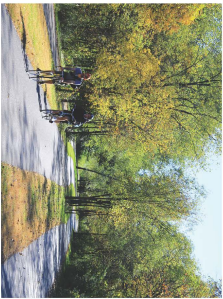
Notes:
1. CCRC Accessory Space consists of building areas allocated for resident amenities, resident services, food service, campus administration, and campus services. CCRC Accessory Spaces are typically located within clubhouse buildings (CB) as well as on the ground/first floor of independent living buildings.
2. Resident parking is provided in garages below independent living buildings.



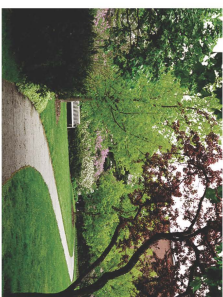
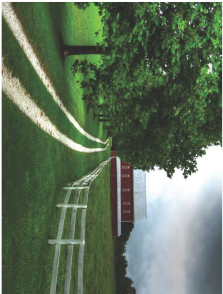
COMMUNITY CHARACTER



- VIBRANT SENIOR COMMUNITY
- RURAL LANDSCAPE
- OUTDOOR ACTIVITIES
- WALKING AND BIKING PATHS
- TRAILS
- GARDENS



CONCEPTUAL VIEW OF MAIN ENTRANCE FROM CLARKSVILLE PIKE

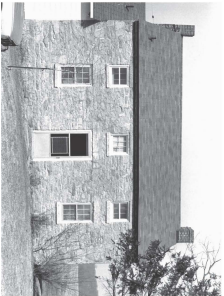


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ARCHITECTURAL CHARACTER



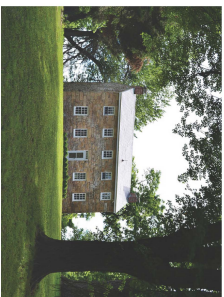
MONTGOMERY COUNTY HOUSE - hipped roof porches, masonry and siding



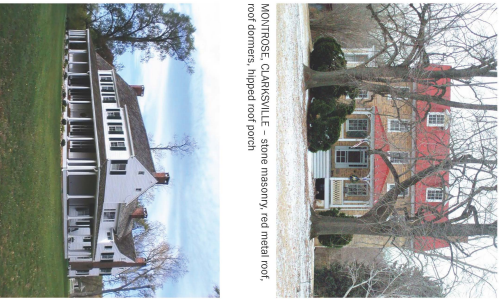
LIMESTONE VALLEY FARM STONE TENANT HOUSE - masonry, gable roof, divided-lie windows



THE VILLAGES OF RIVER HILL, CLARKSVILLE - brick masonry and siding composition, roof dormers, metal roofs



IVY HILL MARRIOTT - masonry, gable roof, divided-lie windows

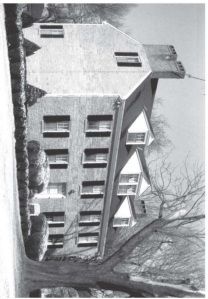


RICHARD, CLARKSVILLE - white lap siding, gable roofs, divided-lie windows



PROPOSED CONCEPTUAL BUILDING ELEVATION

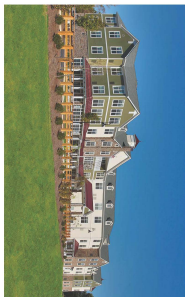
- cupola
- gable roof
- roof dormers
- red metal roof
- single/double hung windows with divided lites
- window surround trim
- hipped roof porches
- lap siding
- stone masonry (use of brick masonry proposed for some buildings)



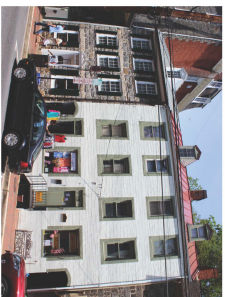
WALNUT GROVE, CLARKSVILLE - stone masonry, gable roof, roof dormers



CARROLL COUNTY HOUSE - masonry and siding, window surrounds, gable roof



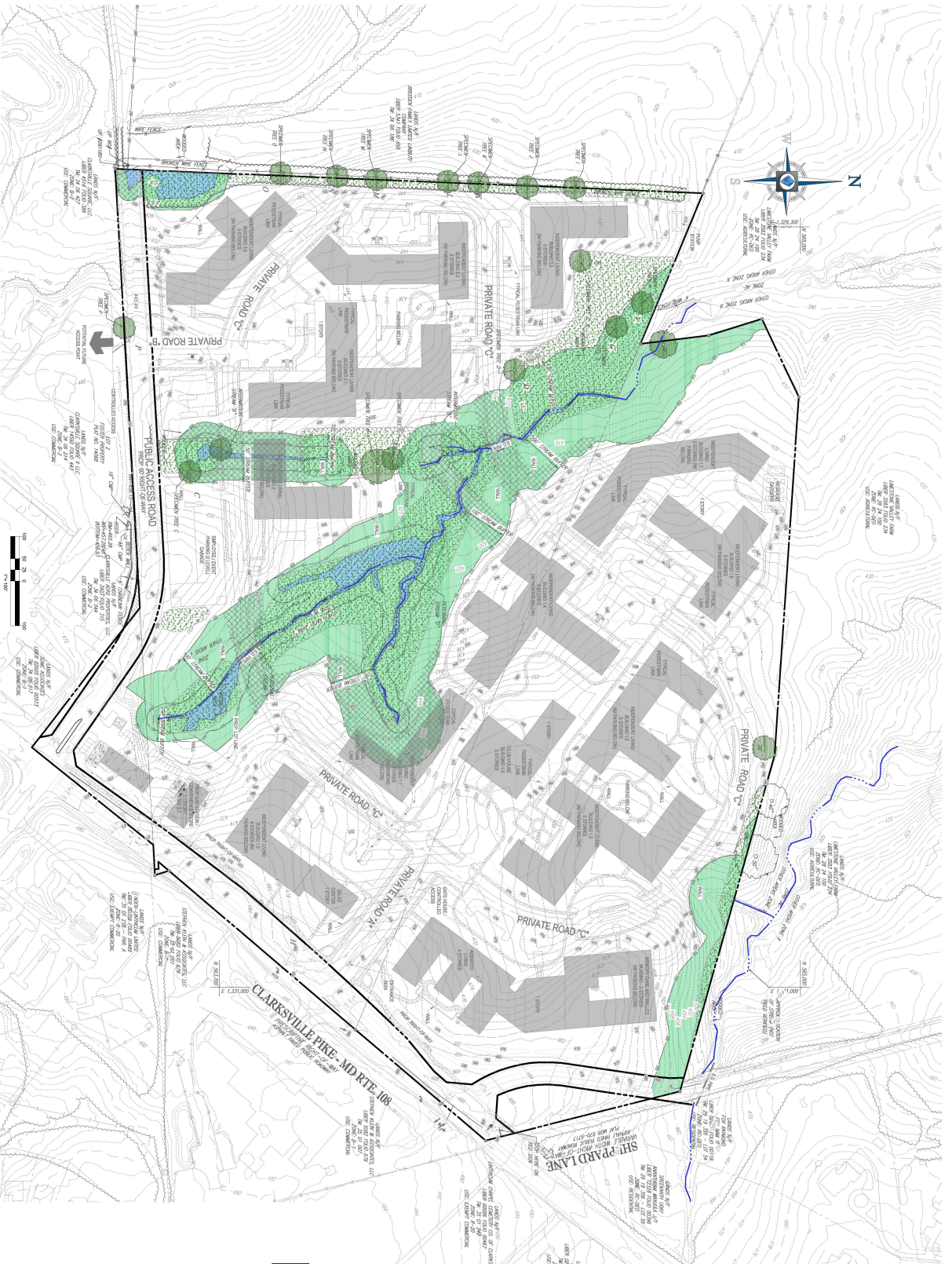
masonry and siding composition, red metal roofs, roof dormers, cupola



ELLCOTT CITY - masonry and siding, window surrounds, metal roof, roof dormers

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ENVIRONMENTAL BUFFER EXHIBIT



NOTE
CONCEPTUAL PLAN SUBJECT TO FINAL ENGINEERING AND ARCHITECTURAL REVISIONS

LEGEND

	20' WETLAND BUFFER
	50' WETLAND WETLAND BUFFER
	STREAM
	100' WETLAND BUFFER
	STREAM BUFFER
	WETLANDS
	POSSIBLE ENVIRONMENTAL SENSITIVE ENVIRONMENTS FORESTS (AREA TO REMAIN)
	SPECIMEN TREE



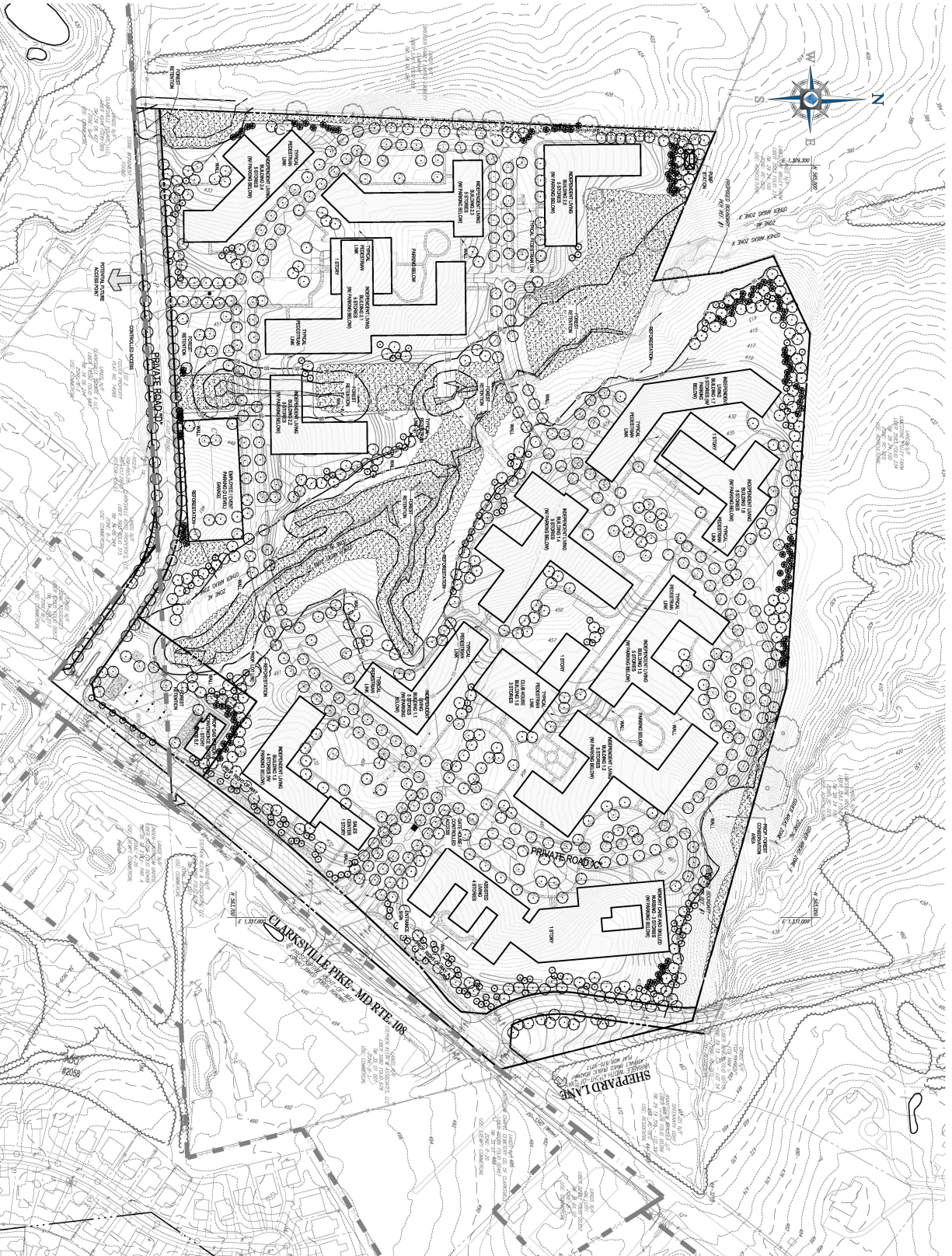
BOHLER
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1000 W. WASHINGTON ST.
FREDERICK, MD 21734
TEL: 301.251.1000
WWW.BOHLER-ENG.COM

ERICKSON LIVING AT LIMESTONE VALLEY
HOWARD COUNTY, MARYLAND
JULY 28, 2017



SHEET
DCP-10

CONCEPTUAL LANDSCAPE PLAN



SYMBOL LEGEND	
	SHADE TREES
	ORNAMENTAL TREES
	EMERGENT TREES
	STREET TREES
	ORNAMENTAL STREET TREES
	FOREST RETENTION (FOREST TO REMAIN)
	REHABILITATION
	FENCE
	10' OR GREATER BUFFER
	10' OR GREATER (AND) STORM
	THRESHOLD
	EXISTING SPECIMEN TREE (TO REMAIN)

NOTE: CONCEPTUAL PLAN SUBJECT TO FINAL ENGINEERING AND ARCHITECTURAL REVISIONS.



CONCEPTUAL STREETSCAPE PLAN



CLARKSVILLE PIKE STREETSCAPE AND DESIGN GUIDELINES (ADOPTED BY HOWARD COUNTY, FEBRUARY 2016)

AREA 3 STREETSCAPE IMPROVEMENTS

- LANES:**
- GENERALLY 2 LANES WITH STRIPED TURN LANE
- STORMWATER MANAGEMENT:**
- TYPICALLY ACCOMMODATED AS BIOSWALS ALONG THE STREET EDGE
- PEDESTRIAN/BICYCLE ACCOMMODATIONS:**
- CONTINUOUS SIDEWALK TRANSITIONS TO A SHARED-USE PATH ALONG THE SOUTHEASTERN NORTHWESTERN EDGE; CROSSWALKS AT ALL MAJOR STREET INTERSECTIONS AND EXCHANGES TO SCHOOLS

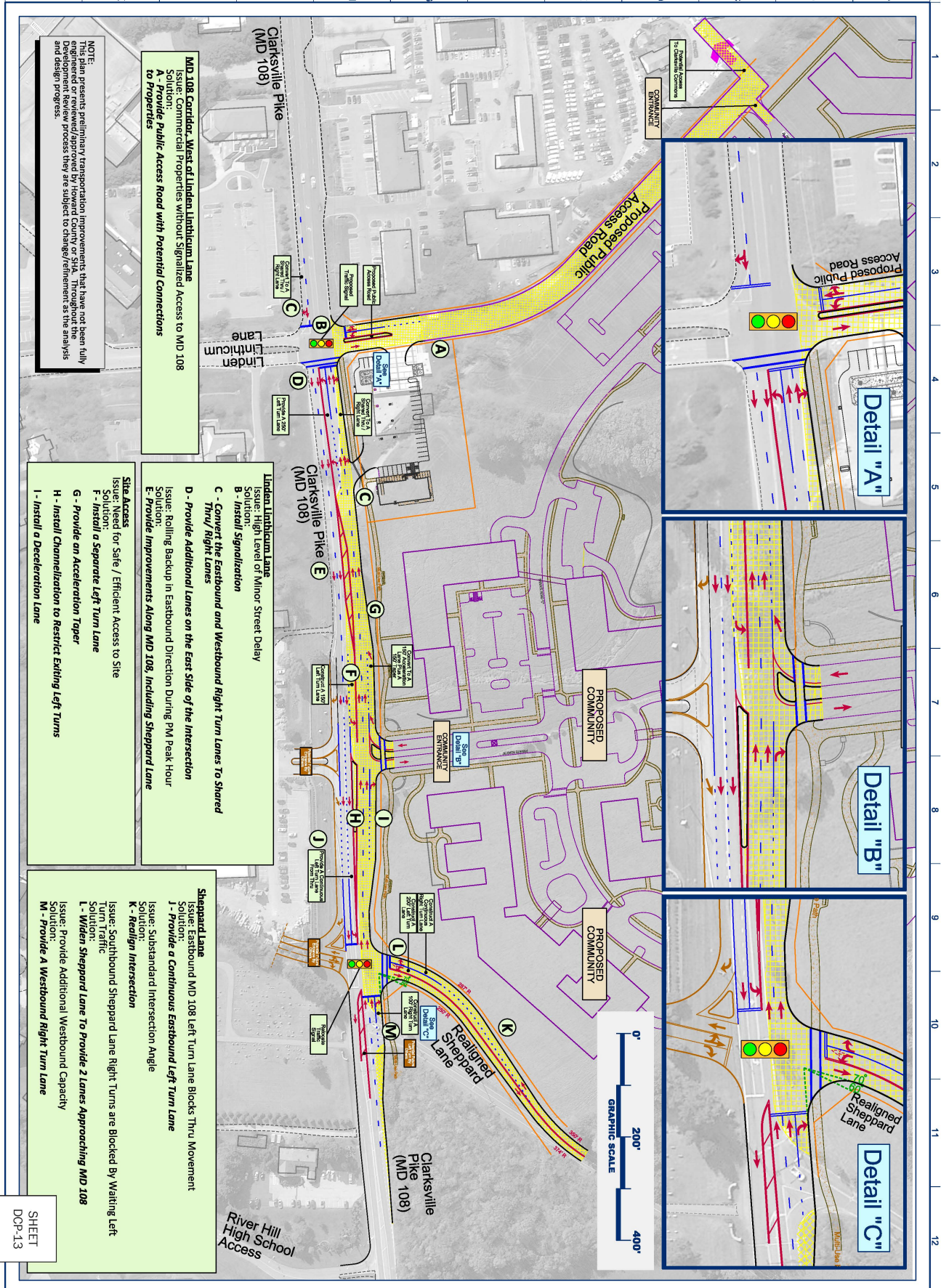
- LANDSCAPE:**
- INFORMALLY CLUSTERED TREES NEXT TO NATURAL AND AGRICULTURAL AREAS; SOME STREET TREES HAVE BEEN PLACED WITHIN THE BUILDING FRONTAGE ZONE, RATHER THAN THE TREE/PLANTING ZONE, TO ACCOMMODATE SETBACK REQUIREMENTS FOR UNDERGROUND WATER LINES



BOHLER
ENGINEERING
ARCHITECTURE
LANDSCAPE ARCHITECTURE

ERICKSON LIVING AT LIMESTONE VALLEY
HOWARD COUNTY, MARYLAND
JULY 28, 2017





NOTE:
 This plan presents preliminary transportation improvements that have not been fully prepared or reviewed/approved by Howard County or SOA. Throughout the project, the design team will coordinate with the relevant agencies to ensure that the design and design progress.

MD 108 Corridor, West of Linden Linthicum Lane
Issue: Commercial Properties without Signalized Access to MD 108
A - Provide Public Access Road with Potential Connectors to Properties

Linden Linthicum Lane
Issue: High Level of Minor Street Delay
Solution:
B - Install Signalization
C - Convert the Eastbound and Westbound Right Turn Lanes To Shared Thru/Right Lanes
D - Provide Additional Lanes on the East Side of the Intersection
Issue: Rolling Backup in Eastbound Direction During PM Peak Hour
Solution:
E - Provide Improvements Along MD 108, Including Sheppard Lane

Sheppard Lane
Issue: Eastbound MD 108 Left Turn Lane Blocks Thru Movement
J - Provide a Continuous Eastbound Left Turn Lane
Solution:
K - Realign Intersection
L - Widen Sheppard Lane To Provide 2 Lanes Approaching MD 108
Issue: Provide Additional Westbound Capacity
M - Provide A Westbound Right Turn Lane

Site Access
Issue: Need for Safe / Efficient Access to Site
Solution:
F - Install a Separate Left Turn Lane
G - Provide an Acceleration Taper
H - Install Channelization to Restrict Exiting Left Turns
I - Install a Deceleration Lane

SHEET
 DCP-13



Erickson at Limestone	
Scale: 1" = 80'	Revision: N/A
Location: 8800 Franklin Square Dr., Beltsville, Maryland	Client: N/A
Job Number: 07171402	Drawn: N/A
File Name: N/A	Checked: N/A

M. Vailis	June 5, 2017
Author	DATE
DESIGNED	DATE
CHECKED	DATE
APPROVED	DATE

Clarksville Pike (MD 108)



GAS STATION EXHIBIT



NOTE
 CONCEPTUAL PLAN SUBJECT TO FINAL ENGINEERING AND ARCHITECTURAL REFINEMENT

LEGEND

---	SOIL DEMONSTRATION
—	FLOODPLAIN
—	WETLAND
—	STREAM BEDS
—	WETLAND BUFFER
—	TREE LINE



ERICKSON LIVING AT LIMESTONE VALLEY
 HOWARD COUNTY, MARYLAND
 JULY 28, 2017



SHEET
 DCP-14

Erickson Living at Limestone Valley

Howard County, Maryland
July 28, 2017

Adequate Road Facilities Test Evaluation and Traffic Study

Prepared for:

Erickson Living

Steven Montgomery

Vice President of Development Acquisitions

701 Maiden Choice Lane

Baltimore, MD 21228

410-402-2449

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APPENDIX D – Trip Assignment for Background Developments

APPENDIX E –Synchro and Simtraffic

APPENDIX F – Crash Data – MD SHA

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. 29931, Expiration Date: 01/08/2018.



Prepared by: Carl R. Wilson, Jr., P.E., PTOE
Fuhsiung Huang (Richard), P.E., PTOE

CRW:rek
(F:\2017\2017-0302_Erickson_MD 108 Site\DOCS\REPORTS\July
2017\Adequate Road Facilities Test Eval and Traffic Study.docx)

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Traffic Engineers & Transportation Planners

Merging Innovation and Excellence®

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INTRODUCTION AND SUMMARY OF FINDINGS

Study Purpose

The Traffic Group, Inc. has prepared this Adequate Road Facilities Test Evaluation and Traffic Study to quantify the impact the proposed development of Erickson Living at Limestone Valley will have on the surrounding road network in Howard County, Maryland. The subject site is situated on the north side of MD 108 (Clarksville Pike), west of Sheppard Lane. A Continuing Care Retirement Community (CCRC) with up to 1200 units is proposed. In addition, a 240 bed Assisted Living Facility (ALF) will also be constructed on-site. A Concept Plan for the development is shown below as Figure 1.1 and Appendix A.

Access to the property is proposed via one point along MD 108 and a secondary point along an extension of Linden Linthicum Lane (Proposed Public Access Road). The MD 108 access will operate under stop control and left turns out of the facility will be restricted. The access point along Proposed Public Access Road will operate under stop control. Traffic signalization is proposed at the intersection of MD 108 and Linden Linthicum Lane/Proposed Public Access Road will. Full buildout of the project is expected within six years.

Study Criteria/Methodology

This study was conducted in accordance with Chapter 4 of the *Howard County Design Manual – Volume III (Road and Bridge Design)*. Chapter 4 details the requirements for the Adequate Road Facilities Test Evaluation, which require that the first intersection of a Major Collector or higher classified roadway with another Major Collector or higher classified roadway in all directions from the subject site be reviewed and analyzed.

Since the site will generate more than 100 trips, a Chapter 5 Traffic Study is also required, which subjects all classified intersections within one-half mile of the property to review, however, improvements are not required at these locations.

All intersections are reviewed using Critical Lane Volume (CLV) methodology. Intersections that are controlled by Maryland State Highway Administration (SHA) must exhibit Level of Service “E” or better conditions during all study periods.

Because of the complexity of this project, a Synchro model was prepared for the MD 108 corridor.

In addition to traditional road improvements that may be required as part of the Adequate Road Facilities Test Evaluation, road improvements that will provide additional community benefit are proposed in conjunction with the CEF (Community Enhanced Floating) Zone requirement for this site. Details on the proposed improvements will be provided in later sections of this document.

Scope of Services

The principal scope of services undertaken for this study was as follows:

- Conduct a field inspection to collect physical information concerning the nearby road system, including a compilation of traffic signal plans, aerial photography and ground level photographs.
- Collect intersection turning movement counts during the morning and evening peak periods at each study intersection while public school is in session.
- Apply a regional growth factor to the road network to incorporate the design year.
- Prepare trip generation and trip distribution forecasts for all approved background developments.
- Prepare trip generation and trip distribution for the development of the subject site.
- Undertake intersection capacity analysis to determine existing and projected levels of service at all study intersections using Critical Lane Volume (CLV) methodology.
- Prepare a Synchro model and SimTraffic simulation to detail existing and projected future operations.
- Provide an overall evaluation of traffic operations, including recommendations for improvements at appropriate concept plans.

Summary of Findings and Recommendations

This analysis will show that the Adequate Road Test Facilities study intersections are currently operating with an acceptable CLV under existing conditions. When considering the impact of background traffic, the intersection of MD 108 at Sheppard Lane is projected to operate at Level of Service "F" conditions during both the morning and evening peak periods. All other remaining Chapter 5 intersections will feature acceptable operations.

With the additional impact associated with the development of the subject site, the intersection of MD 108 at Sheppard Lane will continue to exhibit Level of Service "F" conditions.

Since this project is seeking CEF Zoning, additional road improvements are proposed above and beyond what would typically be required to satisfy Adequate Road Facilities Test Evaluation requirements. Below, the proposed improvements are detailed:

MD 108 at Sheppard Lane

Sheppard Lane currently intersects MD 108 at a 55 degree angle, which is substandard and has a negative impact on intersection operations. In addition, the Sheppard Lane approach features just a single lane for traffic accessing MD 108. Finally, the existing left turn lane from eastbound MD 108 to Sheppard Lane is only 175 feet long which results in significant queuing that blocks the through lane. The following improvements are proposed at this location:

- Realign Sheppard Lane to the west at an angle of a minimum of 70 degrees as acceptable to SHA.
- Widen the Sheppard Lane approach to provide two lanes onto MD 108, including a separate right turn lane and separate left turn lane.
- Provide a continuous left turn lane along eastbound MD 108, approaching Sheppard Lane.
- Widen the westbound MD 108 approach to provide two thru lanes and a separate right lane.
- Reconstruct the traffic signal and provide pedestrian accommodations as required by SHA.
- Provide interconnection of the traffic signal along MD 108 to MD 32.

Not only do the proposed improvements at MD 108 at Sheppard Lane improve the CLV to an acceptable level, but queuing is significantly reduced on all approaches. The queuing is an operations issue that is present under existing conditions. The reduction of queues would provide significant benefits to all roadway users.

MD 108 at Linden Linthicum Lane/Proposed Public Access Road

The existing intersection of MD 108 and Linden Linthicum Lane features stop control for the minor approach. As a result, significant delays are encountered during the peak period for left turning traffic. The following improvements are recommended to mitigate delays and improve operations at this intersection:

- Install traffic signalization once approved by SHA.
- Provide an extension of Linden Linthicum Lane (Proposed Public Access Road) on the north side of MD 108 to provide site access and potential future connections to commercial properties to the west.
- Convert the existing right turn lane along eastbound MD 108 to a shared thru/right lane.
- Convert the westbound MD 108 auxiliary lane to a shared thru/right lane.

The construction of these improvements, including the Proposed Public Access Road on the north side of MD 108, will provide a significant community benefit. The new road will allow property owners on its west side to potentially have signalized access to MD 108. While the elimination of unsignalized access points is not recommended, drivers will have a choice to utilize signalized access to the MD 108 corridor, particularly during peak periods. In addition, the installation of the traffic signal at Linden Linthicum Lane is consistent with elements of the *Clarksville Pike Streetscape Plan* which was adopted by Howard County in 2016. The implementation of the signal will allow for synchronized traffic signals between Sheppard Lane and MD 32, which will significantly enhance operations providing a community benefit.

MD 108 at Site Access

A limited access point is proposed along MD 108, opposite the existing access point for River Hill Garden Center which is approximately 475 feet west of Sheppard Lane. At this access point, which will operate under stop control, a left-in/right-in/right-out is proposed. A separate left turn lane will be provided into the site. The following enhancements are also proposed in conjunction with the access point:

- Construct a five lane section along MD 108 in between Linden Linthicum Lane and Sheppard Lane, covering a distance of approximately 1,300 feet.
- Provide separate acceleration and deceleration lanes into the subject site, based on SHA requirements.
- Provide appropriate channelization to restrict left turns out of the subject site.

The construction of the five lane section along MD 108 is consistent with the Clarksville Pike Streetscape Plan and will match the section of MD 108 to the west of Linden Linthicum Lane. This construction will provide a significant benefit to roadway users, as queuing for Sheppard Lane will no longer block thru traffic along MD 108. A preliminary Concept Plan showing the proposed road improvements can be found in Figure 1.2. A full size version of the plan is included in Appendix A.

As previously stated, the improvements proposed in conjunction with the development of Erickson Living at Limestone will provide significant community benefits in conjunction with the proposed CEF Zoning for this site. All improvements will be consistent with SHA requirements. The details and methodology used for this study are detailed in the sections that follow.

ILLUSTRATIVE SITE PLAN

Note: conceptual plan subject to final engineering and architectural refinement.



Figure 1.1 - Site Concept Plan

SITE DATA

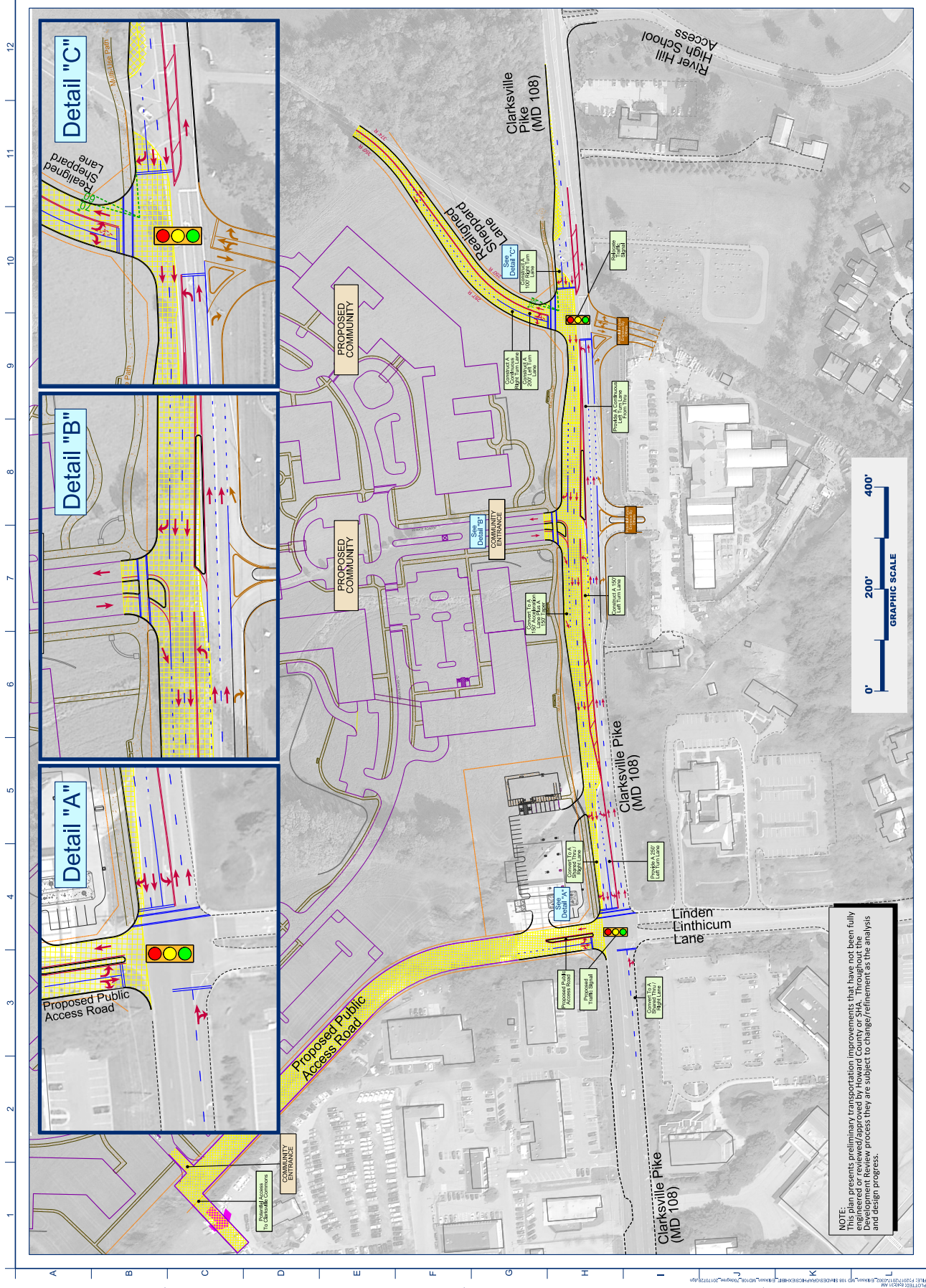
NEIGHBORHOOD 1
 INDEPENDENT LIVING UNITS 730
 CCRC ACCESSORY SPACE: 68,000SF +/-
 PARKING
 700 GARAGE:²
 190 SURFACE

NEIGHBORHOOD 2
 INDEPENDENT LIVING UNITS 470
 CCRC ACCESSORY SPACE: 40,000SF +/-
 PARKING
 680 GARAGE:²
 110 SURFACE

CARE CENTER
 (assisted living, memory care, skilled nursing)
 240 UNITS +/-

TOTALS
 INDEPENDENT LIVING UNITS 1,200
 CARE CENTER UNITS 200 +/-
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- Notes:
1. CCRC Accessory Space consists of building areas allocated for resident amenities, resident services, food service, campus administration, and campus services. CCRC Accessory Spaces are typically located within clubhouse buildings (CB) as well as on the ground/first floor of independent living buildings.
 2. Resident parking is provided in garages below independent living buildings.



NOTE: This plan presents preliminary transportation improvements that have not been fully developed. The plan is subject to change during the Development Review process they are subject to change/refinement as the analysis and design progress.

Figure 12 - Road Improvement Concept Plan

EXISTING TRAFFIC CONDITIONS

Site Information

The proposed Erickson Living at Limestone Valley community will consist of a Continuing Care Retirement Community (CCRC) containing up to 1,200 units and a total of up to 200 beds in an Assisted Living Facility (ALF). The subject site is located on the north side of MD 108 (Clarksville Pike), south of Sheppard Lane in Howard County. Currently, the property is used as a farm.

Study Area

Based on Howard County's Adequate Road Facilities Test Evaluation requirements, the following intersections were identified to be included for the Chapter 4 study:

- MD 108 at Sheppard Lane
- MD 108 at Great Star Drive

Since the site will generate more than 100 peak hour trips, the MD 32, Westbound Ramp at MD 108 is also included to satisfy Chapter 5 Traffic Study.

To further complete the CEF Zoning Study, additional signalized and unsignalized local roads were also included in the study. They include:

- MD 108 at Auto Drive
- MD 108 at Linden Linthicum Lane

Figure 2.1 details the study area.

MD 108 is owned and operated by SHA. The roadway extends for a distance of 15.24 miles from the Montgomery County Line to MD 175. In the vicinity of the subject site, the roadway is classified as an urban minor arterial on the State Secondary system. MD 108 is inventoried in the east/west direction. There are no access controls in the vicinity of the subject site.

Along property frontage MD 108 features one travel lane in each direction. There are limited shoulders available and no existing pedestrian facilities. Immediately opposite the proposed access point for the Erickson Living at Limestone Valley community is a full movement access point for River Hill Garden Center which operates under stop control. The access point features short acceleration and deceleration lanes in addition to a bypass lane.

With the exception of Linden Linthicum Lane, all study intersections are controlled by traffic signalization. Generally, the corridor features separate left turn lanes along mainline MD 108 with shared thru/right lanes. A two-way center left turn lane is available from Auto Drive to Linden Linthicum Lane.

The intersection of MD 108 and Sheppard Lane currently intersects at a 55 degree angle which is considered substandard. In addition, the minor approach only features a single lane approaching MD 108. Observations indicate that the existing left turn lane along eastbound MD 108 is too short to accommodate peak hour demand.

Figure 2.2 contains a summary of the existing lane use of the study intersections. Additional details, including aerial photographs, can be found in Appendix B.

Crash Data

Crash data was obtained from Howard County representatives for all study intersections. The data, compiled by SHA encompasses the most recent three-year period extending from 2014 through 2016. All summarized data can be found in Appendix F.

A review of Appendix F shows that there are no discernable patterns related to crashes that warrant improvements. The most notable pattern involves left turn crashes at the intersection of MD 108 at Great Star Drive. The development of the subject site will not add any left turns to the affected movements, so no improvements should be required of this developer.

It is important to recognize that this data accounts for crashes that involve personal injury or involves property damage that is significant enough for vehicles to be towed from the scene.

Figure 2.1 – Study Area Map

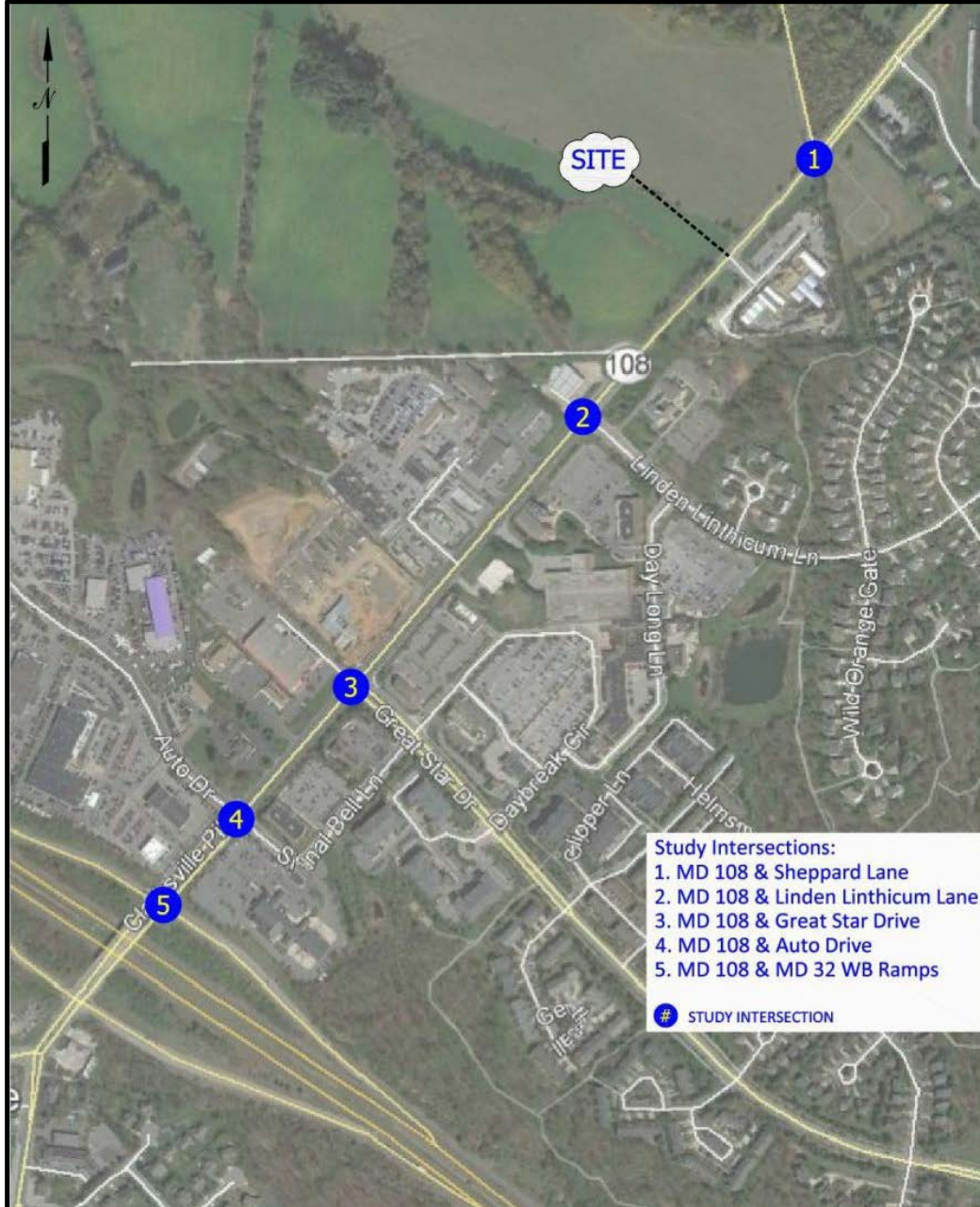
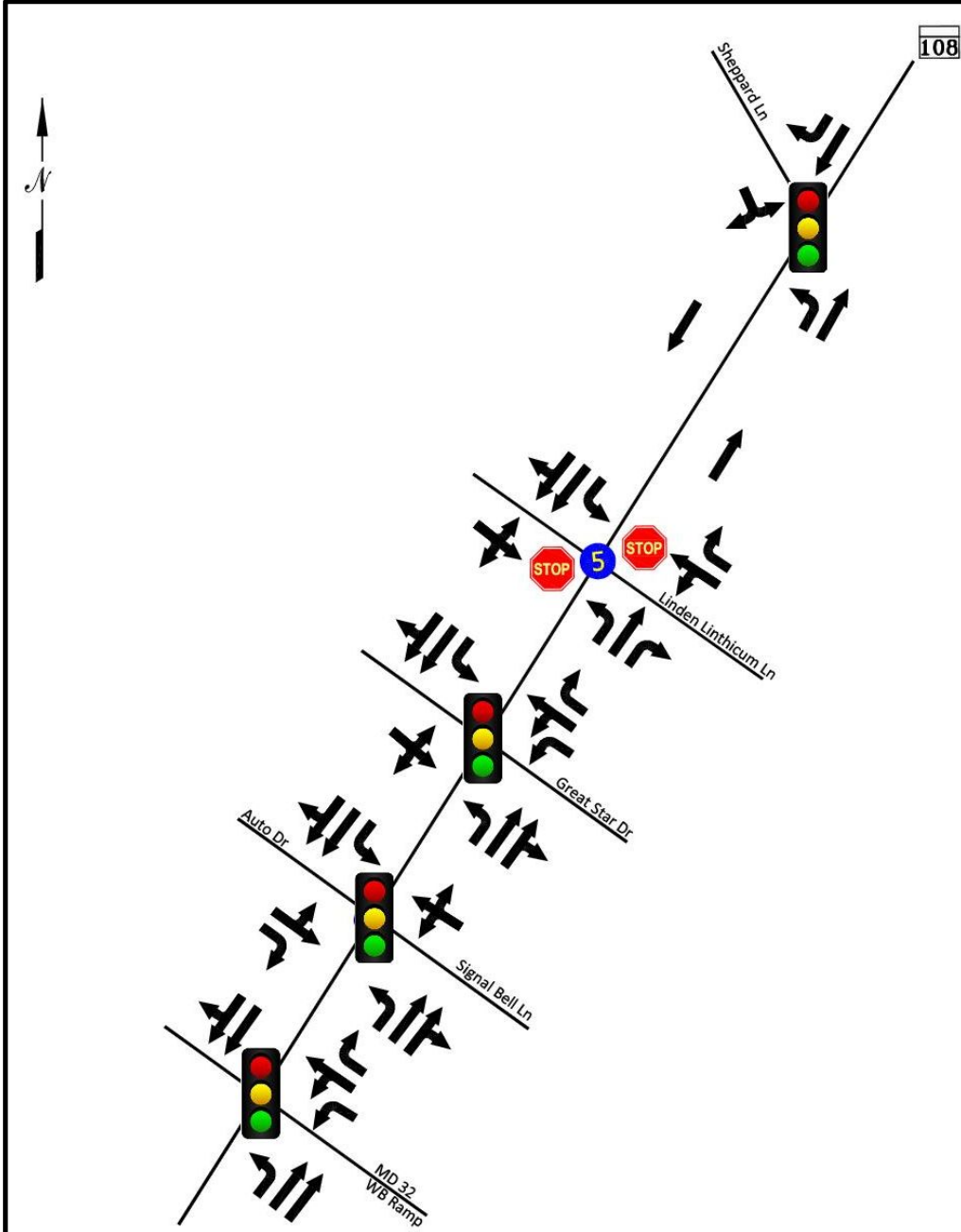


Figure 2.2 – Existing Lane Use



Clarksville Pike Streetscape Plan and Design Guidelines

Howard County adopted the *Clarksville Pike Streetscape Plan and Design Guidelines* on February 1, 2016. The document sets forth different criteria and standards that should be accounted for within the Clarksville Pike (MD 108

corridor). Multiple elements within the design guidelines are incorporated within the improvements that are proposed in conjunction with Erickson Living at Limestone Valley. Among them:

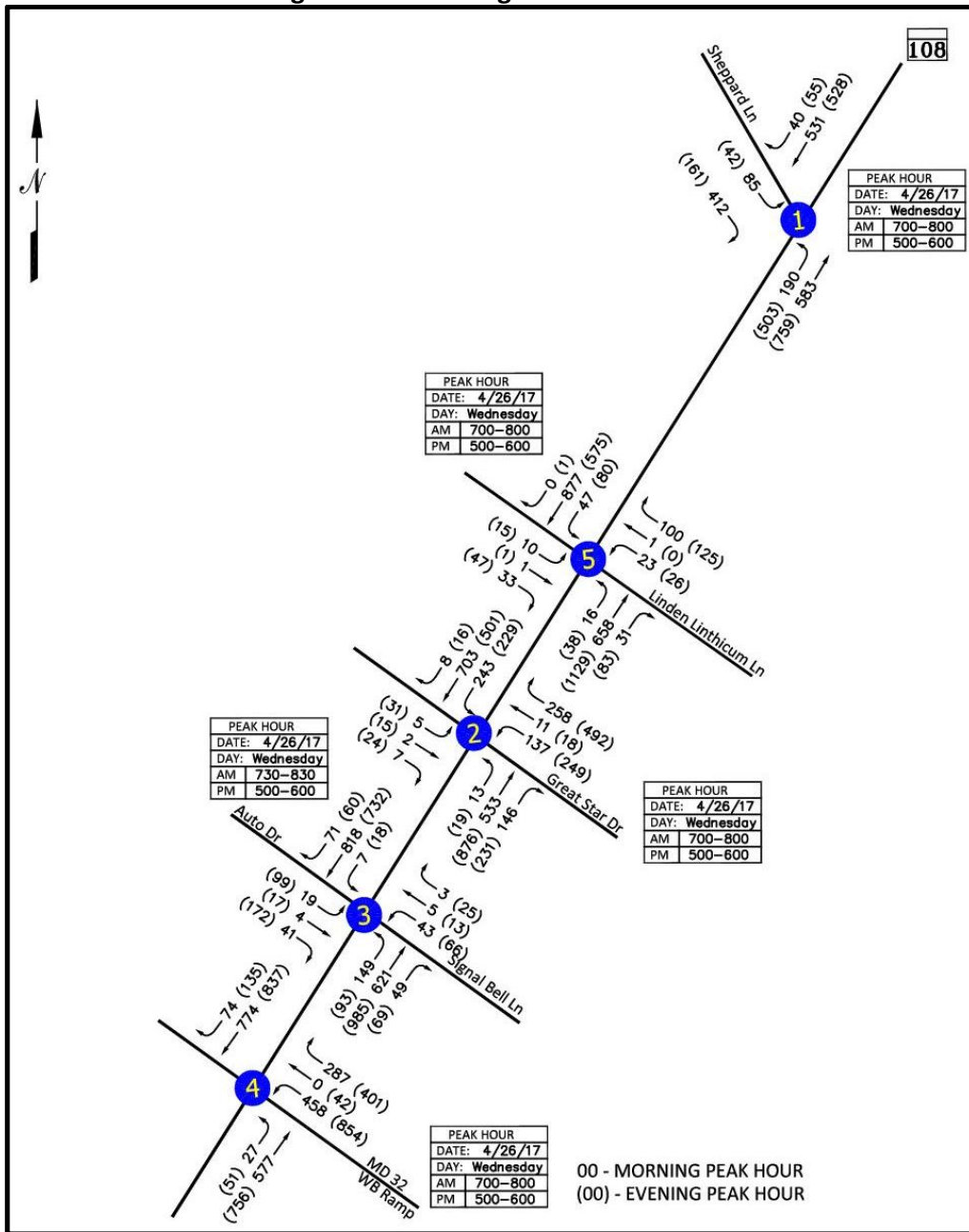
- **Installation of Traffic Signalization at Linden Linthicum Lane** – It is acknowledged within the design guidelines that the minor approach along Linden Linthicum Lane suffers from a high level of delay during peak periods. To mitigate this delay, the installation of traffic signalization is proposed.
- **Pedestrian/Bicycle accommodations** – Within the site frontage, the construction of a continuous shared use path is proposed. The shared use path will permit the safe and efficient of pedestrians and bicycle within the corridor. Connectivity to west is also proposed beyond Linden Linthicum Lane.
- **Implementation of Crosswalks** – In conjunction with traffic signalization at Linden Linthicum Lane, the introduction of crosswalks is also proposed. Crosswalks will allow pedestrians to safely cross MD 108 and minor streets.
- **Development of Roadway Cross Sections** – The area immediately west of the subject site features four travel lanes and a two way center left turn lane. While not specifically stated within the design guidelines, this cross section will be maintained along property frontage to Sheppard Lane. By continuing this cross section, corridor will be significantly enhanced.

Traffic Volumes

Intersection turning movement counts were collected at each of the study intersections between the hours of 6:30-9:00 AM and from 4:00-6:30 PM on a typical weekday while public school was in session. The additional count hours above the standard data collection periods were added because the initial counts showed the peak hours began at 7:00 AM and ended at 6:00 PM. The resulting volumes will, however, show that those peak hours are true peaks, as the 15 minute intervals decreased beyond the peak periods.

River Hill High School, which is located to the east of the subject site, is in session from 7:00 AM-2:30 PM. As previously stated, this school was in session at the time of the data collection and its impact is fully accounted for within this analysis. Figure 2.3 details the existing peak hour traffic volumes. Full details on the turning movement counts can be found in Appendix B.

Figure 2.3 – Existing Traffic Volumes



Analysis of Existing Traffic Conditions

Intersection capacity analysis was undertaken at each of the study intersections using Critical Lane Volume (CLV) methodology. The results are summarized below in Table 2.1. Full details on the CLV analysis can be found in Appendix C.

Table 2.1 – Summary of Existing CLV

AM Peak Hour	Existing LOS / CLV
MD 108 @ Sheppard Lane	C/1218
w/improvements	---
MD 108 @ Great Star Dr	A/719
MD 108 @ Auto Dr/Signal Bell Ln	A/712
MD 108 @ MD 32 WB Ramps	A/780
MD 108 @ Linden Linthicum Ln	A/773
w/improvements	---
MD 108 @ Site Access/Garden Center	---
PM Peak Hour	Existing LOS / CLV
MD 108 @ Sheppard Lane	C/1234
w/improvements	---
MD 108 @ Great Star Dr	C/1171
MD 108 @ Auto Dr/Signal Bell Ln	A/808
MD 108 @ MD 32 WB Ramps	B/1124
MD 108 @ Linden Linthicum Ln	C/1300
w/improvements	---
MD 108 @ Site Access/Garden Center	---

A review of Table 2.1 shows that each intersection is currently operating with an acceptable level of service using CLV methodology.

A Synchro model was also developed for the MD 108 corridor using the model provided by Howard County Department of Public Works (DPW) Traffic Engineering as a base. The model was calibrated to match existing queue length found along MD 108. Table 2.2 summarizes the *Highway Capacity Manual* (HCM) results developed from the Synchro model.

Table 2.2 – Summary of Existing Delay (HCM – in seconds)

Intersection	Control Type	Existing LOS / Delay	
		AM	PM
MD 108 @ Sheppard Lane	Signal	C/33.0	C/20.3
SB		D/41.7	C/34.0
NB		---	---
EB		C/22.1	B/15.9
WB		D/40.7	C/26.2
MD 108 @ Great Star Dr	Signal	B/12.1	C/27.4
SB		B/16.5	C/22.8
NB		B/19.9	D/46.2
EB		B/12.8	C/24.0
WB		A/8.2	B/14.0
MD 108 @ Auto Dr/Signal Bell Ln	Signal	A/8.1	B/10.7
SB		C/20.1	C/24.8
NB		C/20.5	C/26.1
EB		A/5.4	A/7.6
WB		A/8.9	A/8.2
MD 108 @ MD 32 WB Ramps	Signal	C/21.7	C/32.4
NB		D/43.0	D/47.8
EB		A/5.5	B/15.7
WB		B/14.5	C/25.8
MD 108 @ Linden Linthicum Ln	Two Way Stop		
SB/LTR		F/365	F/>999
NB/LT		E/46.5	F/384.0
EB/L		B/11.4	A/9.6
WB/L		B/10.2	C/16.9
w/Signal & Improvement	Signal	---	---
SB		---	---
NB		---	---
EB		---	---
WB		---	---

As shown in Table 2.2, the minor street delay at Linden Linthicum Lane is very high during both peak periods. The implementation of signalization to reduce the delay is discussed in later sections of this document.

A SimTraffic model was also developed based on the Synchro input. The SimTraffic model incorporates queuing found at study intersections. Table 2.3 details the results of the SimTraffic analysis. Appendix E contains output from the models.

Table 2.3 – Summary of Existing Queuing (in feet)

Intersection	Available Storage	Existing	
		AM	PM
MD 108 @ Sheppard Lane			
SB/LR, LTR FOR BACK'D	---	403	164
SB/LT	---	---	---
SB/R	---	---	---
EB/L	---	---	---
EB/TR	---	---	---
EB/L	150 Exist./>1200 Total	223	233
EB/T	---	400	603
EB/R	---	---	---
WB/L	---	---	---
WB/T	445	451	381
WB/T	---	---	---
WB/R	265	165	92
MD 108 @ Great Star Dr			
SB/LTR	---	38	99
NB/L	200	80	147
NB/LT	200	88	302
NB/R	200	103	240
EB/L	---	40	149
EB/T	580	217	593
EB/TR	580	156	554
WB/L	200	128	205
WB/T	>1200'	135	177
WB/TR	>1200'	107	161
MD 108 @ Auto Dr/Signal Bell Ln			
SB/LT	---	45	118
SB/R	250	53	115
NB/LTR	---	75	119
EB/L	190	84	114
EB/T	360	109	241
EB/TR	360	81	221
WB/L	180	27	68
WB/T	580	203	223
WB/TR	580	140	230

Table 2.3, con't – Summary of Existing Queuing (in feet)

Intersection	Available Storage	Existing	
		AM	PM
MD 108 @ MD 32 WB Ramps			
NB/L	430	259	478
NB/LT	>1800	230	565
NB/R	350	283	440
EB/L	400	39	90
EB/T	440	179	300
EB/T	440	149	290
WB/T	350	321	420
WB/TR	350	202	411
MD 108 @ Linden Linthicum Ln			
SB/LTR	---	91	189
SB/L	---	---	---
SB/TR	---	---	---
NB/LT	>400	66	373
NB/R	200	79	473
EB/L	190'	28	35
EB/T	>1200	26	109
EB/TR	---	---	---
EB/R	>500	<25	<25
WB/L	105	44	106
WB/T	---	<25	<25
WB/T	225	<25	<25
WB/R	---	---	---
MD 108 @ Site Access/Garden Center			
NB/R	---	---	---
EB/L	---	---	---
WB/R	---	---	---

BACKGROUND TRAFFIC CONDITIONS

Design Year(s)

Based on the anticipated completion of the Erickson Living at Limestone Valley community, a six year horizon is considered for the Adequate Road Facilities Test Evaluation. Historic traffic volumes in the MD 108 corridor were reviewed to quantify the most accurate growth rate. As shown in Appendix D, traffic volumes have remained consistent, with even a slight decrease. To account for potential regional growth, present a conservative analysis and remain consistent the growth rate utilized by Sabra, Wang & Associates in their document titled ***Multimodal Traffic Study and Conceptual Improvements: Clarksville Pike (MD 108)*** dated April 2015 a 1.5% annual growth rate was considered for 6 years. The growth rate was utilized based on models prepared by Baltimore Metropolitan Council (BMC). Figure 3.1 shows the 2023 base peak hour traffic volumes.

For Chapter 5 purposes, a 2037 Traffic Analysis is also accounted for. Figure 3.2 details the 2037 base peak hour traffic volumes which increase the existing traffic at 6% per year from 2023 to 2037.

Background Traffic

Howard County's Department of Planning and Zoning website was consulted to determine the approved but unbuilt projects in the vicinity of the subject site. As shown in Figure 3.3, a total of seven developments have been approved but remain unbuilt. Table 3.1 includes a list of those developments.

Figure 3.1 – 2023 Base Peak Hour Traffic Volumes

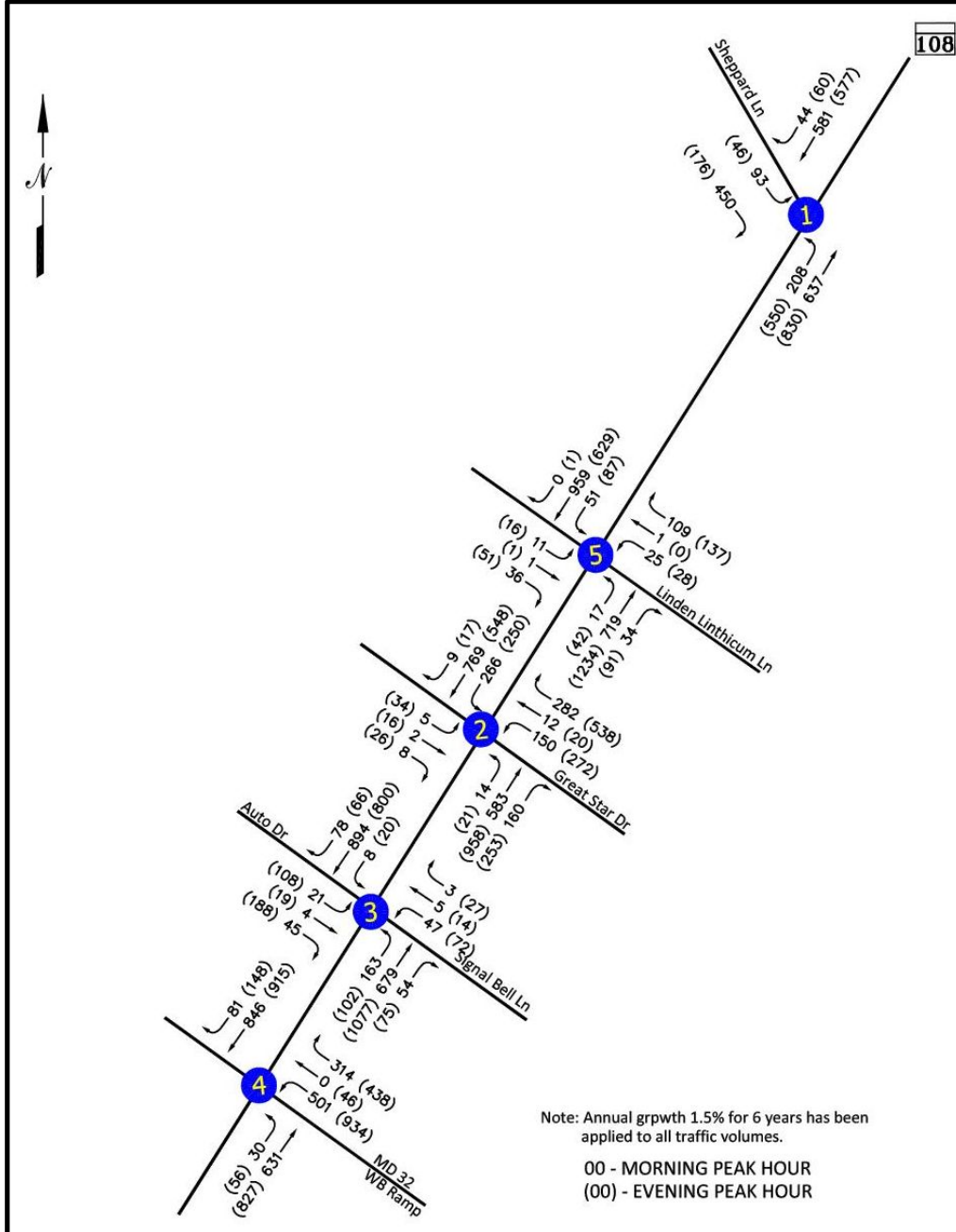


Figure 3.2 – 2037 Base Peak Hour Traffic Volumes

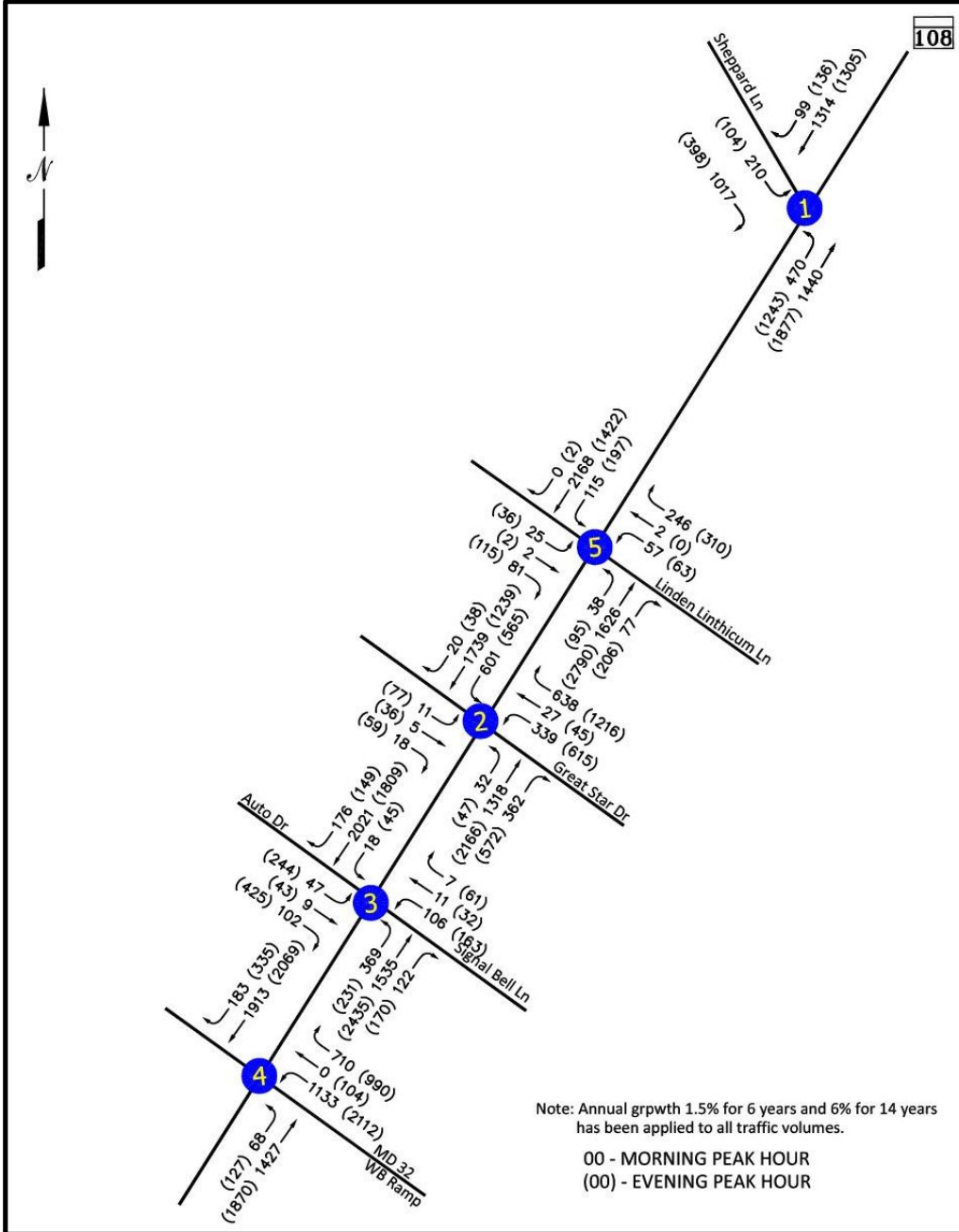


Figure 3.3 – Background Development Map

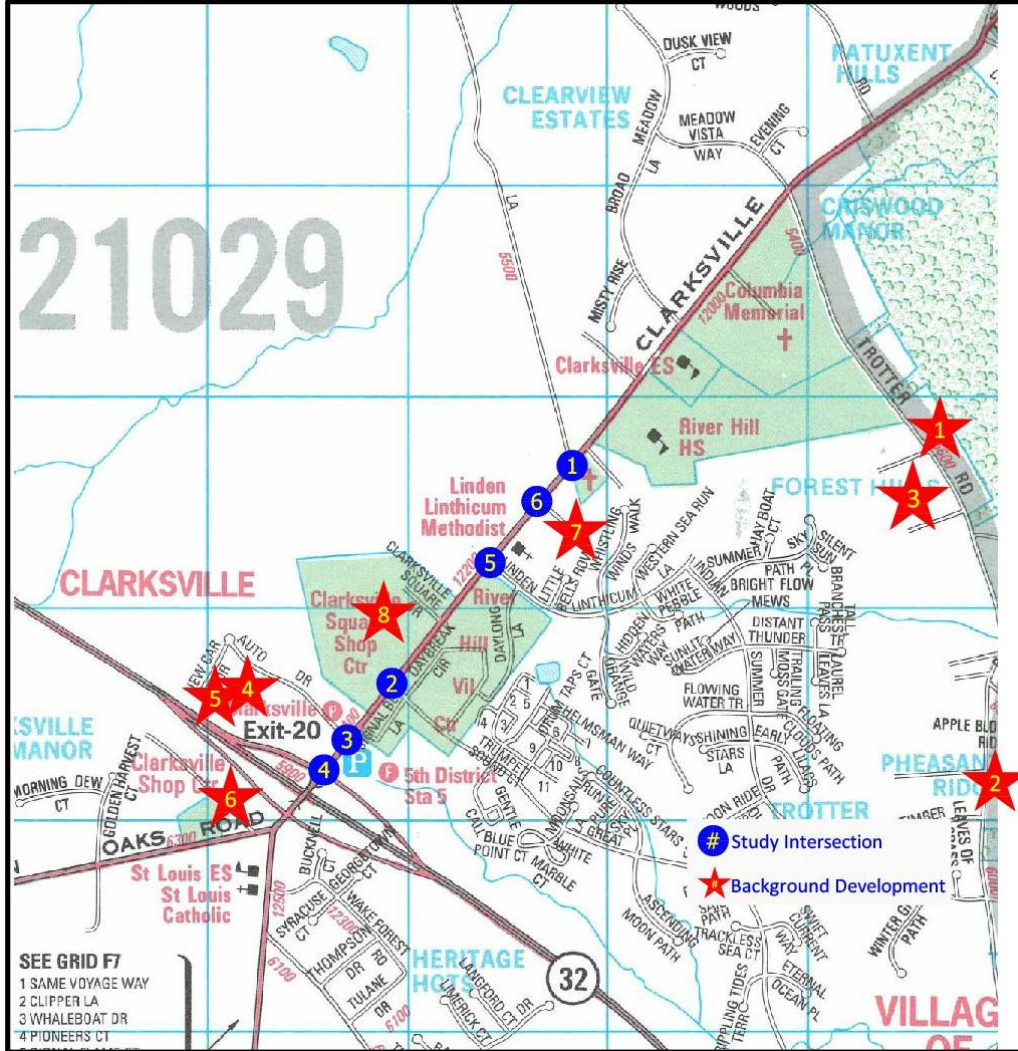


Table 3.1 – Background Development Listing

No.	Development
1.	Criswood Manor Sec 4 Lot 22 (SDP-15-038)
2.	Trotter Woods, Lot 24 (SDP-15-062)
3.	TAJ Property (SDP-15-026)
4.	Antwerpen Hyundai (SDP-14-061)
5.	Coleman Fiat (SDP-15-004)
6.	Antwerpen Properties (SDP-16-021)
7.	River Hill Garden Center
8.	Clarksville Commons (SDP-13-079)

It is important to recognize the redevelopment of River Hill Garden Center was incorporated within this analysis. While the development is not yet approved, it will have a direct impact on study intersections. Therefore, its inclusion represents a conservative analysis for this report.

The Institute of Transportation Engineers (ITE) *Trip Generation* (9th Edition) was consulted to quantify trips projected to be generated by each of the background developments. Based on current traffic patterns and anticipated future demand, the trips associated with each of the background developments were distributed and assigned to the road network. Details on the trip generation and distribution for background developments can be found in Appendix D. Figure 3.4 details the combined trips generated by all approved developments.

Combining the trips projected to be generated by the approved developments with the base peak hour traffic volumes results in the 2023 and 2037 background peak hour traffic volumes as shown in Figures 3.5 and 3.6, respectively.

Figure 3.4 – Combined Trips Generated by Background Developments

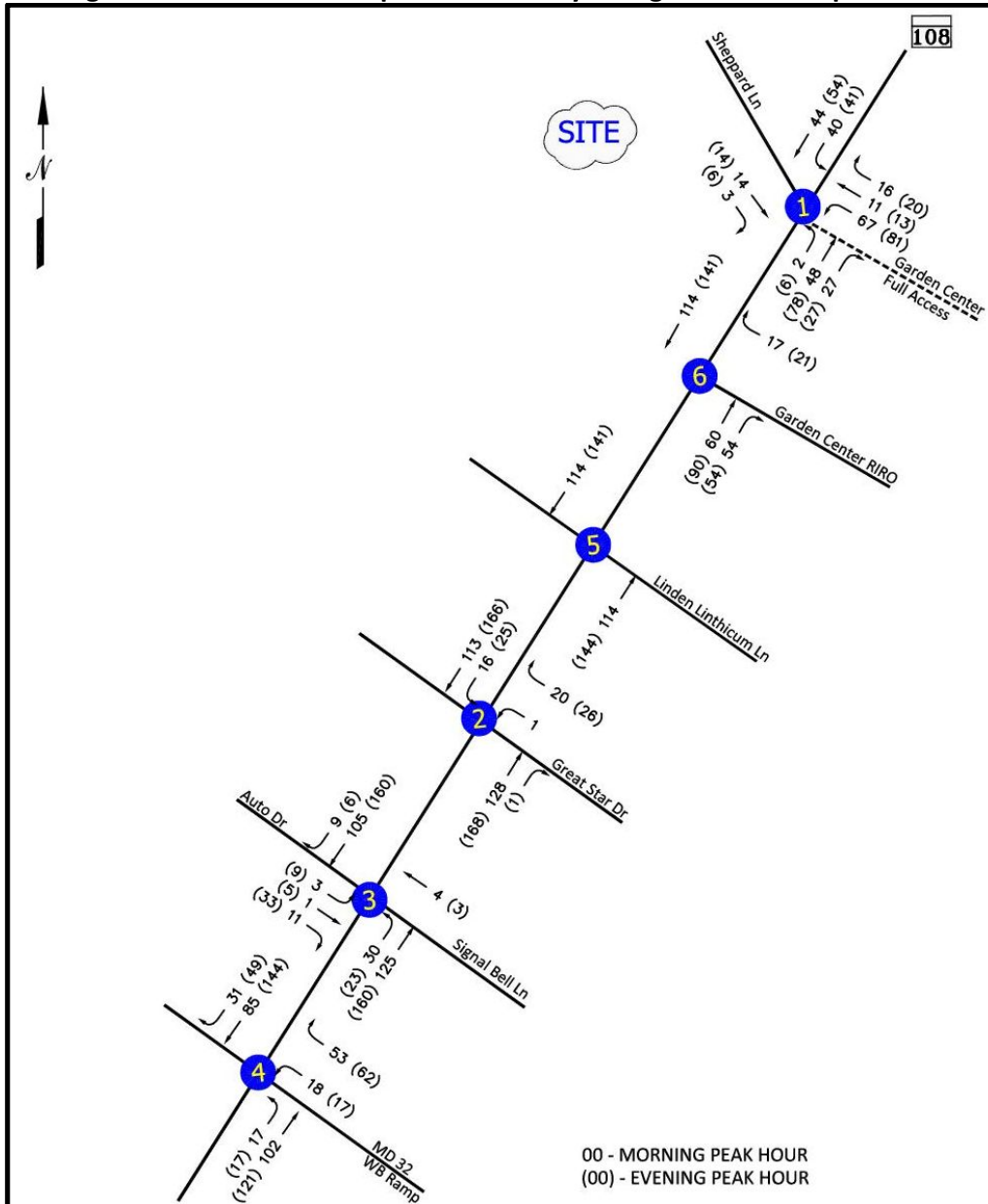


Figure 3.5 – 2023 Background Peak Hour Traffic Volumes

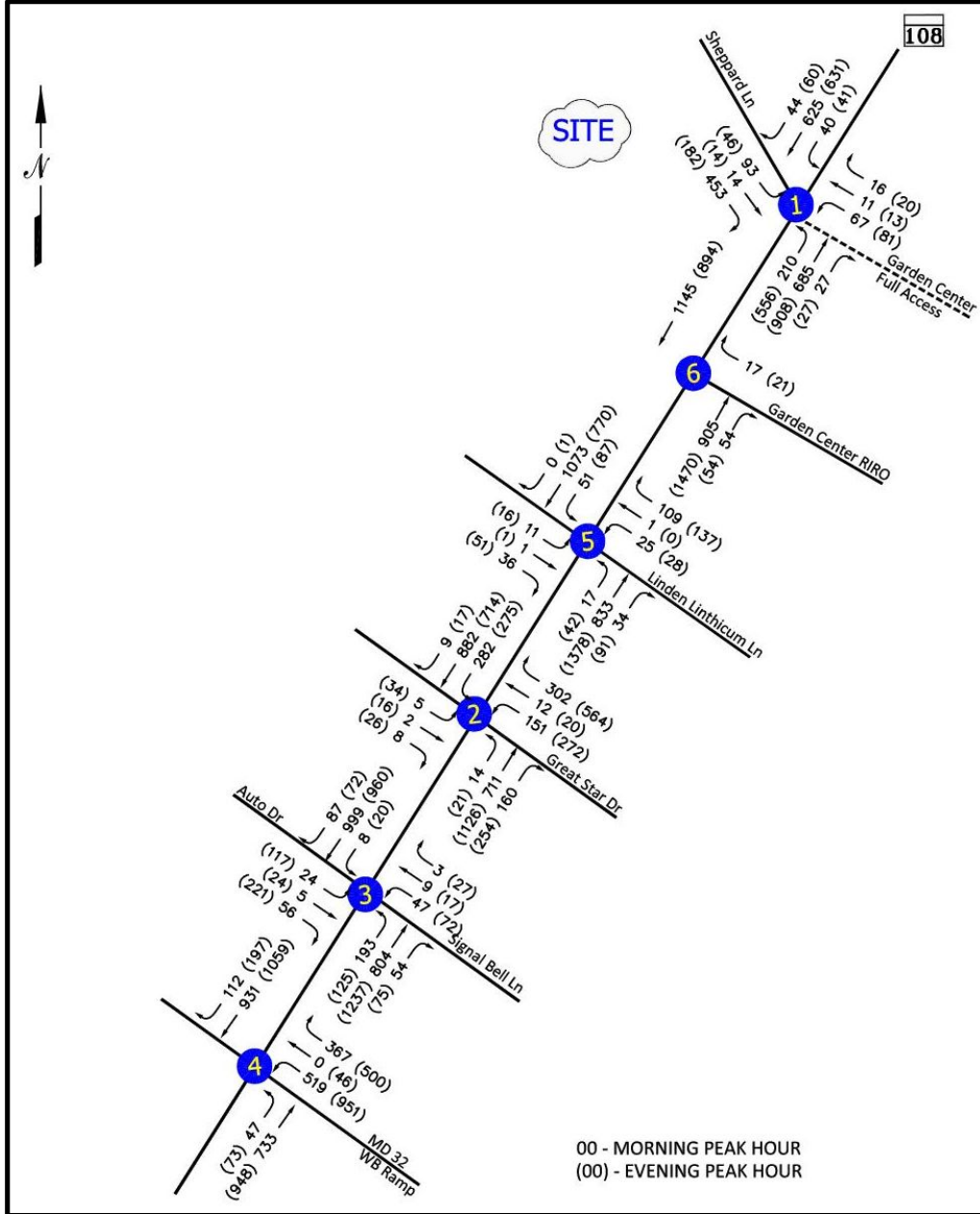
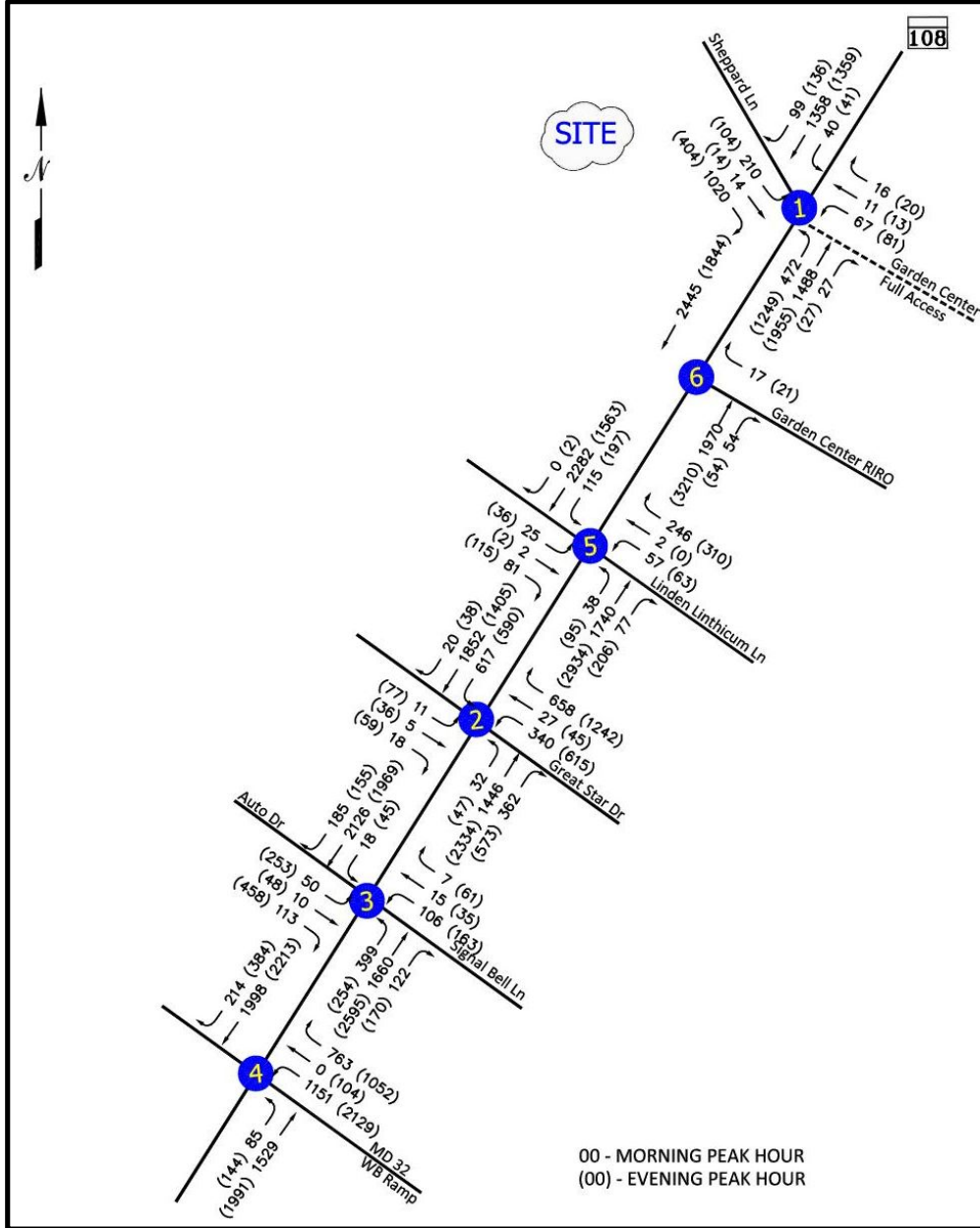


Figure 3.6 – 2037 Background Peak Hour Traffic Volumes



Analysis of Background Traffic Conditions

Critical Lane Volume Analysis was again undertaken for each of the study intersections, this time with consideration given to the development of all background developments. Complete capacity worksheets can be found in Appendix C. As shown in Table 3.2, all intersections are projected to maintain acceptable levels of service, with the exception of MD 108 at Sheppard Lane.

During both the morning and peak periods, this intersection will exhibit Level of Service “F” conditions. Improvements to provide acceptable operations will be detailed later in this document.

Table 3.2 – Summary of Background CLV

AM Peak Hour	Existing LOS / CLV	2023 Back'd LOS / CLV	2037 Back'd LOS / CLV
MD 108 @ Sheppard Lane	C/1218	F/1609	F/3368
w/improvements	---	---	---
MD 108 @ Great Star Dr	A/719	A/874	F/1865
MD 108 @ Auto Dr/Signal Bell Ln	A/712	A/878	F/1859
MD 108 @ MD 32 WB Ramps	A/780	A/988	F/2065
MD 108 @ Linden Linthicum Ln	A/773	A/958	F/2045
w/improvements	---	---	---
MD 108 @ Site Access/Garden Center	---	---	---
PM Peak Hour	Existing LOS / CLV	2023 Back'd LOS / CLV	2037 Back'd LOS / CLV
MD 108 @ Sheppard Lane	C/1234	F/1707	F/3449
w/improvements	---	---	---
MD 108 @ Great Star Dr	C/1171	D/1399	F/3013
MD 108 @ Auto Dr/Signal Bell Ln	A/808	B/1047	F/2241
MD 108 @ MD 32 WB Ramps	B/1124	D/1362	F/2912
MD 108 @ Linden Linthicum Ln	C/1300	E/1563	F/3383
w/improvements	---	---	---
MD 108 @ Site Access/Garden Center	---	---	---

The Synchro model was also updated to incorporate the regional growth and impact from background developments. Table 3.3 summarizes the HCM levels of service associated with the intersection operations. As shown in the analysis, the intersection of MD 108 at Linden Linthicum Lane has a high level of delay on the minor approach. This is a result of the lack of signalization at this location. Improvements will be detailed to enhance the overall level of service at this location.

In addition, LOS ‘E’ conditions are projected at the intersection of MD 108 at Sheppard Lane. Proposed improvements at this location which are discussed in later sections of this document would mitigate the noted deficiency.

Table 3.3 – Summary of Background Delay (HCM – in seconds)

Intersection	Control Type	Existing LOS / Delay		2023 Back'd LOS / Delay	
		AM	PM	AM	PM
MD 108 @ Sheppard Lane	Signal	C/33.0	C/20.3	E/58.7	D/44.0
SB		D/41.7	C/34.0	F/87.5	E/57.6
NB		---	---	C/33.8	D/53.4
EB		C/22.1	B/15.9	D/43.1	C/32.7
WB		D/40.7	C/26.2	E/59.2	E/63.5
MD 108 @ Great Star Dr	Signal	B/12.1	C/27.4	B/15.0	D/44.2
SB		B/16.5	C/22.8	B/19.9	C/27.2
NB		B/19.9	D/46.2	C/27.4	F/102
EB		B/12.8	C/24.0	B/15.3	C/29.3
WB		A/8.2	B/14.0	A/9.8	B/17.2
MD 108 @ Auto Dr/Signal Bell Ln	Signal	A/8.1	B/10.7	A/8.6	B/14.6
SB		C/20.1	C/24.8	C/24.5	C/34.1
NB		C/20.5	C/26.1	C/24.9	D/38.0
EB		A/5.4	A/7.6	A/5.7	B/10.5
WB		A/8.9	A/8.2	A/9.2	B/10.8
MD 108 @ MD 32 WB Ramps	Signal	C/21.7	C/32.4	C/23.6	D/36.7
NB		D/43.0	D/47.8	D/39.1	D/47.4
EB		A/5.5	B/15.7	B/10.3	C/20.9
WB		B/14.5	C/25.8	C/20.3	D/36.8
MD 108 @ Linden Linthicum Ln	Stop				
SB/LTR		F/365	F/>999	F/>999	F/>999
NB/LT		E/46.5	F/384.0	F/142.0	F/>999
EB/L		B/11.4	A/9.6	B/13.2	B/10.9
WB/L		B/10.2	C/16.9	B/11.7	C/24.5
w/Signal & Improvement	Signal	---	---	---	---
SB		---	---	---	---
NB		---	---	---	---
EB		---	---	---	---
WB		---	---	---	---
MD 108 @ Site Access/Garden Center	Stop				
NB/R, FR for Total		---	---	C/17.7	E/38.2
EB/L		---	---	---	---

The queuing for all study intersections is shown in Table 3.4 and output can be found in Appendix E.

Table 3.4 – Summary of Background Queuing (in feet)

Intersection	Available Storage	Existing		2023 Back'd	
		AM	PM	AM	PM
MD 108 @ Sheppard Lane					
SB/LR, LTR FOR BACK'D	---	403	164	968	482
SB/LT	---	---	---	---	---
SB/R	---	---	---	---	---
EB/L	---	---	---	166	142
EB/TR	---	---	---	<25	29
EB/L	150 Exist./>1200 Total	223	233	257	268
EB/T	---	400	603	499	630
EB/R	---	---	---	131	101
WB/L	---	---	---	94	88
WB/T	445	451	381	573	546
WB/T	---	---	---	---	---
WB/R	265	165	92	360	425
MD 108 @ Great Star Dr					
SB/LTR	---	38	99	43	168
NB/L	200	80	147	68	218
NB/LT	200	88	302	210	414
NB/R	200	103	240	172	255
EB/L	---	40	149	97	167
EB/T	580	217	593	418	633
EB/TR	580	156	554	373	642
WB/L	200	128	205	180	245
WB/T	>1200'	135	177	137	244
WB/TR	>1200'	107	161	171	241
MD 108 @ Auto Dr/Signal Bell Ln					
SB/LT	---	45	118	56	384
SB/R	250	53	115	58	338
NB/LTR	---	75	119	84	244
EB/L	190	84	114	127	358
EB/T	360	109	241	202	383
EB/TR	360	81	221	176	383
WB/L	180	27	68	22	70
WB/T	580	203	223	201	453
WB/TR	580	140	230	233	478

Table 3.4 con't– Summary of Background Queuing (in feet)

Intersection	Available Storage	Existing		2023 Back'd	
		AM	PM	AM	PM
MD 108 @ MD 32 WB Ramps					
NB/L	430	259	478	298	619
NB/LT	>1800	230	565	396	568
NB/R	350	283	440	346	391
EB/L	400	39	90	91	573
EB/T	440	179	300	331	537
EB/T	440	149	290	271	555
WB/T	350	321	420	341	470
WB/TR	350	202	411	362	479
MD 108 @ Linden Linthicum Ln					
SB/LTR	---	91	189	174	214
SB/L	---	---	---	---	---
SB/TR	---	---	---	---	---
NB/LT	>400	66	373	284	631
NB/R	200	79	473	364	644
EB/L	190'	28	35	32	38
EB/T	>1200	26	109	150	247
EB/TR	---	---	---	---	---
EB/R	>500	<25	<25	<25	<25
WB/L	105	44	106	61	178
WB/T	---	<25	<25	56	80
WB/T	225	<25	<25	26	41
WB/R	---	---	---	---	---
MD 108 @ Site Access/Garden Center					
NB/R	---	---	---	75	165
EB/L	---	---	---	---	---
WB/R	---	---	---	---	---

TOTAL TRAFFIC CONDITIONS

Site Information

The proposed Erickson Living at Limestone Valley community is situated on the north side of MD 108, west of Sheppard Lane in Howard County, Maryland. A Continuing Care Retirement Community (CCRC) with up to 1200 units is proposed. In addition, a 240 bed Assisted Living Facility (ALF) will also be constructed on-site.

Access to the property is proposed via one point along MD 108 and a secondary point along an extension of Linden Linthicum Lane (Proposed Public Access Road). In order for Proposed Public Access Road to be constructed the existing Freestate gasoline station situated on the north side of MD 108 would have to be relocated. The relocation of the gas station is being considered in conjunction with this application.

The MD 108 access will operate under stop control and left turns out of the facility will be restricted. The access point along Proposed Public Access Road will operate under stop control. Traffic signalization is proposed at the intersection of MD 108 and Linden Linthicum Lane/Proposed Public Access in order to safely and efficiently accommodate site traffic destined to points east along MD 108.

Trip Generation/Distribution

ITE's *Trip Generation* (9th Edition) was again utilized to quantify the trips projected to be generated by the development of the Erickson Living at Limestone Valley Community. Table 4.1 details the trip generation rates for the different uses on-site. The associated trip generation for the project is shown in Table 4.2.

Table 4.1 – Trip Generation Rates

<i>Continuing Care Retirement Community (ITE-255, Units)</i>	<i>In/Out %</i>
Morning Trips = 0.14 x Units	65/35
Evening Trips = 0.16 x Units	39/61
<i>Assisted Living (ITE-254, Beds)</i>	
Morning Trips = 0.14 x Beds	65/35
Evening Trips = 0.22 x Beds	44/56

Table 4.2 – Trip Generation Totals

Land Use	Size		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
CCRC	1,200	Units	109	59	168	75	117	192
ALF	240	Beds	22	12	34	23	30	53
Total Trips			131	71	202	98	147	245

Based on current traffic counts and anticipated future demand, the trips projected to be generated by the Erickson Living at Limestone Valley Community were distributed and assigned to the road network as shown in Figure 4.1. As previously stated, left turns directly to MD 108 will be restricted from the site by the use of physical channelization. Therefore, all left turn traffic is routed via Proposed Public Access Road.

Erickson intends to control access to its facility and therefore route employees and deliveries to the site via Proposed Public Access Road. While trip generation does not differentiate the different types of peak hour trips at a CCRC, it is estimated that 70% of peak hour traffic is related to staff and is therefore assigned to Proposed Public Access Road.

Adding the trips projected to be generated by the subject site to the background peak hour traffic volumes results in the total peak hour traffic volumes as shown in Figure 4.2 for Design Year 2023 and Figure 4.3 for Design Year 2037.

An adjustment was made to the background minor street volumes at the intersection of MD 108 at Linden Linthicum Lane because of the implementation of signalization at this location. It is projected that during the peak periods, 25% of left turn traffic along Great Star Drive approaching MD 108 would be diverted to Linden Linthicum Lane. In addition, the development of Proposed Public Access Road would allow property owners on the north side of MD 108 west of the roadway signalized access to the corridor, if they construct driveways to it. The introduction of access to the new roadway would give drivers the opportunity to access MD 108 via a signalized intersection. Figure 4.4 shows the adjustment and the adjusted total peak hour traffic volumes can be found in Figure 4.5.

Figure 4.1 – Trip Distribution and Assignment

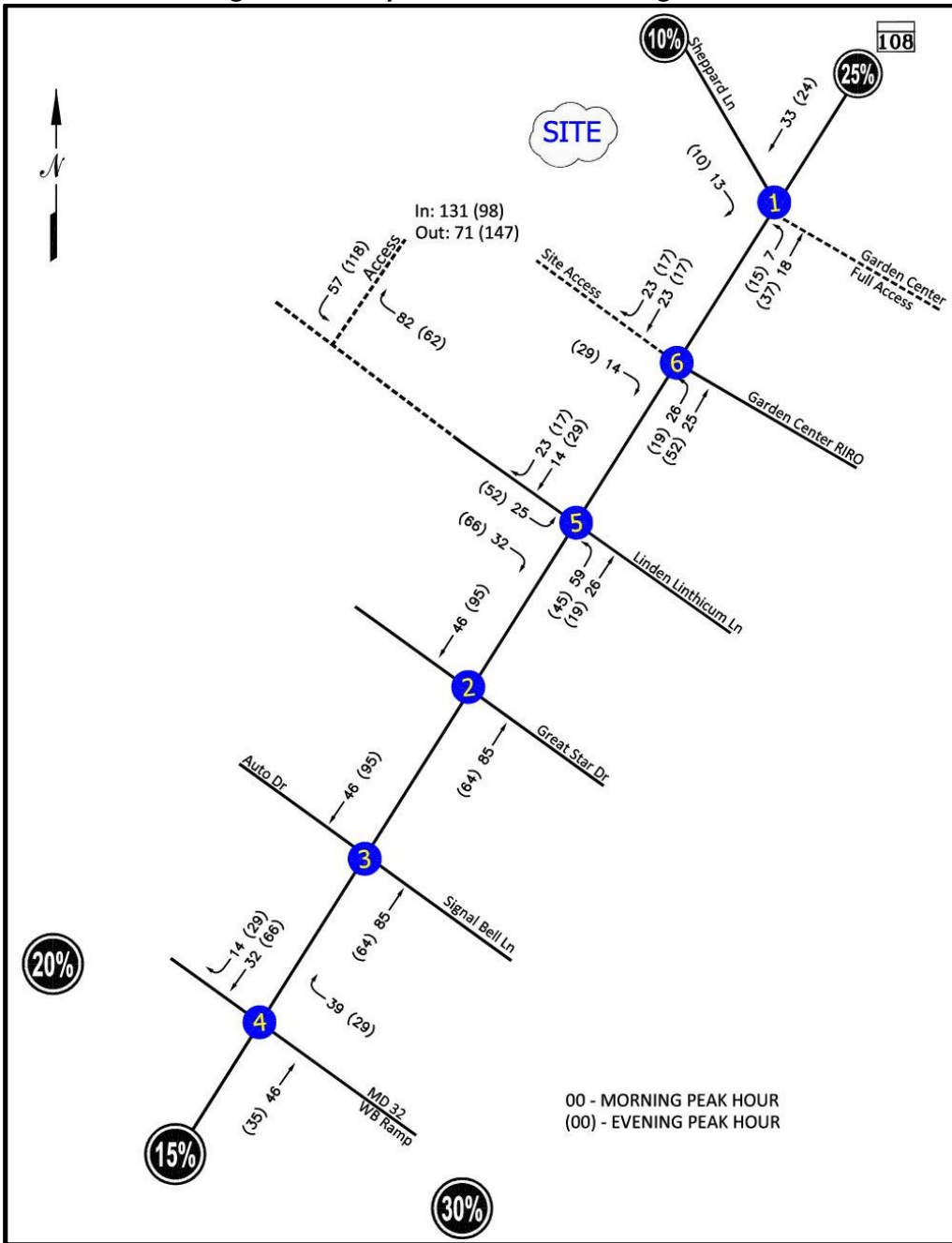


Figure 4.2 – 2023 Total Peak Hour Traffic Volumes

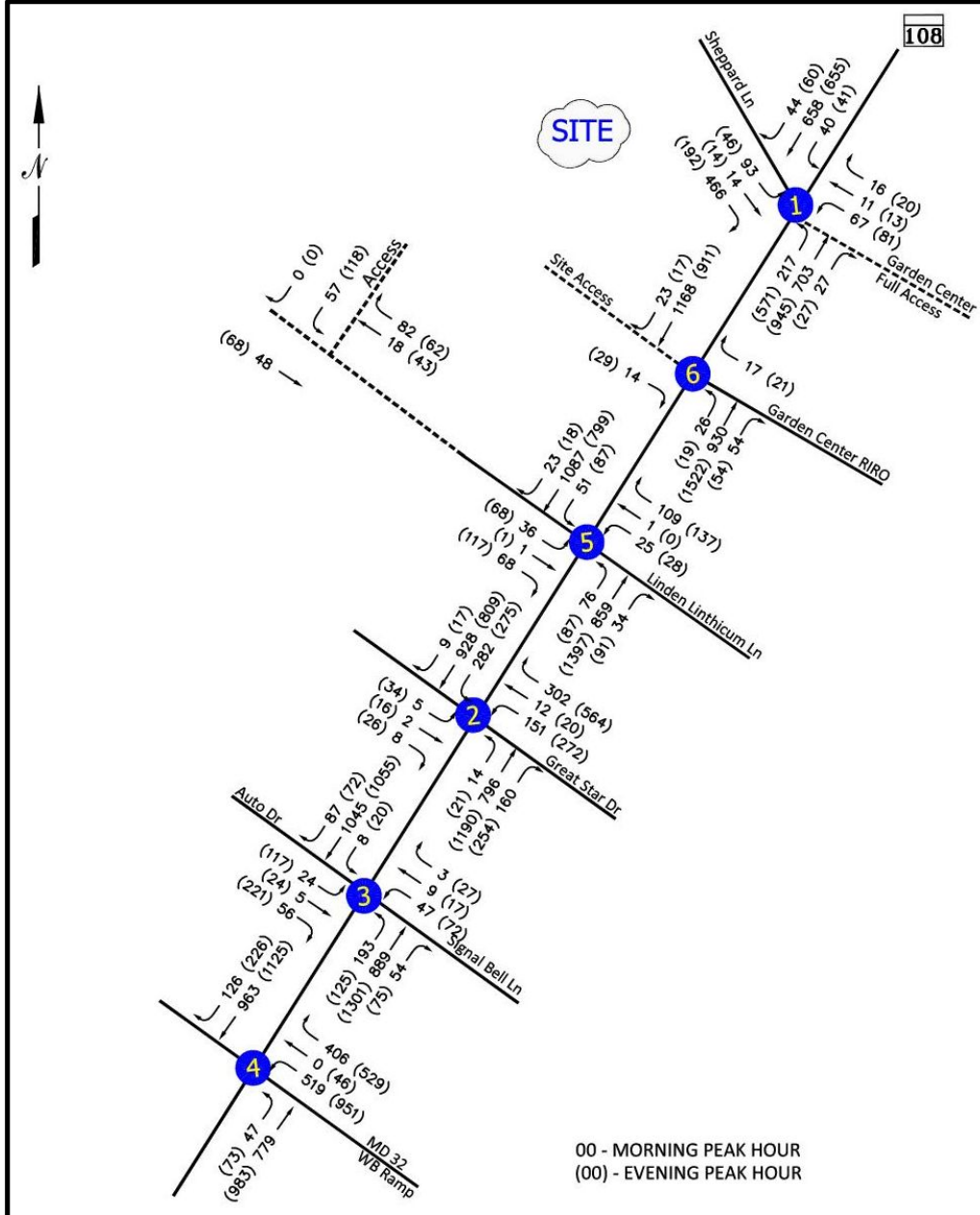


Figure 4.3 – 2037 Total Peak Hour Traffic Volumes

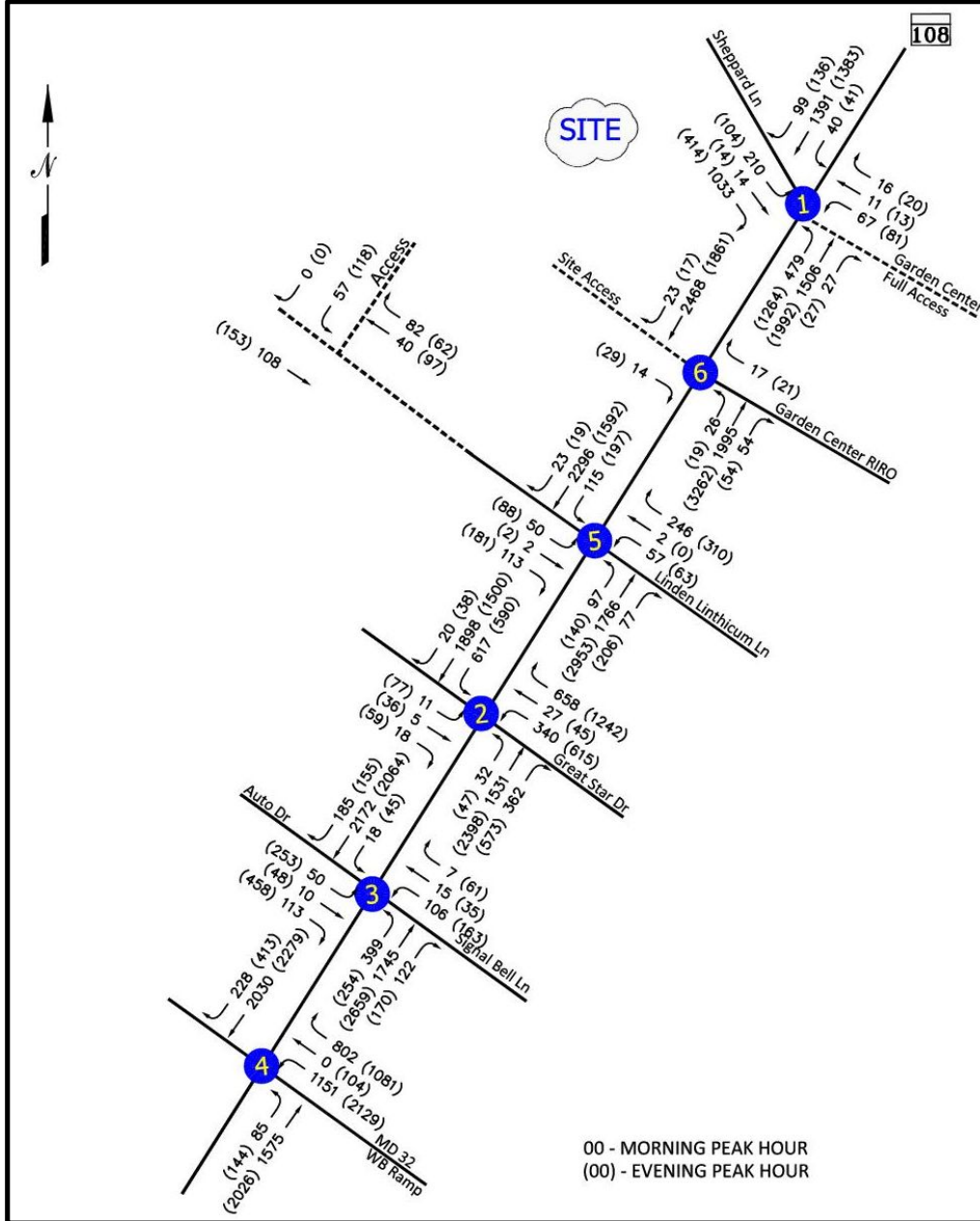


Figure 4.4 – 2023 Adjustment to Total Peak Hour Traffic Volumes

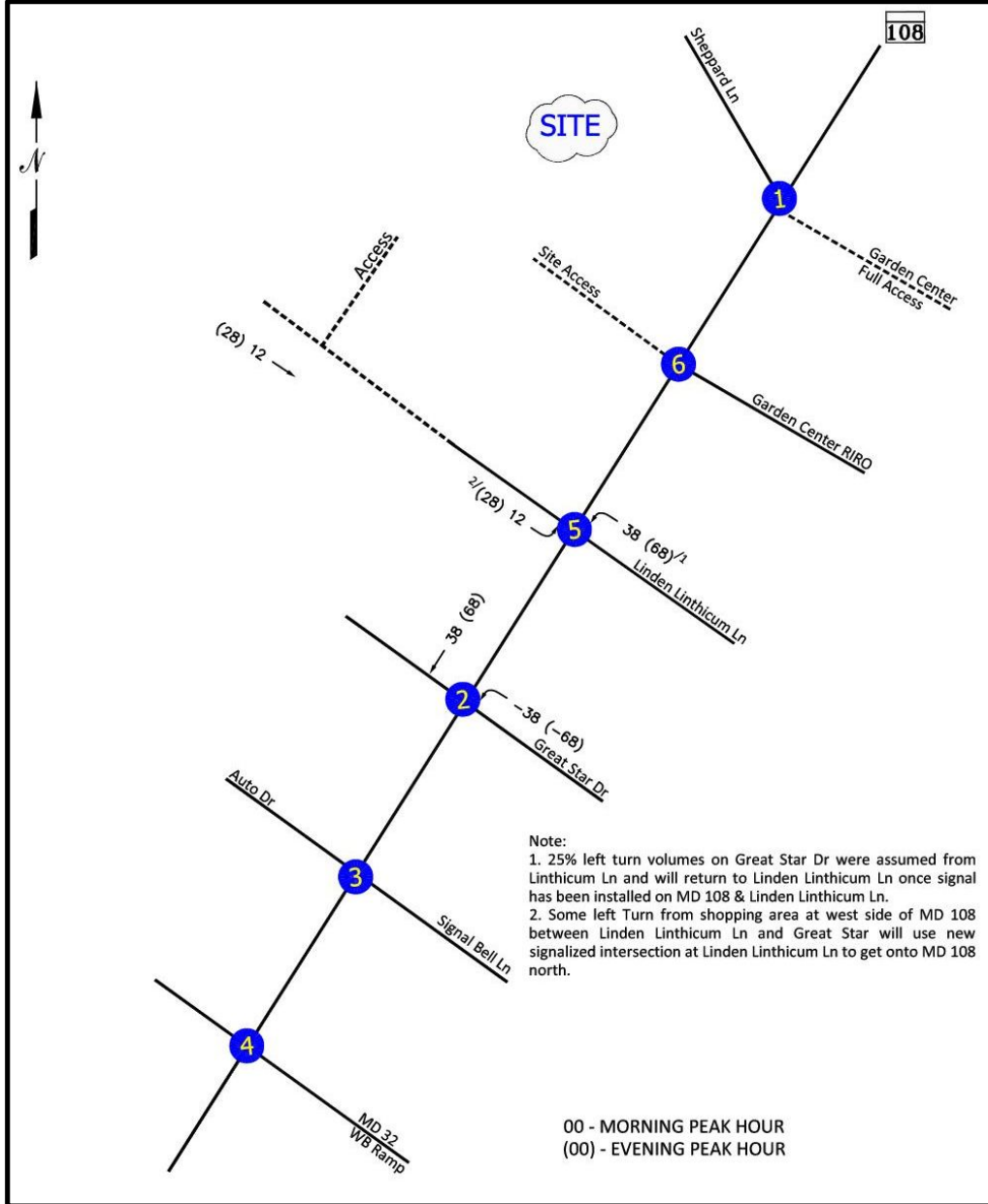
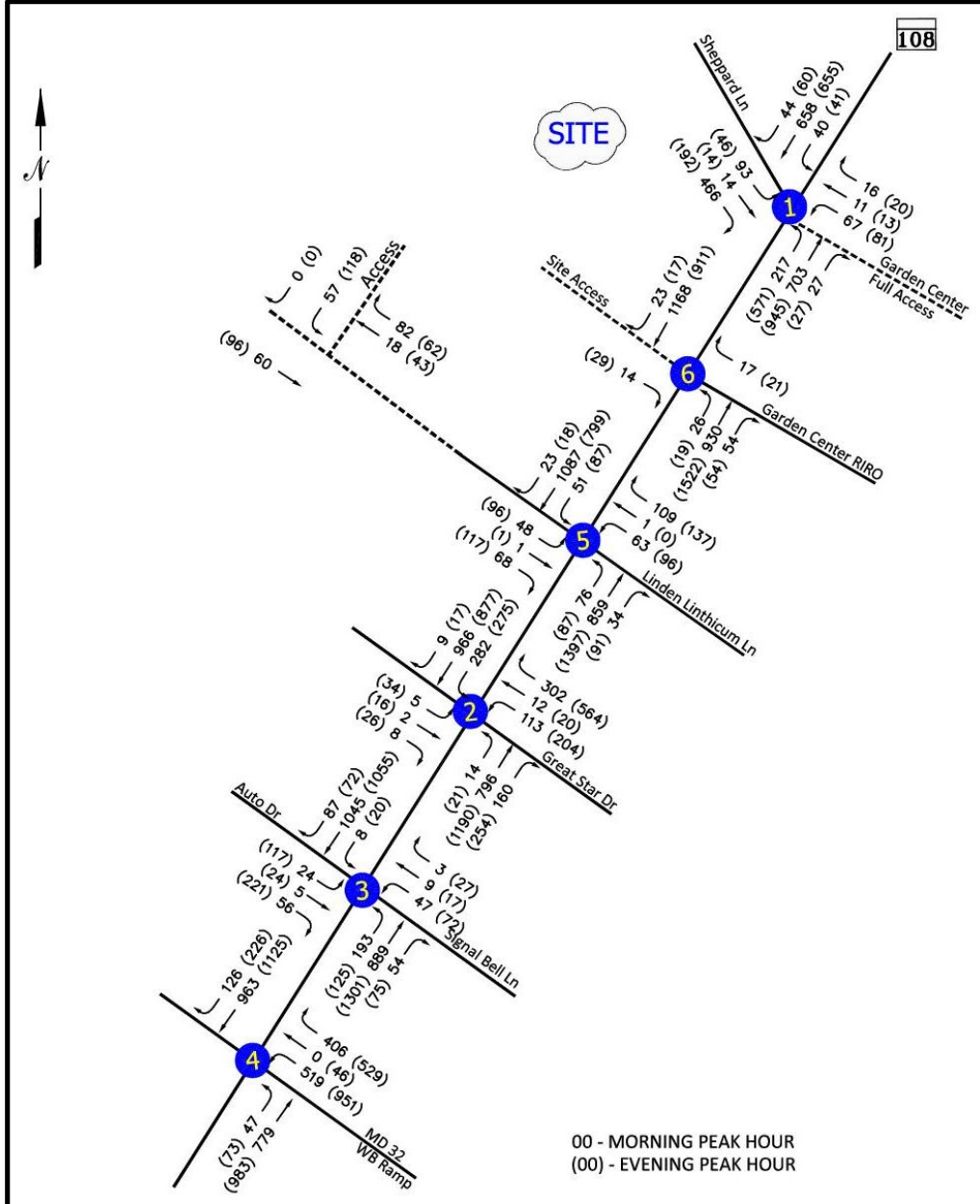


Figure 4.5 – 2023 Adjusted Total Peak Hour Traffic Volumes



Analysis of Total Traffic Conditions

Intersection Capacity Analysis was again undertaken, this time with consideration given to the full buildout of the Erickson Living at Limestone Valley Community.

The CLV results are summarized in Table 4.3. Complete capacity worksheets can be found in Appendix C. As shown, all intersections are projected to exhibit

acceptable levels of service with the exception of MD 108 at Sheppard Lane and MD 108 at Linden Linthicum Lane. Improvements for these locations are detailed below. The 2037 analysis is provided for future planning purposes only. No improvements are required to mitigate 2037 conditions.

Table 4.3 – Summary of Total CLV Analysis

AM Peak Hour	Existing LOS / CLV	2023 Back'd LOS / CLV	2023 Total LOS/CLV	2037 Back'd LOS / CLV	2037 Total LOS/CLV
MD 108 @ Sheppard Lane	C/1218	F/1609	F/1662	F/3368	F/3421
w/improvements	---	---	B/1086	---	F/2194
MD 108 @ Great Star Dr	A/719	A/874	A/921	F/1865	F/1912
w/Adjusted Traffic	---	---	A/898	---	---
MD 108 @ Auto Dr/Signal Bell Ln	A/712	A/878	A/904	F/1859	F/1884
MD 108 @ MD 32 WB Ramps	A/780	A/988	B/1052	F/2065	F/2129
MD 108 @ Linden Linthicum Ln	A/773	A/958	B/1044	F/2045	F/2153
w/Adjustment & improvements	---	---	A/819	---	F/1553
MD 108 @ Site Access/Garden Center	---	---	A/685	---	D/1400
PM Peak Hour					
MD 108 @ Sheppard Lane	C/1234	F/1707	F/1756	F/3449	F/3498
w/improvements	---	---	C/1160	---	F/2265
MD 108 @ Great Star Dr	C/1171	D/1399	D/1434	F/3013	F/3048
w/Adjusted Traffic	---	---	D/1434	---	---
MD 108 @ Auto Dr/Signal Bell Ln	A/808	B/1047	B/1082	F/2241	F/2276
MD 108 @ MD 32 WB Ramps	B/1124	D/1362	D/1414	F/2912	F/2965
MD 108 @ Linden Linthicum Ln	C/1300	E/1563	F/1705	F/3383	F/3572
w/Adjustment & improvements	---	---	B/1119	---	F/2180
MD 108 @ Site Access/Garden Center	---	---	A/858	---	F/1815

The Synchro model was again modified to reflect the impact associated with the full buildout of the site and the associated road improvements. The results are shown in Table 4.4 for the HCM analysis, which demonstrates that with improvements described below, all study intersections will operate with an acceptable level of service and most will exhibit less delay under the total condition than they do under background conditions.

Table 4.5 details the queuing associated with the improvements. As shown within the table, the site will have minimal impacts at all locations. Queue lengths at unimproved intersections are typically changed by less than one vehicle length during both peak periods, with the exception of some of the residual thru queues associated with road widening. All projected turn bays are able to accommodate future demand. At improved intersections, queuing is significantly reduced in most cases. Appendix E contains Synchro/Simtraffic output.

Table 4.4 – Summary of Total Delay (HCM – in seconds)

Intersection	Control Type	Existing LOS / Delay		2023 Back'd LOS / Delay		2023 Total w/Imp LOS/Delay	
		AM	PM	AM	PM	AM	PM
MD 108 @ Sheppard Lane	Signal	C/33.0	C/20.3	E/58.7	D/44.0	C/30.8	C/30.7
SB		D/41.7	C/34.0	F/87.5	E/57.6	D/40.5	D/49.5
NB		---	---	C/33.8	D/53.4	D/52.6	D/53.2
EB		C/22.1	B/15.9	D/43.1	C/32.7	C/29.0	C/28.5
WB		D/40.7	C/26.2	E/59.2	E/63.5	C/24.8	C/27.1
MD 108 @ Great Star Dr	Signal	B/12.1	C/27.4	B/15.0	D/44.2	B/17.3	D/51.7
SB		B/16.5	C/22.8	B/19.9	C/27.2	D/41.6	E/77.9
NB		B/19.9	D/46.2	C/27.4	F/102	C/33.1	E/75.8
EB		B/12.8	C/24.0	B/15.3	C/29.3	B/18.2	D/54.9
WB		A/8.2	B/14.0	A/9.8	B/17.2	B/12.2	C/33.4
MD 108 @ Auto Dr/Signal Bell Ln	Signal	A/8.1	B/10.7	A/8.6	B/14.6	A/8.3	B/15.2
SB		C/20.1	C/24.8	C/24.5	C/34.1	C/28.1	D/36.2
NB		C/20.5	C/26.1	C/24.9	D/38.0	C/28.7	D/42.5
EB		A/5.4	A/7.6	A/5.7	B/10.5	A/5.5	B/11.6
WB		A/8.9	A/8.2	A/9.2	B/10.8	A/8.5	B/11.8
MD 108 @ MD 32 WB Ramps	Signal	C/21.7	C/32.4	C/23.6	D/36.7	C/22.0	C/32.7
NB		D/43.0	D/47.8	D/39.1	D/47.4	C/27.7	D/42.6
EB		A/5.5	B/15.7	B/10.3	C/20.9	B/13.6	B/18.4
WB		B/14.5	C/25.8	C/20.3	D/36.8	C/23.7	C/32.8
MD 108 @ Linden Linthicum Ln	Stop						
SB/LTR		F/365	F/>999	F/>999	F/>999	---	---
NB/LT		E/46.5	F/384.0	F/142.0	F/>999	---	---
EB/L		B/11.4	A/9.6	B/13.2	B/10.9	---	---
WB/L		B/10.2	C/16.9	B/11.7	C/24.5	---	---
w/Signal & Improvement	Signal	---	---	---	---	B/11.8	B/18.2
SB		---	---	---	---	B/19.0	C/32.2
NB		---	---	---	---	B/18.8	C/29.1
EB		---	---	---	---	A/9.7	B/17.8
WB		---	---	---	---	B/11.7	B/12.7
MD 108 @ Site Access/Garden Center	Stop						
NB/R, FR for Total		---	---	C/17.7	E/38.2	---	---
EB/L		---	---	---	---	B/12.2	B/10.4

Table 4.5 – Summary of Total Queuing (in feet)

Intersection	Available Storage	Existing		2023 Back'd		2023 Total Improved	
		AM	PM	AM	PM	AM	PM
MD 108 @ Sheppard Lane							
SB/LR, LTR FOR BACK'D	---	403	164	968	482	---	---
SB/LT	---	---	---	---	---	133	83
SB/R	---	---	---	---	---	192	77
EB/L	---	---	---	166	142	103	115
EB/TR	---	---	---	<25	29	49	65
EB/L	150 Exist./>1200 Total	223	233	257	268	177	386
EB/T	---	400	603	499	630	430	418
EB/R	---	---	---	131	101	103	104
WB/L	---	---	---	94	88	116	128
WB/T	445	451	381	573	546	300	328
WB/T	---	---	---	---	---	254	286
WB/R	265	165	92	360	425	66	100
MD 108 @ Great Star Dr							
SB/LTR	---	38	99	43	168	43	153
NB/L	200	80	147	68	218	65	194
NB/LT	200	88	302	210	414	175	421
NB/R	200	103	240	172	255	185	252
EB/L	---	40	149	97	167	60	132
EB/T	580	217	593	418	633	291	675
EB/TR	580	156	554	373	642	312	676
WB/L	200	128	205	180	245	196	261
WB/T	>1200'	135	177	137	244	233	421
WB/TR	>1200'	107	161	171	241	241	367
MD 108 @ Auto Dr/Signal Bell Ln							
SB/LT	---	45	118	56	384	56	341
SB/R	250	53	115	58	338	60	297
NB/LTR	---	75	119	84	244	84	223
EB/L	190	84	114	127	358	126	299
EB/T	360	109	241	202	383	152	440
EB/TR	360	81	221	176	383	152	445
WB/L	180	27	68	22	70	45	100
WB/T	580	203	223	201	453	253	520
WB/TR	580	140	230	233	478	292	540

Table 4.5 (con't)– Summary of Total Queuing (in feet)

Intersection	Available Storage	Existing		2023 Back'd		2023 Total Improved	
		AM	PM	AM	PM	AM	PM
MD 108 @ MD 32 WB Ramps							
NB/L	430	259	478	298	619	251	556
NB/LT	>1800	230	565	396	568	293	557
NB/R	350	283	440	346	391	213	393
EB/L	400	39	90	91	573	67	338
EB/T	440	179	300	331	537	288	513
EB/T	440	149	290	271	555	239	491
WB/T	350	321	420	341	470	377	443
WB/TR	350	202	411	362	479	396	446
MD 108 @ Linden Linthicum Ln							
SB/LTR	---	91	189	174	214	---	---
SB/L	---	---	---	---	---	61	109
SB/TR	---	---	---	---	---	65	77
NB/LT	>400	66	373	284	631	76	113
NB/R	200	79	473	364	644	82	107
EB/L	190'	28	35	32	38	81	102
EB/T	>1200	26	109	150	247	147	256
EB/TR	---	---	---	---	---	188	279
EB/R	>500	<25	<25	<25	<25	---	---
WB/L	105	44	106	61	178	60	94
WB/T	---	<25	<25	56	80	200	194
WB/TR	225	<25	<25	26	41	210	210
MD 108 @ Site Access/Garden Center							
NB/R	---	---	---	75	165	<25	<25
EB/L	---	---	---	---	---	40	31
WB/R	---	---	---	---	---	<25	<25

Since this project is seeking CEF Zoning, additional road improvements are proposed above are beyond what would typically be required to satisfy Adequate Road Facilities Test Evaluation requirements. Below, the proposed improvements are detailed. The recommended lane use can be found in Figure 4.6. Appendix A contains a full size plan of the proposed improvements.

MD 108 at Sheppard Lane

Sheppard Lane currently intersects MD 108 at a 55 degree angle, which is substandard and has a negative impact on intersection operations. In addition, the Sheppard Lane approach features just a single lane for traffic accessing MD 108. Finally, the existing left turn lane from eastbound MD 108 to Sheppard Lane is only 175 feet long which results in significant queuing that blocks the through lane. The following improvements are proposed at this location:

- Realign Sheppard Lane to the west at an angle of a minimum of 70 degrees as acceptable to SHA.
- Widen the Sheppard Lane approach to provide two lanes onto MD 108, including a separate right turn lane and separate left turn lane.
- Provide a continuous left turn lane along eastbound MD 108, approaching Sheppard Lane.
- Widen the westbound MD 108 approach to provide two thru lanes and a separate right lane.
- Reconstruct the traffic signal and provide pedestrian accommodations as required by SHA.
- Provide interconnection of the traffic signal along MD 108 to MD 32.

Not only do the proposed improvements at MD 108 at Sheppard Lane improve the CLV to an acceptable level, but queuing is significantly reduced on all approaches. This operations issue is existing under current conditions which would provide significant benefits to all roadway users.

MD 108 at Linden Linthicum Lane/Proposed Public Access Road

The existing intersection of MD 108 and Linden Linthicum Lane features stop control for the minor approach. As a result, significant delays are encountered during the peak period for left turning traffic. The following improvements are recommended to mitigate delays and improve operations at this intersection:

- Install traffic signalization once approved by SHA.
- Provide an extension of Linden Linthicum Lane (Proposed Public Access Road) on the north side of MD 108 to provide site access and potential future connections to commercial properties to the west.

- Convert the existing right turn lane along eastbound MD 108 to a shared thru/right lane.

- Convert the westbound MD 108 auxiliary lane to a shared thru/right lane.

The construction of these improvements, including the Proposed Public Access Road on the north side of MD 108, will provide a significant community benefit. The new road will allow property owners on the west side to have signalized access to MD 108. While the elimination of unsignalized access points is not recommended, drivers will have a choice to utilize signalized access to the MD 108 corridor, particularly during peak periods. In addition, the installation of the traffic signal at Linden Linthicum Lane is consistent with elements of the Clarksville Pike Streetscape Plan which was adopted by Howard County in 2016. The implementation of the signal will allow for synchronized traffic signals between Sheppard Lane and MD 32, which will significantly enhance operations providing a community benefit.

MD 108 at Site Access

A limited access point is proposed along MD 108, opposite the existing access point for River Hill Garden Center which is approximately 475 feet west of Sheppard Lane. At this access point, which will operate under stop control, a left-in/right-in/right-out is proposed. A separate left turn lane will be provided into the site. The following enhancements are also proposed in conjunction with the access point:

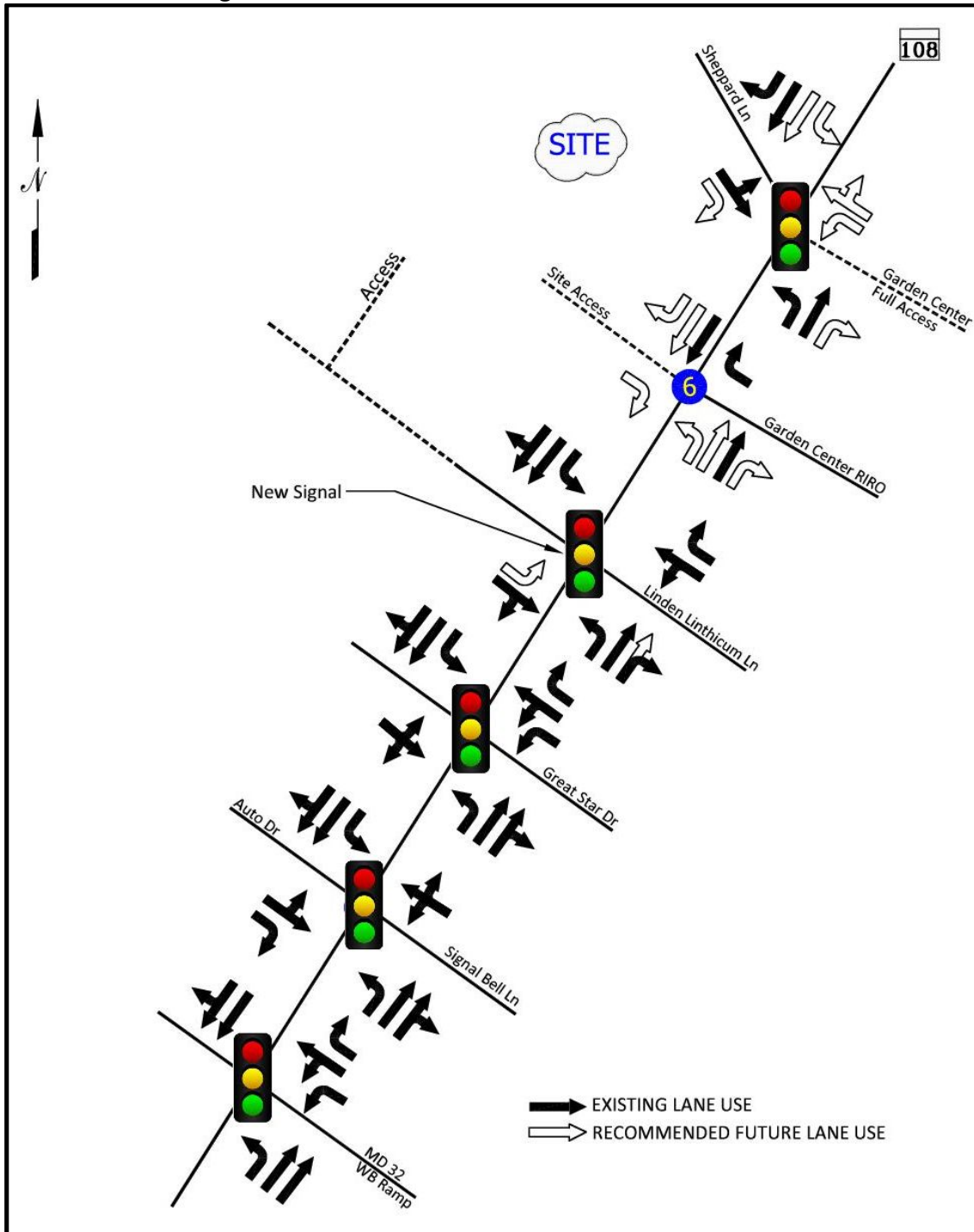
- Construct a five lane section along MD 108 in between Linden Linthicum Lane and Sheppard Lane, covering a distance of approximately 1,300 feet.

- Provide separate acceleration and deceleration lanes into the subject site, based on SHA requirements.

- Provide appropriate channelization to restrict left turns out of the subject site.

The construction of the five lane section along MD 108 is consistent with the Clarksville Pike Streetscape Plan and will match the section of MD 108 to the west of Linden Linthicum Lane. This construction will provide a significant benefit to roadway users, as queuing for Sheppard Lane will no longer block thru traffic along MD 108. A full size version of the plan is included in Appendix A.

Figure 4.6 – Future Recommended Lane Use



RESULTS, RECOMMENDATIONS, AND CONCLUSIONS

Study Purpose

The Traffic Group, Inc. has prepared this Adequate Road Facilities Test Evaluation and Traffic Study to quantify the impact the proposed development of Erickson Living at Limestone will have on the surrounding road network in Howard County, Maryland. The subject site is situated on the north side of MD 108, west of Sheppard Lane. A total of 1,200 units within a continuing care retirement community are proposed. In addition, 240 beds within an assisted living facility will also be constructed on-site.

Access to the property is proposed via one access point along MD 108 and a secondary point of access along an extension of Linden Linthicum Lane. The MD 108 access will operate under stop control and left turns out of the facility will be restricted. The access point along the new public road will operate under stop control. Traffic signalization is proposed at the intersection of MD 108 and Linden Linthicum Lane. Full buildout of the project is expected within three years.

Study Criteria/Methodology

This study was conducted in accordance with Chapter 4 of the *Howard County Design Manual – Volume III (Road and Bridge Design)*. Chapter 4 details the requirements for the Adequate Road Facilities Test Evaluation. Chapter 4 studies require that the first intersection of a Major Collector or higher classified roadway with another Major Collector or higher classified roadway in all directions from the subject site be reviewed and analyzed.

Since the site will generate more than 100 trips, a Chapter 5 traffic study is also required. For this traffic study, all classified intersections within one-half mile of the subject site must be reviewed. However, improvements are not required at these locations.

All intersections are reviewed using Critical Lane Volume (CLV) methodology. Intersections that are controlled by Maryland State Highway Administration (SHA) must exhibit Level of Service “E” or better conditions during all study periods.

Because of the complexity of this project, a Synchro model was prepared for the MD 108 corridor.

In addition to traditional road improvements that may be required as part of the Adequate Road Facilities Test Evaluation road improvements that will provide additional community benefit are proposed in conjunction with the CEF (Community Enhanced Floating Zone) requirement for this site. Details on the proposed improvements will be provided in later sections of this document.

Summary of Findings and Recommendations

This analysis will show that all study intersections are currently operating within acceptable level of service when considering CLV under existing conditions. When considering the impact of background traffic, the intersection of MD 108 at Sheppard Lane is projected to operate at Level of Service "F" conditions during both the morning and evening peak periods. All other remaining intersections will feature acceptable operations.

With the additional impact associated with the development of the subject site, the intersection of MD 108 at Sheppard Lane will continue to exhibit Level of Service "F" conditions.

Since this project is seeking CEF Zoning, additional road improvements are proposed above and beyond what would typically be required to satisfy Adequate Road Facilities Test Evaluation requirements. Below, the proposed improvements are detailed.

MD 108 at Sheppard Lane

Sheppard Lane currently intersects MD 108 at a 55 degree angle, which is substandard and has a negative impact on intersection operations. In addition, the Sheppard Lane approach features just a single lane for traffic accessing MD 108. Finally, the existing left turn lane from eastbound MD 108 to Sheppard Lane is only 175 feet long which results in significant queuing that blocks the through lane. The following improvements are proposed at this location:

- Realign Sheppard Lane to the west at an angle of a minimum of 70 degrees as acceptable to SHA.
- Widen the Sheppard Lane approach to provide two lanes onto MD 108, including a separate right turn lane and separate left turn lane.
- Provide a continuous left turn lane along eastbound MD 108, approaching Sheppard Lane.

- Widen the westbound MD 108 approach to provide two thru lanes and a separate right lane.
- Reconstruct the traffic signal and provide pedestrian accommodations as required by SHA.
- Provide interconnection of the traffic signal along MD 108 to MD 32.

Not only do the proposed improvements at MD 108 at Sheppard Lane improve the CLV to an acceptable level, but queuing is significantly reduced on all approaches with the implementation of these improvements. This operations issue is existing under current conditions which would provide significant benefits to all roadway users.

MD 108 at Linden Linthicum Lane

The existing intersection of MD 108 and Linden Linthicum Lane features stop control for the minor approach. As a result, significant delays are encountered during the peak period for left turning traffic. The following improvements are recommended to mitigate delays and improve operations at this intersection:

- Install traffic signalization once approved by SHA.
- Provide an extension of Linden Linthicum Lane (Proposed Public Access Road) on the north side of MD 108 to provide site access and potential future connections to commercial properties to the west.
- Convert the existing right turn lane along eastbound MD 108 to a shared thru/right lane.
- Convert the westbound MD 108 auxiliary lane to a shared thru/right lane.

The construction of these improvements, including the proposed access road on the north side of MD 108, will provide a significant community benefit. The access road will allow property owners on the west side to have signalized access to MD 108. While the elimination of unsignalized access points is not recommended, drivers will have a choice to utilize signalized access to the corridor, particularly during peak periods. In addition, the installation of the traffic signal at Linden Linthicum Lane is consistent with elements of the Clarksville Pike streetscape plan which was adopted by Howard County in 2016. The implementation of the signal will allow for synchronized traffic signals between Sheppard Lane and MD 32, which will significantly enhance operations providing a community benefit.

MD 108 at Site Access

A limited access point is proposed along MD 108, opposite the existing access point for River Hill Garden Center which is approximately 475 feet west of Sheppard Lane. At this access point, which will operate under stop control, a left-in/right-in/right-out is proposed. A separate left turn lane will be provided into the site. The following enhancements are also proposed in conjunction with the access point:

- Construct a five lane section along MD 108 in between Linden Linthicum Lane and Sheppard Lane, which is a distance of approximately 1,300 feet.
- Provide separate acceleration and deceleration lanes into the subject site.
- Provide appropriate channelization to restrict left turns out of the subject site.

The construction of the five lane section along MD 108 is consistent with the Clarksville Pike streetscape plan and will match the section of MD 108 to the west of Linden Linthicum Lane. This construction will provide a significant benefit to roadway users, as queuing for Sheppard Lane will no longer block through traffic along MD 108.

As previously stated, the improvements proposed in conjunction with the development of Erickson Living at Limestone will provide significant community benefits in conjunction with the proposed CEF Zoning for this site.

APPENDIX A

Concept Road Improvement Plan



ILLUSTRATIVE SITE PLAN

Note: conceptual plan subject to final engineering and architectural refinement.



SITE DATA

NEIGHBORHOOD 1
 INDEPENDENT LIVING UNITS 730
 CCRC ACCESSORY SPACE: 68,000SF +/-
 PARKING
 700 GARAGE:²
 190 SURFACE

NEIGHBORHOOD 2
 INDEPENDENT LIVING UNITS 470
 CCRC ACCESSORY SPACE: 40,000SF +/-
 PARKING
 680 GARAGE:²
 110 SURFACE

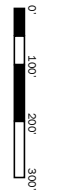
CARE CENTER
 (assisted living, memory care, skilled nursing)
 240 UNITS +/-

TOTALS
 INDEPENDENT LIVING UNITS 1,200
 CARE CENTER UNITS 200 +/-
 CCRC ACCESSORY SPACE: 108,000SF +/-
 PARKING
 1,380 GARAGE:²
 300 SURFACE
 1,680 TOTAL

Notes:
 1. CCRC Accessory Space consists of building areas allocated for resident amenities, resident services, food service, campus administration, and campus services. CCRC Accessory Spaces are typically located within clubhouse buildings (CB) as well as on the ground/first floor of independent living buildings.
 2. Resident parking is provided in garages below independent living buildings.



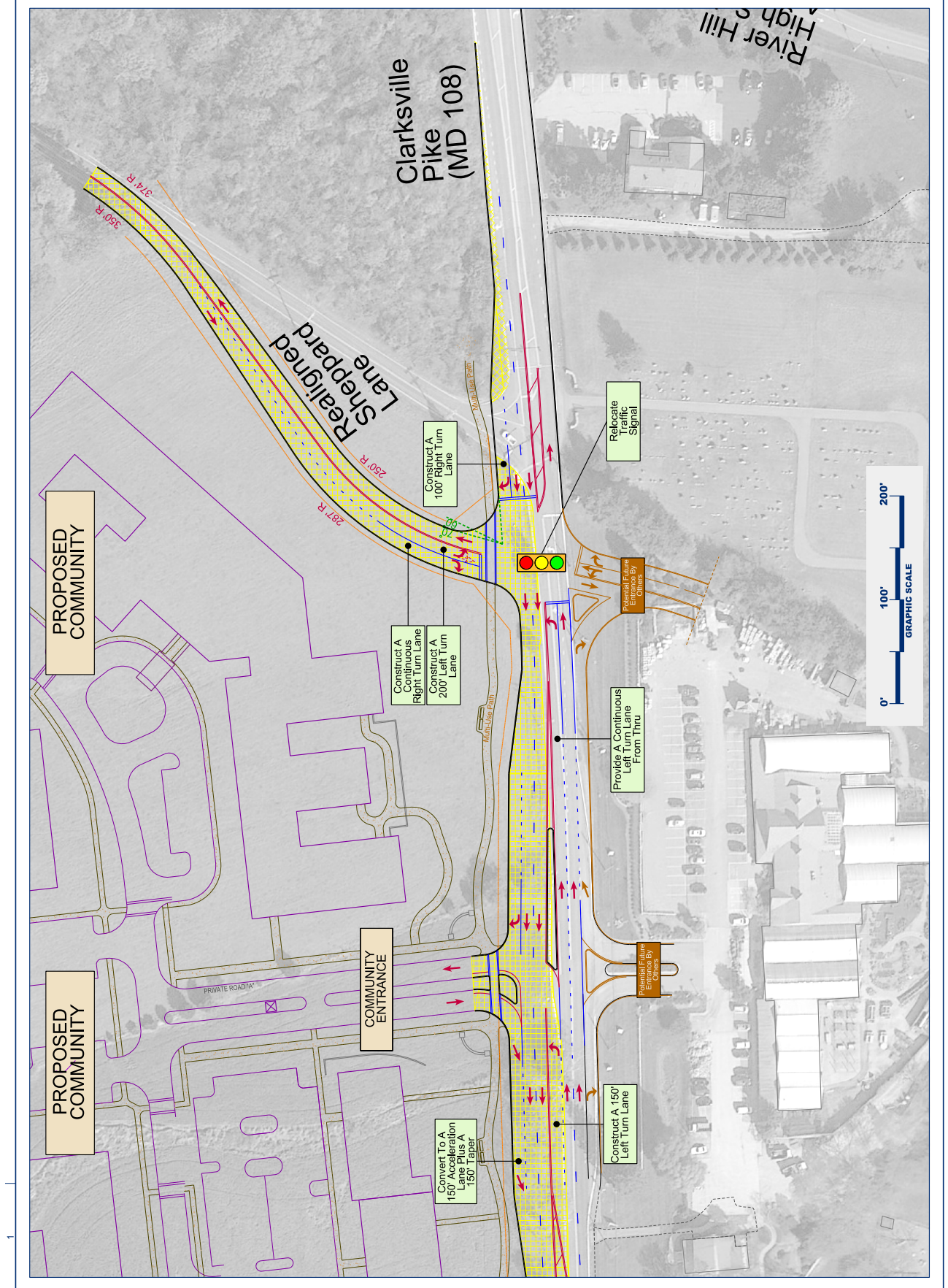
marks thomas



ERICKSON LIVING AT LIMESTONE VALLEY
 HOWARD COUNTY, MARYLAND
 JULY 28, 2017



SHEET
 DCP-6



APPENDIX B

Intersection Turning Movement Counts, and Photos



TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Sheppard Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday

Star Rating: 3



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on:					TRAFFIC FROM WEST on: Sheppard Lane					TOTAL N + S + E + W	
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL		
AM																						
6:30 - 6:45	0	57	0	0	57	0	59	12	0	71	0	0	0	0	0	63	0	3	0	66	194	
6:45 - 7:00	5	94	0	0	99	0	100	20	0	120	0	0	0	0	0	88	0	16	0	104	323	
7:00 - 7:15	10	145	0	0	155	0	212	15	0	227	0	0	0	0	0	69	0	45	0	114	496	
7:15 - 7:30	24	175	0	0	199	0	175	42	0	217	0	0	0	0	0	80	0	33	0	113	529	
7:30 - 7:45	4	118	0	0	122	0	92	57	0	149	0	0	0	0	0	130	0	6	0	136	407	
7:45 - 8:00	2	93	0	0	95	0	104	76	0	180	0	0	0	0	0	133	0	1	0	134	409	
8:00 - 8:15	3	122	0	0	125	0	80	38	0	118	0	0	0	0	0	112	0	6	0	118	361	
8:15 - 8:30	3	97	0	0	100	0	89	23	0	112	0	0	0	0	0	127	0	5	0	132	344	
8:30 - 8:45	1	100	0	0	101	0	82	26	0	108	0	0	0	0	0	123	0	7	0	130	339	
8:45 - 9:00	3	129	0	0	132	0	94	25	0	119	0	0	0	0	0	94	0	2	0	96	347	
3 Hr Totals	55	1130	0	0	1185	0	1087	334	0	1421	0	0	0	0	0	1019	0	124	0	1143	3749	
1 Hr Totals																						
6:30 - 7:30	39	471	0	0	510	0	546	89	0	635	0	0	0	0	0	300	0	97	0	397	1542	
6:45 - 7:45	43	532	0	0	575	0	579	134	0	713	0	0	0	0	0	367	0	100	0	467	1755	
7:00 - 8:00	40	531	0	0	571	0	583	190	0	773	0	0	0	0	0	412	0	85	0	497	1841	
7:15 - 8:15	33	508	0	0	541	0	451	213	0	664	0	0	0	0	54	455	0	46	0	501	1706	
7:30 - 8:30	12	430	0	0	442	0	365	194	0	559	0	0	0	0	0	502	0	18	0	520	1521	
7:45 - 8:45	9	412	0	0	421	0	355	163	0	518	0	0	0	0	0	495	0	19	0	514	1453	
8:00 - 9:00	10	448	0	0	458	0	345	112	0	457	0	0	0	0	0	456	0	20	0	476	1391	
PEAK HOUR	7:00 - 8:00	40	531	0	0	571	0	583	190	0	773	0	0	0	0	0	412	0	85	0	497	1841
PM																						
2:30 - 2:45	12	111	0	0	123	0	95	40	0	135	0	0	0	0	0	24	0	6	0	30	288	
2:45 - 3:00	15	114	0	0	129	0	95	56	0	151	0	0	0	0	0	25	0	8	0	33	313	
3:00 - 3:15	14	110	0	0	124	0	105	68	0	173	0	0	0	0	0	31	0	6	0	37	334	
3:15 - 3:30	7	113	0	0	120	0	122	76	0	198	0	0	0	0	0	32	0	4	0	36	354	
3:30 - 3:45	10	121	0	0	131	0	135	89	0	224	0	0	0	0	0	56	0	8	0	64	419	
3:45 - 4:00	8	171	0	0	179	0	175	66	0	241	0	0	0	0	0	49	0	13	0	62	482	
4:00 - 4:15	17	153	0	0	170	0	193	92	0	285	0	0	0	0	0	52	0	11	0	63	518	
4:15 - 4:30	9	136	0	0	145	0	157	124	0	281	0	0	0	0	0	34	0	6	0	40	466	
4:30 - 4:45	9	166	0	0	175	0	142	99	0	241	0	0	0	0	0	34	0	12	0	46	462	
4:45 - 5:00	10	126	0	0	136	0	200	140	0	340	0	0	0	0	0	38	0	5	0	43	519	
5:00 - 5:15	12	119	0	0	131	0	199	116	0	315	0	0	0	0	0	48	0	10	0	58	504	
5:15 - 5:30	21	140	0	0	161	0	172	122	0	294	0	0	0	0	0	28	0	11	0	39	494	
5:30 - 5:45	14	129	0	0	143	0	179	141	0	320	0	0	0	0	0	42	0	9	0	51	514	
5:45 - 6:00	8	140	0	0	148	0	209	124	0	333	0	0	0	0	0	43	0	12	0	55	536	
6:00 - 6:15	9	126	0	0	135	0	171	82	0	253	0	0	0	0	0	58	0	3	0	61	449	
6:15 - 6:30	20	155	0	0	175	0	201	75	0	276	0	0	0	0	0	38	0	23	0	61	512	
4 Hr Totals	195	2130	0	0	2325	0	2550	1510	0	4060	0	0	0	0	0	632	0	147	0	779	7164	
1 Hr Totals																						
2:30 - 3:30	48	448	0	0	496	0	417	240	0	657	0	0	0	0	0	112	0	24	0	136	1289	
2:45 - 3:45	46	458	0	0	504	0	457	289	0	746	0	0	0	0	0	144	0	26	0	170	1420	
3:00 - 4:00	39	515	0	0	554	0	537	299	0	836	0	0	0	0	0	168	0	31	0	199	1589	
3:15 - 4:15	42	558	0	0	600	0	625	323	0	948	0	0	0	0	0	189	0	36	0	225	1773	
3:30 - 4:30	44	581	0	0	625	0	660	371	0	1031	0	0	0	0	0	191	0	38	0	229	1885	
3:45 - 4:45	43	626	0	0	669	0	667	381	0	1048	0	0	0	0	0	169	0	42	0	211	1928	
4:00 - 5:00	45	581	0	0	626	0	692	455	0	1147	0	0	0	0	0	158	0	34	0	192	1965	
4:15 - 5:15	40	547	0	0	587	0	698	479	0	1177	0	0	0	0	0	154	0	33	0	187	1951	
4:30 - 5:30	52	551	0	0	603	0	713	477	0	1190	0	0	0	0	0	148	0	38	0	186	1979	
4:45 - 5:45	57	514	0	0	571	0	750	519	0	1269	0	0	0	0	0	156	0	35	0	191	2031	
5:00 - 6:00	55	528	0	0	583	0	759	503	0	1262	0	0	0	0	0	161	0	42	0	203	2048	
5:15 - 6:15	52	535	0	0	587	0	731	469	0	1200	0	0	0	0	0	171	0	35	0	206	1993	
5:30 - 6:30	51	550	0	0	601	0	760	422	0	1182	0	0	0	0	0	181	0	47	0	228	2011	
PEAK HOUR	5:00 - 6:00	55	528	0	0	583	0	759	503	0	1262	0	0	0	0	0	161	0	42	0	203	2048

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and: Sheppard Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 3



TIME	NORTH LEG MD 108		SOUTH LEG MD 108	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	1	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
TOTALS	1	0	0	0
PM				
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
TOTALS	0	0	0	0

	EAST LEG		WEST LEG Sheppard Lane	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45			0	0
6:45 - 7:00			0	0
7:00 - 7:15			0	0
7:15 - 7:30			0	0
7:30 - 7:45			0	0
7:45 - 8:00			0	0
8:00 - 8:15			0	0
8:15 - 8:30			0	0
8:30 - 8:45			0	0
8:45 - 9:00			0	0
TOTALS	0	0	0	0
PM				
2:30 - 2:45			0	0
2:45 - 3:00			0	0
3:00 - 3:15			0	0
3:15 - 3:30			0	0
3:30 - 3:45			0	0
3:45 - 4:00			0	0
4:00 - 4:15			0	0
4:15 - 4:30			0	0
4:30 - 4:45			0	0
4:45 - 5:00			0	0
5:00 - 5:15			0	0
5:15 - 5:30			0	0
5:30 - 5:45			0	0
5:45 - 6:00			0	0
6:00 - 6:15			0	0
6:15 - 6:30			0	0
TOTALS	0	0	0	0



MD 108 & Sheppard Ln

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Great Star Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday

Star Rating: 3



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: Great Star Drive					TRAFFIC FROM WEST on: Kendall Hardware Store					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:30 - 6:45	1	92	35	0	128	19	61	0	0	80	20	0	17	0	37	0	0	0	0	0	245
6:45 - 7:00	3	136	47	0	186	35	96	2	0	133	36	5	21	0	62	0	0	1	0	1	382
7:00 - 7:15	3	146	57	0	206	37	156	4	0	197	87	2	25	0	114	2	0	0	0	2	519
7:15 - 7:30	0	180	58	0	238	44	118	2	0	164	47	8	41	0	96	4	0	1	0	5	503
7:30 - 7:45	3	183	68	0	254	35	110	3	0	148	55	1	40	0	96	1	2	2	0	5	503
7:45 - 8:00	2	194	60	0	256	30	149	4	0	183	69	0	31	0	100	0	0	2	0	2	541
8:00 - 8:15	4	180	79	0	263	28	98	1	0	127	43	0	35	0	78	0	1	2	0	3	471
8:15 - 8:30	1	182	64	0	247	42	99	2	0	143	44	0	42	0	86	2	2	3	0	7	483
8:30 - 8:45	1	178	53	0	232	37	97	1	0	135	35	1	56	0	92	4	3	0	0	7	466
8:45 - 9:00	5	175	45	0	225	41	116	8	0	165	43	4	39	0	86	3	2	1	0	6	482
9:00 - 9:15	1	138	53	0	192	51	101	2	0	154	53	2	60	0	115	4	5	2	0	11	472
9:15 - 9:30	3	146	45	0	194	49	107	2	0	158	52	3	43	0	98	0	1	3	0	4	454
9:30 - 9:45	2	102	40	0	144	34	95	1	0	130	41	2	42	0	85	2	1	3	0	6	365
9:45 - 10:00	4	97	36	0	137	40	95	6	0	141	43	9	40	0	92	2	1	2	0	5	375
10:00 - 10:15	1	84	44	0	129	24	79	4	0	107	34	5	34	0	73	1	4	3	0	8	317
10:15 - 10:30	4	87	34	0	125	44	78	3	0	125	40	2	49	0	91	5	4	4	0	13	354
10:30 - 10:45	3	100	40	0	143	47	89	3	0	139	44	2	38	0	84	2	2	1	0	5	371
10:45 - 11:00	7	110	37	0	154	47	105	5	0	157	44	0	33	0	77	1	3	2	0	6	394
11:00 - 11:15	4	94	34	0	132	46	79	2	0	127	36	5	51	0	92	3	2	6	0	11	362
11:15 - 11:30	4	111	25	0	140	52	85	5	0	142	44	5	47	1	97	5	1	4	0	10	389
11:30 - 11:45	6	109	40	0	155	31	86	3	0	120	50	6	43	0	99	5	5	2	0	12	386
11:45 - 12:00	7	87	45	0	139	41	106	5	0	152	43	1	56	0	100	5	4	5	0	14	405
12:00 - 12:15	12	99	47	0	158	50	101	4	0	155	60	4	49	1	114	2	4	3	0	9	436
12:15 - 12:30	6	100	44	0	150	75	99	8	0	182	52	5	56	0	113	3	7	11	0	21	466
12:30 - 12:45	5	123	42	0	170	54	140	6	0	200	64	8	59	0	131	3	9	4	0	16	517
12:45 - 1:00	4	114	45	0	163	49	98	4	0	151	44	2	55	0	101	3	5	3	0	11	426
1:00 - 1:15	13	99	48	0	160	56	96	2	0	154	39	5	47	0	91	3	6	1	0	10	415
1:15 - 1:30	4	85	45	0	134	44	84	6	0	134	50	5	49	0	104	4	3	7	0	14	386
1:30 - 1:45	4	120	44	0	168	60	91	3	0	154	60	1	67	0	128	8	3	6	0	17	467
1:45 - 2:00	1	95	35	0	131	61	95	7	0	163	43	6	45	0	94	5	2	0	0	7	395
2:00 - 2:15	3	105	39	0	147	41	119	2	0	162	55	3	57	1	116	2	4	6	0	12	437
2:15 - 2:30	5	152	64	0	221	57	109	5	0	171	74	2	47	0	123	1	2	4	0	7	522
2:30 - 2:45	4	122	49	0	175	44	98	10	0	152	59	2	73	1	135	2	4	6	0	12	474
2:45 - 3:00	4	120	43	0	167	48	114	6	0	168	68	5	60	0	133	4	1	2	0	7	475
3:00 - 3:15	2	128	35	0	165	56	124	3	0	183	58	2	56	0	116	1	3	4	0	8	472
3:15 - 3:30	3	115	31	0	149	46	140	3	0	189	83	2	53	0	138	1	1	4	0	6	482
3:30 - 3:45	3	154	51	0	208	59	166	8	0	233	89	5	61	0	155	1	6	5	0	12	608
3:45 - 4:00	4	134	61	0	199	55	170	3	0	228	82	6	63	0	151	3	4	6	0	13	591
4:00 - 4:15	3	152	65	0	220	71	192	4	0	267	93	6	62	0	161	2	4	10	0	16	664
4:15 - 4:30	2	138	52	0	192	35	194	5	0	234	83	7	66	0	156	5	2	2	0	9	591
4:30 - 4:45	3	138	70	0	211	44	219	4	0	267	97	3	64	0	164	1	5	7	0	13	655
4:45 - 5:00	5	118	58	0	181	62	207	1	0	270	117	5	61	0	183	4	2	6	0	12	646
5:00 - 5:15	3	127	55	0	185	56	226	4	0	286	120	4	71	0	195	9	6	9	0	24	690
5:15 - 5:30	7	103	59	0	169	60	209	8	0	277	136	3	58	0	197	6	3	6	0	15	658
5:30 - 5:45	5	136	54	0	195	52	209	4	0	265	128	6	54	0	188	5	2	6	0	13	661
5:45 - 6:00	1	135	61	0	197	63	232	3	0	298	108	5	66	0	179	4	4	10	0	18	692
6:00 - 6:15	3	134	64	0	201	64	189	2	0	255	82	4	60	0	146	1	5	1	0	7	609
6:15 - 6:30	4	147	62	0	213	37	194	2	0	233	92	3	52	0	147	2	6	6	0	14	607
6:30 - 6:45	3	130	66	0	199	47	169	0	0	216	84	3	52	0	139	1	3	5	0	9	563
6:45 - 7:00	4	131	49	0	184	48	120	5	0	173	70	5	60	0	135	2	5	3	0	10	502
13 Hr Totals	189	6365	2477	0	9031	2348	6409	190	0	8947	3193	180	2506	4	5883	139	154	192	0	485	24346

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Great Star Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 3



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: Great Star Drive					TRAFFIC FROM WEST on: Kendall Hardware Store					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
1 Hr Totals																					
6:30 - 7:30	7	554	197	0	758	135	431	8	0	574	190	15	104	0	309	6	0	2	0	8	1649
6:45 - 7:45	9	645	230	0	884	151	480	11	0	642	225	16	127	0	368	7	2	4	0	13	1907
7:00 - 8:00	8	703	243	0	954	146	533	13	0	692	258	11	137	0	406	7	2	5	0	14	2066
7:15 - 8:15	9	737	265	0	1011	137	475	10	0	622	214	9	147	0	370	5	3	7	0	15	2018
7:30 - 8:30	10	739	271	0	1020	135	456	10	0	601	211	1	148	0	360	3	5	9	0	17	1998
7:45 - 8:45	8	734	256	0	998	137	443	8	0	588	191	1	164	0	356	6	6	7	0	19	1961
8:00 - 9:00	11	715	241	0	967	148	410	12	0	570	165	5	172	0	342	9	8	6	0	23	1902
8:15 - 9:15	8	673	215	0	896	171	413	13	0	597	175	7	197	0	379	13	12	6	0	31	1903
8:30 - 9:30	10	637	196	0	843	178	421	13	0	612	183	10	198	0	391	11	11	6	0	28	1874
8:45 - 9:45	11	561	183	0	755	175	419	13	0	607	189	11	184	0	384	9	9	9	0	27	1773
9:00 - 10:00	10	483	174	0	667	174	398	11	0	583	189	16	185	0	390	8	8	10	0	26	1666
9:15 - 10:15	10	429	165	0	604	147	376	13	0	536	170	19	159	0	348	5	7	11	0	23	1511
9:30 - 10:30	11	370	154	0	535	142	347	14	0	503	158	18	165	0	341	10	10	12	0	32	1411
9:45 - 10:45	12	368	154	0	534	155	341	16	0	512	161	18	161	0	340	10	11	10	0	31	1417
10:00 - 11:00	15	381	155	0	551	162	351	15	0	528	162	9	154	0	325	9	13	10	0	32	1436
10:15 - 11:15	18	391	145	0	554	184	351	13	0	548	164	9	171	0	344	11	11	13	0	35	1481
10:30 - 11:30	18	415	136	0	569	192	358	15	0	565	168	12	169	1	350	11	8	13	0	32	1516
10:45 - 11:45	21	424	136	0	581	176	355	15	0	546	174	16	174	1	365	14	11	14	0	39	1531
11:00 - 12:00	21	401	144	0	566	170	356	15	0	541	173	17	197	1	388	18	12	17	0	47	1542
11:15 - 12:15	29	406	157	0	592	174	378	17	0	569	197	16	195	2	410	17	14	14	0	45	1616
11:30 - 12:30	31	395	176	0	602	197	392	20	0	609	205	16	204	1	426	15	20	21	0	56	1693
11:45 - 12:45	30	409	178	0	617	220	446	23	0	689	219	18	220	1	458	13	24	23	0	60	1824
12:00 - 1:00	27	436	178	0	641	228	438	22	0	688	220	19	219	1	459	11	25	21	0	57	1845
12:15 - 1:15	28	436	179	0	643	234	433	20	0	687	199	20	217	0	436	12	27	19	0	58	1824
12:30 - 1:30	26	421	180	0	627	203	418	18	0	639	197	20	210	0	427	13	23	15	0	51	1744
12:45 - 1:45	25	418	182	0	625	209	369	15	0	593	193	13	218	0	424	18	17	17	0	52	1694
1:00 - 2:00	22	399	172	0	593	221	366	18	0	605	192	17	208	0	417	20	14	14	0	48	1663
1:15 - 2:15	12	405	163	0	580	206	389	18	0	613	208	15	218	1	442	19	12	19	0	50	1685
1:30 - 2:30	13	472	182	0	667	219	414	17	0	650	232	12	216	1	461	16	11	16	0	43	1821
1:45 - 2:45	13	474	187	0	674	203	421	24	0	648	231	13	222	2	468	10	12	16	0	38	1828
2:00 - 3:00	16	499	195	0	710	190	440	23	0	653	256	12	237	2	507	9	11	18	0	38	1908
2:15 - 3:15	15	522	191	0	728	205	445	24	0	674	259	11	236	1	507	8	10	16	0	34	1943
2:30 - 3:30	13	485	158	0	656	194	476	22	0	692	268	11	242	1	522	8	9	16	0	33	1903
2:45 - 3:45	12	517	160	0	689	209	544	20	0	773	298	14	230	0	542	7	11	15	0	33	2037
3:00 - 4:00	12	531	178	0	721	216	600	17	0	833	312	15	233	0	560	6	14	19	0	39	2153
3:15 - 4:15	13	555	208	0	776	231	668	18	0	917	347	19	239	0	605	7	15	25	0	47	2345
3:30 - 4:30	12	578	229	0	819	220	722	20	0	962	347	24	252	0	623	11	16	23	0	50	2454
3:45 - 4:45	12	562	248	0	822	205	775	16	0	996	355	22	255	0	632	11	15	25	0	51	2501
4:00 - 5:00	13	546	245	0	804	212	812	14	0	1038	390	21	253	0	664	12	13	25	0	50	2556
4:15 - 5:15	13	521	235	0	769	197	846	14	0	1057	417	19	262	0	698	19	15	24	0	58	2582
4:30 - 5:30	18	486	242	0	746	222	861	17	0	1100	470	15	254	0	739	20	16	28	0	64	2649
4:45 - 5:45	20	484	226	0	730	230	851	17	0	1098	501	18	244	0	763	24	13	27	0	64	2655
5:00 - 6:00	16	501	229	0	746	231	876	19	0	1126	492	18	249	0	759	24	15	31	0	70	2701
5:15 - 6:15	16	508	238	0	762	239	839	17	0	1095	454	18	238	0	710	16	14	23	0	53	2620
5:30 - 6:30	13	552	241	0	806	216	824	11	0	1051	410	18	232	0	660	12	17	23	0	52	2569
5:45 - 6:45	11	546	253	0	810	211	784	7	0	1002	366	15	230	0	611	8	18	22	0	48	2471
6:00 - 7:00	14	542	241	0	797	196	672	9	0	877	328	15	224	0	567	6	19	15	0	40	2281
PEAK HOUR																					
7:00 - 8:00	8	703	243	0	954	146	533	13	0	692	258	11	137	0	406	7	2	5	0	14	2066
5:00 - 6:00	16	501	229	0	746	231	876	19	0	1126	492	18	249	0	759	24	15	31	0	70	2701

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and: Great Star Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 3



TIME	NORTH LEG MD 108		SOUTH LEG MD 108	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
9:00 - 9:15	0	0	0	0
9:15 - 9:30	0	0	0	0
9:30 - 9:45	0	0	0	0
9:45 - 10:00	0	0	0	0
10:00 - 10:15	0	0	0	0
10:15 - 10:30	0	0	0	0
10:30 - 10:45	0	0	0	0
10:45 - 11:00	2	0	0	0
11:00 - 11:15	0	0	0	0
11:15 - 11:30	0	0	0	0
11:30 - 11:45	1	0	0	0
11:45 - 12:00	0	0	0	0
12:00 - 12:15	0	0	1	0
12:15 - 12:30	1	0	0	0
12:30 - 12:45	1	0	0	0
12:45 - 1:00	0	0	0	0
1:00 - 1:15	0	0	0	0
1:15 - 1:30	0	0	0	0
1:30 - 1:45	0	0	1	0
1:45 - 2:00	0	0	0	0
2:00 - 2:15	0	0	1	0
2:15 - 2:30	0	0	0	0
2:30 - 2:45	0	0	0	0
2:45 - 3:00	1	0	0	0
3:00 - 3:15	1	0	0	0
3:15 - 3:30	1	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
TOTALS	8	0	3	0

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

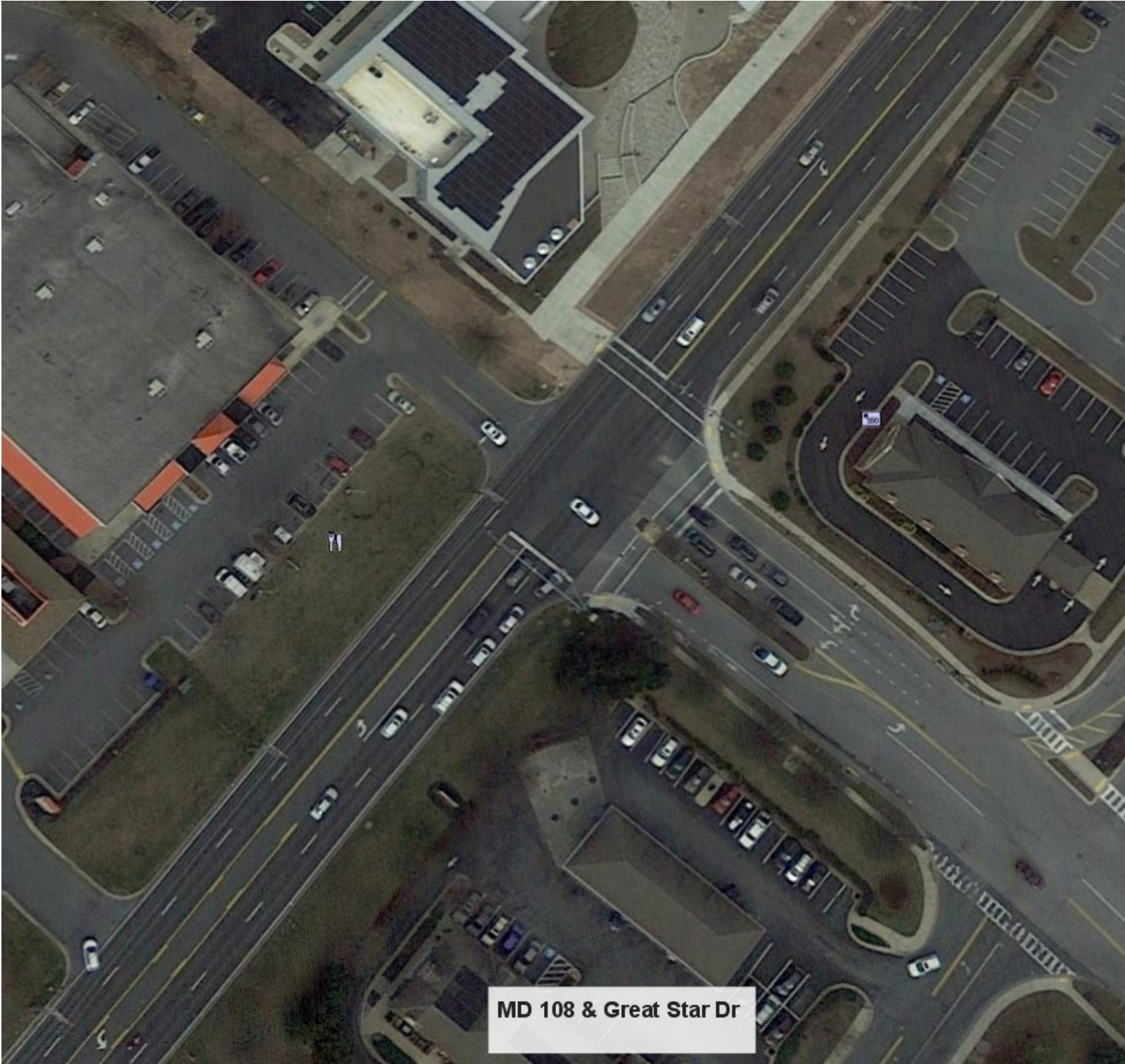
Intersection of: MD 108
and: Great Star Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 3



	EAST LEG Great Star Drive		WEST LEG Kendall Hardware Store	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
9:00 - 9:15	0	0	0	0
9:15 - 9:30	0	0	0	0
9:30 - 9:45	0	0	0	0
9:45 - 10:00	0	0	0	0
10:00 - 10:15	0	0	0	0
10:15 - 10:30	0	0	0	0
10:30 - 10:45	0	0	0	0
10:45 - 11:00	2	0	0	0
11:00 - 11:15	0	0	0	0
11:15 - 11:30	1	0	0	0
11:30 - 11:45	0	0	0	0
11:45 - 12:00	0	0	0	0
12:00 - 12:15	0	0	0	0
12:15 - 12:30	0	0	0	0
12:30 - 12:45	0	0	0	0
12:45 - 1:00	0	0	0	0
1:00 - 1:15	0	0	0	0
1:15 - 1:30	0	0	0	0
1:30 - 1:45	0	0	0	0
1:45 - 2:00	0	0	0	0
2:00 - 2:15	0	0	0	0
2:15 - 2:30	0	0	0	0
2:30 - 2:45	0	0	1	0
2:45 - 3:00	0	0	1	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
TOTALS	3	0	2	0



MD 108 & Great Star Dr

CARS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Auto Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday

Star Rating: 5



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: Signal Bell Lane					TRAFFIC FROM WEST on: Auto Drive					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:30 - 6:45	9	100	1	0	110	9	82	22	0	113	1	0	11	0	12	1	1	1	0	3	238
6:45 - 7:00	11	141	4	0	156	13	137	19	0	169	0	3	18	0	21	2	1	1	0	4	350
7:00 - 7:15	14	160	4	0	178	13	216	16	0	245	4	3	18	0	25	1	0	2	0	3	451
7:15 - 7:30	15	203	4	0	222	9	149	29	0	187	0	0	10	0	10	5	2	0	0	7	426
7:30 - 7:45	24	204	3	0	231	11	174	39	0	224	0	0	11	0	11	10	1	5	0	16	482
7:45 - 8:00	16	191	2	0	209	12	164	40	0	216	2	2	11	0	15	12	1	6	0	19	459
8:00 - 8:15	19	217	2	0	238	12	143	27	0	182	0	1	12	0	13	5	0	5	0	10	443
8:15 - 8:30	12	206	0	0	218	14	140	43	0	197	1	2	9	0	12	14	2	3	0	19	446
8:30 - 8:45	24	223	1	0	248	10	142	28	0	180	1	3	9	0	13	12	2	12	0	26	467
8:45 - 9:00	23	187	2	0	212	9	159	45	0	213	3	4	8	0	15	10	6	7	0	23	463
3 Hr Totals	167	1832	23	0	2022	112	1506	308	0	1926	12	18	117	0	147	72	16	42	0	130	4225
1 Hr Totals																					
6:30 - 7:30	49	604	13	0	666	44	584	86	0	714	5	6	57	0	68	9	4	4	0	17	1465
6:45 - 7:45	64	708	15	0	787	46	676	103	0	825	4	6	57	0	67	18	4	8	0	30	1709
7:00 - 8:00	69	758	13	0	840	45	703	124	0	872	6	5	50	0	61	28	4	13	0	45	1818
7:15 - 8:15	74	815	11	0	900	44	630	135	0	809	2	3	44	0	49	32	4	16	0	52	1810
7:30 - 8:30	71	818	7	0	896	49	621	149	0	819	3	5	43	0	51	41	4	19	0	64	1830
7:45 - 8:45	71	837	5	0	913	48	589	138	0	775	4	8	41	0	53	43	5	26	0	74	1815
8:00 - 9:00	78	833	5	0	916	45	584	143	0	772	5	10	38	0	53	41	10	27	0	78	1819
PEAK HOUR																					
7:30 - 8:30	71	818	7	0	896	49	621	149	0	819	3	5	43	0	51	41	4	19	0	64	1830
PM																					
2:30 - 2:45	21	187	3	0	211	13	137	21	0	171	1	5	12	0	18	36	5	12	0	53	453
2:45 - 3:00	12	170	1	0	183	10	143	28	0	181	0	2	18	0	20	23	4	18	0	45	429
3:00 - 3:15	7	172	3	0	182	9	155	18	0	182	5	2	7	0	14	37	7	19	0	63	441
3:15 - 3:30	25	156	3	0	184	11	181	22	0	214	2	3	12	0	17	25	3	16	0	44	459
3:30 - 3:45	17	189	2	0	208	8	210	17	0	235	3	2	11	0	16	35	7	25	0	67	526
3:45 - 4:00	20	185	3	0	208	11	246	25	0	282	2	1	10	0	13	38	8	15	0	61	564
4:00 - 4:15	17	198	1	0	216	13	242	22	0	277	2	4	19	0	25	38	2	28	0	68	586
4:15 - 4:30	12	187	3	0	202	10	227	29	0	266	4	4	4	0	12	35	7	19	0	61	541
4:30 - 4:45	20	174	2	0	196	8	228	30	0	266	5	7	14	0	26	47	4	32	0	83	571
4:45 - 5:00	14	167	3	0	184	8	259	23	0	290	0	4	19	0	23	30	4	25	0	59	556
5:00 - 5:15	12	189	2	0	203	19	219	30	0	268	12	1	16	0	29	53	2	32	0	87	587
5:15 - 5:30	10	176	5	0	191	14	263	26	0	303	6	6	17	0	29	43	8	25	0	76	599
5:30 - 5:45	17	173	5	0	195	17	244	17	0	278	6	5	19	0	30	41	5	18	0	64	567
5:45 - 6:00	21	194	6	0	221	19	259	20	0	298	1	1	14	0	16	35	2	24	0	61	596
6:00 - 6:15	11	176	8	0	195	23	257	14	0	294	6	4	20	0	30	31	5	27	0	63	582
6:15 - 6:30	13	198	8	0	219					0	8	2	20	0	30	34	3	12	0	49	298
4 Hr Totals	249	2891	58	0	3198	193	3270	342	0	3805	63	53	232	0	348	581	76	347	0	1004	8355
1 Hr Totals																					
2:30 - 3:30	65	685	10	0	760	43	616	89	0	748	8	12	49	0	69	121	19	65	0	205	1782
2:45 - 3:45	61	687	9	0	757	38	689	85	0	812	10	9	48	0	67	120	21	78	0	219	1855
3:00 - 4:00	69	702	11	0	782	39	792	82	0	913	12	8	40	0	60	135	25	75	0	235	1990
3:15 - 4:15	79	728	9	0	816	43	879	86	0	1008	9	10	52	0	71	136	20	84	0	240	2135
3:30 - 4:30	66	759	9	0	834	42	925	93	0	1060	11	11	44	0	66	146	24	87	0	257	2217
3:45 - 4:45	69	744	9	0	822	42	943	106	0	1091	13	16	47	0	76	158	21	94	0	273	2262
4:00 - 5:00	63	726	9	0	798	39	956	104	0	1099	11	19	56	0	86	150	17	104	0	271	2254
4:15 - 5:15	58	717	10	0	785	45	933	112	0	1090	21	16	53	0	90	165	17	108	0	290	2255
4:30 - 5:30	56	706	12	0	774	49	969	109	0	1127	23	18	66	0	107	173	18	114	0	305	2313
4:45 - 5:45	53	705	15	0	773	58	985	96	0	1139	24	16	71	0	111	167	19	100	0	286	2309
5:00 - 6:00	60	732	18	0	810	69	985	93	0	1147	25	13	66	0	104	172	17	99	0	288	2349
5:15 - 6:15	59	719	24	0	802	73	1023	77	0	1173	19	16	70	0	105	150	20	94	0	264	2344
5:30 - 6:30	62	741	27	0	830	59	760	51	0	870	21	12	73	0	106	141	15	81	0	237	2043
PEAK HOUR																					
5:00 - 6:00	60	732	18	0	810	69	985	93	0	1147	25	13	66	0	104	172	17	99	0	288	2349

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and: Auto Drive
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 5



TIME	NORTH LEG MD 108		SOUTH LEG MD 108	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	1	0	0	0
8:15 - 8:30	0	0	1	0
8:30 - 8:45	1	0	0	0
8:45 - 9:00	0	0	2	0
TOTALS	2	0	3	0
PM				
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	1	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	2	0
6:00 - 6:15	0	0	1	0
6:15 - 6:30	0	0	0	0
TOTALS	0	0	4	0

	EAST LEG Signal Bell Lane		WEST LEG Auto Drive	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	1	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	1	0
TOTALS	0	0	2	0
PM				
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
TOTALS	0	0	0	0



MD 108 & Signal Bell Ln/ Auto Dr

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: MD 32 WB Ramps
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday

Star Rating: 5



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: MD 32 WB Off Ramp					TRAFFIC FROM WEST on: MD 32 WB On Ramp					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:30 - 6:45	10	103	0	0	113	0	76	3	0	79	38	0	76	0	114	0	0	0	0	0	306
6:45 - 7:00	12	149	0	0	161	0	125	3	0	128	51	0	96	0	147	0	0	0	0	0	436
7:00 - 7:15	16	171	0	0	187	0	198	3	0	201	45	0	95	0	140	0	0	0	0	0	528
7:15 - 7:30	19	196	0	0	215	0	118	6	0	124	73	0	136	0	209	0	0	0	0	0	548
7:30 - 7:45	20	206	0	0	226	0	149	15	0	164	65	0	108	0	173	0	0	0	0	0	563
7:45 - 8:00	19	201	0	0	220	0	112	3	0	115	104	0	119	0	223	0	0	0	0	0	558
8:00 - 8:15	24	195	0	0	219	0	127	13	0	140	58	0	93	0	151	0	0	0	0	0	510
8:15 - 8:30	23	199	0	0	222	0	124	13	0	137	78	1	127	0	206	0	0	0	0	0	565
8:30 - 8:45	18	229	0	0	247	0	118	13	0	131	57	0	92	0	149	0	0	0	0	0	527
8:45 - 9:00	18	186	0	0	204	0	127	11	0	138	96	0	117	0	213	0	0	0	0	0	555
3 Hr Totals	179	1835	0	0	2014	0	1274	83	0	1357	665	1	1059	0	1725	0	0	0	0	0	5096
1 Hr Totals																					
6:30 - 7:30	57	619	0	0	676	0	517	15	0	532	207	0	403	0	610	0	0	0	0	0	1818
6:45 - 7:45	67	722	0	0	789	0	590	27	0	617	234	0	435	0	669	0	0	0	0	0	2075
7:00 - 8:00	74	774	0	0	848	0	577	27	0	604	287	0	458	0	745	0	0	0	0	0	2197
7:15 - 8:15	82	798	0	0	880	0	506	37	0	543	300	0	456	0	756	0	0	0	0	0	2179
7:30 - 8:30	86	801	0	0	887	0	512	44	0	556	305	1	447	0	753	0	0	0	0	0	2196
7:45 - 8:45	84	824	0	0	908	0	481	42	0	523	297	1	431	0	729	0	0	0	0	0	2160
8:00 - 9:00	83	809	0	0	892	0	496	50	0	546	289	1	429	0	719	0	0	0	0	0	2157
PEAK HOUR																					
7:00 - 8:00	74	774	0	0	848	0	577	27	0	604	287	0	458	0	745	0	0	0	0	0	2197
PM																					
2:30 - 2:45	40	193	0	0	233	0	113	19	0	132	48	2	118	0	168	0	0	0	0	0	533
2:45 - 3:00	27	178	0	0	205	0	106	15	0	121	87	0	145	0	232	0	0	0	0	0	558
3:00 - 3:15	36	189	0	0	225	0	114	7	0	121	58	0	141	0	199	0	0	0	0	0	545
3:15 - 3:30	24	167	0	0	191	0	134	8	0	142	91	0	203	0	294	0	0	0	0	0	627
3:30 - 3:45	25	222	0	0	247	0	138	12	0	150	88	2	192	0	282	0	0	0	0	0	679
3:45 - 4:00	32	193	0	0	225	0	188	11	0	199	93	16	205	0	314	0	0	0	0	0	738
4:00 - 4:15	37	215	0	0	252	0	183	2	0	185	97	34	197	0	328	0	0	0	0	0	765
4:15 - 4:30	24	211	0	0	235	0	161	11	0	172	100	32	233	0	365	0	0	0	0	0	772
4:30 - 4:45	37	212	0	0	249	0	170	13	0	183	106	18	207	0	331	0	0	0	0	0	763
4:45 - 5:00	28	185	0	0	213	0	203	10	0	213	85	10	231	0	326	0	0	0	0	0	752
5:00 - 5:15	34	229	0	0	263	0	179	15	0	194	89	9	190	0	288	0	0	0	0	0	745
5:15 - 5:30	30	202	0	0	232	0	192	12	0	204	114	6	236	0	356	0	0	0	0	0	792
5:30 - 5:45	32	204	0	0	236	0	186	10	0	196	94	16	211	0	321	0	0	0	0	0	753
5:45 - 6:00	39	202	0	0	241	0	199	14	0	213	104	11	217	0	332	0	0	0	0	0	786
6:00 - 6:15	36	191	0	0	227	0	191	4	0	195	106	7	193	0	306	0	0	0	0	0	728
6:15 - 6:30	47	204	0	0	251	0	188	6	0	194	107	2	176	0	285	0	0	0	0	0	730
4 Hr Totals	528	3197	0	0	3725	0	2645	169	0	2814	1467	165	3095	0	4727	0	0	0	0	0	11266
1 Hr Totals																					
2:30 - 3:30	127	727	0	0	854	0	467	49	0	516	284	2	607	0	893	0	0	0	0	0	2263
2:45 - 3:45	112	756	0	0	868	0	492	42	0	534	324	2	681	0	1007	0	0	0	0	0	2409
3:00 - 4:00	117	771	0	0	888	0	574	38	0	612	330	18	741	0	1089	0	0	0	0	0	2589
3:15 - 4:15	118	797	0	0	915	0	643	33	0	676	369	52	797	0	1218	0	0	0	0	0	2809
3:30 - 4:30	118	841	0	0	959	0	670	36	0	706	378	84	827	0	1289	0	0	0	0	0	2954
3:45 - 4:45	130	831	0	0	961	0	702	37	0	739	396	100	842	0	1338	0	0	0	0	0	3038
4:00 - 5:00	126	823	0	0	949	0	717	36	0	753	388	94	868	0	1350	0	0	0	0	0	3052
4:15 - 5:15	123	837	0	0	960	0	713	49	0	762	380	69	861	0	1310	0	0	0	0	0	3032
4:30 - 5:30	129	828	0	0	957	0	744	50	0	794	394	43	864	0	1301	0	0	0	0	0	3052
4:45 - 5:45	124	820	0	0	944	0	760	47	0	807	382	41	868	0	1291	0	0	0	0	0	3042
5:00 - 6:00	135	837	0	0	972	0	756	51	0	807	401	42	854	0	1297	0	0	0	0	0	3076
5:15 - 6:15	137	799	0	0	936	0	768	40	0	808	418	40	857	0	1315	0	0	0	0	0	3059
5:30 - 6:30	154	801	0	0	955	0	764	34	0	798	411	36	797	0	1244	0	0	0	0	0	2997
PEAK HOUR																					
5:00 - 6:00	135	837	0	0	972	0	756	51	0	807	401	42	854	0	1297	0	0	0	0	0	3076

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and MD 32 WB Ramps
Location: Howard County, Maryland

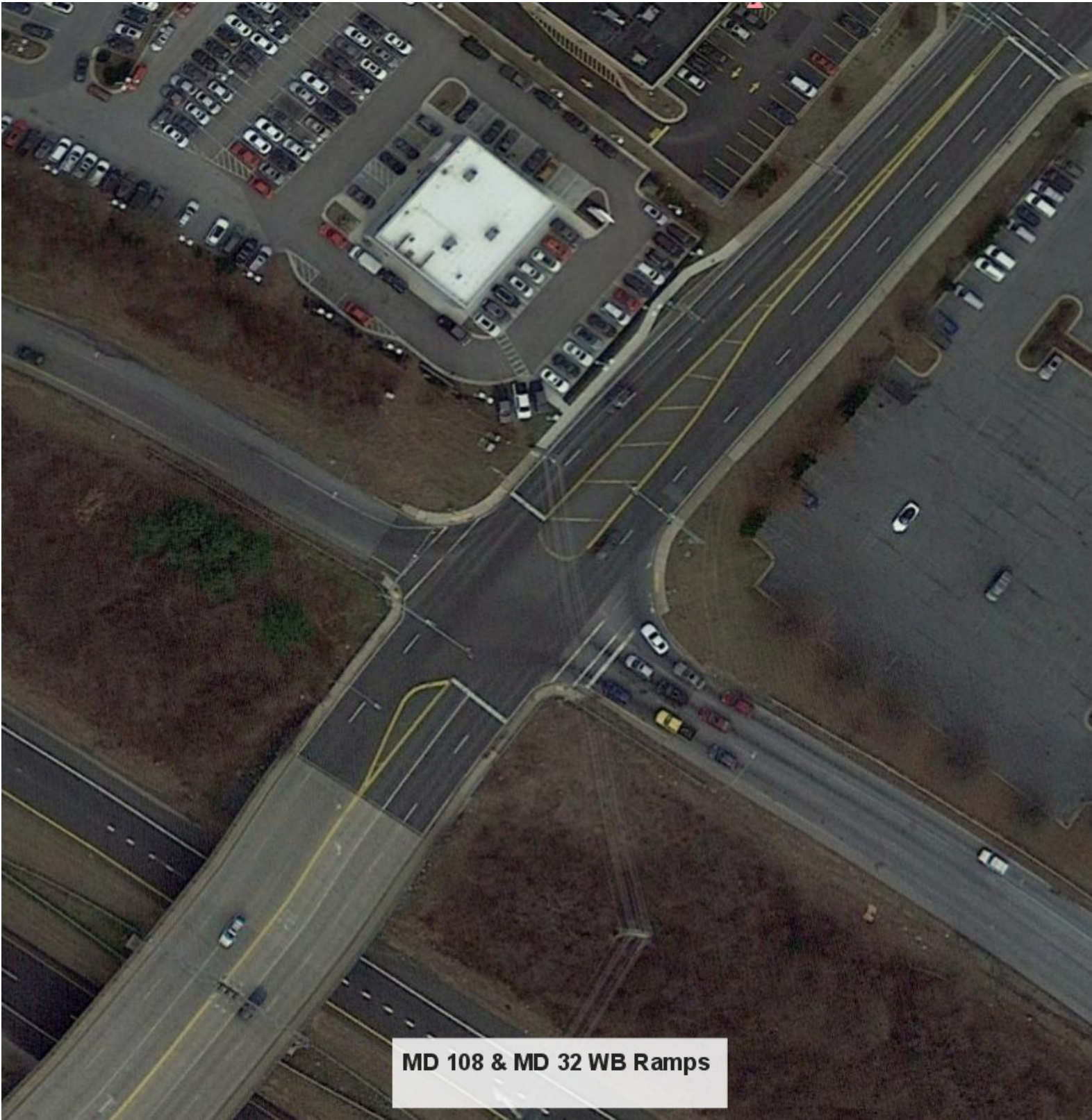
Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 5



TIME	NORTH LEG MD 108		SOUTH LEG MD 108	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
TOTALS	0	0	0	0
PM				
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
TOTALS	0	0	0	0

	EAST LEG MD 32 WB Off Ramp		WEST LEG MD 32 WB ON Ramp	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	1	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
TOTALS	1	0	0	0
PM				
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	6	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	2	0	0	0
4:45 - 5:00	4	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	1	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	1	0	0	0
TOTALS	14	0	0	0



MD 108 & MD 32 WB Ramps

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Linden Lithincum Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday

Star Rating: 4



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: Linden Lithincum Lane					TRAFFIC FROM WEST on: Freestate Gas Station					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:30 - 6:45	0	117	2	0	119	2	67	2	0	71	12	0	6	0	18	6	1	0	0	7	215
6:45 - 7:00	0	171	5	0	176	4	122	2	0	128	14	0	3	0	17	5	1	2	0	8	329
7:00 - 7:15	0	206	18	0	224	11	198	1	0	210	43	0	6	0	49	2	0	1	0	3	486
7:15 - 7:30	0	229	12	0	241	7	154	5	0	166	34	1	4	0	39	7	1	2	0	10	456
7:30 - 7:45	0	226	10	0	236	10	141	6	0	157	9	0	5	0	14	10	0	5	0	15	422
7:45 - 8:00	0	216	7	0	223	3	165	4	0	172	14	0	8	0	22	14	0	2	0	16	433
8:00 - 8:15	0	218	9	0	227	10	110	6	0	126	10	0	6	0	16	10	0	1	0	11	380
8:15 - 8:30	0	203	10	0	213	4	99	9	0	112	11	0	5	0	16	12	0	1	0	13	354
8:30 - 8:45	0	190	19	0	209	8	102	3	0	113	5	0	7	0	12	10	0	2	0	12	346
8:45 - 9:00	0	198	19	0	217	8	102	7	0	117	11	0	4	0	15	14	0	3	0	17	366
9:00 - 9:15	0	167	32	0	199	15	137	4	0	156	45	0	4	0	49	12	1	1	0	14	418
9:15 - 9:30	1	159	44	0	204	11	110	9	2	132	29	0	7	0	36	8	0	4	0	12	384
9:30 - 9:45	0	113	9	0	122	9	102	4	0	115	10	0	5	0	15	12	0	4	0	16	268
9:45 - 10:00	2	99	12	0	113	8	107	5	1	121	7	0	5	0	12	10	0	3	0	13	259
10:00 - 10:15	0	93	10	0	103	5	83	6	0	94	8	1	8	0	17	13	3	6	0	22	236
10:15 - 10:30	0	104	5	0	109	12	86	5	1	104	18	0	6	0	24	11	0	1	0	12	249
10:30 - 10:45	0	112	16	0	128	12	104	16	0	132	17	0	8	0	25	16	0	4	0	20	305
10:45 - 11:00	0	111	15	0	126	13	100	11	0	124	20	0	10	0	30	16	0	4	0	20	300
11:00 - 11:15	0	101	5	0	106	5	80	8	0	93	6	2	8	0	16	12	0	9	0	21	236
11:15 - 11:30	0	115	8	0	123	8	104	8	0	120	17	1	8	0	26	10	1	5	0	16	285
11:30 - 11:45	0	110	8	0	118	9	91	8	0	108	9	0	5	0	14	15	0	7	0	22	262
11:45 - 12:00	1	114	6	0	121	10	95	7	0	112	12	1	8	0	21	15	0	4	0	19	273
12:00 - 12:15	0	113	10	0	123	7	109	14	0	130	20	1	5	0	26	20	0	7	0	27	306
12:15 - 12:30	0	107	8	0	115	7	106	12	0	125	18	2	11	0	31	12	2	5	0	19	290
12:30 - 12:45	0	105	8	0	113	7	149	12	0	168	15	0	11	0	26	15	0	5	0	20	327
12:45 - 1:00	0	122	3	0	125	7	102	10	0	119	10	1	4	0	15	15	1	5	0	21	280
1:00 - 1:15	0	102	6	0	108	3	98	6	1	108	8	2	1	0	11	11	1	11	0	23	250
1:15 - 1:30	0	97	8	0	105	3	99	7	0	109	9	0	3	0	12	9	0	5	0	14	240
1:30 - 1:45	0	103	8	0	111	10	126	12	0	148	13	0	6	0	19	10	0	7	0	17	295
1:45 - 2:00	1	95	10	0	106	10	101	6	0	117	14	0	6	0	20	11	0	4	0	15	258
2:00 - 2:15	0	116	15	0	131	10	149	8	0	167	13	1	5	1	20	9	0	7	0	16	334
2:15 - 2:30	1	181	31	0	213	10	138	11	0	159	17	2	0	0	19	17	1	8	0	26	417
2:30 - 2:45	0	117	14	0	131	6	124	12	0	142	9	1	3	0	13	19	1	12	0	32	318
2:45 - 3:00	0	123	15	0	138	6	140	10	0	156	8	0	4	1	13	8	1	2	0	11	318
3:00 - 3:15	0	114	13	0	127	3	158	7	0	168	15	2	6	0	23	13	0	6	0	19	337
3:15 - 3:30	0	115	16	0	131	8	189	8	1	206	9	0	3	0	12	15	1	5	0	21	370
3:30 - 3:45	0	141	16	0	157	15	203	8	0	226	31	0	5	0	36	18	0	5	0	23	442
3:45 - 4:00	2	163	41	0	206	16	213	7	0	236	37	0	2	0	39	14	0	4	0	18	499
4:00 - 4:15	0	168	33	0	201	22	245	12	0	279	21	0	3	0	24	14	1	5	0	20	524
4:15 - 4:30	0	141	18	0	159	21	240	10	0	271	19	0	5	0	24	16	0	5	0	21	475
4:30 - 4:45	0	164	28	0	192	22	248	11	0	281	20	0	5	0	25	18	0	5	0	23	521
4:45 - 5:00	0	133	18	0	151	19	296	13	0	328	28	0	3	0	31	19	1	4	0	24	534
5:00 - 5:15	0	142	18	0	160	23	288	9	0	320	26	0	8	0	34	9	1	7	0	17	531
5:15 - 5:30	0	145	17	0	162	20	261	7	0	288	36	0	8	0	44	10	0	2	0	12	506
5:30 - 5:45	1	140	17	0	158	24	279	9	0	312	25	0	4	0	29	11	0	3	0	14	513
5:45 - 6:00	0	148	28	0	176	16	301	13	0	330	38	0	6	0	44	17	0	3	0	20	570
6:00 - 6:15	0	156	16	0	172	17	220	9	0	246	26	0	9	1	36	19	1	3	0	23	477
6:15 - 6:30	1	164	20	0	185	22	248	9	0	279	27	1	7	0	35	17	1	6	0	24	523
6:30 - 6:45	0	152	30	0	182	14	203	14	0	231	15	1	10	0	26	11	0	5	0	16	455
6:45 - 7:00	0	128	20	0	148	10	145	10	0	165	21	2	5	0	28	13	1	7	0	21	362
13 Hr Totals	10	7067	766	0	7843	542	7637	412	6	8597	909	22	284	3	1218	630	22	224	0	876	18534

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: MD 108
and: Linden Lithincum Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 4



TIME	TRAFFIC FROM NORTH on: MD 108					TRAFFIC FROM SOUTH on: MD 108					TRAFFIC FROM EAST on: Linden Lithincum Lane					TRAFFIC FROM WEST on: Freestate Gas Station					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
1 Hr Totals																					
6:30 - 7:30	0	723	37	0	760	24	541	10	0	575	103	1	19	0	123	20	3	5	0	28	1486
6:45 - 7:45	0	832	45	0	877	32	615	14	0	661	100	1	18	0	119	24	2	10	0	36	1693
7:00 - 8:00	0	877	47	0	924	31	658	16	0	705	100	1	23	0	124	33	1	10	0	44	1797
7:15 - 8:15	0	889	38	0	927	30	570	21	0	621	67	1	23	0	91	41	1	10	0	52	1691
7:30 - 8:30	0	863	36	0	899	27	515	25	0	567	44	0	24	0	68	46	0	9	0	55	1589
7:45 - 8:45	0	827	45	0	872	25	476	22	0	523	40	0	26	0	66	46	0	6	0	52	1513
8:00 - 9:00	0	809	57	0	866	30	413	25	0	468	37	0	22	0	59	46	0	7	0	53	1446
8:15 - 9:15	0	758	80	0	838	35	440	23	0	498	72	0	20	0	92	48	1	7	0	56	1484
8:30 - 9:30	1	714	114	0	829	42	451	23	2	518	90	0	22	0	112	44	1	10	0	55	1514
8:45 - 9:45	1	637	104	0	742	43	451	24	2	520	95	0	20	0	115	46	1	12	0	59	1436
9:00 - 10:00	3	538	97	0	638	43	456	22	3	524	91	0	21	0	112	42	1	12	0	55	1329
9:15 - 10:15	3	464	75	0	542	33	402	24	3	462	54	1	25	0	80	43	3	17	0	63	1147
9:30 - 10:30	2	409	36	0	447	34	378	20	2	434	43	1	24	0	68	46	3	14	0	63	1012
9:45 - 10:45	2	408	43	0	453	37	380	32	2	451	50	1	27	0	78	50	3	14	0	67	1049
10:00 - 11:00	0	420	46	0	466	42	373	38	1	454	63	1	32	0	96	56	3	15	0	74	1090
10:15 - 11:15	0	428	41	0	469	42	370	40	1	453	61	2	32	0	95	55	0	18	0	73	1090
10:30 - 11:30	0	439	44	0	483	38	388	43	0	469	60	3	34	0	97	54	1	22	0	77	1126
10:45 - 11:45	0	437	36	0	473	35	375	35	0	445	52	3	31	0	86	53	1	25	0	79	1083
11:00 - 12:00	1	440	27	0	468	32	370	31	0	433	44	4	29	0	77	52	1	25	0	78	1056
11:15 - 12:15	1	452	32	0	485	34	399	37	0	470	58	3	26	0	87	60	1	23	0	84	1126
11:30 - 12:30	1	444	32	0	477	33	401	41	0	475	59	4	29	0	92	62	2	23	0	87	1131
11:45 - 12:45	1	439	32	0	472	31	459	45	0	535	65	4	35	0	104	62	2	21	0	85	1196
12:00 - 1:00	0	447	29	0	476	28	466	48	0	542	63	4	31	0	98	62	3	22	0	87	1203
12:15 - 1:15	0	436	25	0	461	24	455	40	1	520	51	5	27	0	83	53	4	26	0	83	1147
12:30 - 1:30	0	426	25	0	451	20	448	35	1	504	42	3	19	0	64	50	2	26	0	78	1097
12:45 - 1:45	0	424	25	0	449	23	425	35	1	484	40	3	14	0	57	45	2	28	0	75	1065
1:00 - 2:00	1	397	32	0	430	26	424	31	1	482	44	2	16	0	62	41	1	27	0	69	1043
1:15 - 2:15	1	411	41	0	453	33	475	33	0	541	49	1	20	1	71	39	0	23	0	62	1127
1:30 - 2:30	2	495	64	0	561	40	514	37	0	591	57	3	17	1	78	47	1	26	0	74	1304
1:45 - 2:45	2	509	70	0	581	36	512	37	0	585	53	4	14	1	72	56	2	31	0	89	1327
2:00 - 3:00	1	537	75	0	613	32	551	41	0	624	47	4	12	2	65	53	3	29	0	85	1387
2:15 - 3:15	1	535	73	0	609	25	560	40	0	625	49	5	13	1	68	57	3	28	0	88	1390
2:30 - 3:30	0	469	58	0	527	23	611	37	1	672	41	3	16	1	61	55	3	25	0	83	1343
2:45 - 3:45	0	493	60	0	553	32	690	33	1	756	63	2	18	1	84	54	2	18	0	74	1467
3:00 - 4:00	2	533	86	0	621	42	763	30	1	836	92	2	16	0	110	60	1	20	0	81	1648
3:15 - 4:15	2	587	106	0	695	61	850	35	1	947	98	0	13	0	111	61	2	19	0	82	1835
3:30 - 4:30	2	613	108	0	723	74	901	37	0	1012	108	0	15	0	123	62	1	19	0	82	1940
3:45 - 4:45	2	636	120	0	758	81	946	40	0	1067	97	0	15	0	112	62	1	19	0	82	2019
4:00 - 5:00	0	606	97	0	703	84	1029	46	0	1159	88	0	16	0	104	67	2	19	0	88	2054
4:15 - 5:15	0	580	82	0	662	85	1072	43	0	1200	93	0	21	0	114	62	2	21	0	85	2061
4:30 - 5:30	0	584	81	0	665	84	1093	40	0	1217	110	0	24	0	134	56	2	18	0	76	2092
4:45 - 5:45	1	560	70	0	631	86	1124	38	0	1248	115	0	23	0	138	49	2	16	0	67	2084
5:00 - 6:00	1	575	80	0	656	83	1129	38	0	1250	125	0	26	0	151	47	1	15	0	63	2120
5:15 - 6:15	1	589	78	0	668	77	1061	38	0	1176	125	0	27	1	153	57	1	11	0	69	2066
5:30 - 6:30	2	608	81	0	691	79	1048	40	0	1167	116	1	26	1	144	64	2	15	0	81	2083
5:45 - 6:45	1	620	94	0	715	69	972	45	0	1086	106	2	32	1	141	64	2	17	0	83	2025
6:00 - 7:00	1	600	86	0	687	63	816	42	0	921	89	4	31	1	125	60	3	21	0	84	1817
PEAK HOUR																					
7:00 - 8:00	0	877	47	0	924	31	658	16	0	705	100	1	23	0	124	33	1	10	0	44	1797
5:00 - 6:00	1	575	80	0	656	83	1129	38	0	1250	125	0	26	0	151	47	1	15	0	63	2120

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and: Linden Lithincum Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 4



TIME	NORTH LEG MD 108		SOUTH LEG MD 108	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
9:00 - 9:15	0	0	0	0
9:15 - 9:30	0	0	0	0
9:30 - 9:45	0	0	0	0
9:45 - 10:00	0	0	0	0
10:00 - 10:15	0	0	0	0
10:15 - 10:30	0	0	1	0
10:30 - 10:45	0	0	0	0
10:45 - 11:00	0	0	0	0
11:00 - 11:15	0	0	0	0
11:15 - 11:30	0	0	0	0
11:30 - 11:45	0	0	0	0
11:45 - 12:00	0	0	0	0
12:00 - 12:15	0	0	0	0
12:15 - 12:30	0	0	0	0
12:30 - 12:45	0	0	0	0
12:45 - 1:00	0	0	0	0
1:00 - 1:15	0	0	0	0
1:15 - 1:30	0	0	0	0
1:30 - 1:45	0	0	0	0
1:45 - 2:00	0	0	0	0
2:00 - 2:15	0	0	0	0
2:15 - 2:30	0	0	0	0
2:30 - 2:45	0	0	1	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
TOTALS	0	0	2	0

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Intersection of: MD 108
and: Linden Lithincum Lane
Location: Howard County, Maryland

Counted by: VCU
Date: April 26, 2017
Weather: Cool, Light Rain
Entered by: BGJ

Wednesday
Star Rating: 4



	EAST LEG Linden Lithincum Lane		WEST LEG Freestate Gas Station	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
9:00 - 9:15	0	0	0	0
9:15 - 9:30	0	0	0	0
9:30 - 9:45	0	0	0	0
9:45 - 10:00	0	0	0	0
10:00 - 10:15	0	0	0	0
10:15 - 10:30	0	0	0	0
10:30 - 10:45	0	0	0	0
10:45 - 11:00	0	0	0	0
11:00 - 11:15	0	0	0	0
11:15 - 11:30	0	0	0	0
11:30 - 11:45	0	0	0	0
11:45 - 12:00	0	0	0	0
12:00 - 12:15	0	0	0	0
12:15 - 12:30	0	0	0	0
12:30 - 12:45	0	0	0	0
12:45 - 1:00	0	0	0	0
1:00 - 1:15	0	0	0	0
1:15 - 1:30	0	0	0	0
1:30 - 1:45	0	0	0	0
1:45 - 2:00	0	0	0	0
2:00 - 2:15	0	0	0	0
2:15 - 2:30	0	0	0	0
2:30 - 2:45	0	0	0	0
2:45 - 3:00	0	0	0	0
3:00 - 3:15	0	0	0	0
3:15 - 3:30	0	0	0	0
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	1	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
6:00 - 6:15	0	0	0	0
6:15 - 6:30	0	0	0	0
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
TOTALS	1	0	0	0



MD 108 & Linden Linthicum Ln

APPENDIX C

Intersection Capacity Analysis Worksheets

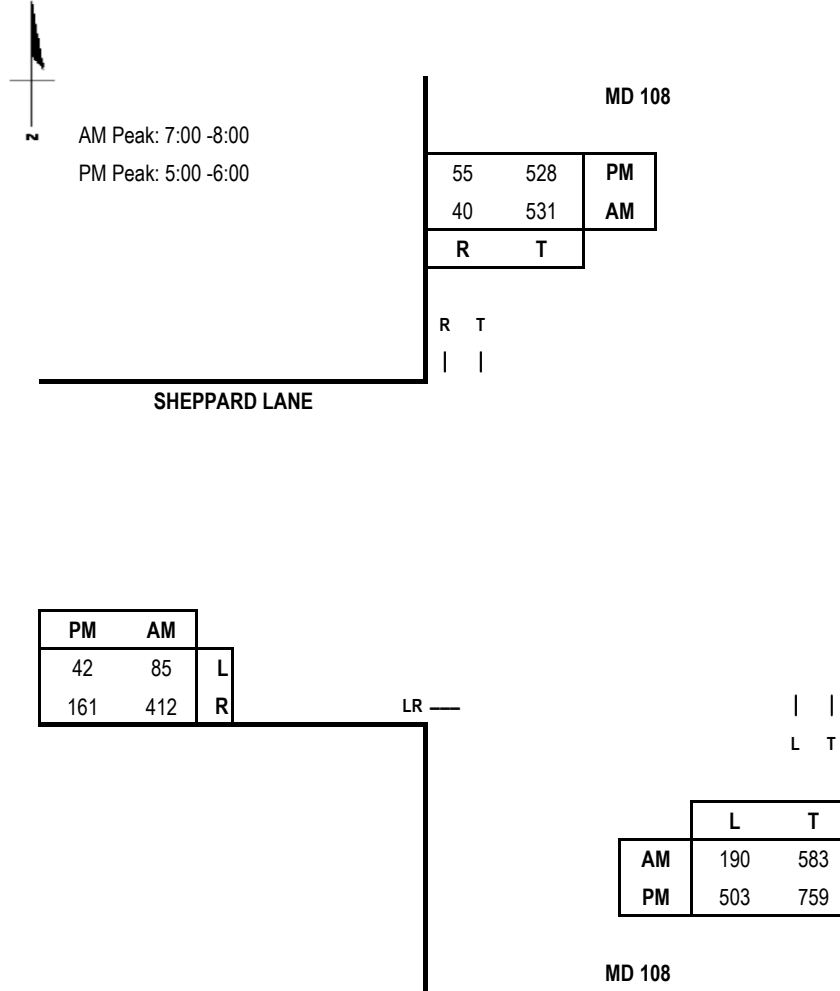
CLV Worksheets



CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road Name: Sheppard Lane
N/S Road Name: MD 108
Conditions: Existing Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	497	1.00	497				497
NB	583	1.00	583				721
SB	531	1.00	531	190	1.00	190	
CLV TOTAL=							1,218
Level of Service (LOS)=							C

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	203	1.00	203				203
NB	759	1.00	759				1031
SB	528	1.00	528	503	1.00	503	
CLV TOTAL=							1,234
Level of Service (LOS)=							C

Scenario ID - EXIST1

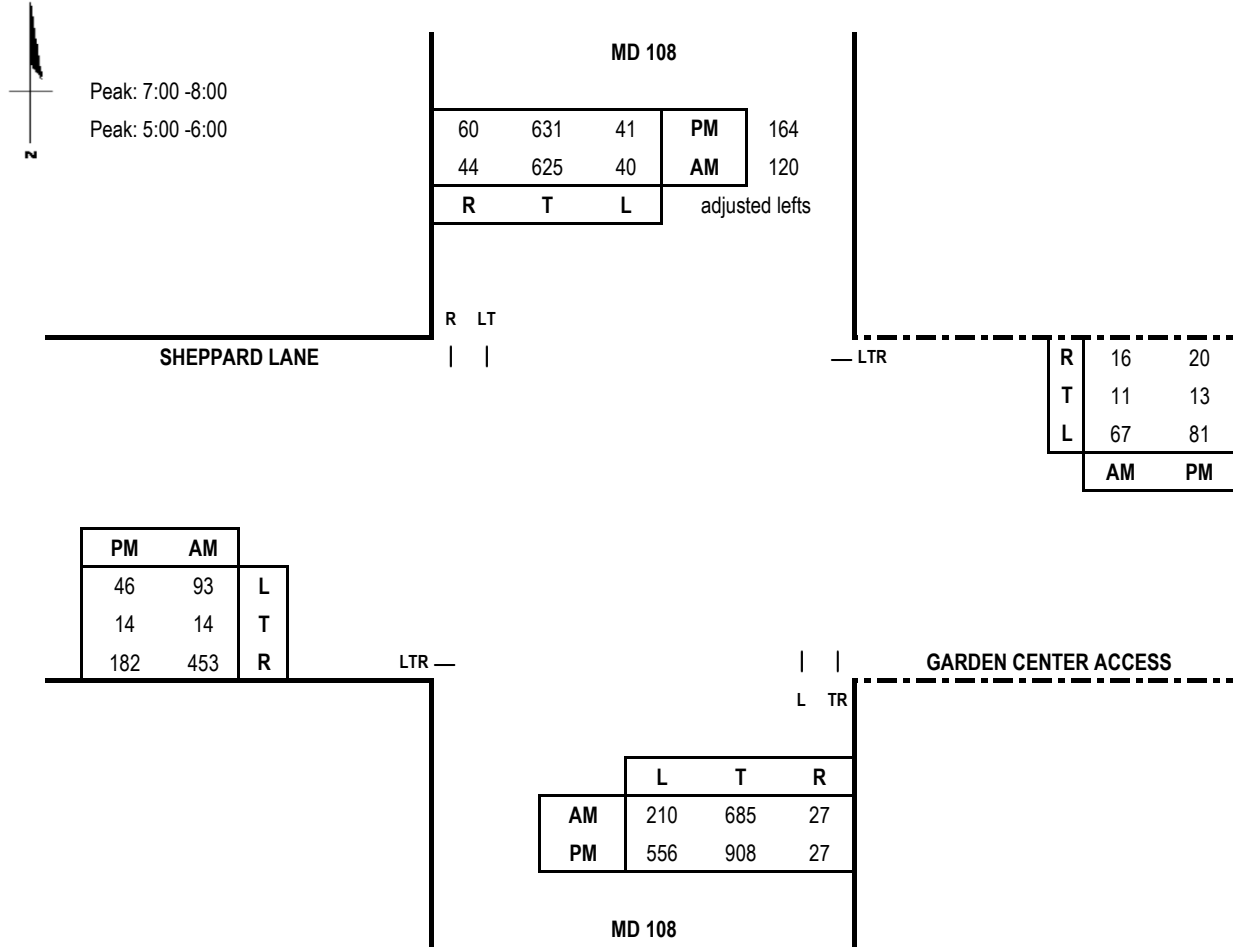
CLV V/C =0.76

CLV V/C =0.77

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center Access/Sheppard Lane
N/S Road: MD 108
Conditions: 2023 Background Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	560	1.00	560				560
WB	94	1.00	94				94
NB	712	1.00	712	40	1.00	40	955
SB	745	1.00	745	210	1.00	210	
CLV TOTAL=							1,609
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	242	1.00	242				242
WB	114	1.00	114				114
NB	935	1.00	935	41	1.00	41	1351
SB	795	1.00	795	556	1.00	556	
CLV TOTAL=							1,707
Level of Service (LOS)=							F

Scenario ID - BACK11

AM V/C = 1.01

PM V/C = 1.07

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center Access/Sheppard Lane

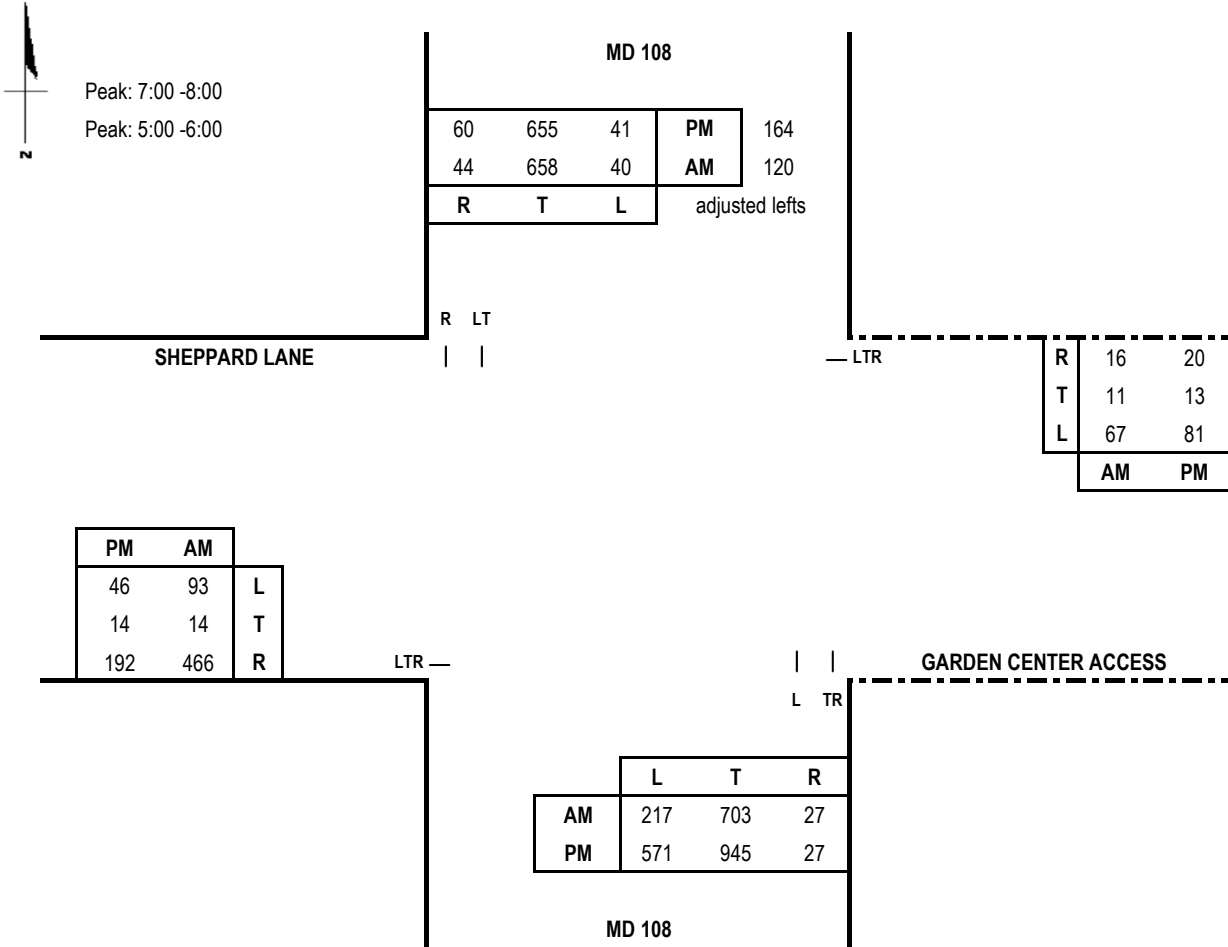
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2023 Total Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	573	1.00	573				573
WB	94	1.00	94				94
NB	730	1.00	730	40	1.00	40	995
SB	778	1.00	778	217	1.00	217	
CLV TOTAL=							1,662
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	252	1.00	252				252
WB	114	1.00	114				114
NB	972	1.00	972	41	1.00	41	1390
SB	819	1.00	819	571	1.00	571	
CLV TOTAL=							1,756
Level of Service (LOS)=							F

Scenario ID - TOT11

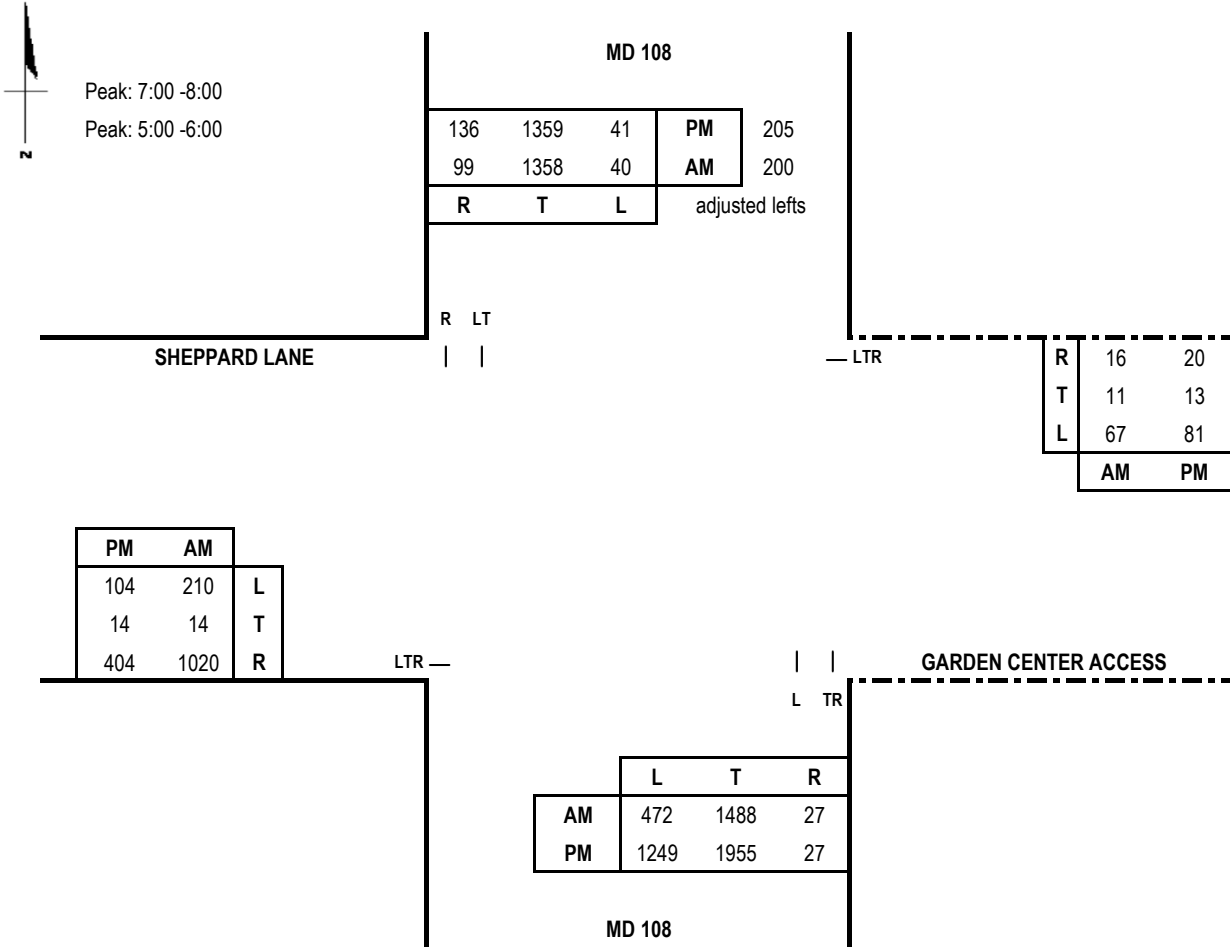
AM V/C = 1.04

PM V/C = 1.1

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center Access/Sheppard Lane
N/S Road: MD 108
Conditions: 2037 Background Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	1244	1.00	1244				1244
WB	94	1.00	94				94
NB	1515	1.00	1515	40	1.00	40	2030
SB	1558	1.00	1558	472	1.00	472	
CLV TOTAL=							3,368
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	522	1.00	522				522
WB	114	1.00	114				114
NB	1982	1.00	1982	41	1.00	41	2813
SB	1564	1.00	1564	1249	1.00	1249	
CLV TOTAL=							3,449
Level of Service (LOS)=							F

Scenario ID - BACK21

AM V/C = 2.11

PM V/C = 2.16

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center Access/Sheppard Lane

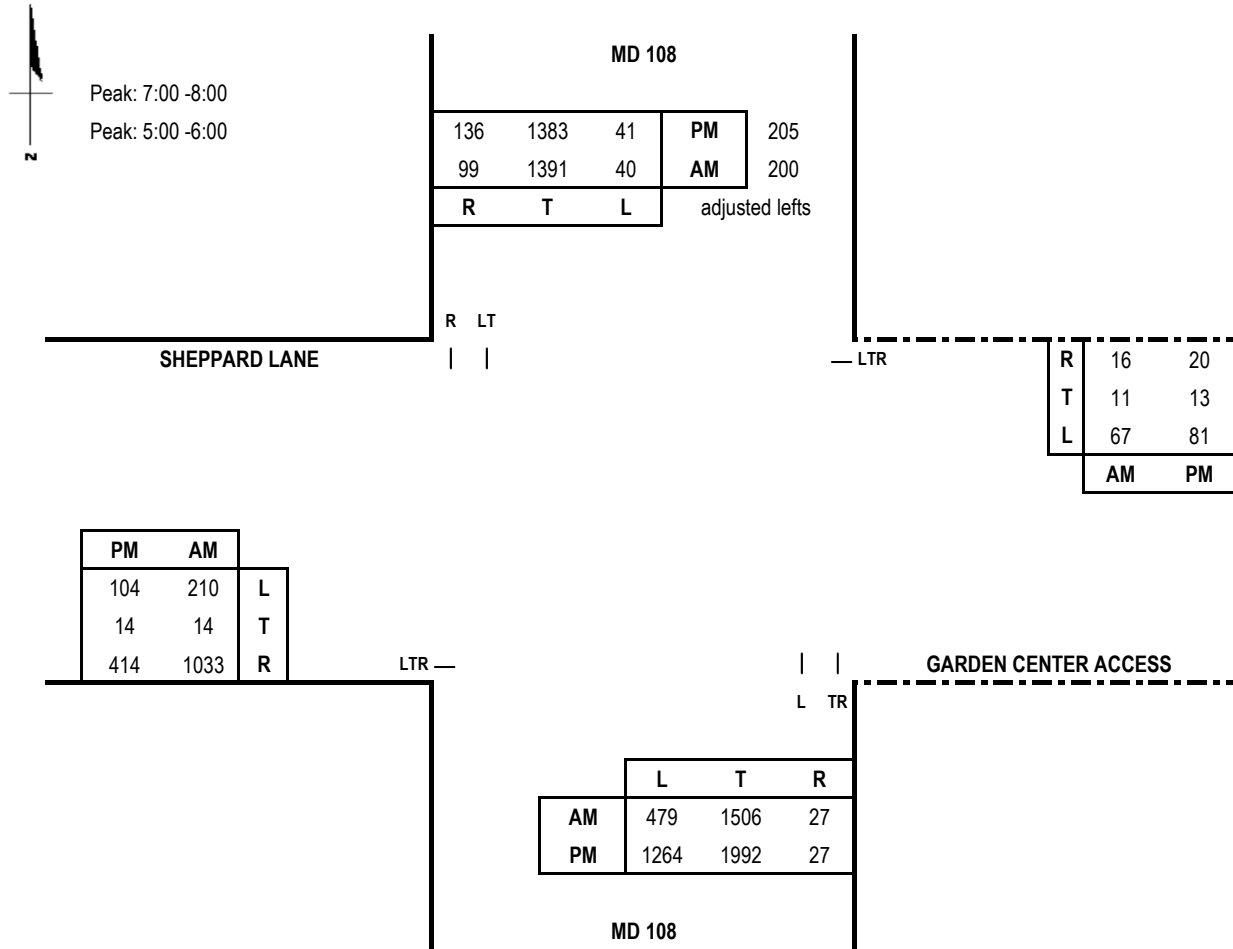
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2037 Total Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	1257	1.00	1257				1257
WB	94	1.00	94				94
NB	1533	1.00	1533	40	1.00	40	2070
SB	1591	1.00	1591	479	1.00	479	
CLV TOTAL=							3,421
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	532	1.00	532				532
WB	114	1.00	114				114
NB	2019	1.00	2019	41	1.00	41	2852
SB	1588	1.00	1588	1264	1.00	1264	
CLV TOTAL=							3,498
Level of Service (LOS)=							F

Scenario ID - TOT21

AM V/C = 2.14

PM V/C = 2.19

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Sheppard Lane/Garden Center

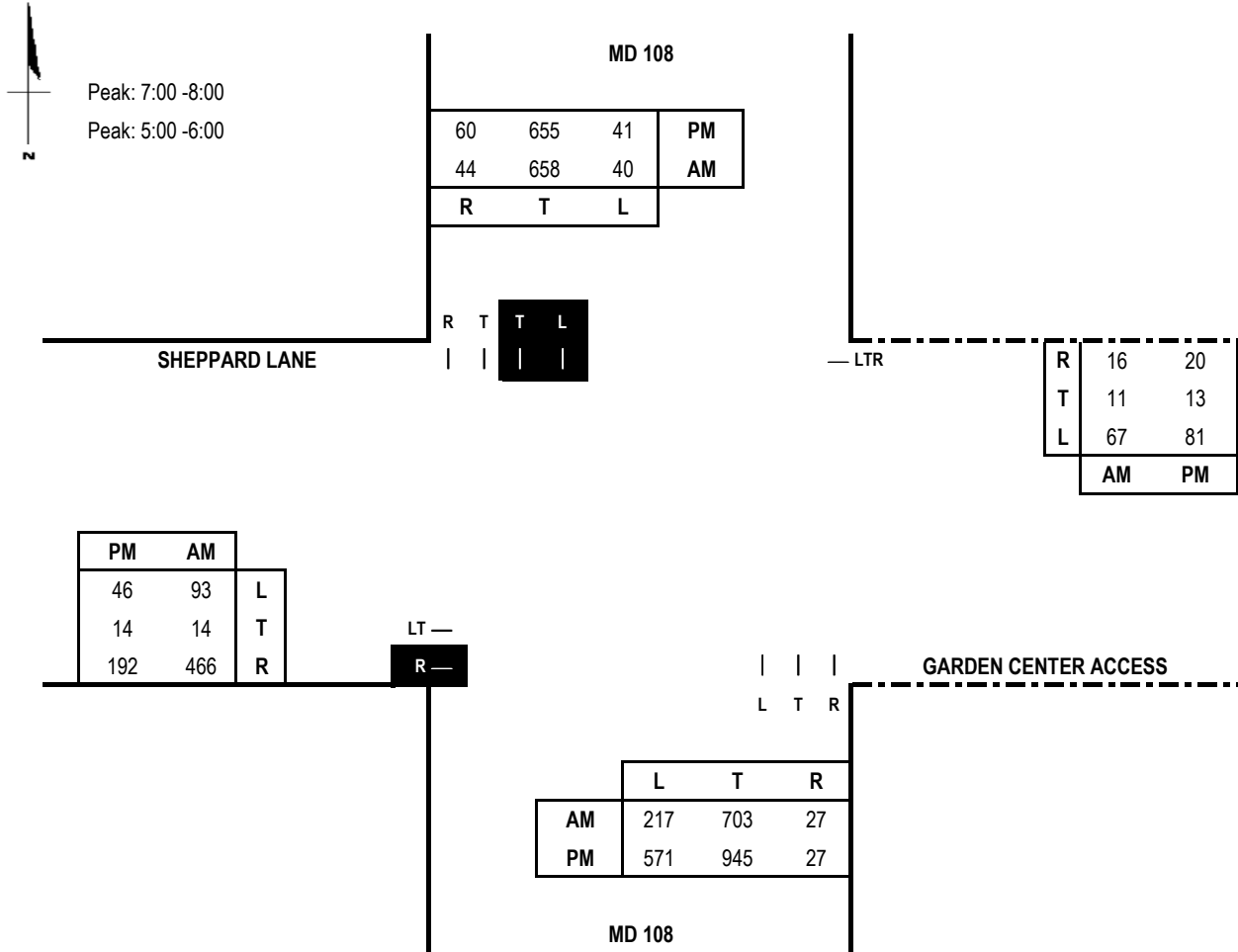
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2023 Total Traffic
w/imp

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	249	1.00	249				249
WB	94	1.00	94				94
NB	703	1.00	703	40	1.00	40	743
SB	658	0.55	362	217	1.00	217	
CLV TOTAL=							1,086
Level of Service (LOS) =							B

AM V/C = 0.68

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	60	1.00	60				60
WB	114	1.00	114				114
NB	945	1.00	945	41	1.00	41	986
SB	655	0.55	360	571	1.00	571	
CLV TOTAL=							1,160
Level of Service (LOS) =							C

PM V/C = 0.73

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Sheppard Lane/Garden Center

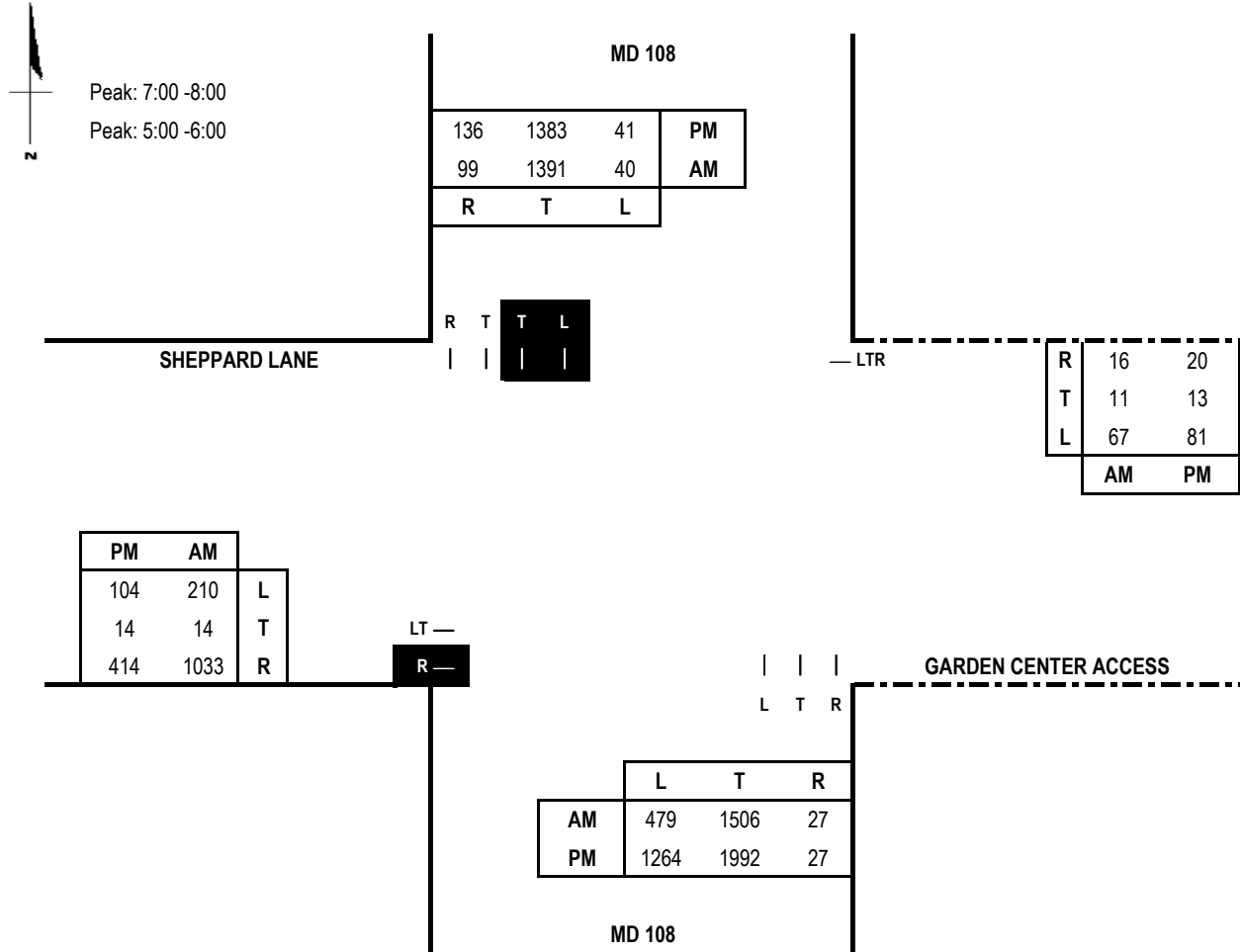
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2037 Total Traffic
w/imp

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
EB	554	1.00	554				554
WB	94	1.00	94				94
NB	1506	1.00	1506	40	1.00	40	1546
SB	1391	0.55	765	479	1.00	479	
CLV TOTAL=							2,194
Level of Service (LOS) =							F

AM V/C = 1.37

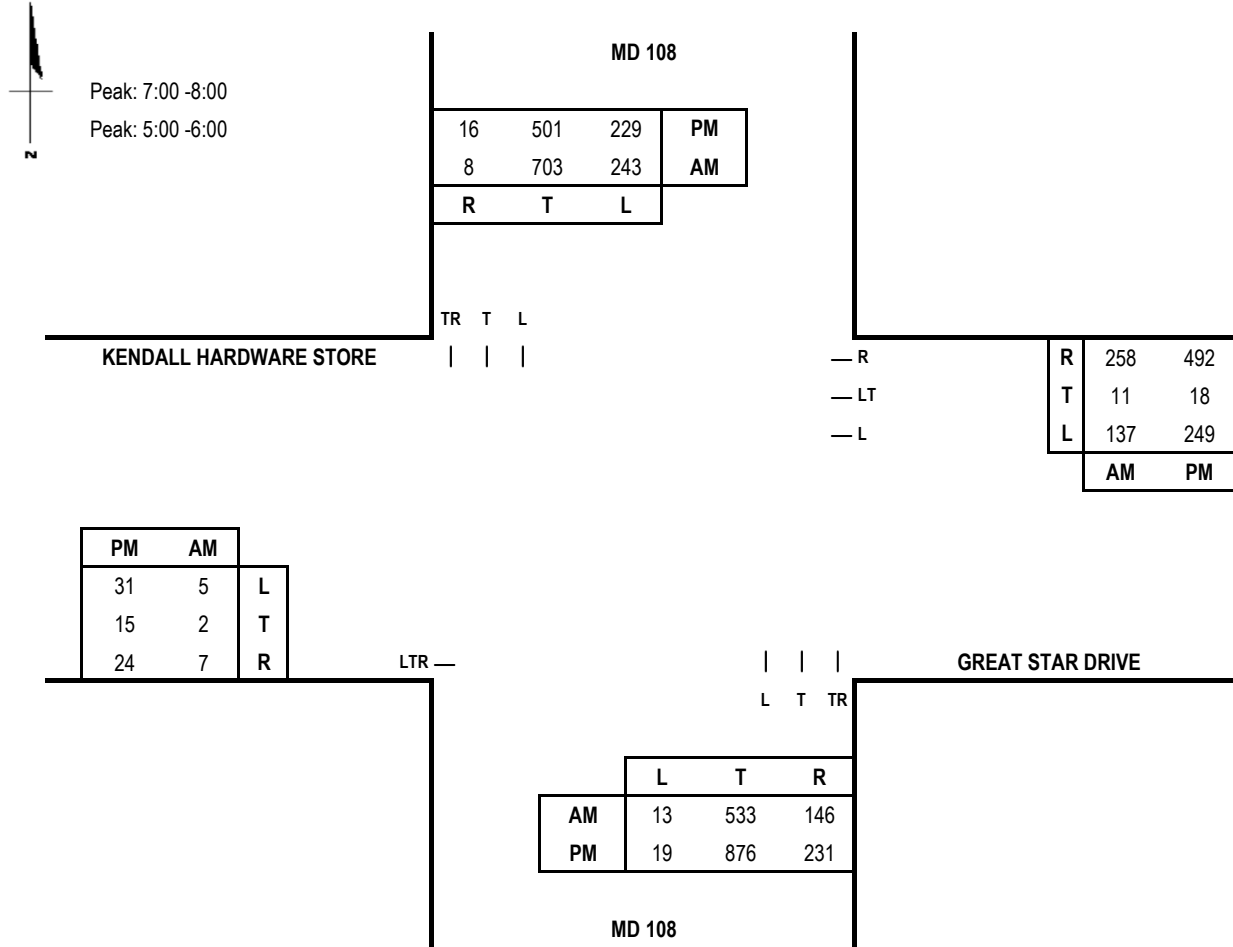
Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
EB	118	1.00	118				118
WB	114	1.00	114				114
NB	1992	1.00	1992	41	1.00	41	2033
SB	1383	0.55	761	1264	1.00	1264	
CLV TOTAL=							2,265
Level of Service (LOS) =							F

PM V/C = 1.42

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Great Star Drive/Kendall Hardware Store
N/S Road: MD 108
Conditions: Existing Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	14	1.00	14				14
WB	148	0.60	89				89
NB	679	0.55	373	243	1.00	243	616
SB	711	0.55	391	13	1.00	13	
CLV TOTAL=							719
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	70	1.00	70				70
WB	263	1.00	263				263
NB	1107	0.55	609	229	1.00	229	838
SB	517	0.55	284	19	1.00	19	
CLV TOTAL=							1,171
Level of Service (LOS)=							C

Scenario ID - EXIST2

AM V/C = 0.45

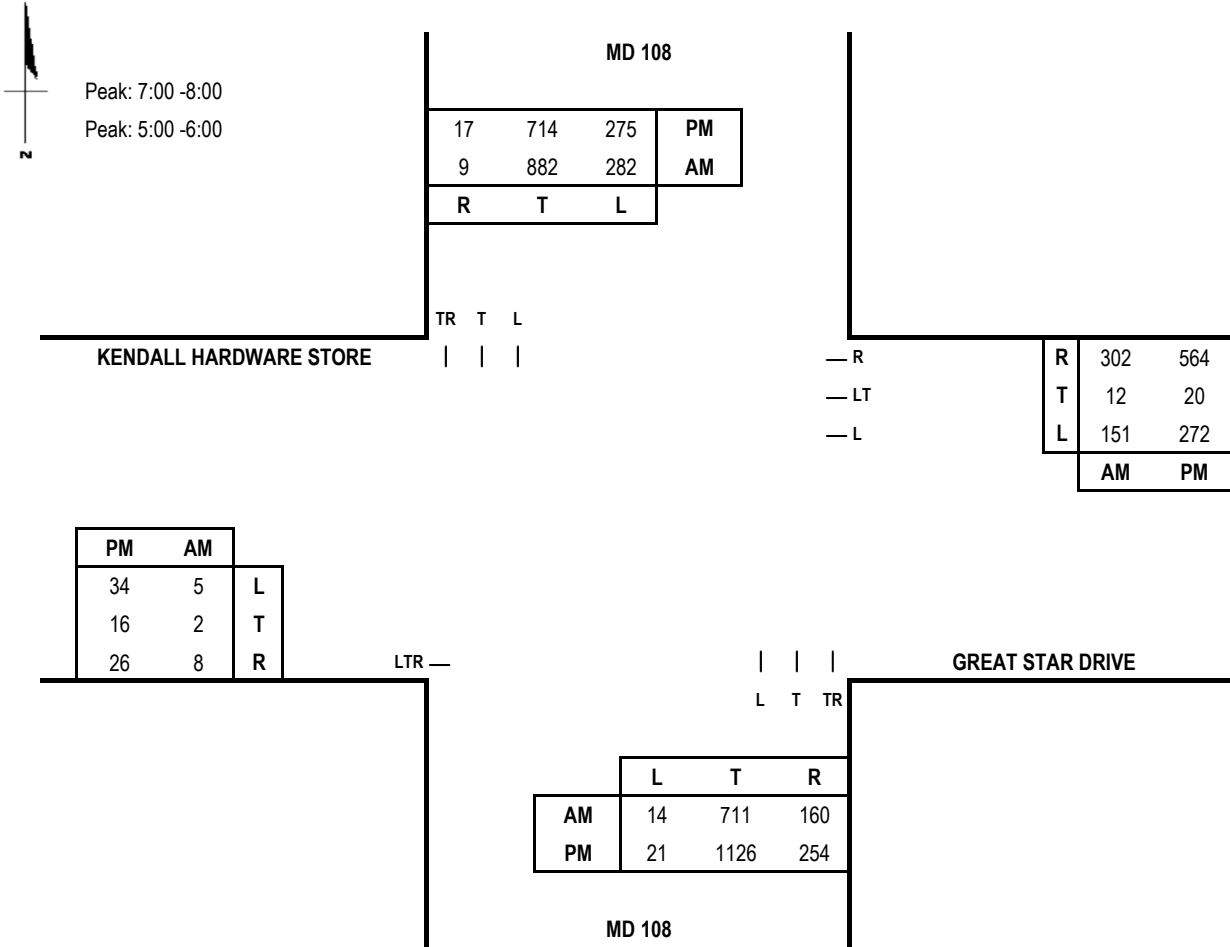
PM V/C = 0.73

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA



E/W Road: Great Star Drive/Kendall Hardware Store
N/S Road: MD 108
Conditions: 2023 Background Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	15	1.00	15				15
WB	163	0.60	98				98
NB	871	0.55	479	282	1.00	282	761
SB	891	0.55	490	14	1.00	14	
CLV TOTAL=							874
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	76	1.00	76				76
WB	289	1.00	289				289
NB	1380	0.55	759	275	1.00	275	1034
SB	731	0.55	402	21	1.00	21	
CLV TOTAL=							1,399
Level of Service (LOS)=							D

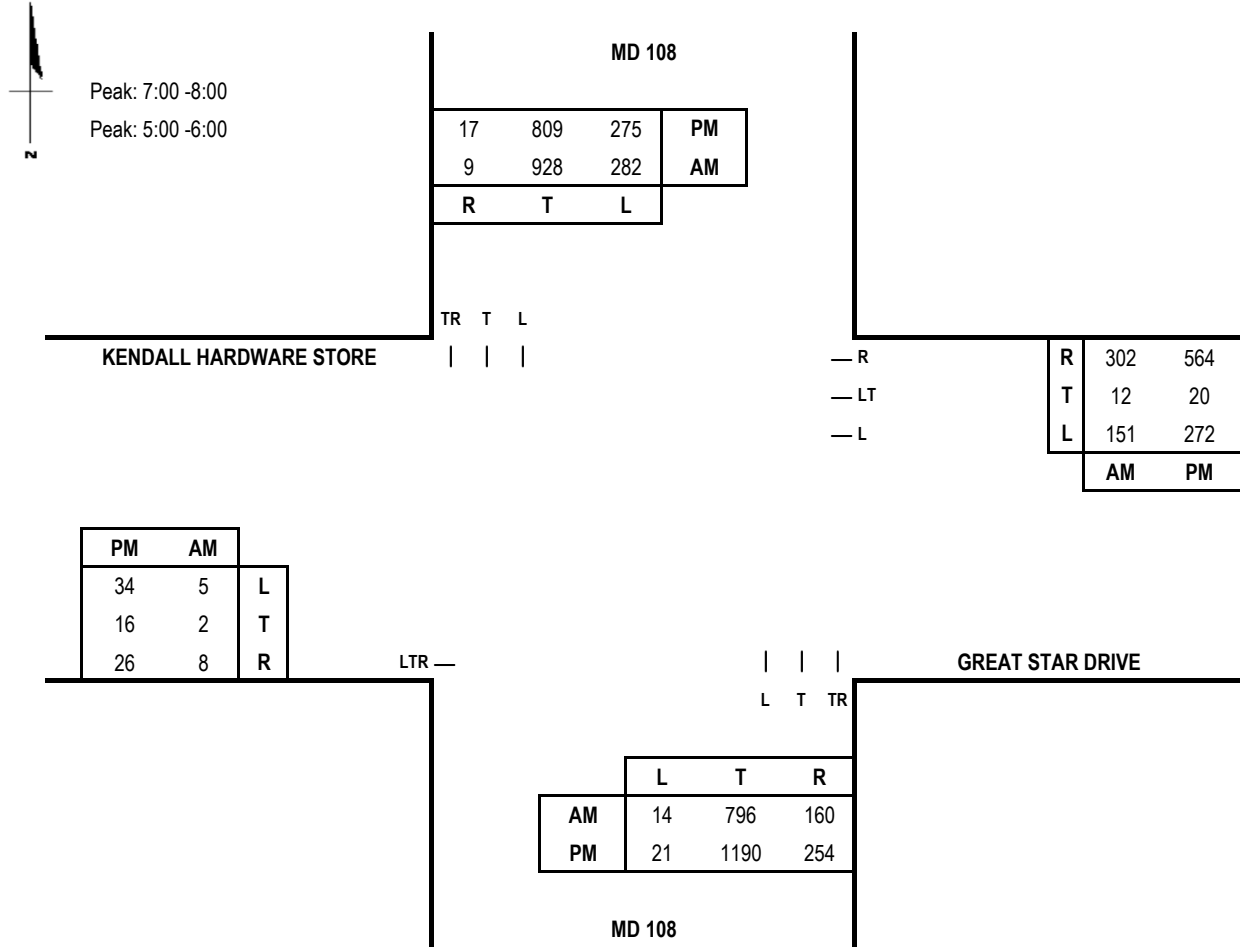
Scenario ID - BACK12

AM V/C = 0.55

PM V/C = 0.87

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Great Star Drive/Kendall Hardware Store **Date of Count:** 4/26/2017
N/S Road: MD 108 **Day of Week:** Wednesday
Conditions: 2023 Total Traffic **Analyst:** Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	15	1.00	15				15
WB	163	0.60	98				98
NB	956	0.55	526	282	1.00	282	808
SB	937	0.55	515	14	1.00	14	
CLV TOTAL=							921
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	76	1.00	76				76
WB	289	1.00	289				289
NB	1444	0.55	794	275	1.00	275	1069
SB	826	0.55	454	21	1.00	21	
CLV TOTAL=							1,434
Level of Service (LOS)=							D

Scenario ID - TOT12

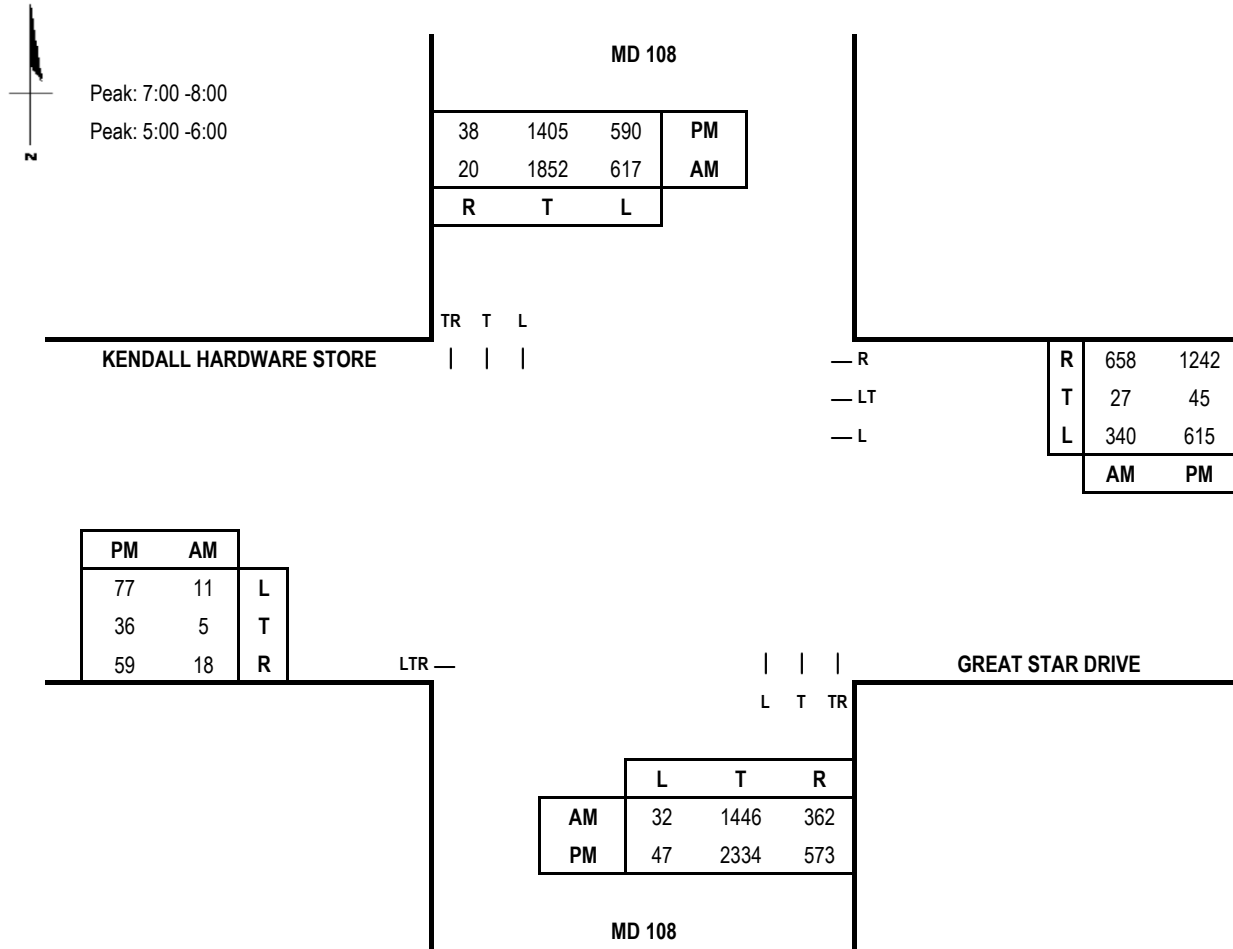
AM V/C = 0.58

PM V/C = 0.9

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Great Star Drive/Kendall Hardware Store
N/S Road: MD 108
Conditions: 2037 Background Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	34	1.00	34				34
WB	367	0.60	220				220
NB	1808	0.55	994	617	1.00	617	1611
SB	1872	0.55	1030	32	1.00	32	
CLV TOTAL=							1,865
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	172	1.00	172				172
WB	652	1.00	652				652
NB	2907	0.55	1599	590	1.00	590	2189
SB	1443	0.55	794	47	1.00	47	
CLV TOTAL=							3,013
Level of Service (LOS)=							F

Scenario ID - BACK22

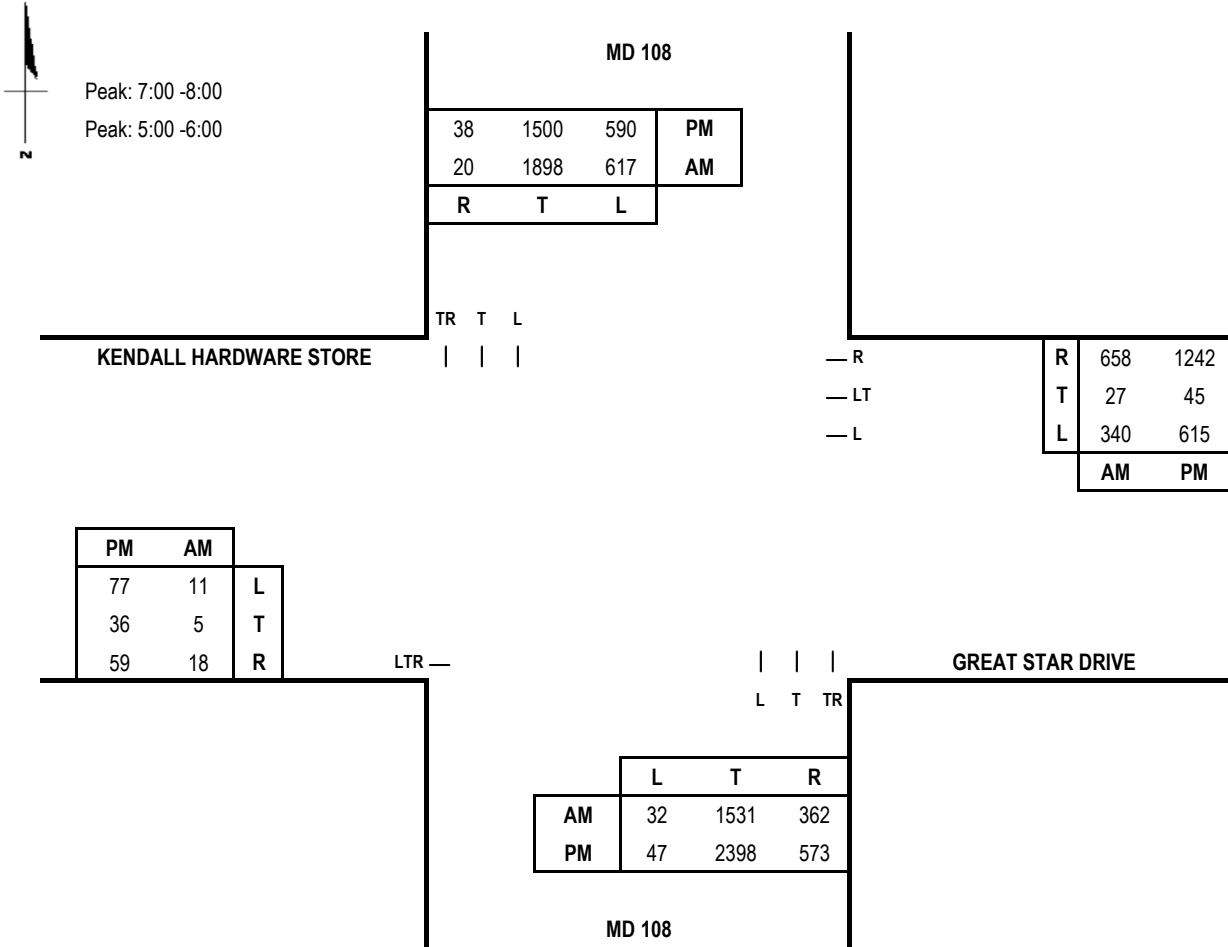
AM V/C = 1.17

PM V/C = 1.88

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Great Star Drive/Kendall Hardware Store
N/S Road: MD 108
Conditions: 2037 Total Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	34	1.00	34				34
WB	367	0.60	220				220
NB	1893	0.55	1041	617	1.00	617	1658
SB	1918	0.55	1055	32	1.00	32	
CLV TOTAL=							1,912
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	172	1.00	172				172
WB	652	1.00	652				652
NB	2971	0.55	1634	590	1.00	590	2224
SB	1538	0.55	846	47	1.00	47	
CLV TOTAL=							3,048
Level of Service (LOS)=							F

Scenario ID - TOT22

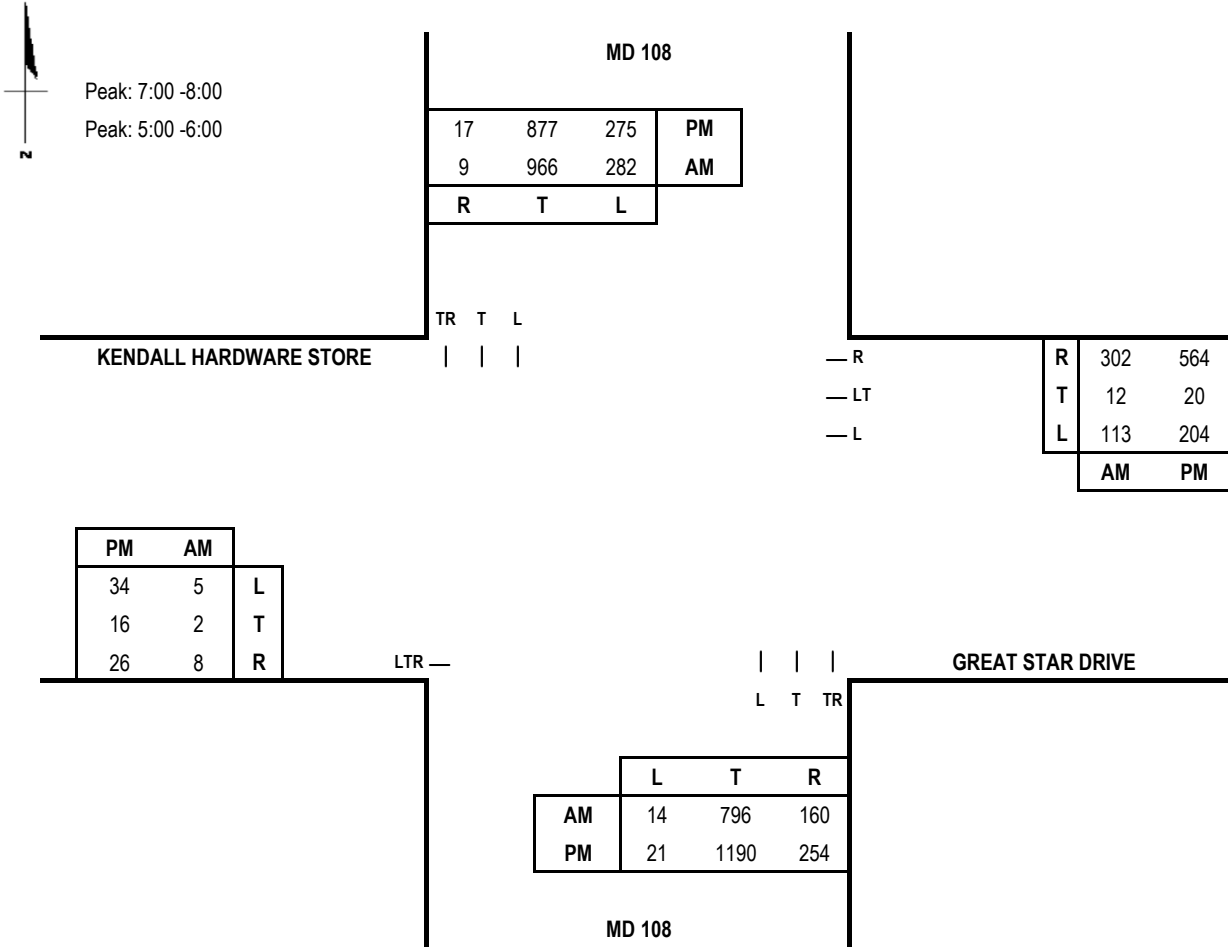
AM V/C = 1.2

PM V/C = 1.91

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Great Star Drive/Kendall Hardware Store
N/S Road: MD 108
Conditions: Adjusted 2023 Total Traffic

Date of Count: 4/26/2017
Day of Week: Wednesday
Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	15	1.00	15				15
WB	125	0.60	75				75
NB	956	0.55	526	282	1.00	282	808
SB	975	0.55	536	14	1.00	14	
CLV TOTAL=							898
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	76	1.00	76				76
WB	289	1.00	289				289
NB	1444	0.55	794	275	1.00	275	1069
SB	894	0.55	492	21	1.00	21	
CLV TOTAL=							1,434
Level of Service (LOS)=							D

Scenario ID - TOT32

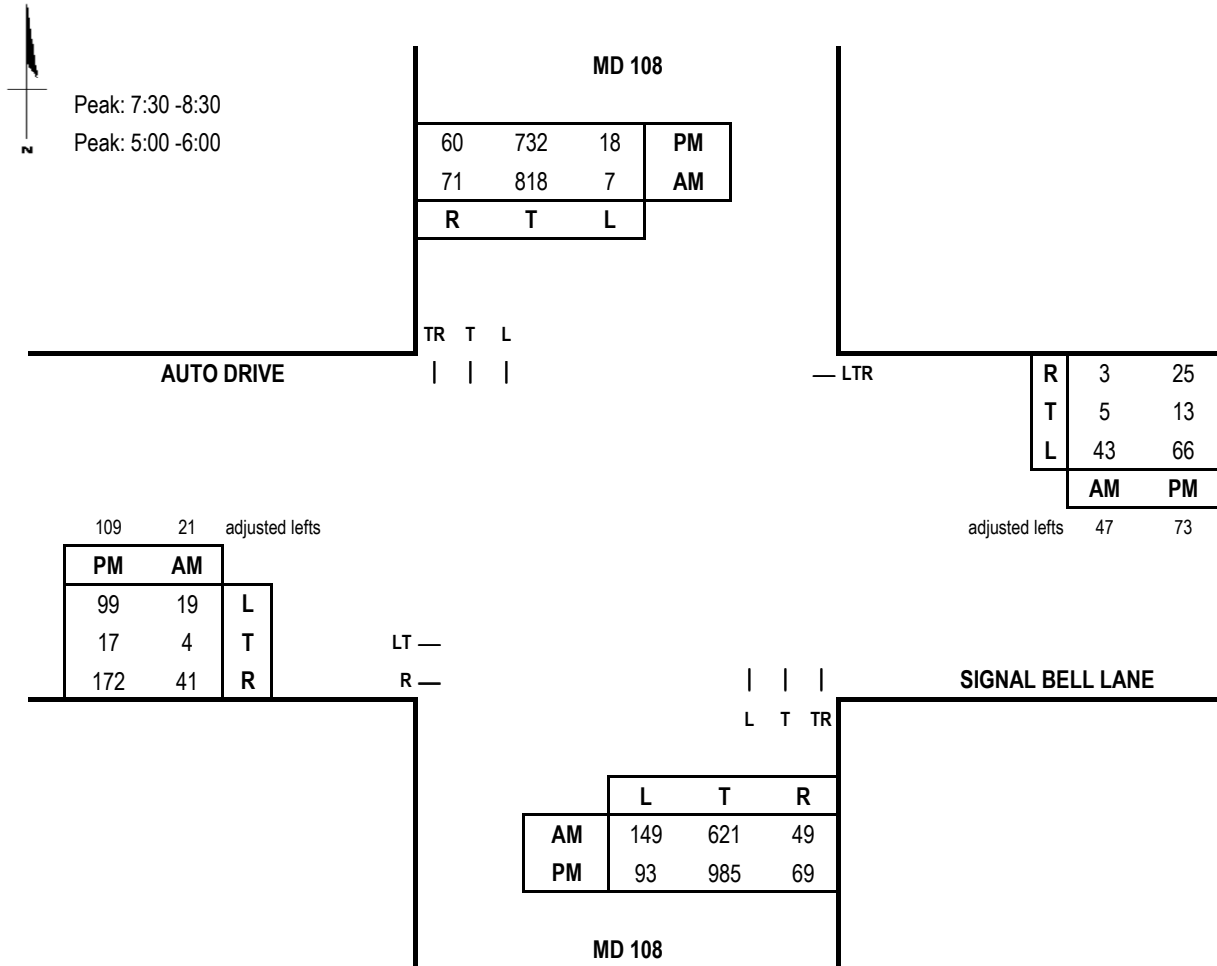
AM V/C = 0.56

PM V/C = 0.9

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Signal Bell Lane/Auto Drive
N/S Road: MD 108
Conditions: Existing Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	670	0.55	369	7	1.00	7	638
SB	889	0.55	489	149	1.00	149	
EB	25	1.00	25	43	1.00	43	74
WB	55	1.00	55	19	1.00	19	
CLV TOTAL=							712
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1054	0.55	580	18	1.00	18	598
SB	792	0.55	436	93	1.00	93	
EB	126	1.00	126	66	1.00	66	210
WB	111	1.00	111	99	1.00	99	
CLV TOTAL=							808
Level of Service (LOS)=							A

Scenario ID - EXIST3

AM V/C = 0.45

PM V/C = 0.51

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Signal Bell Lane/Auto Drive

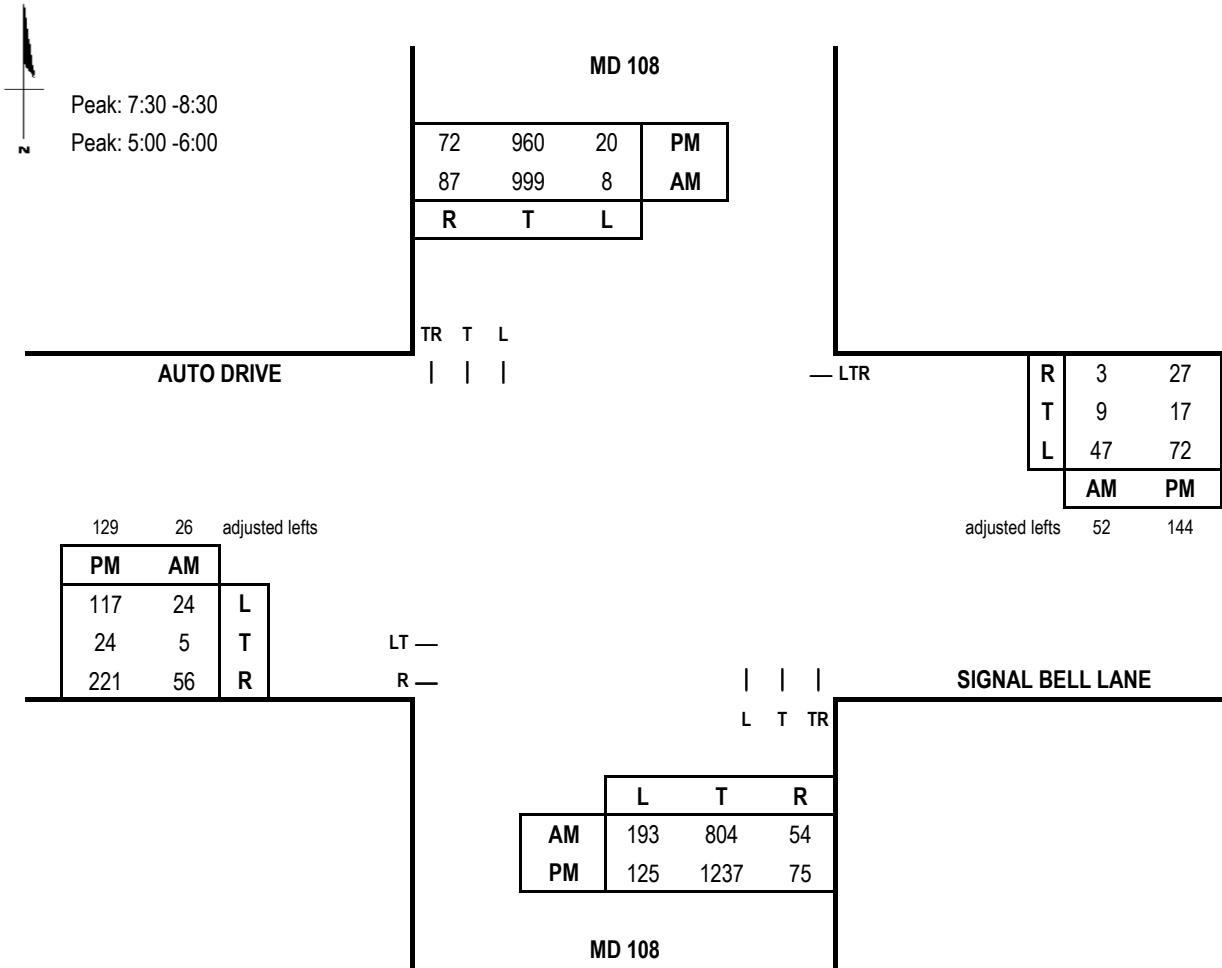
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Count: Wednesday

Conditions: 2023 Background Traffic

Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	858	0.55	472	8	1.00	8	790
SB	1086	0.55	597	193	1.00	193	
EB	31	1.00	31	47	1.00	47	88
WB	64	1.00	64	24	1.00	24	
CLV TOTAL=							878
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1312	0.55	722	20	1.00	20	742
SB	1032	0.55	568	125	1.00	125	
EB	153	1.00	153	72	1.00	72	305
WB	188	1.00	188	117	1.00	117	
CLV TOTAL=							1,047
Level of Service (LOS)=							B

Scenario ID - BACK13

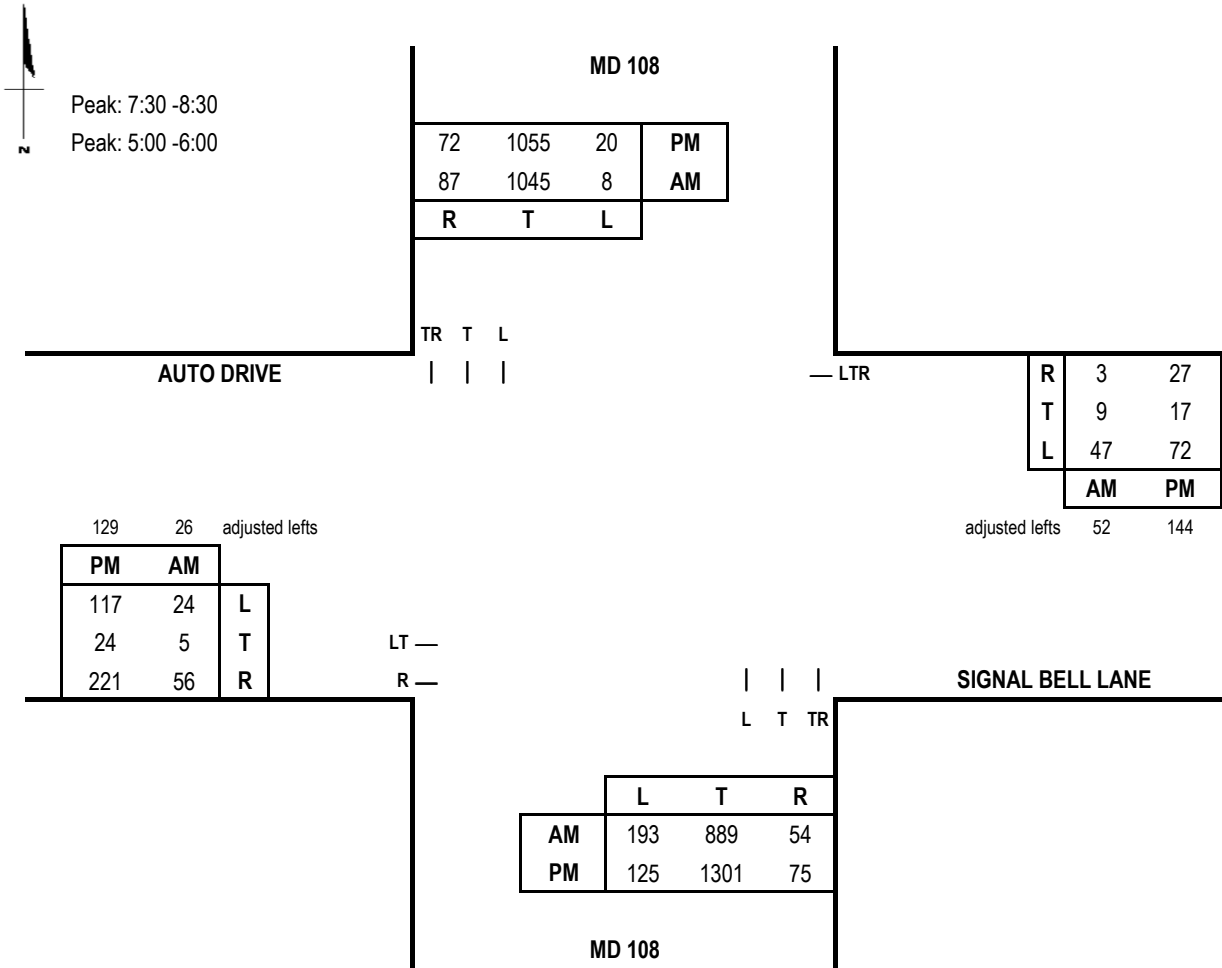
AM V/C = 0.55

PM V/C = 0.65

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Signal Bell Lane/Auto Drive
N/S Road: MD 108
Conditions: 2023 Total Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	943	0.55	519	8	1.00	8	816
SB	1132	0.55	623	193	1.00	193	
EB	31	1.00	31	47	1.00	47	88
WB	64	1.00	64	24	1.00	24	
CLV TOTAL=							904
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1376	0.55	757	20	1.00	20	777
SB	1127	0.55	620	125	1.00	125	
EB	153	1.00	153	72	1.00	72	305
WB	188	1.00	188	117	1.00	117	
CLV TOTAL=							1,082
Level of Service (LOS)=							B

Scenario ID - TOT13

AM V/C = 0.57

PM V/C = 0.68

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Signal Bell Lane/Auto Drive

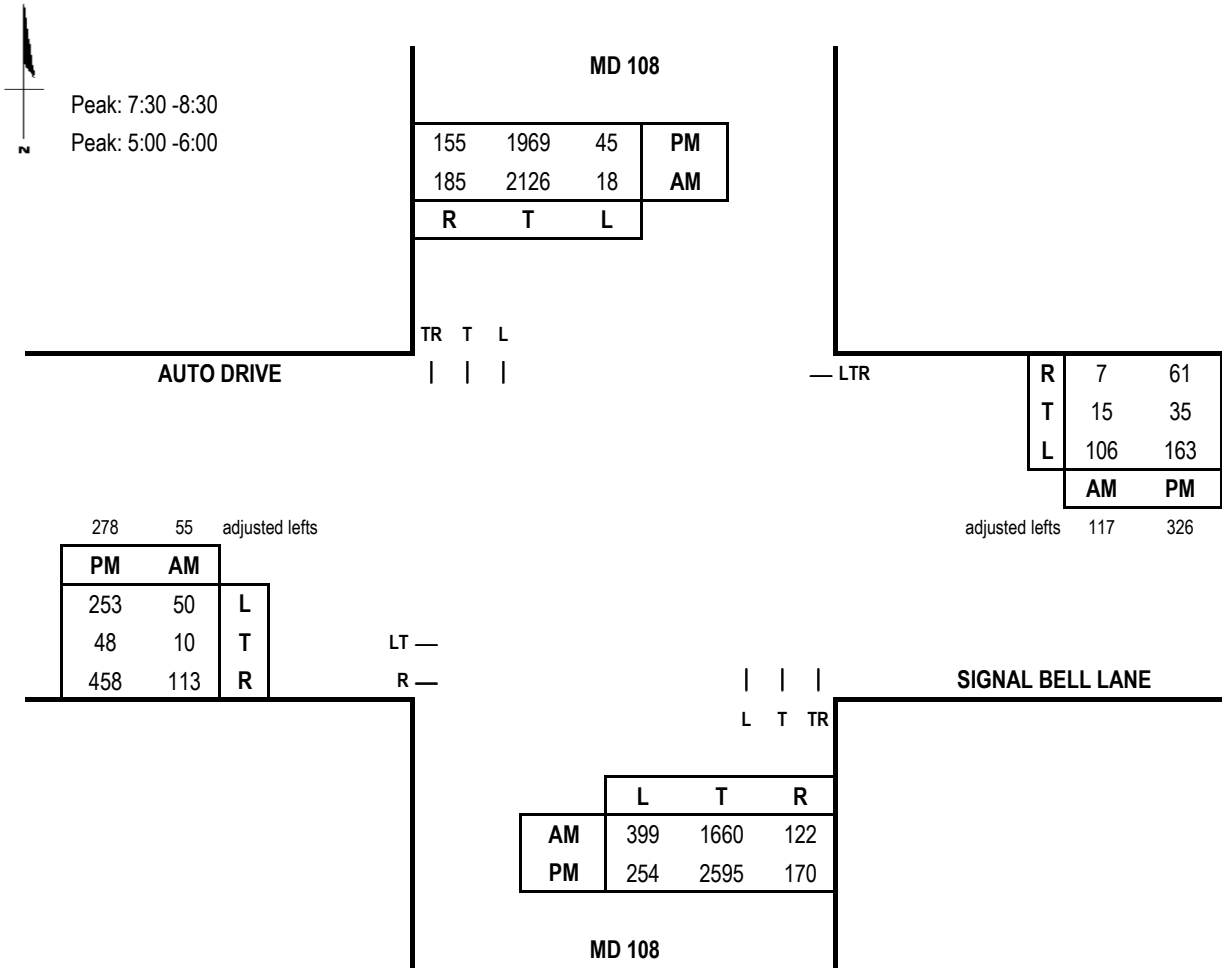
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Count: Wednesday

Conditions: 2037 Background Traffic

Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1782	0.55	980	18	1.00	18	1670
SB	2311	0.55	1271	399	1.00	399	
EB	65	1.00	65	106	1.00	106	
WB	139	1.00	139	50	1.00	50	
CLV TOTAL=							1,859
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	2765	0.55	1521	45	1.00	45	1566
SB	2124	0.55	1168	254	1.00	254	
EB	326	1.00	326	163	1.00	163	
WB	422	1.00	422	253	1.00	253	
CLV TOTAL=							2,241
Level of Service (LOS)=							F

Scenario ID - BACK23

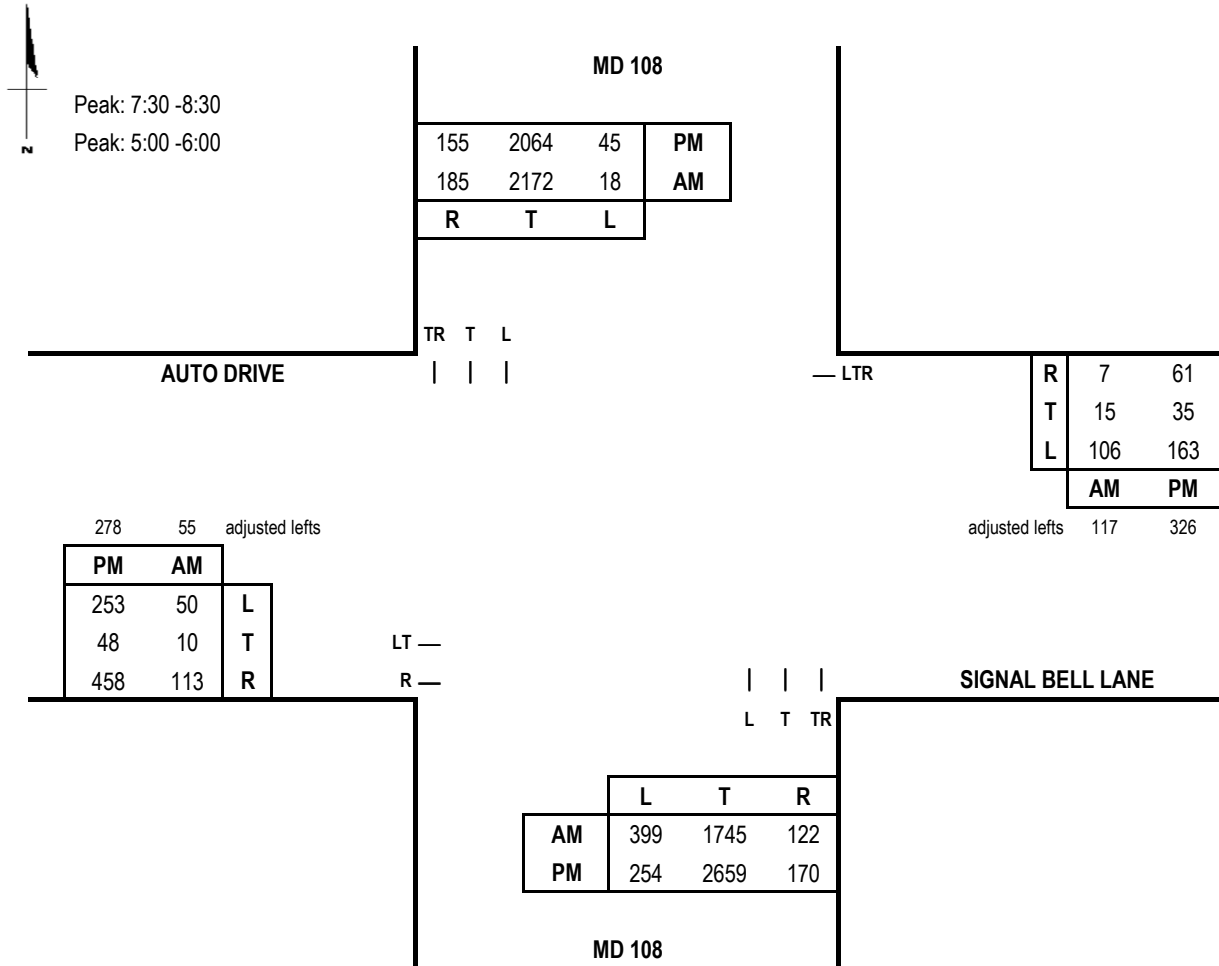
AM V/C = 1.16

PM V/C = 1.4

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Signal Bell Lane/Auto Drive
N/S Road: MD 108
Conditions: 2037 Total Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1867	0.55	1027	18	1.00	18	1695
SB	2357	0.55	1296	399	1.00	399	
EB	65	1.00	65	106	1.00	106	189
WB	139	1.00	139	50	1.00	50	
CLV TOTAL=							1,884
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	2829	0.55	1556	45	1.00	45	1601
SB	2219	0.55	1220	254	1.00	254	
EB	326	1.00	326	163	1.00	163	675
WB	422	1.00	422	253	1.00	253	
CLV TOTAL=							2,276
Level of Service (LOS)=							F

Scenario ID - TOT23

AM V/C = 1.18

PM V/C = 1.42

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

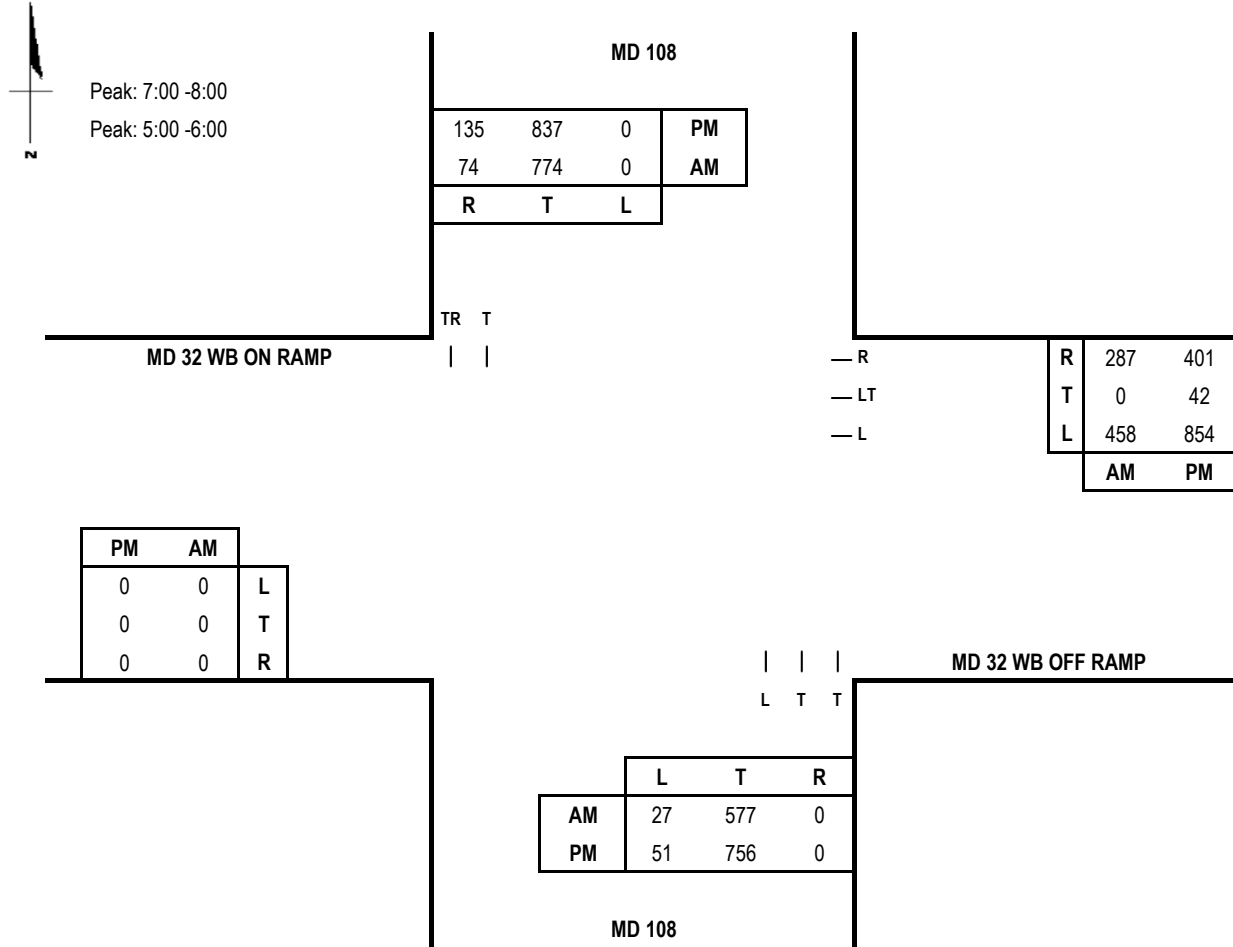
E/W Road: MD 32 WB Off Ramp/Md 32 Wb On Ramp **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: Existing Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	287	1.00	287				287
NB	577	0.55	317	0	0.00	0	493
SB	848	0.55	466	27	1.00	27	
CLV TOTAL=							780
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	896	0.60	538				538
NB	756	0.55	416	0	0.00	0	586
SB	972	0.55	535	51	1.00	51	
CLV TOTAL=							1,124
Level of Service (LOS)=							B

Scenario ID - EXIST4

AM V/C = 0.49

PM V/C = 0.7

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

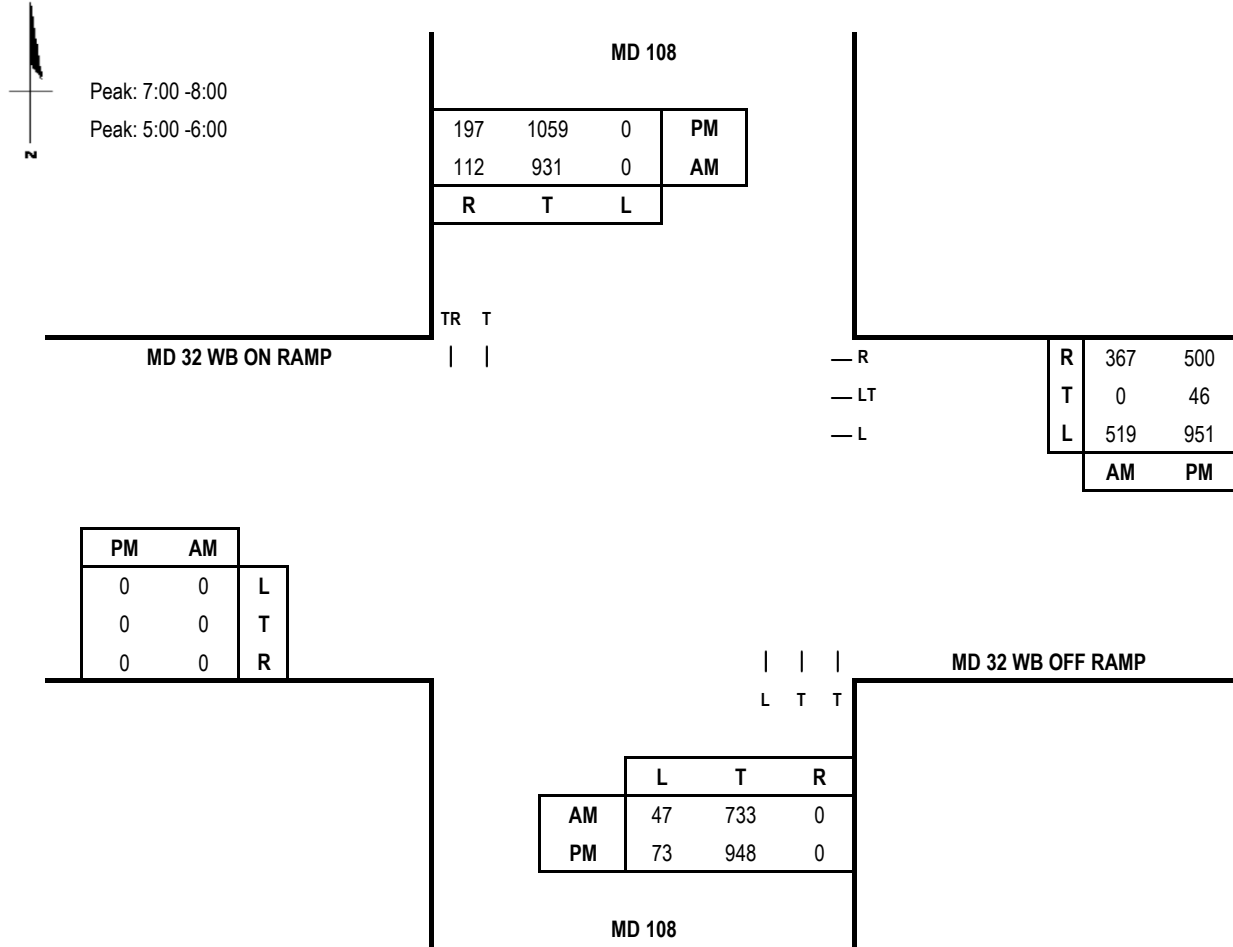
E/W Road: MD 32 WB Off Ramp/Md 32 Wb On Ramp **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2023 Background Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	367	1.00	367				367
NB	733	0.55	403	0	0.00	0	621
SB	1043	0.55	574	47	1.00	47	
CLV TOTAL=							988
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	997	0.60	598				598
NB	948	0.55	521	0	0.00	0	764
SB	1256	0.55	691	73	1.00	73	
CLV TOTAL=							1,362
Level of Service (LOS)=							D

Scenario ID - BACK14

AM V/C = 0.62

PM V/C = 0.85

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

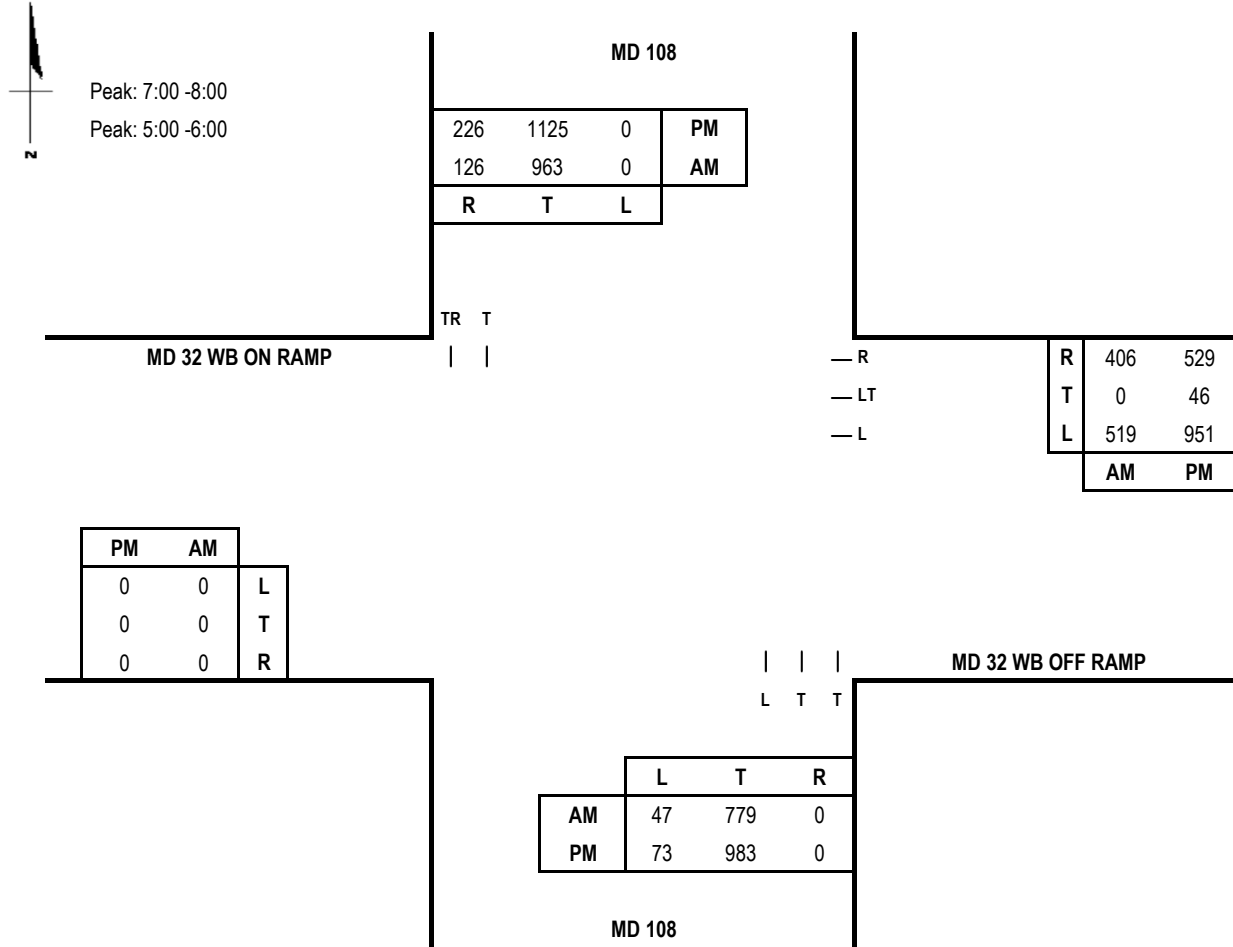
E/W Road: MD 32 WB Off Ramp/Md 32 Wb On Ramp **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2023 Total Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	406	1.00	406				406
NB	779	0.55	428	0	0.00	0	646
SB	1089	0.55	599	47	1.00	47	
CLV TOTAL=							1,052
Level of Service (LOS)=							B

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	997	0.60	598				598
NB	983	0.55	541	0	0.00	0	816
SB	1351	0.55	743	73	1.00	73	
CLV TOTAL=							1,414
Level of Service (LOS)=							D

Scenario ID - TOT14

AM V/C = 0.66

PM V/C = 0.88

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

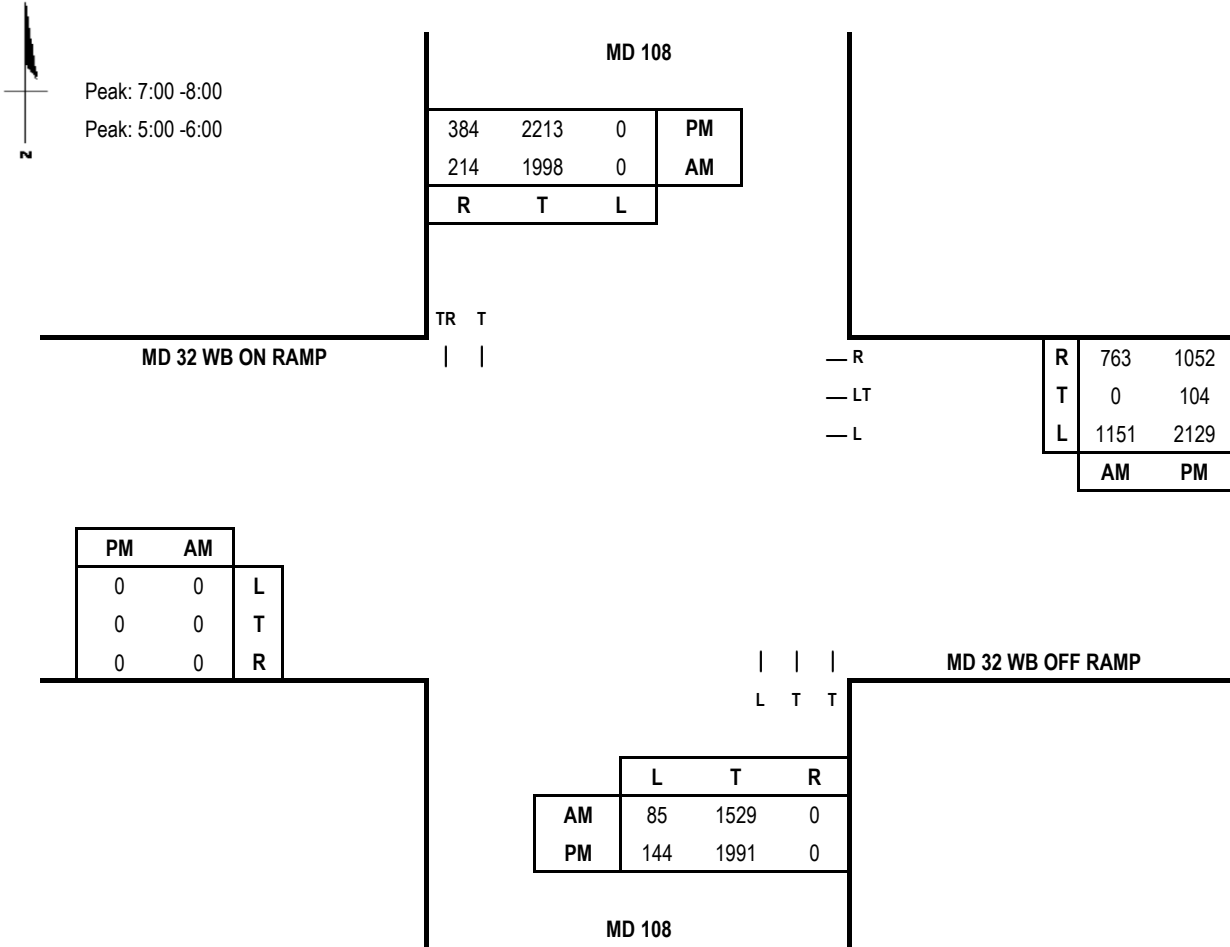
E/W Road: MD 32 WB Off Ramp/Md 32 Wb On Ramp **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2037 Background Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	763	1.00	763				763
NB	1529	0.55	841	0	0.00	0	1302
SB	2212	0.55	1217	85	1.00	85	
CLV TOTAL=							2,065
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	2233	0.60	1340				1340
NB	1991	0.55	1095	0	0.00	0	1572
SB	2597	0.55	1428	144	1.00	144	
CLV TOTAL=							2,912
Level of Service (LOS)=							F

Scenario ID - BACK24

AM V/C = 1.29

PM V/C = 1.82

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

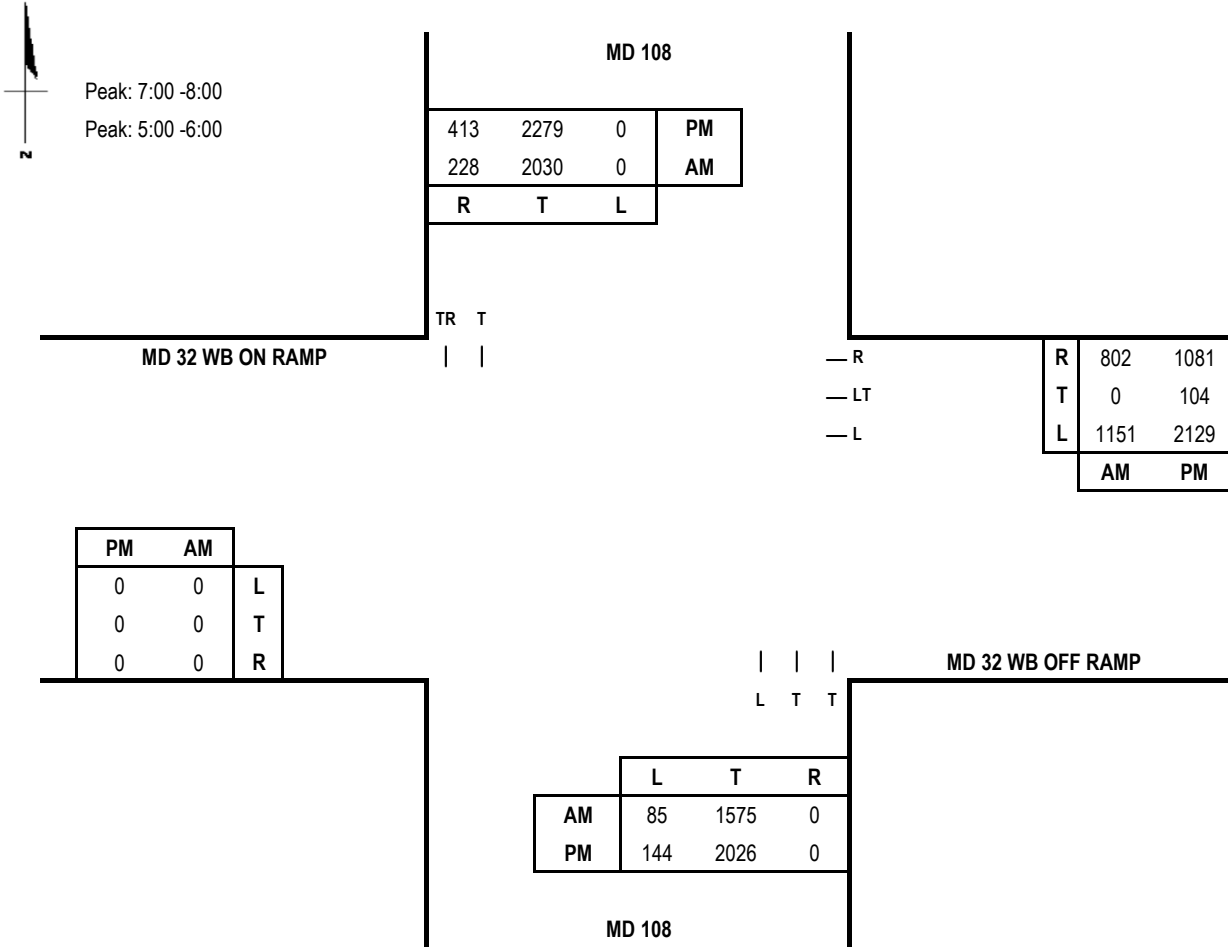
E/W Road: MD 32 WB Off Ramp/Md 32 Wb On Ramp **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Week: Wednesday

Conditions: 2037 Total Traffic

Analyst: Richard Huang



Capacity Analysis - East/West Split

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	802	1.00	802				802
NB	1575	0.55	866	0	0.00	0	1327
SB	2258	0.55	1242	85	1.00	85	
CLV TOTAL=							2,129
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
EB	0	0.00	0				0
WB	2233	0.60	1340				1340
NB	2026	0.55	1114	0	0.00	0	1625
SB	2692	0.55	1481	144	1.00	144	
CLV TOTAL=							2,965
Level of Service (LOS)=							F

Scenario ID - TOT24

AM V/C = 1.33

PM V/C = 1.85

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

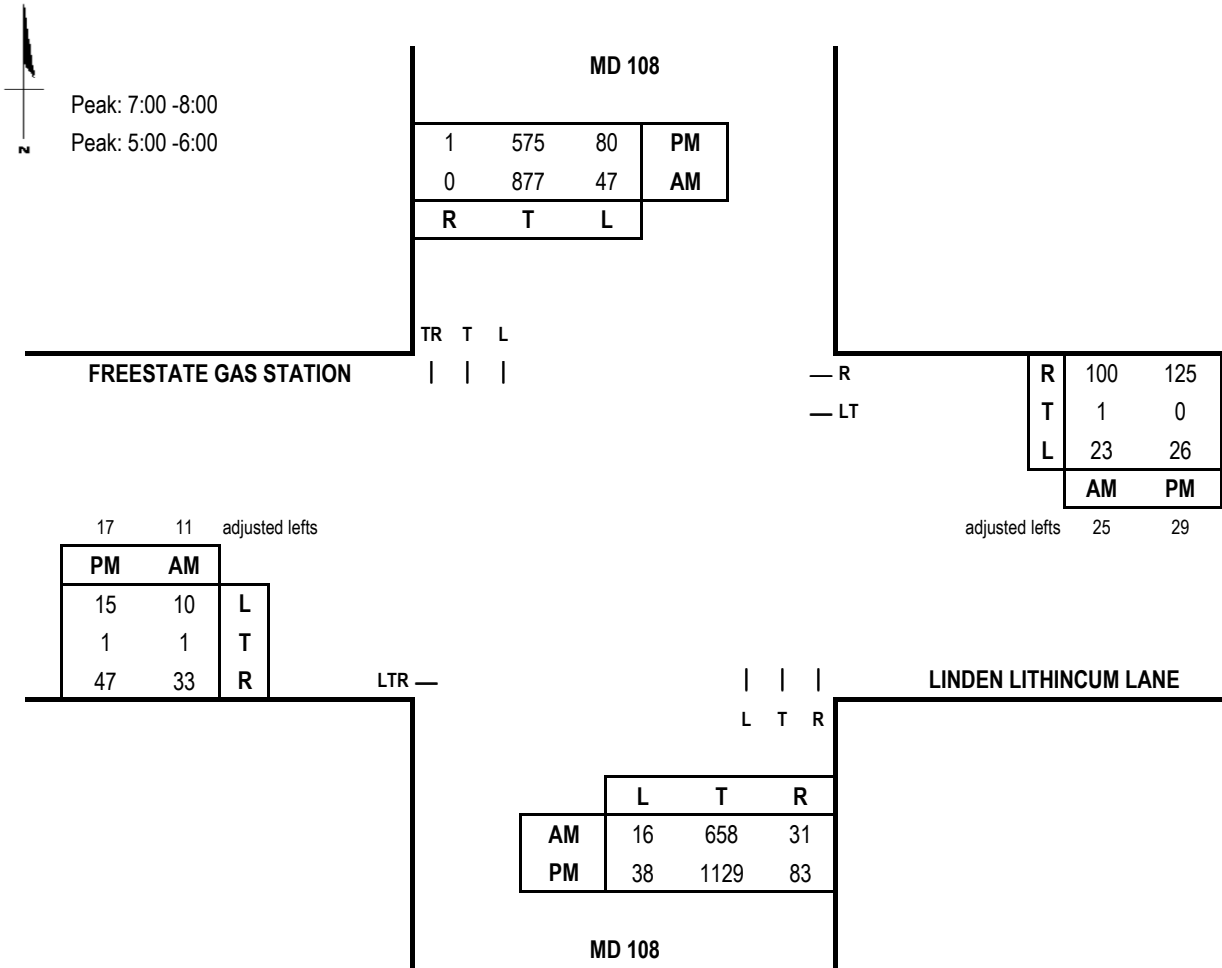
E/W Road: Linden Lithincum Lane/Freestate Gas Station **Date of Count:** 4/26/2017

N/S Road: MD 108

Day of Count: Wednesday

Conditions: Existing Traffic

Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	658	1.00	658	47	1.00	47	705
SB	877	0.55	482	16	1.00	16	
EB	45	1.00	45	23	1.00	23	68
WB	53	1.00	53	10	1.00	10	
CLV TOTAL=							773
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1129	1.00	1129	80	1.00	80	1209
SB	576	0.55	317	38	1.00	38	
EB	65	1.00	65	26	1.00	26	91
WB	45	1.00	45	15	1.00	15	
CLV TOTAL=							1,300
Level of Service (LOS)=							C

Scenario ID - EXIST6

AM V/C = 0.48

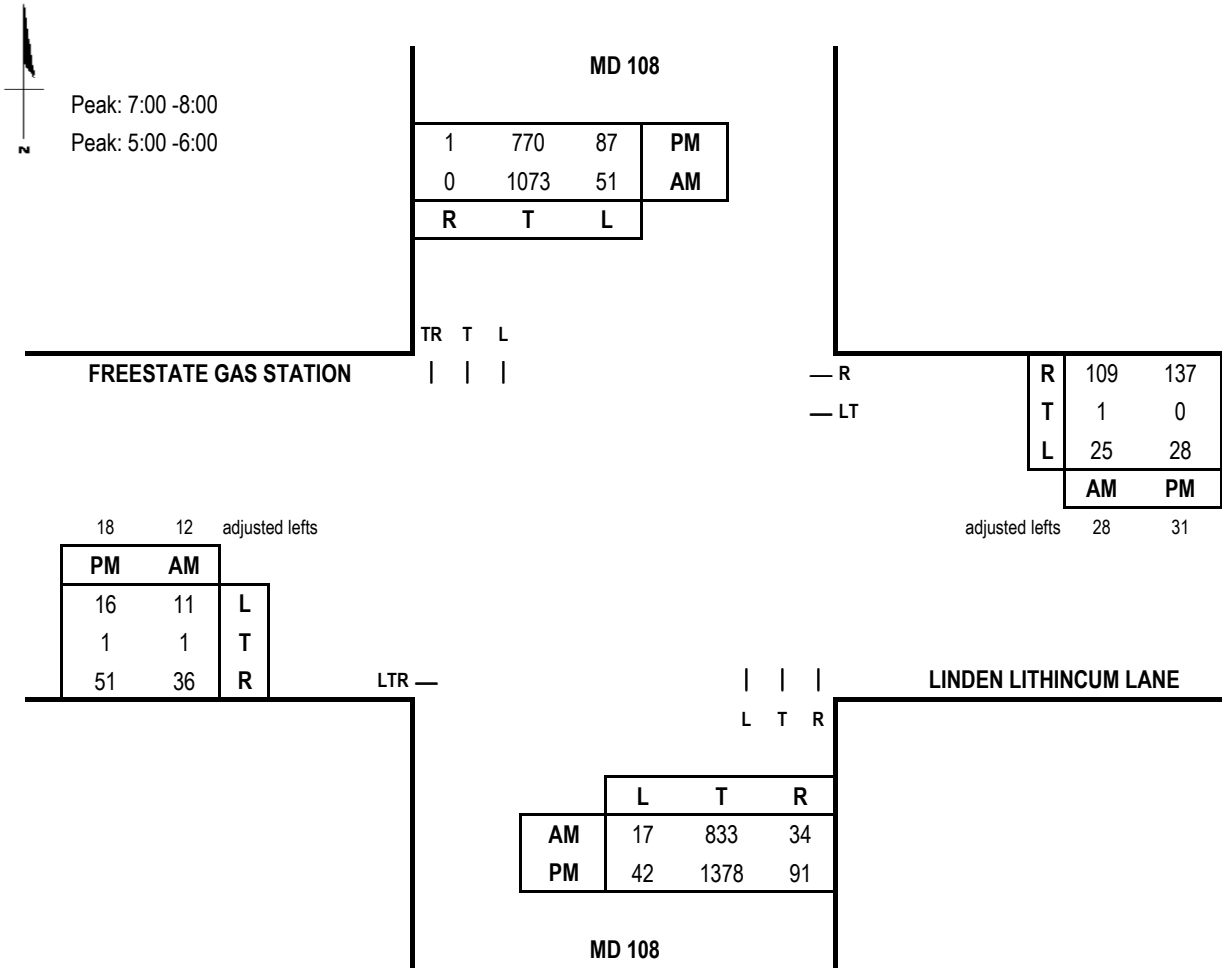
PM V/C = 0.81

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Linden Lithincum Lane/Freestate Gas Station **Date of Count:** 4/26/2017

N/S Road: MD 108 **Day of Count:** Wednesday

Conditions: 2023 Background Traffic **Analyst:** Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	833	1.00	833	51	1.00	51	884
SB	1073	0.55	590	17	1.00	17	
EB	49	1.00	49	25	1.00	25	74
WB	58	1.00	58	11	1.00	11	
CLV TOTAL=							958
Level of Service (LOS)=							A

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1378	1.00	1378	87	1.00	87	1465
SB	771	0.55	424	42	1.00	42	
EB	70	1.00	70	28	1.00	28	98
WB	50	1.00	50	16	1.00	16	
CLV TOTAL=							1,563
Level of Service (LOS)=							E

Scenario ID - BACK16

AM V/C = 0.6

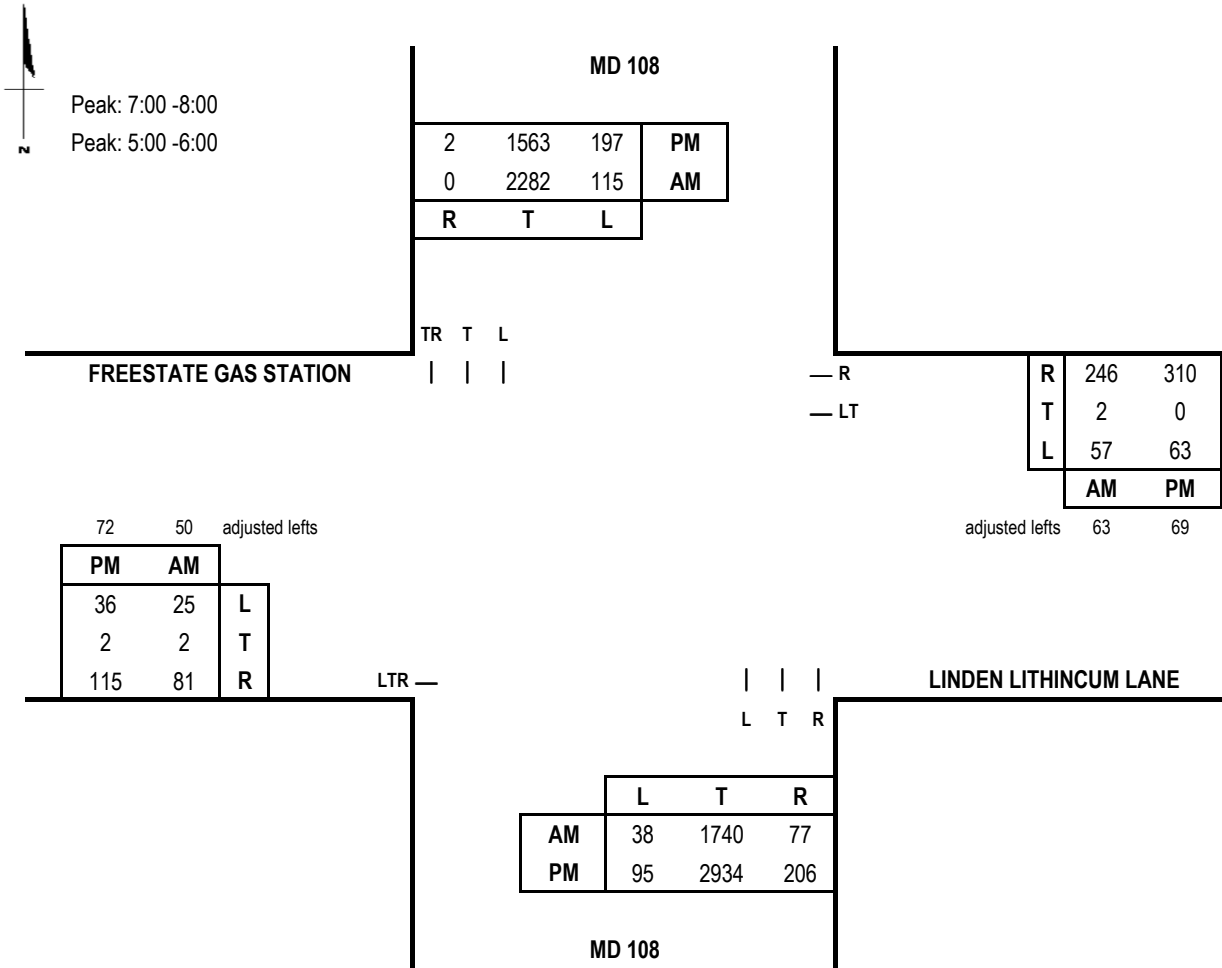
PM V/C = 0.98

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Linden Lithincum Lane/Freestate Gas Station **Date of Count:** 4/26/2017

N/S Road: MD 108 **Day of Count:** Wednesday

Conditions: 2037 Background Traffic **Analyst:** Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	1740	1.00	1740	115	1.00	115	1855
SB	2282	0.55	1255	38	1.00	38	
EB	133	1.00	133	57	1.00	57	190
WB	131	1.00	131	25	1.00	25	
CLV TOTAL=							2,045
Level of Service (LOS)=							F

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM CLV
	VOL	x LUF	= Total	VOL	x LUF	= Total	
NB	2934	1.00	2934	197	1.00	197	3131
SB	1565	0.55	861	95	1.00	95	
EB	189	1.00	189	63	1.00	63	252
WB	113	1.00	113	36	1.00	36	
CLV TOTAL=							3,383
Level of Service (LOS)=							F

Scenario ID - BACK26

AM V/C =1.28

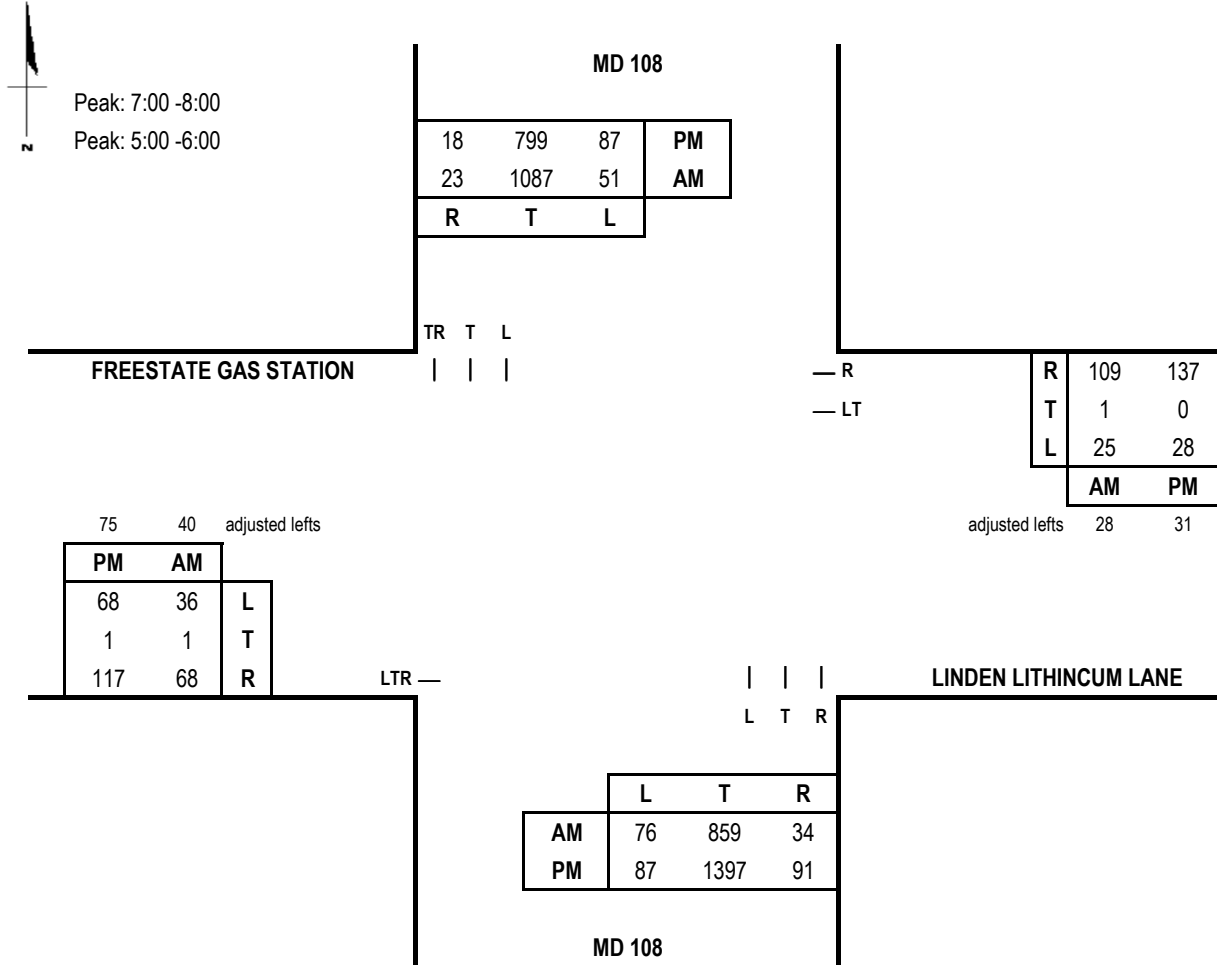
PM V/C =2.11

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA



E/W Road: Linden Lithincum Lane
N/S Road: MD 108
Conditions: 2023 Total Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	859	1.00	859	51	1.00	51	910
SB	1110	0.55	611	76	1.00	76	
EB	109	1.00	109	25	1.00	25	134
WB	58	1.00	58	36	1.00	36	
CLV TOTAL=							1,044
Level of Service (LOS)=							B

AM V/C = 0.65

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1397	1.00	1397	87	1.00	87	1484
SB	817	0.55	449	87	1.00	87	
EB	193	1.00	193	28	1.00	28	221
WB	50	1.00	50	68	1.00	68	
CLV TOTAL=							1,705
Level of Service (LOS)=							F

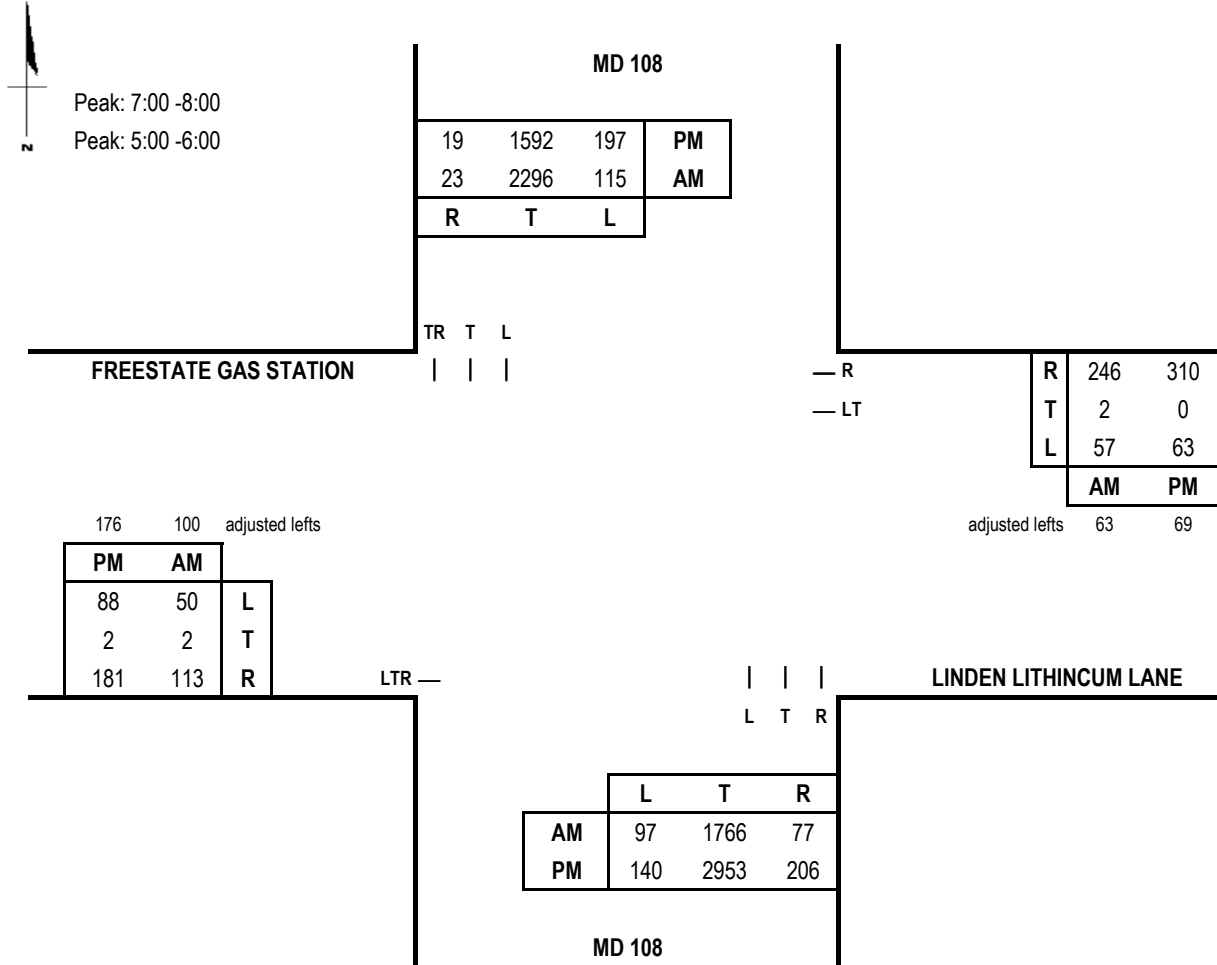
PM V/C = 1.07

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA



E/W Road: Linden Lithincum Lane
N/S Road: MD 108
Conditions: 2037 Total Traffic

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1766	1.00	1766	115	1.00	115	1881
SB	2319	0.55	1275	97	1.00	97	
EB	215	1.00	215	57	1.00	57	272
WB	131	1.00	131	50	1.00	50	
CLV TOTAL=							2,153
Level of Service (LOS)=							F
AM V/C =1.35							

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	2953	1.00	2953	197	1.00	197	3150
SB	1611	0.55	886	140	1.00	140	
EB	359	1.00	359	63	1.00	63	422
WB	113	1.00	113	88	1.00	88	
CLV TOTAL=							3,572
Level of Service (LOS)=							F
PM V/C =2.23							

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA



E/W Road: Linden Lithincum Lane

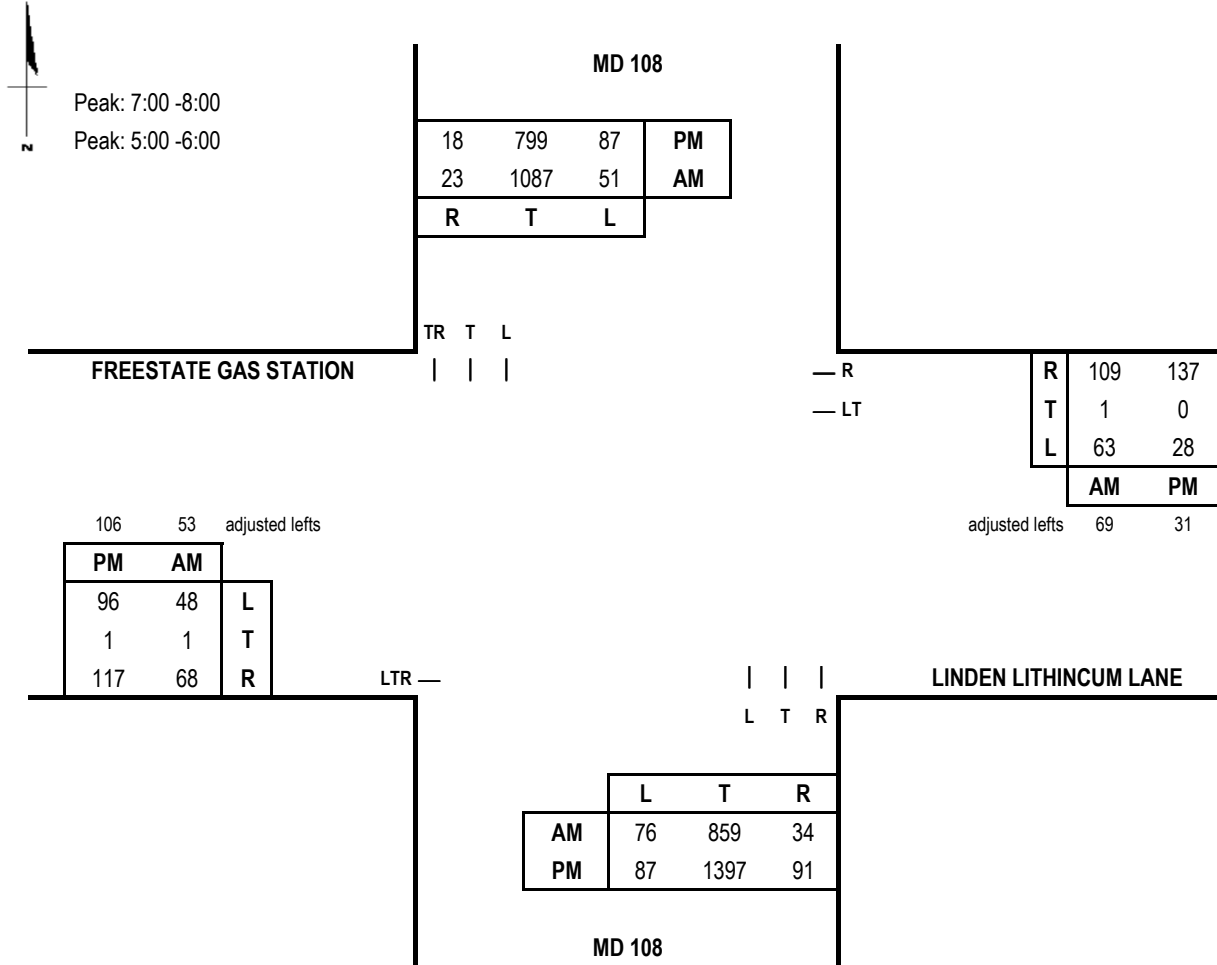
Date of Count: 4/26/2017

N/S Road: MD 108

Day of Count: Wednesday

Conditions: Adjusted 2023 Total Traffic

Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	859	1.00	859	51	1.00	51	910
SB	1110	0.55	611	76	1.00	76	
EB	122	1.00	122	63	1.00	63	185
WB	70	1.00	70	48	1.00	48	
CLV TOTAL=							1,095
Level of Service (LOS)=							B

AM V/C = 0.68

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1397	1.00	1397	87	1.00	87	1484
SB	817	0.55	449	87	1.00	87	
EB	224	1.00	224	28	1.00	28	252
WB	50	1.00	50	96	1.00	96	
CLV TOTAL=							1,736
Level of Service (LOS)=							F

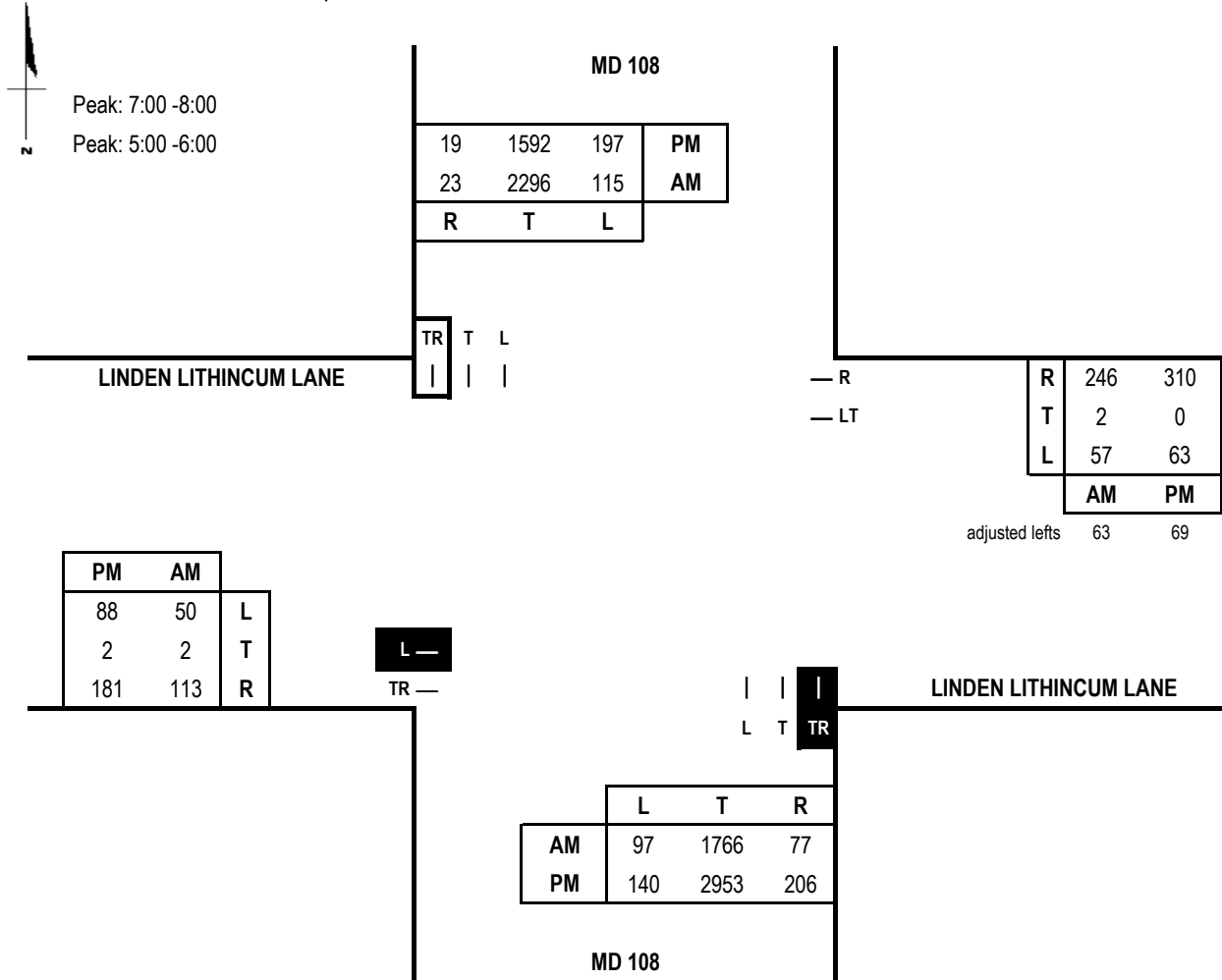
PM V/C = 1.09

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA



E/W Road: Linden Lithincum Lane
N/S Road: MD 108
Conditions: 2037 Total Traffic
 w/imp

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1843	0.55	1014	115	1.00	115	1372
SB	2319	0.55	1275	97	1.00	97	
EB	115	1.00	115	57	1.00	57	181
WB	131	1.00	131	50	1.00	50	
CLV TOTAL=							1,553
Level of Service (LOS)=							E

AM V/C = 0.97

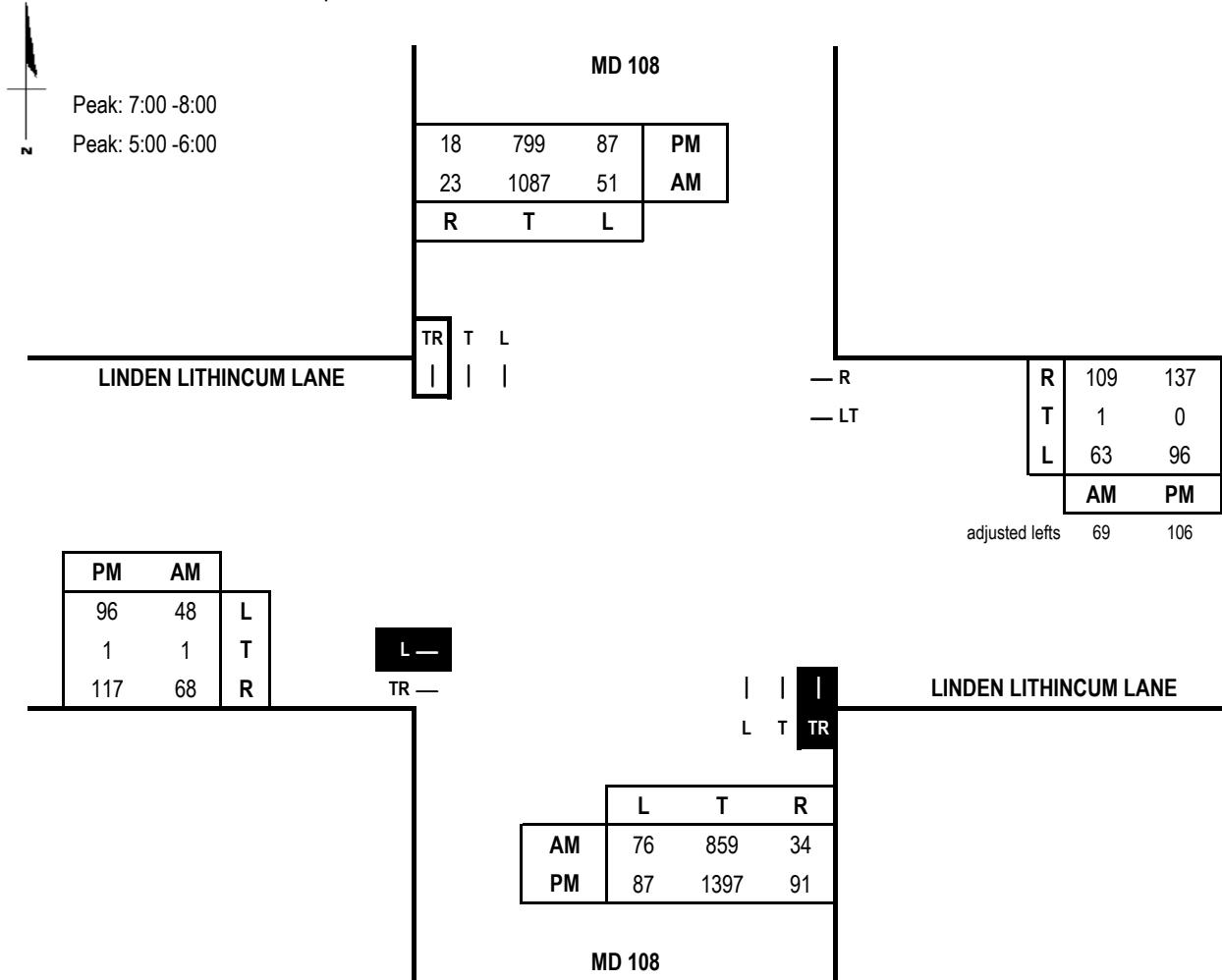
Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	3159	0.55	1737	197	1.00	197	1934
SB	1611	0.55	886	140	1.00	140	
EB	183	1.00	183	63	1.00	63	246
WB	113	1.00	113	88	1.00	88	
CLV TOTAL=							2,180
Level of Service (LOS)=							F

PM V/C = 1.36

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Linden Lithincum Lane
N/S Road: MD 108
Conditions: 2023 Total Traffic
 w/imp

Date of Count: 4/26/2017
Day of Count: Wednesday
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	893	0.55	491	51	1.00	51	687
SB	1110	0.55	611	76	1.00	76	
EB	69	1.00	69	63	1.00	63	132
WB	70	1.00	70	48	1.00	48	
CLV TOTAL=							819
Level of Service (LOS)=							A

AM V/C = 0.51

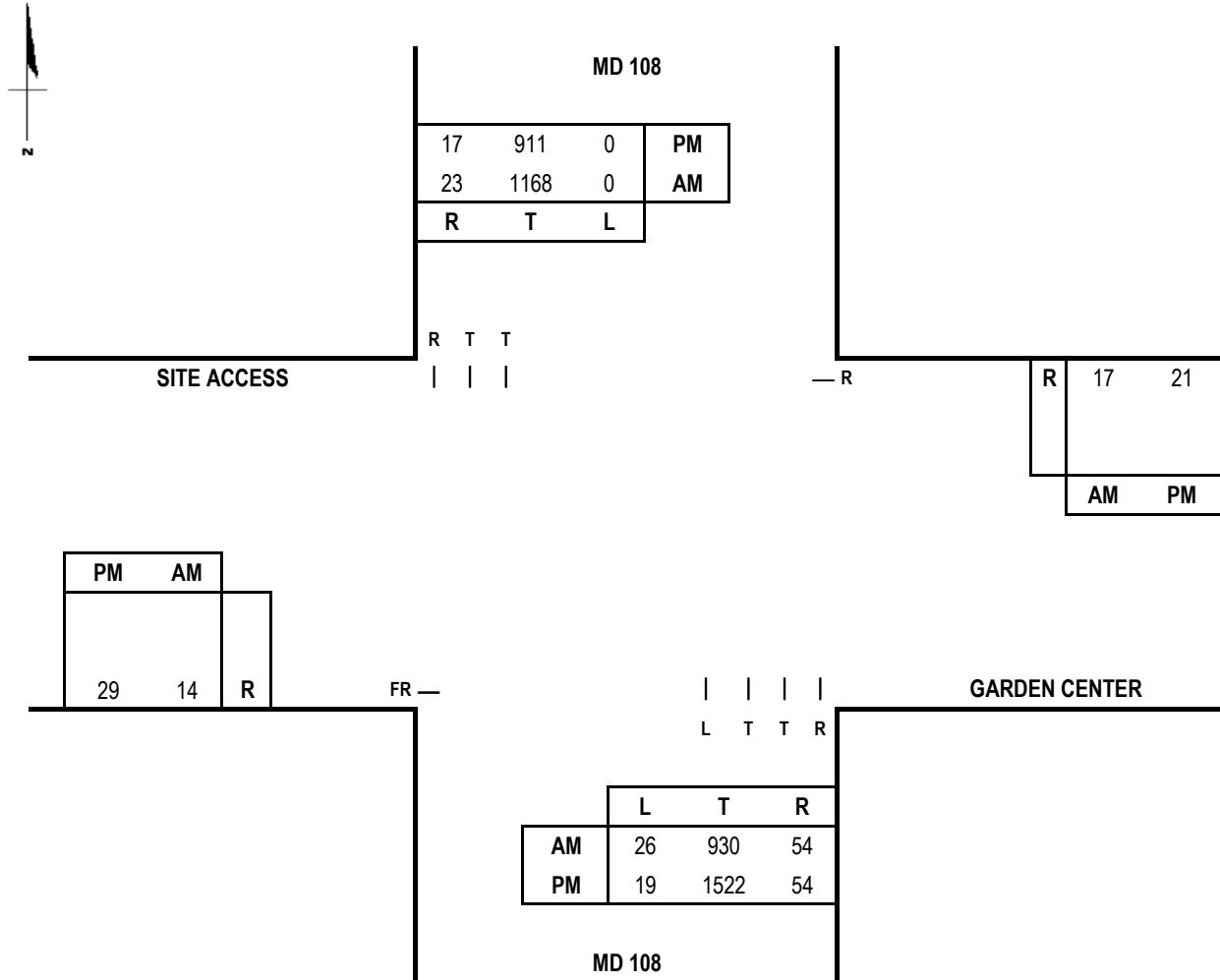
Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1488	0.55	818	87	1.00	87	905
SB	817	0.55	449	87	1.00	87	
EB	118	1.00	118	96	1.00	96	214
WB	106	1.00	106	96	1.00	96	
CLV TOTAL=							1,119
Level of Service (LOS)=							B

PM V/C = 0.7

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center/Site Access
N/S Road: MD 108
Conditions: 2023 Total Traffic

Date of Count:
Day of Count:
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	930	0.55	512	0	0.00	0	668
SB	1168	0.55	642	26	1.00	26	
EB	0	0.00	0	0	0.00	0	17
WB	17	1.00	17	0	0.00	0	
CLV TOTAL=							685
Level of Service (LOS)=							A

AM V/C = 0.43

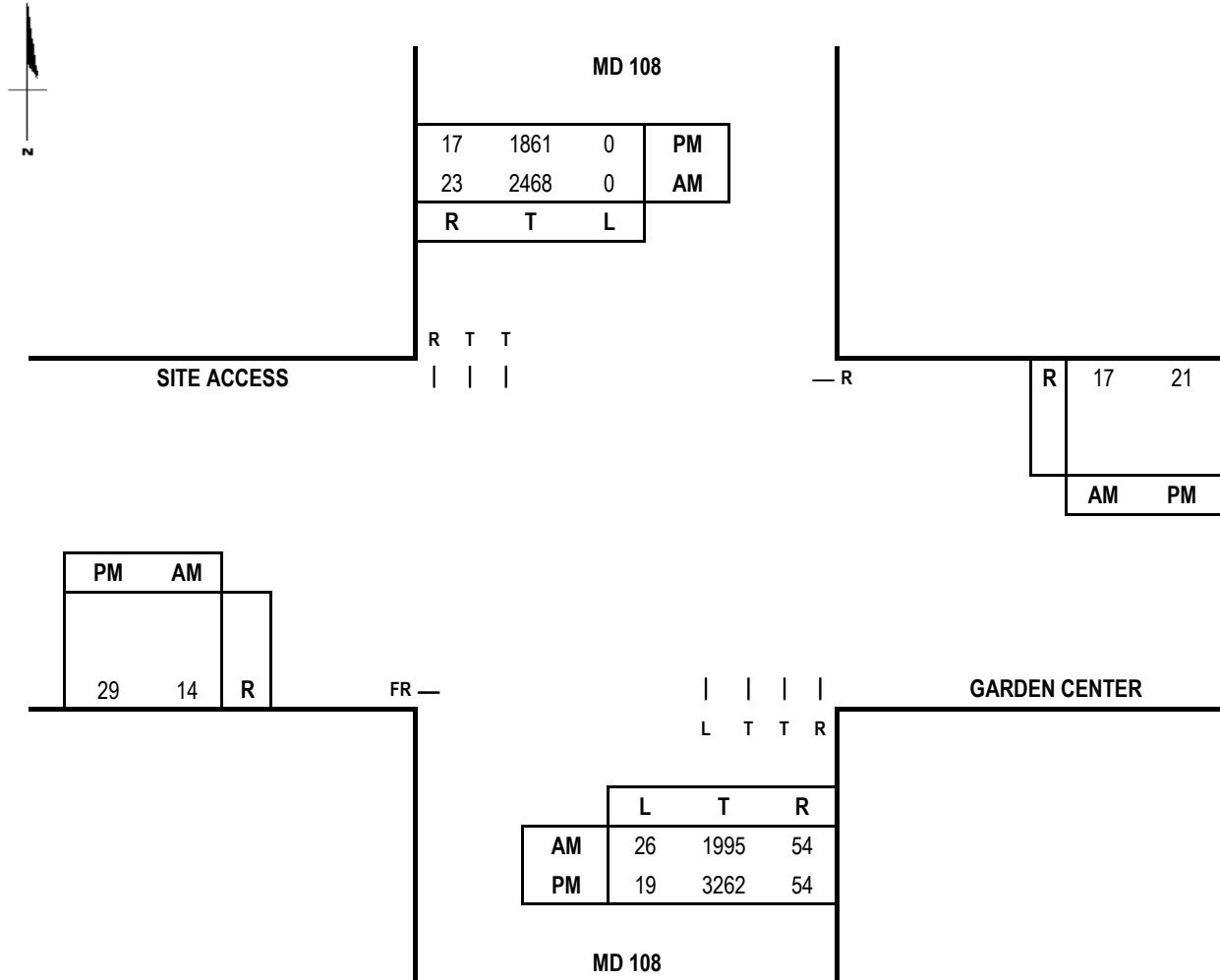
Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1522	0.55	837	0	0.00	0	837
SB	911	0.55	501	19	1.00	19	
EB	0	0.00	0	0	0.00	0	21
WB	21	1.00	21	0	0.00	0	
CLV TOTAL=							858
Level of Service (LOS)=							A

PM V/C = 0.54

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

E/W Road: Garden Center/Site Access
N/S Road: MD 108
Conditions: 2037 Total Traffic

Date of Count:
Day of Count:
Analyst: Richard Huang



Capacity Analysis

Morning Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			AM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	1995	0.55	1097	0	0.00	0	1383
SB	2468	0.55	1357	26	1.00	26	
EB	0	0.00	0	0	0.00	0	17
WB	17	1.00	17	0	0.00	0	
CLV TOTAL=							1,400
Level of Service (LOS)=							D
AM V/C =0.88							

Evening Peak Hour							
Dir	Thru Volumes			+ Opposing Lefts			PM
	VOL	x LUF	= Total	VOL	x LUF	= Total	CLV
NB	3262	0.55	1794	0	0.00	0	1794
SB	1861	0.55	1024	19	1.00	19	
EB	0	0.00	0	0	0.00	0	21
WB	21	1.00	21	0	0.00	0	
CLV TOTAL=							1,815
Level of Service (LOS)=							F
PM V/C =1.13							

APPENDIX D

Trip Assignment for Background Developments



TRAFFIC GROWTH PROJECTION

Average Growth: -0.07%
Mathematical Growth: -0.09%

Year	ADT Volume	Vol. increase	% increase	Average %
2006	20,271			
2007	20,272	1	0.00%	0.00%
2008	19,663	-609	-3.00%	-1.50%
2009	19,870	207	1.05%	-0.65%
2010	19,991	121	0.61%	-0.33%
2011	19,990	-1	-0.01%	-0.27%
2012	19,220	-770	-3.85%	-0.87%
2013	19,261	41	0.21%	-0.71%
2014	19,202	-59	-0.31%	-0.66%
2015	19,703	501	2.61%	-0.30%
2016	20,084	381	1.93%	-0.07%

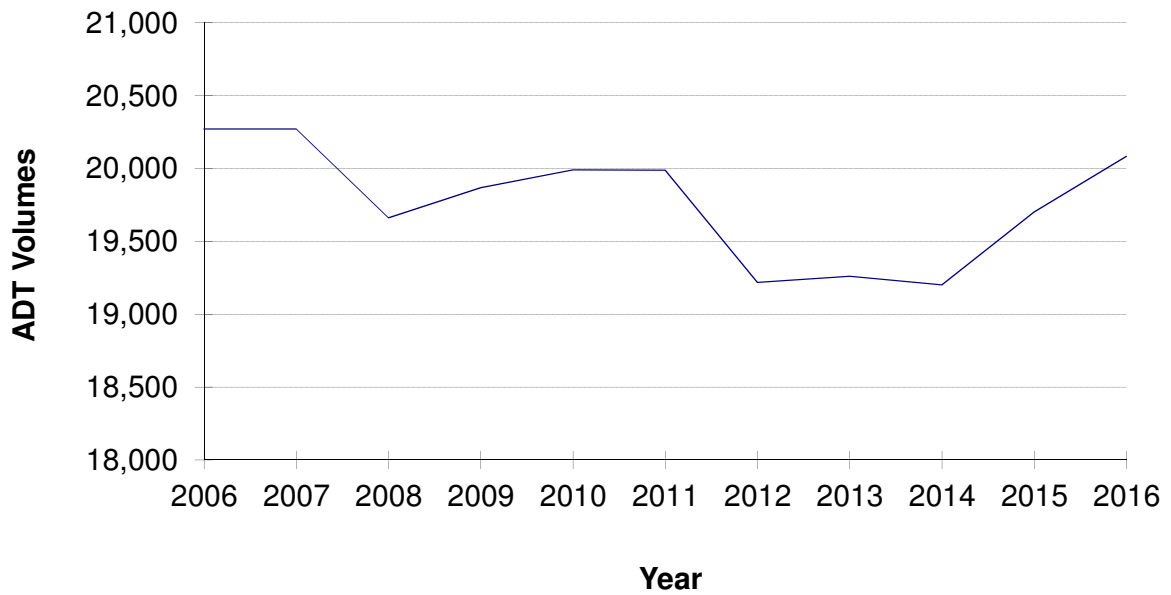
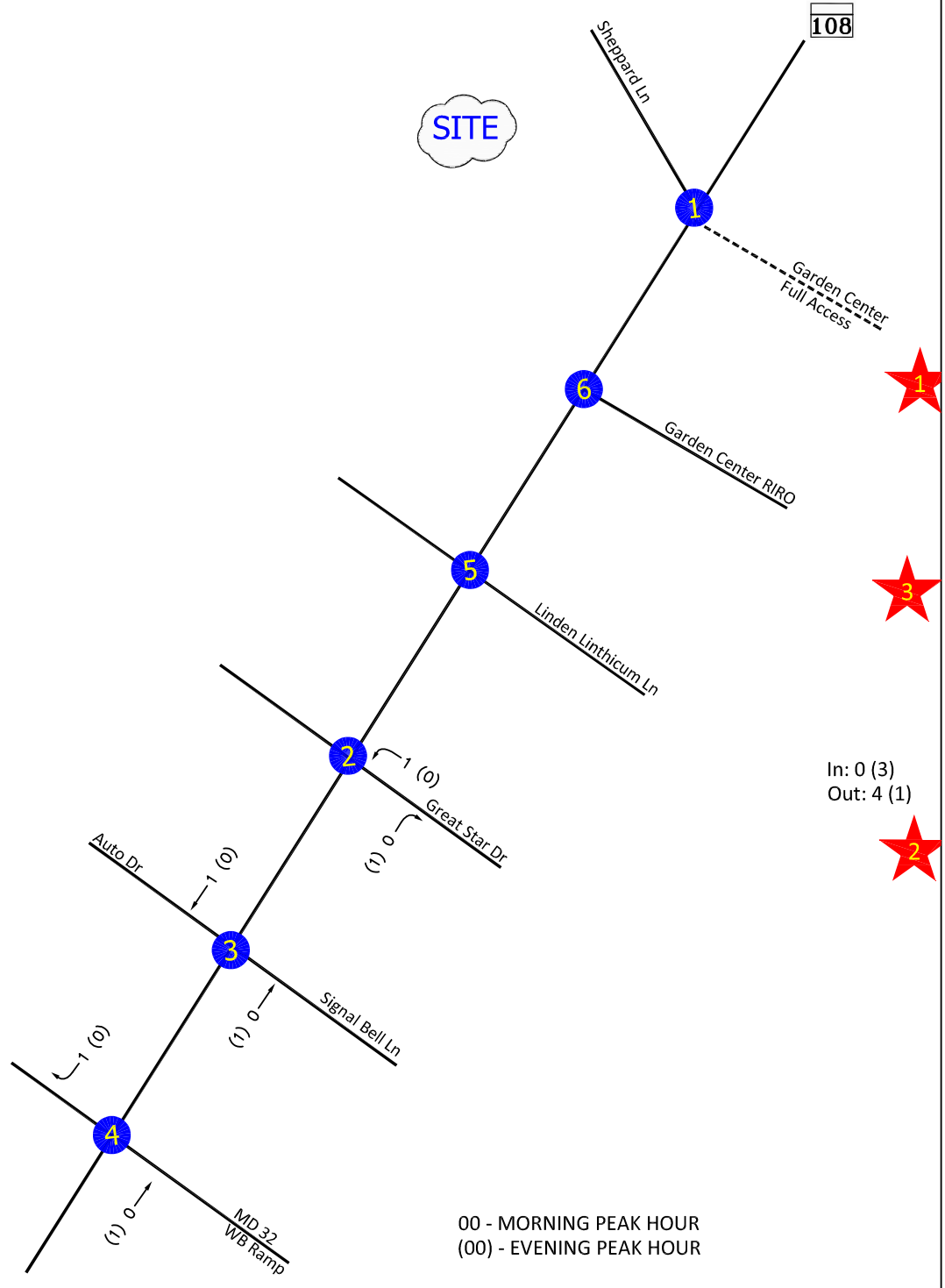


EXHIBIT D-1
TRAFFIC GROWTH PROJECTION
MD 108 N. of MD 32



SITE

108



In: 0 (3)
Out: 4 (1)



00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

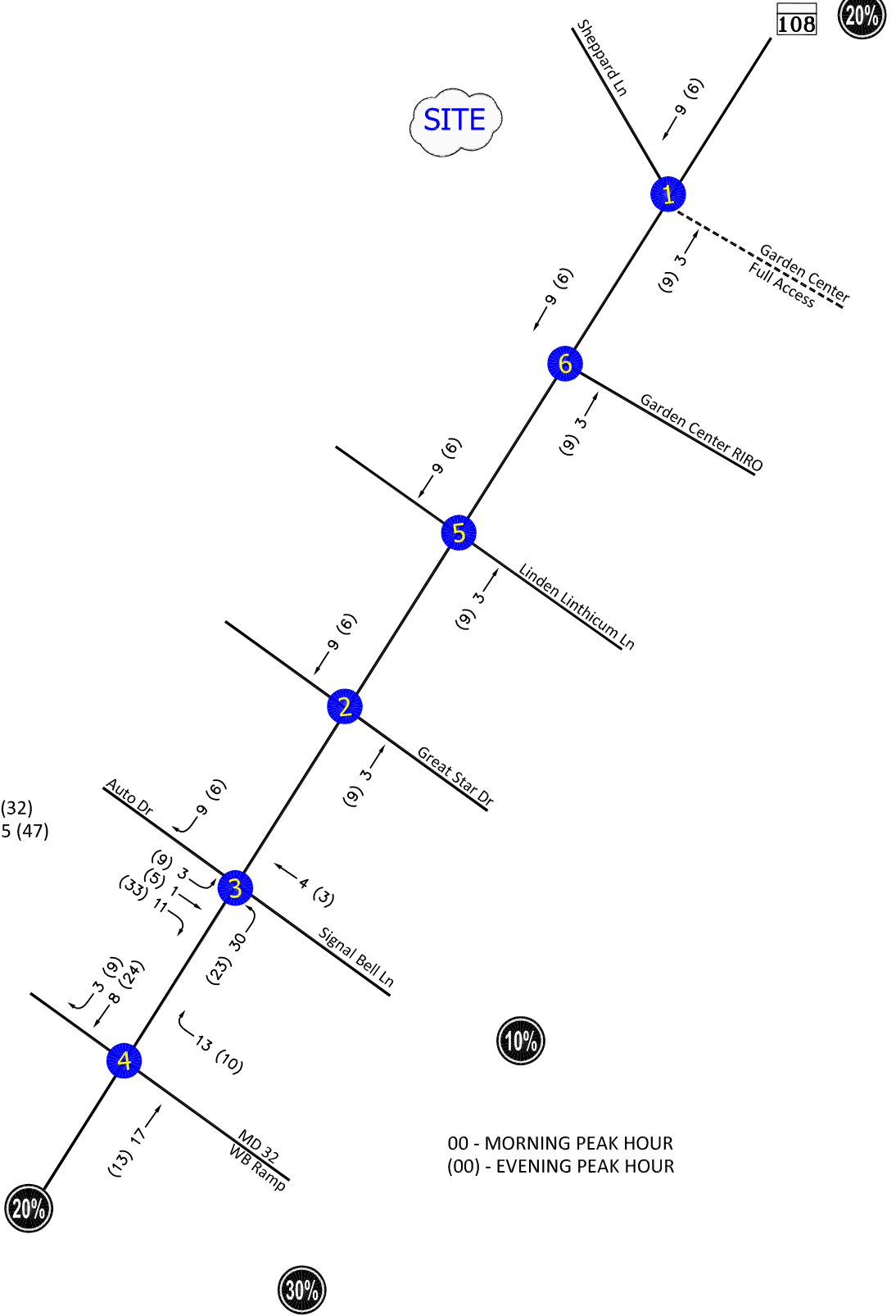
20%

EXHIBIT D-2
TRIP ASSIGNMENT FOR
BACKGROUND DEVELOPMENTS #1~#3



SITE



In: 43 (32)
Out: 15 (47)

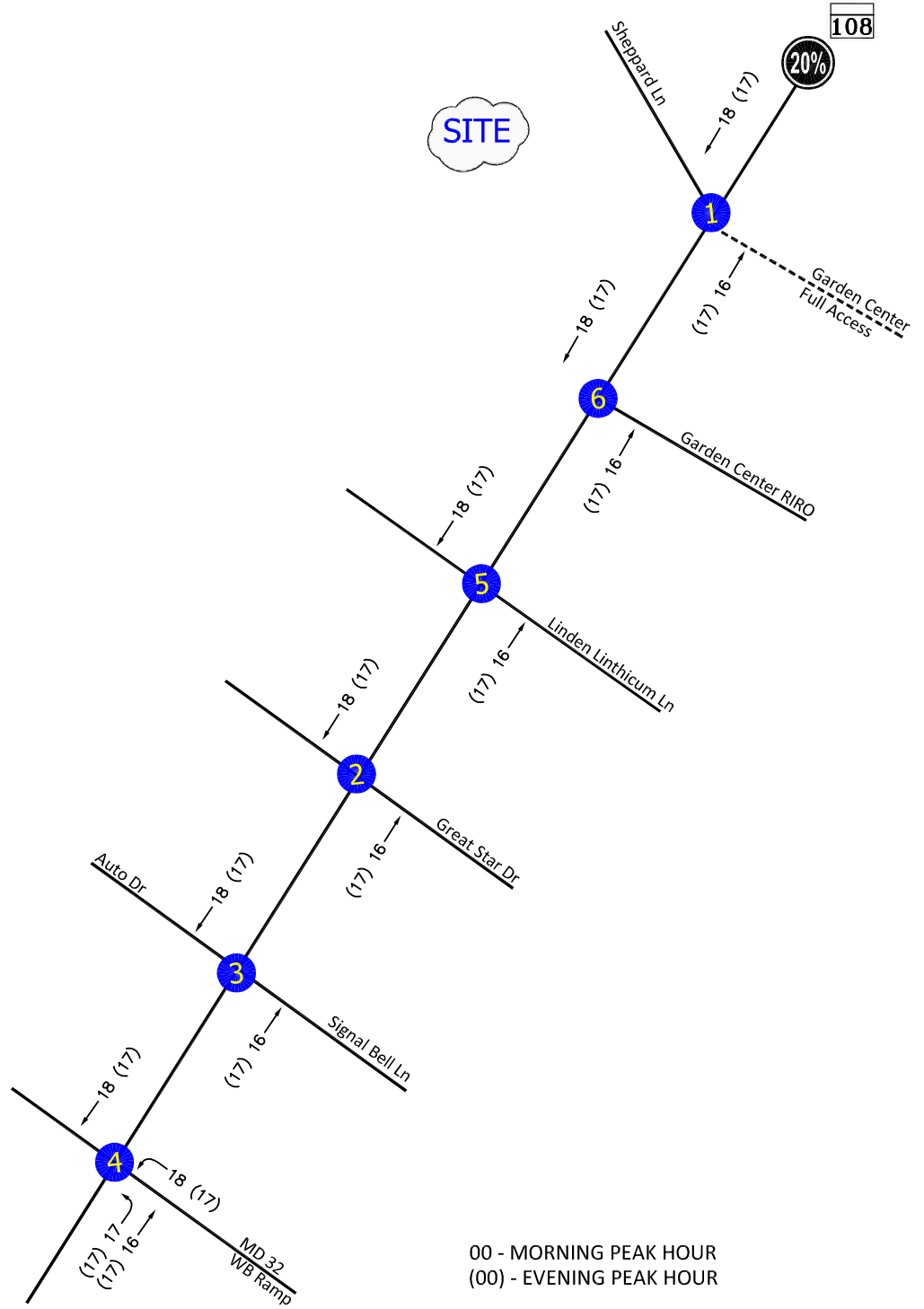


00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT D-3
TRIP ASSIGNMENT FOR
BACKGROUND DEVELOPMENTS #4~#5



SITE



00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

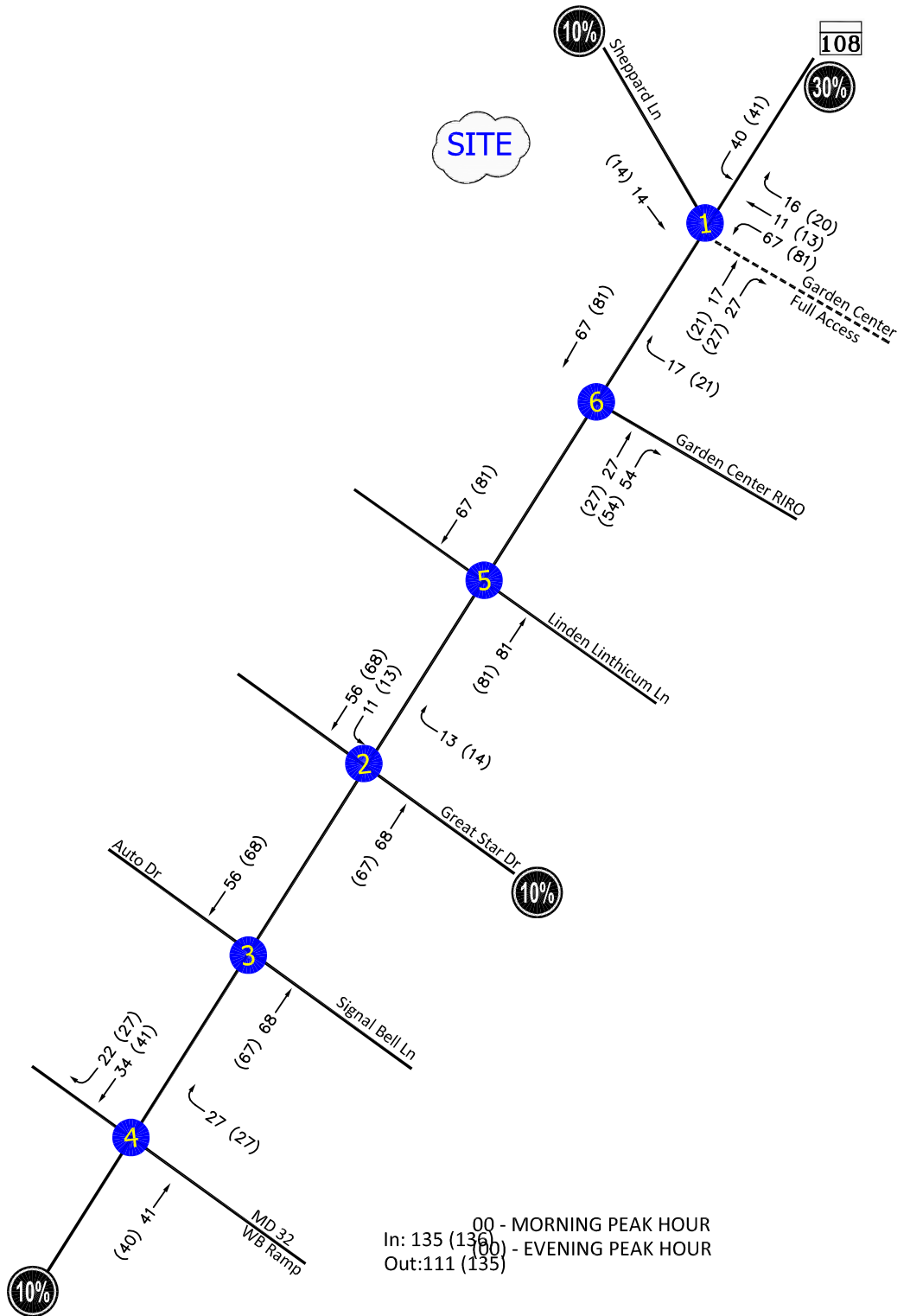
In: 92 (86)
Out: 83 (86)



EXHIBIT D-4
TRIP ASSIGNMENT FOR
BACKGROUND DEVELOPMENTS #6

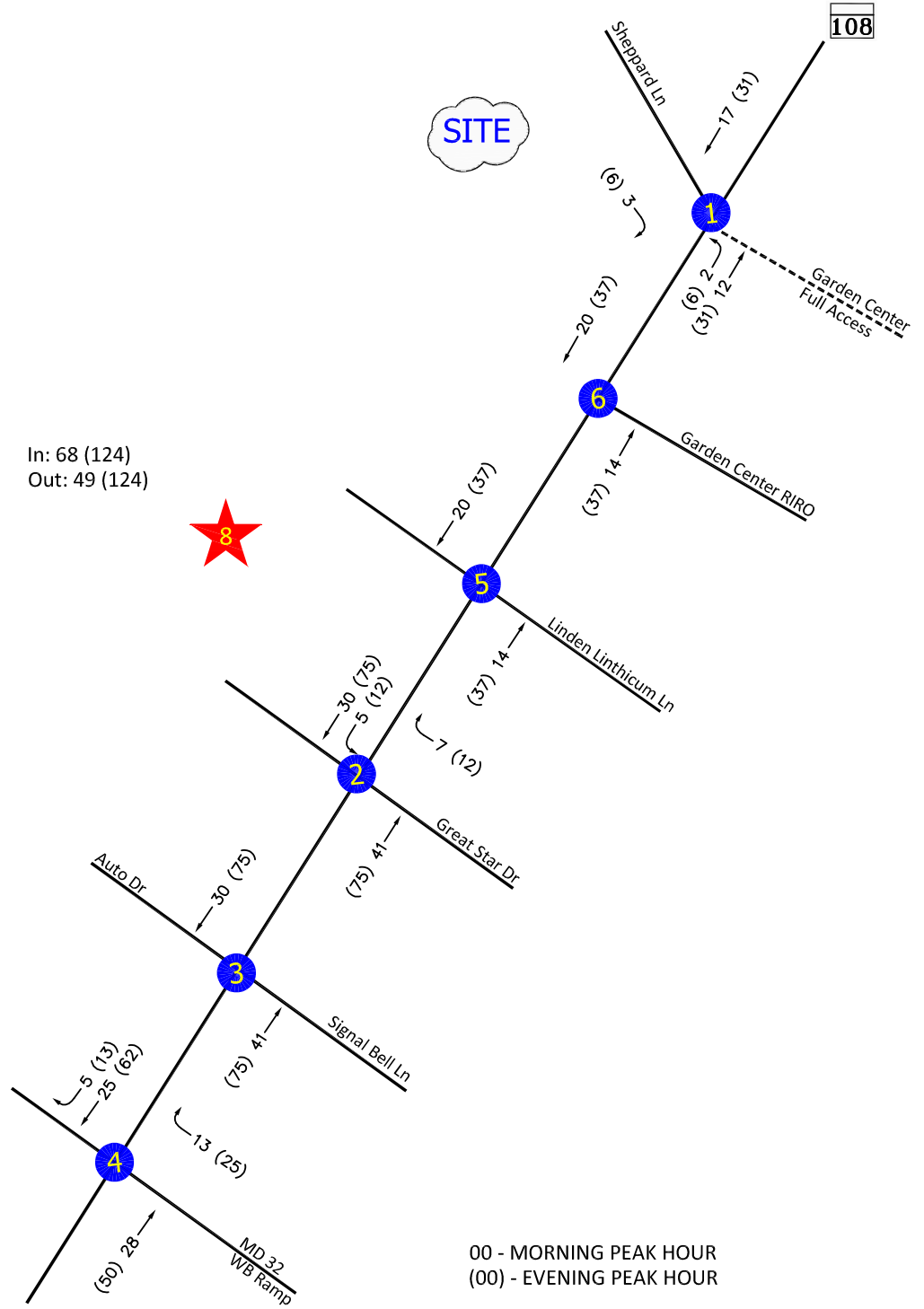


SITE



00 - MORNING PEAK HOUR
In: 135 (136)
Out: 111 (135)
00 - EVENING PEAK HOUR

EXHIBIT D-5
TRIP ASSIGNMENT FOR
RIVER HILL GARDEN CENTER



In: 68 (124)
Out: 49 (124)

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT D-6
TRIP ASSIGNMENT FOR
BACKGROUND DEVELOPMENTS #8

APPENDIX E

Synchro & SimTraffic



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	4628	4624	4610	4558	4567	4619	4664
Vehs Exited	4624	4628	4588	4573	4547	4611	4637
Starting Vehs	211	215	183	217	197	197	187
Ending Vehs	215	211	205	202	217	205	214
Travel Distance (mi)	2274	2195	2215	2198	2153	2225	2242
Travel Time (hr)	444.3	473.7	431.8	475.9	403.3	467.3	461.8
Total Delay (hr)	359.0	391.4	348.8	393.4	322.0	383.8	377.6
Total Stops	6581	6530	6684	6484	6570	6638	6558
Fuel Used (gal)	167.4	172.0	162.6	172.6	154.8	171.1	171.5

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	4606	4572	4654	4607
Vehs Exited	4587	4579	4632	4599
Starting Vehs	199	196	203	196
Ending Vehs	218	189	225	202
Travel Distance (mi)	2210	2195	2247	2215
Travel Time (hr)	487.1	455.5	467.7	456.8
Total Delay (hr)	404.2	372.9	383.3	373.6
Total Stops	6572	6550	6547	6570
Fuel Used (gal)	175.6	168.0	172.2	168.8

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	490	199	447	483	350
Average Queue (ft)	229	123	220	271	21
95th Queue (ft)	403	223	400	451	165
Link Distance (ft)	772		445	472	
Upstream Blk Time (%)			1	2	
Queuing Penalty (veh)			5	0	
Storage Bay Dist (ft)		150			265
Storage Blk Time (%)		4	15	11	
Queuing Penalty (veh)		22	29	5	

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	47	92	106	135	64	240	190	162	160	137
Average Queue (ft)	12	41	49	61	7	120	76	71	75	53
95th Queue (ft)	38	80	88	103	40	217	156	128	135	107
Link Distance (ft)	272		325			602	602		324	324
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)				0		2		0	0	
Queuing Penalty (veh)				0		0		0	0	

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	48	64	96	108	156	114	39	248	181
Average Queue (ft)	17	25	34	42	42	28	6	108	68
95th Queue (ft)	45	53	75	84	109	81	27	203	140
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)					0			1	
Queuing Penalty (veh)					0			0	

Intersection: 4: MD 108 & MD 32 WB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	294	260	306	49	191	183	326	265
Average Queue (ft)	172	140	182	13	93	67	191	89
95th Queue (ft)	259	230	283	39	179	149	321	202
Link Distance (ft)		520			440	440	347	347
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							1	0
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)			0					
Queuing Penalty (veh)			0					

Intersection: 5: MD 108 & MD32 EB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	L	LTR	TR	R	L	T	T
Maximum Queue (ft)	200	355	189	140	313	400	193
Average Queue (ft)	164	283	97	11	167	117	54
95th Queue (ft)	230	415	207	69	290	298	145
Link Distance (ft)		332	173	173		440	440
Upstream Blk Time (%)		43	3	0		0	
Queuing Penalty (veh)		0	21	0		1	
Storage Bay Dist (ft)	175				400		
Storage Blk Time (%)	34	75			0	0	
Queuing Penalty (veh)	30	36			1	1	

Intersection: 6: MD 108 & Gas Station/Linden Linthicum Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	113	78	105	30	47	4	54	29	22
Average Queue (ft)	36	26	42	7	3	0	17	2	1
95th Queue (ft)	91	66	79	28	26	4	44	14	11
Link Distance (ft)	159	467	467		191	191	77	77	77
Upstream Blk Time (%)	3						0		
Queuing Penalty (veh)	0						0		
Storage Bay Dist (ft)				5					
Storage Blk Time (%)				2	0				
Queuing Penalty (veh)				15	0				

Intersection: 7: MD 108 & Garden Center

Movement	NE
Directions Served	T
Maximum Queue (ft)	153
Average Queue (ft)	9
95th Queue (ft)	74
Link Distance (ft)	424
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Zone Summary

Zone wide Queuing Penalty: 169

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	5824	5914	5686	5732	5809	5799	5927
Vehs Exited	5845	5832	5640	5709	5720	5747	5848
Starting Vehs	296	262	233	294	203	264	225
Ending Vehs	275	344	279	317	292	316	304
Travel Distance (mi)	2810	2811	2702	2763	2771	2758	2793
Travel Time (hr)	387.9	434.2	349.0	364.2	403.5	425.8	387.8
Total Delay (hr)	281.9	328.0	247.0	260.1	298.7	321.4	282.2
Total Stops	10751	10468	9238	9745	9965	10189	10027
Fuel Used (gal)	171.7	181.7	159.2	164.9	173.5	178.7	172.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	5810	5839	5927	5829
Vehs Exited	5780	5754	5874	5774
Starting Vehs	265	226	239	239
Ending Vehs	295	311	292	292
Travel Distance (mi)	2786	2756	2806	2776
Travel Time (hr)	392.4	386.6	380.3	391.2
Total Delay (hr)	287.2	282.3	274.3	286.3
Total Stops	9840	9969	9940	10019
Fuel Used (gal)	172.3	169.9	170.8	171.5

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	205	200	529	456	78
Average Queue (ft)	92	178	307	236	7
95th Queue (ft)	164	233	603	381	92
Link Distance (ft)	772		445	472	
Upstream Blk Time (%)			9	0	
Queuing Penalty (veh)			119	0	
Storage Bay Dist (ft)		150			265
Storage Blk Time (%)		28	4	6	
Queuing Penalty (veh)		211	20	3	

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	119	182	348	225	224	610	596	217	224	209
Average Queue (ft)	53	77	145	152	32	373	328	122	87	84
95th Queue (ft)	99	147	302	240	149	593	554	205	177	161
Link Distance (ft)	272		325			602	602		324	324
Upstream Blk Time (%)			2			1	0		0	0
Queuing Penalty (veh)			0			4	2		1	0
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)		0	0	6		41		2		
Queuing Penalty (veh)		0	1	17		8		6		

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	151	140	152	222	322	295	93	251	264
Average Queue (ft)	60	62	61	38	105	91	16	118	118
95th Queue (ft)	118	115	119	114	241	221	68	223	230
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)			0		0	0			
Queuing Penalty (veh)			0		1	0			
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)					2			2	
Queuing Penalty (veh)					2			0	

Intersection: 4: MD 108 & MD 32 WB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	455	546	375	113	343	329	372	376
Average Queue (ft)	309	364	273	40	177	162	292	277
95th Queue (ft)	478	565	440	90	300	290	420	411
Link Distance (ft)		520			440	440	347	347
Upstream Blk Time (%)		4					7	5
Queuing Penalty (veh)		0					36	26
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)	0	8	2		0			
Queuing Penalty (veh)	2	68	22		0			

Intersection: 5: MD 108 & MD32 EB Ramps

Movement	EB	EB	NB	SB	SB	SB
Directions Served	L	LTR	TR	L	T	T
Maximum Queue (ft)	200	357	195	330	463	459
Average Queue (ft)	153	274	107	159	152	199
95th Queue (ft)	237	410	229	288	416	498
Link Distance (ft)		332	173		440	440
Upstream Blk Time (%)		34	7	0	1	3
Queuing Penalty (veh)		0	44	0	8	25
Storage Bay Dist (ft)	175			400		
Storage Blk Time (%)	23	68			2	
Queuing Penalty (veh)	24	35			5	

Intersection: 6: MD 108 & Gas Station/Linden Linthicum Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	175	304	430	30	193	34	128	44	32
Average Queue (ft)	84	116	196	12	22	2	47	3	1
95th Queue (ft)	189	373	473	35	109	16	106	21	16
Link Distance (ft)	159	467	467		191	191	77	77	77
Upstream Blk Time (%)	26	10	13		0		7	0	0
Queuing Penalty (veh)	0	0	0		2		17	0	0
Storage Bay Dist (ft)				5					
Storage Blk Time (%)				2	0				
Queuing Penalty (veh)				28	0				

Intersection: 7: MD 108 & Garden Center

Movement	NE	NE	B17
Directions Served	T	R	T
Maximum Queue (ft)	341	40	80
Average Queue (ft)	75	2	12
95th Queue (ft)	325	36	80
Link Distance (ft)	424		106
Upstream Blk Time (%)	3		2
Queuing Penalty (veh)	37		25
Storage Bay Dist (ft)		175	
Storage Blk Time (%)	5		
Queuing Penalty (veh)	0		

Zone Summary

Zone wide Queuing Penalty: 800

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	4650	4620	4638	4629	4596	4639	4715
Vehs Exited	4653	4616	4632	4564	4568	4605	4636
Starting Vehs	177	158	172	177	154	125	160
Ending Vehs	174	162	178	242	182	159	239
Travel Distance (mi)	2219	2177	2200	2207	2167	2189	2243
Travel Time (hr)	175.3	178.3	206.4	266.5	195.6	182.6	232.4
Total Delay (hr)	93.4	98.2	125.5	185.3	115.6	102.0	150.2
Total Stops	6916	6328	6409	8165	7337	6904	7711
Fuel Used (gal)	105.0	104.5	112.4	125.8	108.1	106.4	119.4

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	4668	3157	4681	4500
Vehs Exited	4649	2873	4663	4445
Starting Vehs	146	156	169	153
Ending Vehs	165	440	187	207
Travel Distance (mi)	2187	1288	2205	2108
Travel Time (hr)	171.1	533.8	218.8	236.1
Total Delay (hr)	90.6	486.2	137.8	158.5
Total Stops	6903	4620	6757	6803
Fuel Used (gal)	103.7	159.8	115.3	116.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	810	178	36	200	400	224	120	507	436
Average Queue (ft)	613	76	4	157	323	26	32	437	75
95th Queue (ft)	968	166	21	257	499	131	94	573	360
Link Distance (ft)	777	192	192		383			477	477
Upstream Blk Time (%)	35	6			14			30	2
Queuing Penalty (veh)	0	0			131			0	0
Storage Bay Dist (ft)				150		150	100		
Storage Blk Time (%)				29	22		1	54	
Queuing Penalty (veh)				205	53		3	22	

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	54	145	216	203	166	410	375	192	171	202
Average Queue (ft)	13	10	108	92	17	223	165	104	71	93
95th Queue (ft)	43	68	210	172	97	418	373	180	137	171
Link Distance (ft)	272		325			602	602		324	324
Upstream Blk Time (%)			4			4	4			
Queuing Penalty (veh)			0			17	17			
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)			0	5		15		0	0	
Queuing Penalty (veh)			0	8		2		2	0	

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	69	68	102	161	225	181	33	243	272
Average Queue (ft)	22	31	42	63	79	57	4	102	127
95th Queue (ft)	56	58	84	127	202	176	22	201	233
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)					4	4			
Queuing Penalty (veh)					20	20			
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)				0	4			1	
Queuing Penalty (veh)				0	8			0	

Intersection: 4: MD 108 & MD 32 WB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	325	463	360	125	340	287	347	352
Average Queue (ft)	174	251	225	34	185	122	195	210
95th Queue (ft)	298	396	346	91	331	271	341	362
Link Distance (ft)		520			463	463	347	347
Upstream Blk Time (%)		3			3	0	0	1
Queuing Penalty (veh)		0			0	0	2	4
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)	0	0	4		3			
Queuing Penalty (veh)	0	2	20		2			

Intersection: 6: MD 108 & Gas Station/Linden Linthicum Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	167	233	298	30	142	18	79	49	47
Average Queue (ft)	74	73	122	10	36	1	24	8	5
95th Queue (ft)	174	284	364	32	150	9	61	56	26
Link Distance (ft)	159	467	467		191	191	77	77	77
Upstream Blk Time (%)	23	7	9		2		2	5	
Queuing Penalty (veh)	0	0	0		11		6	17	
Storage Bay Dist (ft)				5					
Storage Blk Time (%)				3	4				
Queuing Penalty (veh)				25	1				

Intersection: 7: MD 108 & Garden Center

Movement	NW	NE	NE	B17	SW
Directions Served	R	T	R	T	T
Maximum Queue (ft)	77	491	180	149	44
Average Queue (ft)	24	207	23	42	19
95th Queue (ft)	75	553	129	166	163
Link Distance (ft)	128	424		106	383
Upstream Blk Time (%)	2	12		9	4
Queuing Penalty (veh)	0	113		83	47
Storage Bay Dist (ft)			175		
Storage Blk Time (%)		17	0		4
Queuing Penalty (veh)		9	0		0

Zone Summary

Zone wide Queuing Penalty: 852

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	5301	5233	1347	5340	5370	5319	5368
Vehs Exited	5171	5070	1082	5193	5196	5209	5235
Starting Vehs	272	265	287	257	230	288	239
Ending Vehs	402	428	552	404	404	398	372
Travel Distance (mi)	2305	2321	424	2337	2336	2289	2319
Travel Time (hr)	832.5	1060.7	2618.8	852.6	867.7	860.2	807.7
Total Delay (hr)	746.9	974.9	2602.9	766.1	780.9	774.9	721.5
Total Stops	10997	11443	2261	11467	11525	11049	11372
Fuel Used (gal)	259.0	309.8	607.4	263.1	265.4	264.2	252.2

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	5448	5304	5514	4953
Vehs Exited	5316	5222	5412	4811
Starting Vehs	253	298	277	259
Ending Vehs	385	380	379	400
Travel Distance (mi)	2353	2317	2381	2138
Travel Time (hr)	746.8	877.9	731.3	1025.6
Total Delay (hr)	659.4	791.8	642.6	946.2
Total Stops	11115	10933	11310	10353
Fuel Used (gal)	240.6	269.2	238.4	296.9

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	350	150	50	200	487	205	114	513	390
Average Queue (ft)	196	61	6	181	412	15	29	485	125
95th Queue (ft)	482	142	29	268	630	101	88	546	425
Link Distance (ft)	777	192	192		383			477	
Upstream Blk Time (%)	7	0			26			61	
Queuing Penalty (veh)	0	0			387			0	
Storage Bay Dist (ft)				150		150	100		265
Storage Blk Time (%)				40	8		0	67	
Queuing Penalty (veh)				374	45		0	68	

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	146	212	359	225	204	640	654	215	308	293
Average Queue (ft)	72	97	281	212	37	616	619	137	114	120
95th Queue (ft)	168	218	414	255	167	633	642	245	244	241
Link Distance (ft)	272		325			602	602		324	324
Upstream Blk Time (%)	0		23			47	41		0	0
Queuing Penalty (veh)	0		0			327	287		1	1
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)		0	5	32		80		5	1	
Queuing Penalty (veh)		1	32	94		17		18	2	

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	325	275	226	255	381	390	123	473	502
Average Queue (ft)	215	172	137	175	359	360	14	214	236
95th Queue (ft)	384	338	244	358	383	383	70	453	478
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)	37		27		37	44		0	0
Queuing Penalty (veh)	0		0		271	319		0	1
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)	28	18			83			16	
Queuing Penalty (veh)	62	25			103			3	

Intersection: 4: MD 108 & MD 32 WB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	455	554	375	425	497	498	375	373
Average Queue (ft)	372	535	370	243	469	455	314	318
95th Queue (ft)	619	568	391	573	537	555	470	479
Link Distance (ft)		520			463	463	347	347
Upstream Blk Time (%)		54			76	58	17	23
Queuing Penalty (veh)		0			0	0	105	147
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)	1	10	53	0	77			
Queuing Penalty (veh)	9	94	523	0	57			

Intersection: 6: MD 108 & Gas Station/Linden Linthicum Lane

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	172	494	499	30	273	19	160	55	48
Average Queue (ft)	130	293	343	15	84	1	81	15	8
95th Queue (ft)	214	631	644	38	247	13	178	80	41
Link Distance (ft)	159	467	467		191	191	77	77	77
Upstream Blk Time (%)	69	53	59		4		37	8	8
Queuing Penalty (veh)	0	0	0		32		106	24	24
Storage Bay Dist (ft)				5					
Storage Blk Time (%)				10	2				
Queuing Penalty (veh)				142	1				

Intersection: 7: MD 108 & Garden Center

Movement	NW	NE	NE	B17	SW
Directions Served	R	T	R	T	T
Maximum Queue (ft)	136	516	180	206	44
Average Queue (ft)	91	299	28	82	33
95th Queue (ft)	165	663	141	231	221
Link Distance (ft)	128	424		106	383
Upstream Blk Time (%)	50	17		14	8
Queuing Penalty (veh)	0	268		221	71
Storage Bay Dist (ft)			175		
Storage Blk Time (%)		21	0		8
Queuing Penalty (veh)		11	0		0

Zone Summary

Zone wide Queuing Penalty: 4273

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	4342	4360	4347	4265	4388	4353	4388
Vehs Exited	4334	4347	4376	4272	4383	4390	4362
Starting Vehs	157	145	164	164	155	170	155
Ending Vehs	165	158	135	157	160	133	181
Travel Distance (mi)	2342	2424	2350	2364	2364	2394	2360
Travel Time (hr)	151.1	157.7	151.5	154.9	151.7	156.0	151.8
Total Delay (hr)	65.4	69.5	65.6	68.7	65.2	68.4	65.6
Total Stops	7170	7354	7146	7377	7381	7502	7352
Fuel Used (gal)	103.8	107.1	103.9	105.0	104.9	105.7	104.5

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4377	4298	4315	4337
Vehs Exited	4363	4296	4261	4339
Starting Vehs	138	137	118	144
Ending Vehs	152	139	172	150
Travel Distance (mi)	2404	2325	2305	2363
Travel Time (hr)	158.1	152.3	152.0	153.7
Total Delay (hr)	70.3	67.4	67.8	67.4
Total Stops	7460	7277	7377	7343
Fuel Used (gal)	107.1	104.0	103.1	104.9

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	4342	4360	4347	4265	4388	4353	4388
Vehs Exited	4334	4347	4376	4272	4383	4390	4362
Starting Vehs	157	145	164	164	155	170	155
Ending Vehs	165	158	135	157	160	133	181
Travel Distance (mi)	2342	2424	2350	2364	2364	2394	2360
Travel Time (hr)	151.1	157.7	151.5	154.9	151.7	156.0	151.8
Total Delay (hr)	65.4	69.5	65.6	68.7	65.2	68.4	65.6
Total Stops	7170	7354	7146	7377	7381	7502	7352
Fuel Used (gal)	103.8	107.1	103.9	105.0	104.9	105.7	104.5

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	4377	4298	4315	4337
Vehs Exited	4363	4296	4261	4339
Starting Vehs	138	137	118	144
Ending Vehs	152	139	172	150
Travel Distance (mi)	2404	2325	2305	2363
Travel Time (hr)	158.1	152.3	152.0	153.7
Total Delay (hr)	70.3	67.4	67.8	67.4
Total Stops	7460	7277	7377	7343
Fuel Used (gal)	107.1	104.0	103.1	104.9

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	EB	WB	WB	B12	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	T	L	T	R	L	T	T	R
Maximum Queue (ft)	190	247	118	53	17	234	399	244	198	349	274	99
Average Queue (ft)	62	97	54	20	1	99	273	10	33	191	140	22
95th Queue (ft)	133	192	103	49	9	177	430	103	116	300	254	66
Link Distance (ft)	747		55	55	188	370	370	370		476	476	
Upstream Blk Time (%)			21	3			4	0				
Queuing Penalty (veh)			0	0			11	0				
Storage Bay Dist (ft)		200							150			100
Storage Blk Time (%)	0	1								17	9	0
Queuing Penalty (veh)	0	1								7	4	0

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	51	108	233	217	125	334	340	220	302	306
Average Queue (ft)	15	10	91	104	11	167	188	108	106	121
95th Queue (ft)	43	65	175	185	60	291	312	196	233	241
Link Distance (ft)	272		325			602	602		326	326
Upstream Blk Time (%)									0	0
Queuing Penalty (veh)									1	1
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)			0	1		5		1	1	
Queuing Penalty (veh)			0	1		1		7	2	

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	64	73	101	154	198	218	83	323	363
Average Queue (ft)	23	31	43	69	61	65	8	126	157
95th Queue (ft)	56	60	84	126	152	152	45	253	292
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)				0	0			2	
Queuing Penalty (veh)				0	1			0	

Intersection: 4: MD 32 WB Ramp & MD 108

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	270	332	278	81	332	286	358	368
Average Queue (ft)	126	198	117	32	180	129	229	245
95th Queue (ft)	251	293	213	67	288	239	377	396
Link Distance (ft)		520			463	463	347	347
Upstream Blk Time (%)							1	2
Queuing Penalty (veh)							7	12
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)		0	0		0			
Queuing Penalty (veh)		1	0		0			

Intersection: 6: MD 108 & New Road/Linden Linthicum Lane

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	B17
Directions Served	L	TR	LT	R	L	T	TR	L	T	TR	T
Maximum Queue (ft)	73	86	94	104	114	186	197	80	268	275	2
Average Queue (ft)	28	32	37	44	38	67	108	24	99	110	0
95th Queue (ft)	61	65	76	82	81	147	188	60	200	210	2
Link Distance (ft)	270	270	456	456		186	186		315	315	367
Upstream Blk Time (%)						0	1		0	0	
Queuing Penalty (veh)						1	4		0	1	
Storage Bay Dist (ft)					100			250			
Storage Blk Time (%)					0	1		0			
Queuing Penalty (veh)					0	1		0			

Intersection: 7: MD 108 & Garden Center

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	T	T	R
Maximum Queue (ft)	51	49	204	37	36	4
Average Queue (ft)	14	2	25	1	1	0
95th Queue (ft)	40	38	116	36	35	3
Link Distance (ft)		367	367	370	370	370
Upstream Blk Time (%)		0	0		0	
Queuing Penalty (veh)		0	0		0	
Storage Bay Dist (ft)	150					
Storage Blk Time (%)				1		
Queuing Penalty (veh)			0			

Zone Summary

Zone wide Queuing Penalty: 66

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	5600	5288	5392	4956	5668	5375	5361
Vehs Exited	5575	5275	5357	4852	5527	5260	5290
Starting Vehs	244	255	263	216	230	215	247
Ending Vehs	269	268	298	320	371	330	318
Travel Distance (mi)	2813	2748	2751	2560	2883	2784	2793
Travel Time (hr)	339.8	572.5	523.8	542.6	404.5	483.6	506.9
Total Delay (hr)	236.8	472.1	423.1	449.1	299.0	381.6	404.4
Total Stops	11694	11551	12215	10820	12727	11591	12121
Fuel Used (gal)	163.8	213.6	202.5	201.0	179.6	193.5	200.7

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	5690	5498	5469	5426
Vehs Exited	5616	5452	5414	5361
Starting Vehs	234	264	238	227
Ending Vehs	308	310	293	302
Travel Distance (mi)	2876	2819	2815	2784
Travel Time (hr)	426.7	421.1	442.0	466.4
Total Delay (hr)	321.3	317.8	338.9	364.4
Total Stops	12229	11762	11568	11828
Fuel Used (gal)	184.2	181.5	186.1	190.7

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	5600	5288	5392	4956	5668	5375	5361
Vehs Exited	5575	5275	5357	4852	5527	5260	5290
Starting Vehs	244	255	263	216	230	215	247
Ending Vehs	269	268	298	320	371	330	318
Travel Distance (mi)	2813	2748	2751	2560	2883	2784	2793
Travel Time (hr)	339.8	572.5	523.8	542.6	404.5	483.6	506.9
Total Delay (hr)	236.8	472.1	423.1	449.1	299.0	381.6	404.4
Total Stops	11694	11551	12215	10820	12727	11591	12121
Fuel Used (gal)	163.8	213.6	202.5	201.0	179.6	193.5	200.7

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	5690	5498	5469	5426
Vehs Exited	5616	5452	5414	5361
Starting Vehs	234	264	238	227
Ending Vehs	308	310	293	302
Travel Distance (mi)	2876	2819	2815	2784
Travel Time (hr)	426.7	421.1	442.0	466.4
Total Delay (hr)	321.3	317.8	338.9	364.4
Total Stops	12229	11762	11568	11828
Fuel Used (gal)	184.2	181.5	186.1	190.7

Intersection: 1: MD 108 & Sheppard Lane

Movement	EB	EB	WB	WB	B12	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	TR	T	L	T	R	L	T	T	R
Maximum Queue (ft)	102	102	122	76	38	384	391	218	190	371	314	171
Average Queue (ft)	40	41	64	27	3	234	248	10	37	211	166	34
95th Queue (ft)	83	77	115	65	19	386	418	104	128	328	286	100
Link Distance (ft)	747		64	64	183	370	370	370		508	508	
Upstream Blk Time (%)			14	1		3	3	0				
Queuing Penalty (veh)			0	0		14	13	0				
Storage Bay Dist (ft)		200							150			100
Storage Blk Time (%)										23	15	0
Queuing Penalty (veh)										9	9	0

Intersection: 2: MD 108 & Hardware Store/Great Star Drive

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	176	204	362	225	208	640	646	225	411	375
Average Queue (ft)	78	72	306	219	28	601	604	197	244	223
95th Queue (ft)	153	194	421	252	132	675	676	261	421	367
Link Distance (ft)	272		325			602	602		326	326
Upstream Blk Time (%)	0		25			26	28		10	2
Queuing Penalty (veh)	0		0			186	204		57	12
Storage Bay Dist (ft)		200		200	200			200		
Storage Blk Time (%)		1	3	37		57		27	4	
Queuing Penalty (veh)		8	22	82		12		118	12	

Intersection: 3: MD 108 & Auto Dr./Signal Bell Ln

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	329	275	223	255	378	381	193	505	530
Average Queue (ft)	180	152	117	127	309	312	23	265	291
95th Queue (ft)	341	297	223	299	440	445	100	520	540
Link Distance (ft)	300		208		347	347		602	602
Upstream Blk Time (%)	17		14		14	19		2	2
Queuing Penalty (veh)	0		0		104	143		8	13
Storage Bay Dist (ft)		250		190			180		
Storage Blk Time (%)	16	6		0	40			19	
Queuing Penalty (veh)	35	9		0	50			4	

Intersection: 4: MD 108 & MD 32 WB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	L	T	T	T	TR
Maximum Queue (ft)	455	562	375	366	480	475	370	378
Average Queue (ft)	397	537	372	109	327	295	301	313
95th Queue (ft)	556	557	393	338	513	491	443	446
Link Distance (ft)		520			463	463	347	347
Upstream Blk Time (%)		41			13	11	11	13
Queuing Penalty (veh)		0			0	0	72	89
Storage Bay Dist (ft)	430		350	400				
Storage Blk Time (%)	1	16	32		14			
Queuing Penalty (veh)	7	162	321		10			

Intersection: 6: MD 108 & New Road/Linden Linthicum Lane

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	B17
Directions Served	L	TR	LT	R	L	T	TR	L	T	TR	T
Maximum Queue (ft)	127	106	132	129	125	274	274	131	238	255	2
Average Queue (ft)	58	41	60	61	45	143	169	44	87	97	0
95th Queue (ft)	109	77	113	107	102	256	279	94	194	210	2
Link Distance (ft)	270	270	456	456		186	186		315	315	367
Upstream Blk Time (%)						3	6		0	0	
Queuing Penalty (veh)						24	44		0	0	
Storage Bay Dist (ft)					100			250			
Storage Blk Time (%)					0	9		0			
Queuing Penalty (veh)					1	8		0			

Intersection: 7: MD 108 & Garden Center












Movement	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	R
Maximum Queue (ft)	41	196	250	50	2
Average Queue (ft)	8	15	33	2	0
95th Queue (ft)	31	105	152	35	2
Link Distance (ft)		367	367		370
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)	150			175	
Storage Blk Time (%)		1	1		
Queuing Penalty (veh)		0	1		

Zone Summary

Zone wide Queuing Penalty: 1863

HCM 2010 Signalized Intersection Summary
 1: MD 108 & Sheppard Lane

MD 108
 Existing AM

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	85	412	190	583	531	40		
Future Volume (veh/h)	85	412	190	583	531	40		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863		
Adj Flow Rate, veh/h	98	474	218	670	610	0		
Adj No. of Lanes	0	0	1	1	1	1		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87		
Percent Heavy Veh, %	0	0	2	2	2	2		
Cap, veh/h	107	515	284	944	667	567		
Arrive On Green	0.39	0.39	0.10	0.51	0.36	0.00		
Sat Flow, veh/h	276	1335	1774	1863	1863	1583		
Grp Volume(v), veh/h	573	0	218	670	610	0		
Grp Sat Flow(s),veh/h/ln	1613	0	1774	1863	1863	1583		
Q Serve(g_s), s	34.6	0.0	7.5	28.4	32.0	0.0		
Cycle Q Clear(g_c), s	34.6	0.0	7.5	28.4	32.0	0.0		
Prop In Lane	0.17	0.83	1.00			1.00		
Lane Grp Cap(c), veh/h	623	0	284	944	667	567		
V/C Ratio(X)	0.92	0.00	0.77	0.71	0.91	0.00		
Avail Cap(c_a), veh/h	867	0	540	1528	982	835		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	29.9	0.0	22.9	19.5	31.4	0.0		
Incr Delay (d2), s/veh	11.8	0.0	4.4	1.0	9.4	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	24.1	0.0	7.2	21.1	25.2	0.0		
LnGrp Delay(d),s/veh	41.7	0.0	27.2	20.5	40.7	0.0		
LnGrp LOS	D		C	C	D			
Approach Vol, veh/h	573			888	610			
Approach Delay, s/veh	41.7			22.1	40.7			
Approach LOS	D			C	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		57.9		44.5	15.2	42.7		
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		
Max Green Setting (Gmax), s		84.0		55.0	25.0	54.0		
Max Q Clear Time (g_c+I1), s		30.4		36.6	9.5	34.0		
Green Ext Time (p_c), s		3.4		2.9	0.7	2.7		
Intersection Summary								
HCM 2010 Ctrl Delay			33.0					
HCM 2010 LOS			C					
Notes								
User approved volume balancing among the lanes for turning movement.								

HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108
 Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↶	↷	↵	↶↷		↵	↶↷	
Traffic Volume (veh/h)	5	2	7	137	11	258	13	533	146	243	703	8
Future Volume (veh/h)	5	2	7	137	11	258	13	533	146	243	703	8
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	2	7	145	0	258	13	533	146	243	703	8
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	176	88	176	929	0	376	513	1206	329	599	1907	22
Arrive On Green	0.24	0.24	0.22	0.24	0.00	0.24	0.05	0.44	0.40	0.14	0.53	0.50
Sat Flow, veh/h	372	369	742	2801	0	1583	1774	2750	750	1774	3584	41
Grp Volume(v), veh/h	14	0	0	145	0	258	13	342	337	243	347	364
Grp Sat Flow(s),veh/h/ln	1483	0	0	1400	0	1583	1774	1770	1730	1774	1770	1856
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.0	8.3	0.2	7.5	7.7	3.5	6.3	6.4
Cycle Q Clear(g_c), s	0.4	0.0	0.0	2.2	0.0	8.3	0.2	7.5	7.7	3.5	6.3	6.4
Prop In Lane	0.36		0.50	1.00		1.00	1.00		0.43	1.00		0.02
Lane Grp Cap(c), veh/h	440	0	0	929	0	376	513	776	759	599	941	987
V/C Ratio(X)	0.03	0.00	0.00	0.16	0.00	0.69	0.03	0.44	0.44	0.41	0.37	0.37
Avail Cap(c_a), veh/h	460	0	0	1271	0	569	1093	1623	1587	1013	1623	1701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	0.0	17.0	0.0	19.3	7.8	10.9	11.2	6.4	7.6	7.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	2.2	0.0	1.8	1.9	0.4	1.1	1.1
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.0	1.6	0.0	6.9	0.2	7.2	7.2	3.2	6.1	6.4
LnGrp Delay(d),s/veh	16.5	0.0	0.0	17.1	0.0	21.5	7.9	12.7	13.1	6.8	8.7	8.7
LnGrp LOS	B			B		C	A	B	B	A	A	A
Approach Vol, veh/h		14			403			692			954	
Approach Delay, s/veh		16.5			19.9			12.8			8.2	
Approach LOS		B			B			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	32.6		17.2	11.0	27.4		17.2				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	48.0	48.0		12.0	19.0	48.0		18.0				
Max Q Clear Time (g_c+1), s	12.2	8.4		2.4	5.5	9.7		10.3				
Green Ext Time (p_c), s	0.0	12.3		0.0	0.6	11.7		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay				12.1								
HCM 2010 LOS				B								
Notes												
User approved volume balancing among the lanes for turning movement.												





















HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108
 Existing AM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	19	4	41	43	5	3	149	621	49	7	818	71
Future Volume (veh/h)	19	4	41	43	5	3	149	621	49	7	818	71
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	19	4	41	43	5	3	149	621	49	7	818	71
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	57	271	307	33	14	574	2081	164	605	1830	159
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.14	0.12	0.63	0.63	0.04	0.56	0.52
Sat Flow, veh/h	1198	333	1583	1112	196	82	1774	3324	262	1774	3296	286
Grp Volume(v), veh/h	23	0	41	51	0	0	149	330	340	7	439	450
Grp Sat Flow(s),veh/h/ln	1531	0	1583	1389	0	0	1774	1770	1817	1774	1770	1812
Q Serve(g_s), s	0.0	0.0	1.2	1.3	0.0	0.0	1.6	4.9	4.9	0.1	8.3	8.4
Cycle Q Clear(g_c), s	0.6	0.0	1.2	1.9	0.0	0.0	1.6	4.9	4.9	0.1	8.3	8.4
Prop In Lane	0.83		1.00	0.84		0.06	1.00		0.14	1.00		0.16
Lane Grp Cap(c), veh/h	378	0	271	355	0	0	574	1108	1137	605	983	1006
V/C Ratio(X)	0.06	0.00	0.15	0.14	0.00	0.00	0.26	0.30	0.30	0.01	0.45	0.45
Avail Cap(c_a), veh/h	825	0	754	783	0	0	1027	1966	2018	1183	1982	2029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	20.0	20.3	0.0	0.0	4.3	4.9	4.9	5.0	7.5	7.6
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.2	0.0	0.0	0.2	0.7	0.7	0.0	1.5	1.4
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	0.6	0.0	1.0	1.3	0.0	0.0	1.4	4.5	4.6	0.1	7.9	8.1
LnGrp Delay(d),s/veh	19.8	0.0	20.3	20.5	0.0	0.0	4.5	5.6	5.6	5.0	8.9	9.0
LnGrp LOS	B		C	C			A	A	A	A	A	A
Approach Vol, veh/h	64			51			819			896		
Approach Delay, s/veh	20.1			20.5			5.4			8.9		
Approach LOS	C			C			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	34.5		12.7	5.5	38.5		12.7				
Change Period (Y+Rc), s	5.0	* 6		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	* 61		24.0	19.0	60.0		24.0				
Max Q Clear Time (g_c+1), s	13.6	10.4		3.2	2.1	6.9		3.9				
Green Ext Time (p_c), s	0.4	18.1		0.1	0.0	12.4		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay	8.1											
HCM 2010 LOS	A											
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis
 4: MD 108 & MD 32 WB Ramps

MD 108
 Existing AM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	458	0	287	27	577	0	0	774	74	
Future Volume (vph)	0	0	0	458	0	287	27	577	0	0	774	74	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				3.0	3.0	3.0	3.0	3.0			3.0		
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95		
Flt				1.00	1.00	0.85	1.00	1.00			0.99		
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1681	1681	1583	1770	3539			3493		
Flt Permitted				0.95	0.95	1.00	0.27	1.00			1.00		
Satd. Flow (perm)				1681	1681	1583	500	3539			3493		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	0	0	458	0	287	27	577	0	0	774	74	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0	
Lane Group Flow (vph)	0	0	0	229	229	287	27	577	0	0	843	0	
Turn Type				Perm	NA	Perm	custom	NA			NA		
Protected Phases					4		1	16			2		
Permitted Phases				4		4	6						
Actuated Green, G (s)				27.2	27.2	27.2	74.8	80.8			66.8		
Effective Green, g (s)				30.2	30.2	30.2	80.8	83.8			69.8		
Actuated g/C Ratio				0.25	0.25	0.25	0.67	0.70			0.58		
Clearance Time (s)				6.0	6.0	6.0	6.0				6.0		
Vehicle Extension (s)				3.0	3.0	3.0	3.0				5.0		
Lane Grp Cap (vph)				423	423	398	453	2471			2031		
v/s Ratio Prot							0.01	c0.16			c0.24		
v/s Ratio Perm				0.14	0.14	c0.18	0.03						
v/c Ratio				0.54	0.54	0.72	0.06	0.23			0.42		
Uniform Delay, d1				38.9	38.9	41.0	12.1	6.5			13.8		
Progression Factor				1.00	1.00	1.00	0.44	0.84			1.00		
Incremental Delay, d2				1.4	1.4	6.3	0.1	0.0			0.6		
Delay (s)				40.3	40.3	47.4	5.4	5.5			14.5		
Level of Service				D	D	D	A	A			B		
Approach Delay (s)		0.0			43.0			5.5			14.5		
Approach LOS		A			D			A			B		
Intersection Summary													
HCM 2000 Control Delay			21.7		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.49										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					9.0			
Intersection Capacity Utilization			75.8%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

Intersection

Int Delay, s/veh 12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↘	↑	↗	↘	↕	↕
Traffic Vol, veh/h	10	1	33	23	1	100	16	658	31	47	877	0
Future Vol, veh/h	10	1	33	23	1	100	16	658	31	47	877	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	5	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	2	2	0	2	0	2	0	2	2	0
Mvmt Flow	14	1	45	32	1	137	22	901	42	64	1201	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2343	2274	601	1674	2274	901	1201	0	-	901	0	0
Stage 1	1329	1329	-	945	945	-	-	-	-	-	-	-
Stage 2	1014	945	-	729	1329	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.93	7.33	6.5	6.23	4.1	-	-	4.13	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.53	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.319	3.519	4	3.319	2.2	-	-	2.219	-	-
Pot Cap-1 Maneuver	23	41	444	69	41	336	588	-	0	752	-	-
Stage 1	166	226	-	314	343	-	-	-	0	-	-	-
Stage 2	290	343	-	381	226	-	-	-	0	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 12	36	444	55	36	336	588	-	-	752	-	-
Mov Cap-2 Maneuver	~ 12	36	-	55	36	-	-	-	-	-	-	-
Stage 1	160	207	-	302	330	-	-	-	-	-	-	-
Stage 2	165	330	-	311	207	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	\$ 364.8	46.5	0.3	0.5
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	588	-	47	54	336	752	-	-
HCM Lane V/C Ratio	0.037	-	1.282	0.609	0.408	0.086	-	-
HCM Control Delay (s)	11.4	-	\$ 364.8	144.9	22.9	10.2	-	-
HCM Lane LOS	B	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	5.7	2.4	1.9	0.3	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	0	0	773	0	0	943
Future Vol, veh/h	0	0	773	0	0	943
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	175	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	840	0	0	1025












Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1865	840	0
Stage 1	840	-	-
Stage 2	1025	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	80	365	795
Stage 1	424	-	-
Stage 2	346	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	80	365	795
Mov Cap-2 Maneuver	80	-	-
Stage 1	424	-	-
Stage 2	346	-	-

Approach	NW	NE	SW
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NERNWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	-	795	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 2010 Signalized Intersection Summary
 1: MD 108 & Sheppard Lane

MD 108
 Existing PM

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	42	161	503	759	528	55		
Future Volume (veh/h)	42	161	503	759	528	55		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863		
Adj Flow Rate, veh/h	44	169	565	834	562	0		
Adj No. of Lanes	0	0	1	1	1	1		
Peak Hour Factor	0.95	0.95	0.89	0.91	0.94	0.65		
Percent Heavy Veh, %	0	0	2	2	2	2		
Cap, veh/h	56	215	625	1268	644	548		
Arrive On Green	0.17	0.17	0.27	0.68	0.35	0.00		
Sat Flow, veh/h	333	1280	1774	1863	1863	1583		
Grp Volume(v), veh/h	214	0	565	834	562	0		
Grp Sat Flow(s),veh/h/ln	1620	0	1774	1863	1863	1583		
Q Serve(g_s), s	9.2	0.0	15.8	18.8	20.6	0.0		
Cycle Q Clear(g_c), s	9.2	0.0	15.8	18.8	20.6	0.0		
Prop In Lane	0.21	0.79	1.00			1.00		
Lane Grp Cap(c), veh/h	272	0	625	1268	644	548		
V/C Ratio(X)	0.79	0.00	0.90	0.66	0.87	0.00		
Avail Cap(c_a), veh/h	1224	0	761	2149	1382	1174		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	29.0	0.0	16.0	6.7	22.3	0.0		
Incr Delay (d2), s/veh	5.0	0.0	12.6	0.6	3.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	7.9	0.0	18.7	14.8	16.6	0.0		
LnGrp Delay(d),s/veh	34.0	0.0	28.5	7.3	26.2	0.0		
LnGrp LOS	C		C	A	C			
Approach Vol, veh/h	214			1399	562			
Approach Delay, s/veh	34.0			15.9	26.2			
Approach LOS	C			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.6		17.2	24.4	31.2		
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		
Max Green Setting (Gmax), s		84.0		55.0	25.0	54.0		
Max Q Clear Time (g_c+I1), s		20.8		11.2	17.8	22.6		
Green Ext Time (p_c), s		4.8		1.0	1.6	2.6		
Intersection Summary								
HCM 2010 Ctrl Delay			20.3					
HCM 2010 LOS			C					
Notes								
User approved volume balancing among the lanes for turning movement.								

HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108
 Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↶	↷	↵	↶↷		↵	↶↷	
Traffic Volume (veh/h)	31	15	24	249	18	492	19	876	231	229	501	16
Future Volume (veh/h)	31	15	24	249	18	492	19	876	231	229	501	16
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	31	15	24	262	0	492	19	876	231	229	501	16
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	109	142	1068	0	519	542	1304	344	374	1886	60
Arrive On Green	0.33	0.33	0.32	0.33	0.00	0.33	0.04	0.47	0.45	0.11	0.54	0.52
Sat Flow, veh/h	495	332	431	2726	0	1583	1774	2773	731	1774	3501	112
Grp Volume(v), veh/h	70	0	0	262	0	492	19	559	548	229	253	264
Grp Sat Flow(s),veh/h/ln	1258	0	0	1363	0	1583	1774	1770	1734	1774	1770	1843
Q Serve(g_s), s	0.3	0.0	0.0	3.2	0.0	29.1	0.5	23.5	23.7	5.9	7.4	7.4
Cycle Q Clear(g_c), s	2.8	0.0	0.0	5.9	0.0	29.1	0.5	23.5	23.7	5.9	7.4	7.4
Prop In Lane	0.44		0.34	1.00		1.00	1.00		0.42	1.00		0.06
Lane Grp Cap(c), veh/h	467	0	0	1068	0	519	542	832	815	374	953	993
V/C Ratio(X)	0.15	0.00	0.00	0.25	0.00	0.95	0.04	0.67	0.67	0.61	0.27	0.27
Avail Cap(c_a), veh/h	467	0	0	1068	0	519	611	995	975	562	1235	1286
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	23.5	0.0	31.4	12.2	19.7	20.1	15.6	11.9	12.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	26.8	0.0	4.3	4.4	1.6	0.7	0.7
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	2.4	0.0	0.0	4.6	0.0	23.2	0.5	18.1	18.1	5.6	6.8	7.1
LnGrp Delay(d),s/veh	22.8	0.0	0.0	23.6	0.0	58.2	12.2	24.0	24.5	17.2	12.6	12.6
LnGrp LOS	C			C		E	B	C	C	B	B	B
Approach Vol, veh/h	70			754			1126			746		
Approach Delay, s/veh	22.8			46.2			24.0			14.0		
Approach LOS	C			D			C			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	54.7		35.0	12.9	48.2		35.0				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	5	64.0		29.5	18.5	51.0		29.5				
Max Q Clear Time (g_c+12), s	5	9.4		4.8	7.9	25.7		31.1				
Green Ext Time (p_c), s	0.0	8.9		0.2	0.5	16.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				27.4								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108
 Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	99	17	172	66	13	25	93	985	69	18	732	60
Future Volume (veh/h)	99	17	172	66	13	25	93	985	69	18	732	60
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	99	17	172	66	13	25	93	985	69	18	732	60
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	333	50	316	196	45	48	581	2115	148	444	1955	160
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.17	0.09	0.63	0.63	0.05	0.59	0.56
Sat Flow, veh/h	1169	249	1583	544	224	243	1774	3356	235	1774	3313	271
Grp Volume(v), veh/h	116	0	172	104	0	0	93	519	535	18	391	401
Grp Sat Flow(s),veh/h/ln	1417	0	1583	1011	0	0	1774	1770	1821	1774	1770	1815
Q Serve(g_s), s	0.0	0.0	6.5	3.3	0.0	0.0	1.1	10.3	10.3	0.3	7.8	7.9
Cycle Q Clear(g_c), s	4.7	0.0	6.5	8.0	0.0	0.0	1.1	10.3	10.3	0.3	7.8	7.9
Prop In Lane	0.85		1.00	0.63		0.24	1.00		0.13	1.00		0.15
Lane Grp Cap(c), veh/h	382	0	316	289	0	0	581	1115	1148	444	1044	1071
V/C Ratio(X)	0.30	0.00	0.54	0.36	0.00	0.00	0.16	0.47	0.47	0.04	0.37	0.37
Avail Cap(c_a), veh/h	947	0	945	818	0	0	856	2443	2514	605	2258	2315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	24.1	25.4	0.0	0.0	4.1	6.5	6.5	5.2	7.2	7.3
Incr Delay (d2), s/veh	0.4	0.0	1.5	0.8	0.0	0.0	0.1	1.4	1.4	0.0	1.0	1.0
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	3.4	0.0	5.4	3.3	0.0	0.0	1.0	9.1	9.3	0.2	7.4	7.6
LnGrp Delay(d),s/veh	23.8	0.0	25.6	26.1	0.0	0.0	4.2	7.9	7.8	5.2	8.3	8.3
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		288			104			1147			810	
Approach Delay, s/veh		24.8			26.1			7.6			8.2	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	42.0		16.4	5.9	44.7		16.4				
Change Period (Y+Rc), s	4.5	5.5		6.0	4.5	5.5		6.0				
Max Green Setting (Gmax), s	4.5	82.5		37.0	7.5	89.5		37.0				
Max Q Clear Time (g_c+1), s	13.1	9.9		8.5	2.3	12.3		10.0				
Green Ext Time (p_c), s	0.2	16.6		1.0	0.0	26.9		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				10.7								
HCM 2010 LOS				B								

HCM Signalized Intersection Capacity Analysis
 4: MD 108 & MD 32 WB Ramps

MD 108
 Existing PM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	854	42	401	51	756	0	0	837	135	
Future Volume (vph)	0	0	0	854	42	401	51	756	0	0	837	135	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				3.0	3.0	3.0	3.0	3.0			3.0		
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95		
Flt				1.00	1.00	0.85	1.00	1.00			0.98		
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1681	1693	1583	1770	3539			3465		
Flt Permitted				0.95	0.96	1.00	0.20	1.00			1.00		
Satd. Flow (perm)				1681	1693	1583	364	3539			3465		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	0	0	854	42	401	51	756	0	0	837	135	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	7	0	
Lane Group Flow (vph)	0	0	0	427	469	401	51	756	0	0	965	0	
Turn Type				Perm	NA	Perm	custom	NA			NA		
Protected Phases					4		1	16			2		
Permitted Phases				4		4	6						
Actuated Green, G (s)				49.9	49.9	49.9	82.1	88.1			74.0		
Effective Green, g (s)				52.9	52.9	52.9	88.1	91.1			77.0		
Actuated g/C Ratio				0.35	0.35	0.35	0.59	0.61			0.51		
Clearance Time (s)				6.0	6.0	6.0	6.0				6.0		
Vehicle Extension (s)				3.0	3.0	3.0	3.0				5.0		
Lane Grp Cap (vph)				592	597	558	317	2149			1778		
v/s Ratio Prot							0.01	c0.21			c0.28		
v/s Ratio Perm				0.25	0.28	0.25	0.08						
v/c Ratio				0.72	0.79	0.72	0.16	0.35			0.54		
Uniform Delay, d1				42.1	43.5	42.1	28.4	14.7			24.6		
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00		
Incremental Delay, d2				4.3	6.7	4.4	0.2	0.1			1.2		
Delay (s)				46.5	50.2	46.5	28.6	14.8			25.8		
Level of Service				D	D	D	C	B			C		
Approach Delay (s)		0.0			47.8			15.7			25.8		
Approach LOS		A			D			B			C		
Intersection Summary													
HCM 2000 Control Delay			32.4		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			150.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			68.9%		ICU Level of Service						C		
Analysis Period (min)			15										

c Critical Lane Group

Intersection

Int Delay, s/veh 29.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↘	↑	↗	↘	↕	↕
Traffic Vol, veh/h	15	1	47	26	0	125	38	1129	83	80	575	1
Future Vol, veh/h	15	1	47	26	0	125	38	1129	83	80	575	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	5	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	1	6	6	6	0	2	0	6	6	6
Mvmt Flow	21	1	64	36	0	171	52	1547	114	110	788	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2746	2660	395	2266	2660	1547	789	0	-	1547	0	0
Stage 1	1009	1009	-	1651	1651	-	-	-	-	-	-	-
Stage 2	1737	1651	-	615	1009	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.915	7.39	6.59	6.29	4.1	-	-	4.19	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.59	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	43.3095	-	3.557	4.057	3.357	2.2	-	-	2.257	-	-
Pot Cap-1 Maneuver	~ 11	23	607	~ 24	21	~ 136	840	-	0	412	-	-
Stage 1	261	320	-	120	151	-	-	-	0	-	-	-
Stage 2	112	158	-	438	310	-	-	-	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	16	607	~ 15	14	~ 136	840	-	-	412	-	-
Mov Cap-2 Maneuver	-	16	-	~ 15	14	-	-	-	-	-	-	-
Stage 1	245	235	-	113	142	-	-	-	-	-	-	-
Stage 2	-	148	-	285	227	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 384.2	0.3	2.1
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	840	-	-	15	136	412	-	-
HCM Lane V/C Ratio	0.062	-	-	2.374	1.259	0.266	-	-
HCM Control Delay (s)	9.6	-	\$ 1147.6	225.4	16.9	-	-	-
HCM Lane LOS	A	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.2	10.5	1.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	0	0	1262	7	0	689
Future Vol, veh/h	0	0	1262	7	0	689
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	175	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1372	8	0	749













Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	2121	1372	0 0 1380 0
Stage 1	1372	-	- - - -
Stage 2	749	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	55	179	- - 497 -
Stage 1	236	-	- - - -
Stage 2	467	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	55	179	- - 497 -
Mov Cap-2 Maneuver	55	-	- - - -
Stage 1	236	-	- - - -
Stage 2	467	-	- - - -

Approach	NW	NE	SW
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	-	-	497	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	0	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-













HCM 2010 Signalized Intersection Summary
1: MD 108 & Sheppard Lane

MD 108 Erickson
Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↶		↵	↶	↶	↵	↶	↶
Traffic Volume (veh/h)	93	14	453	67	11	16	210	685	27	40	625	44
Future Volume (veh/h)	93	14	453	67	11	16	210	685	27	40	625	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	107	15	521	73	12	17	241	787	29	43	718	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.87	0.92	0.87	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	22	485	177	269	380	248	1003	853	184	756	643
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.10	0.54	0.54	0.41	0.41	0.00
Sat Flow, veh/h	237	58	1261	865	699	990	1774	1863	1583	667	1863	1583
Grp Volume(v), veh/h	643	0	0	73	0	29	241	787	29	43	718	0
Grp Sat Flow(s),veh/h/ln	1556	0	0	865	0	1688	1774	1863	1583	667	1863	1583
Q Serve(g_s), s	50.5	0.0	0.0	0.0	0.0	1.5	13.3	48.3	1.2	7.9	53.3	0.0
Cycle Q Clear(g_c), s	55.0	0.0	0.0	25.0	0.0	1.5	13.3	48.3	1.2	37.2	53.3	0.0
Prop In Lane	0.17		0.81	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	628	0	0	177	0	649	248	1003	853	184	756	643
V/C Ratio(X)	1.02	0.00	0.00	0.41	0.00	0.04	0.97	0.78	0.03	0.23	0.95	0.00
Avail Cap(c_a), veh/h	628	0	0	177	0	649	248	1094	930	217	846	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.2	0.0	0.0	34.8	0.0	27.6	40.6	26.4	15.5	48.8	41.1	0.0
Incr Delay (d2), s/veh	42.3	0.0	0.0	1.5	0.0	0.0	48.8	3.5	0.0	0.6	18.7	0.0
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	57.8	0.0	0.0	4.2	0.0	1.3	18.8	34.0	1.0	2.7	40.4	0.0
LnGrp Delay(d),s/veh	87.5	0.0	0.0	36.3	0.0	27.6	89.4	29.9	15.5	49.4	59.8	0.0
LnGrp LOS	F			D		C	F	C	B	D	E	
Approach Vol, veh/h		643			102			1057			761	
Approach Delay, s/veh		87.5			33.8			43.1			59.2	
Approach LOS		F			C			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		83.1		60.0	19.0	64.1		60.0				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		84.0		55.0	14.0	65.0		55.0				
Max Q Clear Time (g_c+I1), s		50.3		57.0	15.3	55.3		27.0				
Green Ext Time (p_c), s		4.4		0.0	0.0	2.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			58.7									
HCM 2010 LOS			E									





















HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108 Erickson
 Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↵	↶	↵	↶	↶	↵	↶	
Traffic Volume (veh/h)	5	2	8	151	12	302	14	711	160	282	882	9
Future Volume (veh/h)	5	2	8	151	12	302	14	711	160	282	882	9
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	2	8	160	0	302	14	711	160	282	882	9
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	80	192	903	0	390	437	1347	303	528	2024	21
Arrive On Green	0.25	0.25	0.23	0.25	0.00	0.25	0.04	0.47	0.44	0.14	0.56	0.53
Sat Flow, veh/h	357	325	780	2798	0	1583	1774	2872	646	1774	3589	37
Grp Volume(v), veh/h	15	0	0	160	0	302	14	438	433	282	435	456
Grp Sat Flow(s),veh/h/ln	1462	0	0	1399	0	1583	1774	1770	1749	1774	1770	1856
Q Serve(g_s), s	0.0	0.0	0.0	2.5	0.0	12.2	0.3	12.0	12.2	4.9	9.8	9.8
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.0	0.0	12.2	0.3	12.0	12.2	4.9	9.8	9.8
Prop In Lane	0.33		0.53	1.00		1.00	1.00		0.37	1.00		0.02
Lane Grp Cap(c), veh/h	430	0	0	903	0	390	437	830	820	528	998	1047
V/C Ratio(X)	0.03	0.00	0.00	0.18	0.00	0.78	0.03	0.53	0.53	0.53	0.44	0.44
Avail Cap(c_a), veh/h	430	0	0	1029	0	461	900	1313	1297	822	1313	1377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	0.0	20.6	0.0	24.1	8.8	12.9	13.2	8.4	8.7	8.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	6.9	0.0	2.4	2.4	0.8	1.4	1.3
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	0.4	0.0	0.0	2.2	0.0	10.0	0.2	10.5	10.5	4.3	8.8	9.1
LnGrp Delay(d),s/veh	19.9	0.0	0.0	20.7	0.0	31.0	8.8	15.3	15.6	9.3	10.0	10.0
LnGrp LOS	B			C		C	A	B	B	A	B	A
Approach Vol, veh/h		15			462			885			1173	
Approach Delay, s/veh		19.9			27.4			15.3			9.8	
Approach LOS		B			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	41.8		20.9	12.6	35.2		20.9				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	19.0	48.0		12.0	19.0	48.0		18.0				
Max Q Clear Time (g_c+I1), s	2.3	11.8		2.5	6.9	14.2		14.2				
Green Ext Time (p_c), s	0.0	15.8		0.0	0.7	15.1		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			15.0									
HCM 2010 LOS			B									
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108 Erickson
 Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	5	56	47	9	3	193	804	54	8	999	87
Future Volume (veh/h)	24	5	56	47	9	3	193	804	54	8	999	87
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	24	5	56	47	9	3	193	804	54	8	999	87
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	52	250	259	44	11	506	2241	150	531	1985	173
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.13	0.10	0.67	0.67	0.04	0.60	0.57
Sat Flow, veh/h	1219	328	1583	1025	282	70	1774	3366	226	1774	3295	287
Grp Volume(v), veh/h	29	0	56	59	0	0	193	423	435	8	536	550
Grp Sat Flow(s),veh/h/ln	1547	0	1583	1377	0	0	1774	1770	1823	1774	1770	1812
Q Serve(g_s), s	0.0	0.0	2.0	1.8	0.0	0.0	2.3	6.9	6.9	0.1	11.4	11.5
Cycle Q Clear(g_c), s	0.9	0.0	2.0	2.7	0.0	0.0	2.3	6.9	6.9	0.1	11.4	11.5
Prop In Lane	0.83		1.00	0.80		0.05	1.00		0.12	1.00		0.16
Lane Grp Cap(c), veh/h	344	0	250	315	0	0	506	1178	1213	531	1066	1092
V/C Ratio(X)	0.08	0.00	0.22	0.19	0.00	0.00	0.38	0.36	0.36	0.02	0.50	0.50
Avail Cap(c_a), veh/h	709	0	646	668	0	0	886	1686	1736	1022	1699	1740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	24.3	24.7	0.0	0.0	5.1	4.9	4.9	4.7	7.5	7.6
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.3	0.0	0.0	0.5	0.9	0.8	0.0	1.7	1.7
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	0.8	0.0	1.7	1.8	0.0	0.0	2.1	6.4	6.6	0.1	10.0	10.3
LnGrp Delay(d),s/veh	23.9	0.0	24.8	24.9	0.0	0.0	5.6	5.7	5.7	4.7	9.2	9.3
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		85			59			1051			1094	
Approach Delay, s/veh		24.5			24.9			5.7			9.2	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	42.8		13.4	5.7	47.0		13.4				
Change Period (Y+Rc), s	5.0	* 6		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	19.0	* 61		24.0	19.0	60.0		24.0				
Max Q Clear Time (g_c+I1), s	4.3	13.5		4.0	2.1	8.9		4.7				
Green Ext Time (p_c), s	0.5	23.3		0.2	0.0	17.3		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis
 4: MD 108 & MD 32 WB Ramps

MD 108 Erickson
 Background AM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	519	0	367	47	733	0	0	931	112	
Future Volume (vph)	0	0	0	519	0	367	47	733	0	0	931	112	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				3.0	3.0	3.0	3.0	3.0			3.0		
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95		
Fr _t				1.00	1.00	0.85	1.00	1.00			0.98		
Fl _t Protected				0.95	0.95	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1681	1681	1583	1770	3539			3482		
Fl _t Permitted				0.95	0.95	1.00	0.18	1.00			1.00		
Satd. Flow (perm)				1681	1681	1583	335	3539			3482		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	0	0	519	0	367	47	733	0	0	931	112	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	7	0	
Lane Group Flow (vph)	0	0	0	259	260	367	47	733	0	0	1036	0	
Turn Type				Perm	NA	Perm	custom	NA			NA		
Protected Phases					4		1	16			2		
Permitted Phases				4		4	6						
Actuated Green, G (s)				33.6	33.6	33.6	68.4	74.4			60.3		
Effective Green, g (s)				36.6	36.6	36.6	74.4	77.4			63.3		
Actuated g/C Ratio				0.31	0.31	0.31	0.62	0.65			0.53		
Clearance Time (s)				6.0	6.0	6.0	6.0				6.0		
Vehicle Extension (s)				3.0	3.0	3.0	3.0				5.0		
Lane Grp Cap (vph)				512	512	482	340	2282			1836		
v/s Ratio Prot							0.01	c0.21			c0.30		
v/s Ratio Perm				0.15	0.15	c0.23	0.07						
v/c Ratio				0.51	0.51	0.76	0.14	0.32			0.56		
Uniform Delay, d1				34.3	34.3	37.7	20.9	9.5			19.1		
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00		
Incremental Delay, d2				0.8	0.8	7.0	0.2	0.1			1.3		
Delay (s)				35.1	35.1	44.7	21.1	9.6			20.3		
Level of Service				D	D	D	C	A			C		
Approach Delay (s)		0.0			39.1			10.3			20.3		
Approach LOS		A			D			B			C		
Intersection Summary													
HCM 2000 Control Delay			23.6		HCM 2000 Level of Service							C	
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			60.1%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group

Intersection

Int Delay, s/veh 62.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↘	↑	↗	↘	↕	↕
Traffic Vol, veh/h	11	1	36	25	1	109	17	833	34	51	1073	0
Future Vol, veh/h	11	1	36	25	1	109	17	833	34	51	1073	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	5	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	2	2	0	2	0	2	0	2	2	0
Mvmt Flow	15	1	49	34	1	149	23	1141	47	70	1470	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2872	2797	735	2063	2797	1141	1470	0	-	1141	0	0
Stage 1	1610	1610	-	1187	1187	-	-	-	-	-	-	-
Stage 2	1262	1187	-	876	1610	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.93	7.33	6.5	6.23	4.1	-	-	4.13	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.53	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.319	3.519	4	3.319	2.2	-	-	2.219	-	-
Pot Cap-1 Maneuver	~9	19	363	36	19	243	465	-	0	610	-	-
Stage 1	111	165	-	229	264	-	-	-	0	-	-	-
Stage 2	210	264	-	311	165	-	-	-	0	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~3	16	363	~26	16	243	465	-	-	610	-	-
Mov Cap-2 Maneuver	~3	16	-	~26	16	-	-	-	-	-	-	-
Stage 1	106	146	-	218	251	-	-	-	-	-	-	-
Stage 2	77	251	-	236	146	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	\$ 2404.9	141.5	0.3	0.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	465	-	13	25	243	610	-	-
HCM Lane V/C Ratio	0.05	-	5.058	1.425	0.614	0.115	-	-
HCM Control Delay (s)	13.2	\$ 2404.9	\$ 563.1	40.9	11.7	-	-	-
HCM Lane LOS	B	-	F	F	E	B	-	-
HCM 95th %tile Q(veh)	0.2	-	9.3	4.4	3.6	0.4	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	0	17	905	54	0	1145
Future Vol, veh/h	0	17	905	54	0	1145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	175	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	984	59	0	1245






















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	2229	984	0 0 1043 0
Stage 1	984	-	- - - -
Stage 2	1245	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	47	301	- - 667 -
Stage 1	362	-	- - - -
Stage 2	271	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	47	301	- - 667 -
Mov Cap-2 Maneuver	47	-	- - - -
Stage 1	362	-	- - - -
Stage 2	271	-	- - - -

Approach	NW	NE	SW
HCM Control Delay, s	17.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NERNWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	-	301	667
HCM Lane V/C Ratio	-	-	-	0.061	-
HCM Control Delay (s)	-	-	0	17.7	0
HCM Lane LOS	-	-	A	C	A
HCM 95th %tile Q(veh)	-	-	-	0.2	0

HCM 2010 Signalized Intersection Summary
 1: MD 108 & Sheppard Lane

MD 108 Erickson
 Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	14	182	81	13	20	556	908	27	41	631	60
Future Volume (veh/h)	46	14	182	81	13	20	556	908	27	41	631	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	48	15	192	88	14	22	625	998	29	45	671	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.95	0.92	0.95	0.92	0.92	0.92	0.89	0.91	0.92	0.92	0.94	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	29	218	163	120	189	642	1366	1161	258	696	591
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.32	0.73	0.73	0.37	0.37	0.00
Sat Flow, veh/h	231	157	1182	1170	654	1028	1774	1863	1583	547	1863	1583
Grp Volume(v), veh/h	255	0	0	88	0	36	625	998	29	45	671	0
Grp Sat Flow(s),veh/h/ln	1570	0	0	1170	0	1681	1774	1863	1583	547	1863	1583
Q Serve(g_s), s	15.9	0.0	0.0	0.9	0.0	2.4	41.0	41.0	0.7	7.5	47.0	0.0
Cycle Q Clear(g_c), s	21.0	0.0	0.0	21.9	0.0	2.4	41.0	41.0	0.7	7.5	47.0	0.0
Prop In Lane	0.19		0.75	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	0	0	163	0	309	642	1366	1161	258	696	591
V/C Ratio(X)	0.79	0.00	0.00	0.54	0.00	0.12	0.97	0.73	0.02	0.17	0.96	0.00
Avail Cap(c_a), veh/h	501	0	0	308	0	517	642	1383	1176	263	712	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.9	0.0	0.0	53.9	0.0	45.4	37.9	10.2	4.8	28.5	40.9	0.0
Incr Delay (d2), s/veh	4.7	0.0	0.0	2.8	0.0	0.2	28.9	2.0	0.0	0.3	24.9	0.0
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	14.6	0.0	0.0	5.9	0.0	2.0	36.4	29.2	0.5	2.1	37.9	0.0
LnGrp Delay(d),s/veh	57.6	0.0	0.0	56.6	0.0	45.5	66.7	12.2	4.8	28.8	65.8	0.0
LnGrp LOS	E			E		D	E	B	A	C	E	
Approach Vol, veh/h		255			124			1652			716	
Approach Delay, s/veh		57.6			53.4			32.7			63.5	
Approach LOS		E			D			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		103.8		29.5	48.0	55.8		29.5				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		* 5				
Max Green Setting (Gmax), s		99.0		40.0	43.0	51.0		* 41				
Max Q Clear Time (g_c+I1), s		43.0		23.0	43.0	49.0		23.9				
Green Ext Time (p_c), s		6.9		1.5	0.0	0.8		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			44.0									
HCM 2010 LOS			D									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108 Erickson
 Background PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↶	↷	↵	↶↷		↵	↶↷	
Traffic Volume (veh/h)	34	16	26	272	20	564	21	1126	254	275	714	17
Future Volume (veh/h)	34	16	26	272	20	564	21	1126	254	275	714	17
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	34	16	26	286	0	564	21	1126	254	275	714	17
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	95	124	984	0	476	468	1422	319	341	2032	48
Arrive On Green	0.30	0.30	0.29	0.30	0.00	0.30	0.04	0.49	0.48	0.12	0.58	0.56
Sat Flow, veh/h	480	316	414	2718	0	1583	1774	2875	644	1774	3533	84
Grp Volume(v), veh/h	76	0	0	286	0	564	21	690	690	275	357	374
Grp Sat Flow(s),veh/h/ln1210	0	0	0	1359	0	1583	1774	1770	1749	1774	1770	1848
Q Serve(g_s), s	1.3	0.0	0.0	3.5	0.0	31.5	0.6	33.9	34.7	7.9	11.3	11.3
Cycle Q Clear(g_c), s	3.8	0.0	0.0	7.3	0.0	31.5	0.6	33.9	34.7	7.9	11.3	11.3
Prop In Lane	0.45		0.34	1.00		1.00	1.00		0.37	1.00		0.05
Lane Grp Cap(c), veh/h	413	0	0	984	0	476	468	875	865	341	1018	1063
V/C Ratio(X)	0.18	0.00	0.00	0.29	0.00	1.19	0.04	0.79	0.80	0.81	0.35	0.35
Avail Cap(c_a), veh/h	413	0	0	984	0	476	526	911	901	476	1131	1181
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh 27.0	0.0	0.0	0.0	28.0	0.0	36.7	12.1	22.0	22.5	22.0	11.9	11.9
Incr Delay (d2), s/veh 0.2	0.0	0.0	0.0	0.2	0.0	103.1	0.0	7.1	7.6	6.9	1.0	0.9
Initial Q Delay(d3),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	0.0
%ile BackOfQ(95%),veh/lr3.0	0.0	0.0	0.0	5.8	0.0	49.3	0.5	25.2	25.6	13.0	9.7	10.0
LnGrp Delay(d),s/veh 27.2	0.0	0.0	0.0	28.2	0.0	139.8	12.1	29.1	30.0	28.9	12.8	12.8
LnGrp LOS	C			C		F	B	C	C	C	B	B
Approach Vol, veh/h	76			850			1401			1006		
Approach Delay, s/veh	27.2			102.3			29.3			17.2		
Approach LOS	C			F			C			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s6.6	63.3			35.0	15.0	54.9		35.0				
Change Period (Y+Rc), s 4.5	6.0			5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s 5	64.0			29.5	18.5	51.0		29.5				
Max Q Clear Time (g_c+12.6	13.3			5.8	9.9	36.7		33.5				
Green Ext Time (p_c), s 0.0	13.8			0.3	0.6	12.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				44.2								
HCM 2010 LOS				D								
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108 Erickson
 Background PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	24	221	72	17	27	125	1237	75	20	960	72
Future Volume (veh/h)	117	24	221	72	17	27	125	1237	75	20	960	72
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	117	24	221	72	17	27	125	1237	75	20	960	72
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	56	349	162	41	43	455	2209	134	337	2076	156
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.20	0.07	0.65	0.65	0.04	0.62	0.60
Sat Flow, veh/h	1058	254	1583	451	188	194	1774	3391	205	1774	3338	250
Grp Volume(v), veh/h	141	0	221	116	0	0	125	645	667	20	509	523
Grp Sat Flow(s),veh/h/ln	1312	0	1583	833	0	0	1774	1770	1827	1774	1770	1819
Q Serve(g_s), s	0.0	0.0	11.9	6.3	0.0	0.0	2.1	18.7	18.8	0.4	14.3	14.4
Cycle Q Clear(g_c), s	9.0	0.0	11.9	15.3	0.0	0.0	2.1	18.7	18.8	0.4	14.3	14.4
Prop In Lane	0.83		1.00	0.62		0.23	1.00		0.11	1.00		0.14
Lane Grp Cap(c), veh/h	359	0	349	246	0	0	455	1153	1190	337	1100	1131
V/C Ratio(X)	0.39	0.00	0.63	0.47	0.00	0.00	0.27	0.56	0.56	0.06	0.46	0.46
Avail Cap(c_a), veh/h	653	0	676	512	0	0	638	1747	1803	440	1615	1660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	0.0	33.1	36.6	0.0	0.0	6.2	9.0	9.0	7.1	9.4	9.5
Incr Delay (d2), s/veh	0.7	0.0	1.9	1.4	0.0	0.0	0.3	2.0	1.9	0.1	1.4	1.4
Initial Q Delay(d3),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
%ile BackOfQ(95%),veh/ln	5.8	0.0	9.1	5.3	0.0	0.0	1.8	14.7	15.1	0.3	11.8	12.1
LnGrp Delay(d),s/veh	32.6	0.0	35.0	38.0	0.0	0.0	6.6	10.9	10.9	7.2	10.8	10.9
LnGrp LOS	C		D	D			A	B	B	A	B	B
Approach Vol, veh/h		362			116			1437			1052	
Approach Delay, s/veh		34.1			38.0			10.5			10.8	
Approach LOS		C			D			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	60.8		23.6	6.5	63.5		23.6				
Change Period (Y+Rc), s	4.5	5.5		6.0	4.5	5.5		6.0				
Max Green Setting (Gmax), s	4.5	82.5		37.0	7.5	89.5		37.0				
Max Q Clear Time (g_c+14), s	14.5	16.4		13.9	2.4	20.8		17.3				
Green Ext Time (p_c), s	0.2	24.8		1.3	0.0	37.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			14.6									
HCM 2010 LOS			B									

HCM Signalized Intersection Capacity Analysis
 4: MD 108 & MD 32 WB Ramps

MD 108 Erickson
 Background PM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	951	46	500	73	948	0	0	1059	197	
Future Volume (vph)	0	0	0	951	46	500	73	948	0	0	1059	197	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				3.0	3.0	3.0	3.0	3.0			3.0		
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95		
Fr _t				1.00	1.00	0.85	1.00	1.00			0.98		
Fl _t Protected				0.95	0.96	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1681	1692	1583	1770	3539			3456		
Fl _t Permitted				0.95	0.96	1.00	0.08	1.00			1.00		
Satd. Flow (perm)				1681	1692	1583	158	3539			3456		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	0	0	951	46	500	73	948	0	0	1059	197	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	9	0	
Lane Group Flow (vph)	0	0	0	475	522	500	73	948	0	0	1247	0	
Turn Type				Perm	NA	Perm	custom	NA			NA		
Protected Phases					4		1	16			2		
Permitted Phases				4		4	6						
Actuated Green, G (s)				54.8	54.8	54.8	77.2	83.2			67.2		
Effective Green, g (s)				57.8	57.8	57.8	83.2	86.2			70.2		
Actuated g/C Ratio				0.39	0.39	0.39	0.55	0.57			0.47		
Clearance Time (s)				6.0	6.0	6.0	6.0				6.0		
Vehicle Extension (s)				3.0	3.0	3.0	3.0				5.0		
Lane Grp Cap (vph)				647	651	609	227	2033			1617		
v/s Ratio Prot							0.03	c0.27			c0.36		
v/s Ratio Perm				0.28	0.31	c0.32	0.15						
v/c Ratio				0.73	0.80	0.82	0.32	0.47			0.77		
Uniform Delay, d1				39.5	41.0	41.4	49.1	18.5			33.2		
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00		
Incremental Delay, d2				4.3	7.1	8.7	0.8	0.2			3.6		
Delay (s)				43.8	48.1	50.2	49.9	18.7			36.8		
Level of Service				D	D	D	D	B			D		
Approach Delay (s)		0.0			47.4			20.9			36.8		
Approach LOS		A			D			C			D		
Intersection Summary													
HCM 2000 Control Delay			36.7		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			150.0		Sum of lost time (s)					9.0			
Intersection Capacity Utilization			79.8%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

Intersection												
Int Delay, s/veh	86.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↘	↑	↗	↘	↕	↕
Traffic Vol, veh/h	16	1	51	28	0	137	42	1378	91	87	770	1
Future Vol, veh/h	16	1	51	28	0	137	42	1378	91	87	770	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	5	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	1	6	6	6	0	2	0	6	6	6
Mvmt Flow	22	1	70	38	0	188	58	1888	125	119	1055	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3392	3298	528	2770	3298	1888	1056	0	-	1888	0	0
Stage 1	1294	1294	-	2004	2004	-	-	-	-	-	-	-
Stage 2	2098	2004	-	766	1294	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.915	7.39	6.59	6.29	4.1	-	-	4.19	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.59	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	43.3095		3.557	4.057	3.357	2.2	-	-	2.257	-	-
Pot Cap-1 Maneuver	~ 4	9	498	~ 10	8	~ 84	667	-	0	302	-	-
Stage 1	175	235	-	74	100	-	-	-	0	-	-	-
Stage 2	69	105	-	355	226	-	-	-	0	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	-	5	498	~ 5	4	~ 84	667	-	-	302	-	-
Mov Cap-2 Maneuver	-	5	-	~ 5	4	-	-	-	-	-	-	-
Stage 1	160	142	-	68	91	-	-	-	-	-	-	-
Stage 2	-	96	-	183	137	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 1305.3	0.3	2.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	667	-	-	5	84	302	-	-
HCM Lane V/C Ratio	0.086	-	-	7.671	2.234	0.395	-	-
HCM Control Delay (s)	10.9	-	\$ 4402.9	\$ 672.2	24.5	-	-	
HCM Lane LOS	B	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.3	-	-	6.4	17.1	1.8	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	0	21	1470	54	0	894
Future Vol, veh/h	0	21	1470	54	0	894
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	175	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	1598	59	0	972























Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	2570	1598	0	0	1657	0
Stage 1	1598	-	-	-	-	-
Stage 2	972	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	29	131	-	-	389	-
Stage 1	182	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	29	131	-	-	389	-
Mov Cap-2 Maneuver	29	-	-	-	-	-
Stage 1	182	-	-	-	-	-
Stage 2	367	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	38.2	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	-	131	389	-
HCM Lane V/C Ratio	-	-	-	0.174	-	-
HCM Control Delay (s)	-	-	0	38.2	0	-
HCM Lane LOS	-	-	A	E	A	-
HCM 95th %tile Q(veh)	-	-	-	0.6	0	-

HCM 2010 Signalized Intersection Summary
 1: MD 108 & Sheppard Lane

MD 108 Erickson
 2023 Total AM w/improvement & Traffic Adjustment

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	14	466	67	11	16	217	703	27	40	658	44
Future Volume (veh/h)	93	14	466	67	11	16	217	703	27	40	658	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	15	357	73	12	17	236	764	0	43	715	48
Adj No. of Lanes	0	1	1	1	1	0	1	1	1	1	2	1
Peak Hour Factor	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	396	64	408	102	40	57	403	831	706	164	1312	587
Arrive On Green	0.26	0.26	0.26	0.06	0.06	0.06	0.10	0.45	0.00	0.03	0.37	0.37
Sat Flow, veh/h	1538	248	1583	1774	699	990	1774	1863	1583	1774	3539	1583
Grp Volume(v), veh/h	108	0	357	73	0	29	236	764	0	43	715	48
Grp Sat Flow(s),veh/h/ln	1786	0	1583	1774	0	1688	1774	1863	1583	1774	1770	1583
Q Serve(g_s), s	4.8	0.0	21.5	4.0	0.0	1.6	7.7	38.4	0.0	1.5	15.9	2.0
Cycle Q Clear(g_c), s	4.8	0.0	21.5	4.0	0.0	1.6	7.7	38.4	0.0	1.5	15.9	2.0
Prop In Lane	0.86		1.00	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	460	0	408	102	0	97	403	831	706	164	1312	587
V/C Ratio(X)	0.23	0.00	0.88	0.71	0.00	0.30	0.58	0.92	0.00	0.26	0.54	0.08
Avail Cap(c_a), veh/h	717	0	636	178	0	169	541	1384	1176	204	2167	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	0.0	35.5	46.1	0.0	45.0	17.1	25.9	0.0	23.6	24.7	20.3
Incr Delay (d2), s/veh	0.3	0.0	8.4	8.8	0.0	1.7	1.3	6.3	0.0	0.8	0.4	0.1
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.4	0.0	10.4	2.2	0.0	0.8	3.8	21.0	0.0	0.8	7.8	0.9
LnGrp Delay(d),s/veh	29.5	0.0	43.9	54.9	0.0	46.7	18.5	32.2	0.0	24.4	25.1	20.4
LnGrp LOS	C		D	D		D	B	C		C	C	C
Approach Vol, veh/h		465			102			1000			806	
Approach Delay, s/veh		40.5			52.6			29.0			24.8	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	50.4		30.6	15.3	42.9		10.8				
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s	5.0	74.0		40.0	18.0	61.0		10.0				
Max Q Clear Time (g_c+I1), s	3.5	40.4		23.5	9.7	17.9		6.0				
Green Ext Time (p_c), s	0.0	4.1		2.1	0.6	4.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			30.8									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108 Erickson
 2023 Total AM w/improvement & Traffic Adjustment

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↶	↷	↵	↶	↷	↵	↶	↷
Traffic Volume (veh/h)	5	2	8	113	12	302	14	796	160	282	966	9
Future Volume (veh/h)	5	2	8	113	12	302	14	796	160	282	966	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	2	8	122	0	211	14	796	160	282	966	9
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	8	34	663	0	296	384	1419	285	472	2052	19
Arrive On Green	0.04	0.04	0.03	0.19	0.00	0.19	0.04	0.48	0.46	0.13	0.57	0.55
Sat Flow, veh/h	559	224	894	3548	0	1583	1774	2938	590	1774	3593	33
Grp Volume(v), veh/h	15	0	0	122	0	211	14	479	477	282	476	499
Grp Sat Flow(s),veh/h/ln	1677	0	0	1774	0	1583	1774	1770	1759	1774	1770	1857
Q Serve(g_s), s	0.7	0.0	0.0	2.4	0.0	10.6	0.3	16.2	16.4	6.0	13.3	13.3
Cycle Q Clear(g_c), s	0.7	0.0	0.0	2.4	0.0	10.6	0.3	16.2	16.4	6.0	13.3	13.3
Prop In Lane	0.33		0.53	1.00		1.00	1.00		0.34	1.00		0.02
Lane Grp Cap(c), veh/h	63	0	0	663	0	296	384	855	850	472	1011	1061
V/C Ratio(X)	0.24	0.00	0.00	0.18	0.00	0.71	0.04	0.56	0.56	0.60	0.47	0.47
Avail Cap(c_a), veh/h	218	0	0	1596	0	712	463	1403	1394	667	1676	1758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	0.0	0.0	28.9	0.0	32.2	10.4	15.5	15.8	11.1	10.6	10.6
Incr Delay (d2), s/veh	1.9	0.0	0.0	0.1	0.0	3.2	0.0	2.7	2.7	1.2	1.6	1.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.2	0.0	4.9	0.2	8.5	8.5	3.1	6.9	7.2
LnGrp Delay(d),s/veh	41.6	0.0	0.0	29.1	0.0	35.4	10.5	18.1	18.4	12.3	12.2	12.1
LnGrp LOS	D			C		D	B	B	B	B	B	B
Approach Vol, veh/h		15			333			970			1257	
Approach Delay, s/veh		41.6			33.1			18.2			12.2	
Approach LOS		D			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.7	43.8		7.2	6.3	51.3		19.8				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	18.0	64.0		9.0	5.0	77.0		36.0				
Max Q Clear Time (g_c+1/3), s	18.4			2.7	2.3	15.3		12.6				
Green Ext Time (p_c), s	0.7	19.4		0.0	0.0	22.1		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				17.3								
HCM 2010 LOS				B								
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108 Erickson
 2023 Total AM w/improvement & Traffic Adjustment

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	24	5	56	47	9	3	193	889	54	8	1045	87
Future Volume (veh/h)	24	5	56	47	9	3	193	889	54	8	1045	87
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	24	5	56	47	9	3	193	889	54	8	1045	87
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	47	228	234	40	10	492	2359	143	504	2116	176
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.12	0.09	0.70	0.70	0.04	0.64	0.61
Sat Flow, veh/h	1230	330	1583	1014	279	69	1774	3390	206	1774	3308	275
Grp Volume(v), veh/h	29	0	56	59	0	0	193	464	479	8	559	573
Grp Sat Flow(s),veh/h/ln	1559	0	1583	1361	0	0	1774	1770	1826	1774	1770	1814
Q Serve(g_s), s	0.0	0.0	2.3	2.1	0.0	0.0	2.3	7.9	7.9	0.1	12.2	12.3
Cycle Q Clear(g_c), s	1.0	0.0	2.3	3.1	0.0	0.0	2.3	7.9	7.9	0.1	12.2	12.3
Prop In Lane	0.83		1.00	0.80		0.05	1.00		0.11	1.00		0.15
Lane Grp Cap(c), veh/h	314	0	228	284	0	0	492	1232	1271	504	1132	1160
V/C Ratio(X)	0.09	0.00	0.25	0.21	0.00	0.00	0.39	0.38	0.38	0.02	0.49	0.49
Avail Cap(c_a), veh/h	819	0	776	772	0	0	735	2361	2437	607	2121	2174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	27.9	28.3	0.0	0.0	4.9	4.6	4.6	4.3	7.0	7.1
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.4	0.0	0.0	0.5	0.9	0.9	0.0	1.5	1.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.5	0.0	1.0	1.1	0.0	0.0	1.2	4.2	4.3	0.1	6.4	6.6
LnGrp Delay(d),s/veh	27.5	0.0	28.4	28.7	0.0	0.0	5.4	5.5	5.5	4.3	8.5	8.6
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h	85		59				1136			1140		
Approach Delay, s/veh	28.1		28.7				5.5			8.5		
Approach LOS	C		C				A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	50.0		13.6	5.8	54.1		13.6				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	85.0		33.0	5.0	95.0		33.0				
Max Q Clear Time (g_c+14), s	14.3			4.3	2.1	9.9		5.1				
Green Ext Time (p_c), s	0.4	29.6		0.2	0.0	22.6		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			8.3									
HCM 2010 LOS			A									























HCM 2010 Signalized Intersection Summary
 4: MD 32 WB Ramp & MD 108

MD 108 Erickson
 2023 Total AM w/improvement & Traffic Adjustment

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	519	0	406	47	779	0	0	963	126
Future Volume (veh/h)	0	0	0	519	0	406	47	779	0	0	963	126
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				564	0	441	51	847	0	0	1047	137
Adj No. of Lanes				2	0	1	1	2	0	0	2	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1162	0	519	204	1864	0	0	1346	176
Arrive On Green				0.33	0.00	0.33	0.03	0.53	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3548	0	1583	1774	3632	0	0	3241	412
Grp Volume(v), veh/h				564	0	441	51	847	0	0	588	596
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1770	0	0	1770	1790
Q Serve(g_s), s				11.3	0.0	23.2	1.4	13.3	0.0	0.0	25.4	25.5
Cycle Q Clear(g_c), s				11.3	0.0	23.2	1.4	13.3	0.0	0.0	25.4	25.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.23
Lane Grp Cap(c), veh/h				1162	0	519	204	1864	0	0	756	765
V/C Ratio(X)				0.49	0.00	0.85	0.25	0.45	0.00	0.00	0.78	0.78
Avail Cap(c_a), veh/h				2225	0	993	267	3210	0	0	1367	1383
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	28.0	17.1	13.1	0.0	0.0	21.9	21.9
Incr Delay (d2), s/veh				0.3	0.0	4.0	0.6	0.2	0.0	0.0	1.8	1.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	0.0	10.6	0.7	6.5	0.0	0.0	12.8	13.0
LnGrp Delay(d),s/veh				24.3	0.0	32.0	17.7	13.3	0.0	0.0	23.7	23.7
LnGrp LOS				C		C	B	B			C	C
Approach Vol, veh/h					1005			898			1184	
Approach Delay, s/veh					27.7			13.6			23.7	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			8.9	45.2		35.3				
Change Period (Y+Rc), s		7.0			6.0	7.0		6.0				
Max Green Setting (Gmax), s		81.0			6.0	69.0		56.0				
Max Q Clear Time (g_c+I1), s		15.3			3.4	27.5		25.2				
Green Ext Time (p_c), s		7.5			0.0	10.7		4.1				
Intersection Summary												
HCM 2010 Ctrl Delay				22.0								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 2010 Signalized Intersection Summary
 6: MD 108 & New Road/Linden Linthicum Lane

MD 108 Erickson
 2023 Total AM w/improvement & Traffic Adjustment

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	1	68	63	1	109	76	859	34	51	1087	23
Future Volume (veh/h)	48	1	68	63	1	109	76	859	34	51	1087	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	52	1	74	68	1	118	83	934	37	55	1182	25
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	2	2	2	2	2	2	2
Cap, veh/h	260	4	272	324	4	275	335	1620	64	385	1610	34
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.47	0.47	0.04	0.45	0.45
Sat Flow, veh/h	1268	21	1565	996	21	1583	1774	3471	137	1774	3544	75
Grp Volume(v), veh/h	52	0	75	69	0	118	83	476	495	55	590	617
Grp Sat Flow(s),veh/h/ln	1268	0	1587	1018	0	1583	1774	1770	1838	1774	1770	1850
Q Serve(g_s), s	1.9	0.0	1.9	2.2	0.0	3.2	1.1	9.3	9.3	0.8	13.0	13.0
Cycle Q Clear(g_c), s	6.0	0.0	1.9	4.2	0.0	3.2	1.1	9.3	9.3	0.8	13.0	13.0
Prop In Lane	1.00		0.99	0.99		1.00	1.00		0.07	1.00		0.04
Lane Grp Cap(c), veh/h	260	0	275	327	0	275	335	826	858	385	804	840
V/C Ratio(X)	0.20	0.00	0.27	0.21	0.00	0.43	0.25	0.58	0.58	0.14	0.73	0.73
Avail Cap(c_a), veh/h	575	0	669	656	0	668	609	2798	2907	682	2798	2924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	0.0	17.0	18.8	0.0	17.5	8.1	9.2	9.2	7.1	10.6	10.6
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.3	0.0	1.1	0.4	0.6	0.6	0.2	1.3	1.3
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	0.9	0.0	1.5	0.6	4.6	4.8	0.4	6.5	6.8
LnGrp Delay(d),s/veh	21.1	0.0	17.5	19.1	0.0	18.6	8.5	9.9	9.8	7.2	11.9	11.9
LnGrp LOS	C		B	B		B	A	A	A	A	B	B
Approach Vol, veh/h		127			187			1054			1262	
Approach Delay, s/veh		19.0			18.8			9.7			11.7	
Approach LOS		B			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	27.2		13.2	7.7	26.6		13.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	75.0		20.0	10.0	75.0		20.0				
Max Q Clear Time (g_c+I1), s	2.8	11.3		8.0	3.1	15.0		6.2				
Green Ext Time (p_c), s	0.1	4.8		0.3	0.1	6.6		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			11.8									
HCM 2010 LOS			B									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↘	↕	↘		↕	↗
Traffic Vol, veh/h	0	0	14	0	0	17	26	930	54	0	1168	23
Future Vol, veh/h	0	0	14	0	0	17	26	930	54	0	1168	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	0	-	-	0	150	-	175	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	15	0	0	18	28	1011	59	0	1270	25























Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	-	-	1295	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	4.14	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	2.22	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	0	0	531	-	0	0	-	-
Stage 1	0	0	0	0	0	0	-	-	0	0	-	-
Stage 2	0	0	0	0	0	0	-	-	0	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	531	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	531	-	-	-	-	-
HCM Lane V/C Ratio	0.053	-	-	-	-	-
HCM Control Delay (s)	12.2	-	0	0	-	-
HCM Lane LOS	B	-	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	-













HCM 2010 Signalized Intersection Summary
 1: MD 108 & Sheppard Lane

MD 108 Erickson
 Total PM w/improvement

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	14	192	81	13	20	571	945	27	41	655	60
Future Volume (veh/h)	46	14	192	81	13	20	571	945	27	41	655	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	48	15	141	88	14	22	621	1027	0	44	697	64
Adj No. of Lanes	0	1	1	1	1	0	1	1	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	48	179	121	44	70	676	1097	932	164	1241	555
Arrive On Green	0.11	0.11	0.11	0.07	0.07	0.07	0.27	0.59	0.00	0.03	0.35	0.35
Sat Flow, veh/h	1367	427	1583	1774	654	1028	1774	1863	1583	1774	3539	1583
Grp Volume(v), veh/h	63	0	141	88	0	36	621	1027	0	44	697	64
Grp Sat Flow(s),veh/h/ln	1794	0	1583	1774	0	1681	1774	1863	1583	1774	1770	1583
Q Serve(g_s), s	3.3	0.0	9.0	5.0	0.0	2.1	22.7	52.4	0.0	1.6	16.5	2.8
Cycle Q Clear(g_c), s	3.3	0.0	9.0	5.0	0.0	2.1	22.7	52.4	0.0	1.6	16.5	2.8
Prop In Lane	0.76		1.00	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	0	179	121	0	114	676	1097	932	164	1241	555
V/C Ratio(X)	0.31	0.00	0.79	0.73	0.00	0.31	0.92	0.94	0.00	0.27	0.56	0.12
Avail Cap(c_a), veh/h	433	0	382	257	0	243	974	1510	1283	201	1503	672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.3	0.0	44.8	47.4	0.0	46.0	18.0	19.5	0.0	24.6	27.2	22.8
Incr Delay (d2), s/veh	0.9	0.0	7.5	8.1	0.0	1.6	10.2	9.1	0.0	0.9	0.4	0.1
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.7	0.0	4.3	2.7	0.0	1.0	18.8	29.3	0.0	0.8	8.1	1.3
LnGrp Delay(d),s/veh	43.1	0.0	52.3	55.5	0.0	47.6	28.2	28.7	0.0	25.4	27.6	22.9
LnGrp LOS	D		D	E		D	C	C		C	C	C
Approach Vol, veh/h		204			124			1648			805	
Approach Delay, s/veh		49.5			53.2			28.5			27.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	67.0		16.7	32.6	42.3		12.0				
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s	5.0	84.0		25.0	45.0	44.0		15.0				
Max Q Clear Time (g_c+I1), s	3.6	54.4		11.0	24.7	18.5		7.0				
Green Ext Time (p_c), s	0.0	6.7		0.7	2.9	3.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			30.7									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 2: MD 108 & Hardware Store/Great Star Drive

MD 108 Erickson
 Total PM w/improvement

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↵	↶	↵	↶	↶	↵	↶	
Traffic Volume (veh/h)	34	16	26	204	20	564	21	1190	254	275	877	17
Future Volume (veh/h)	34	16	26	204	20	564	21	1190	254	275	877	17
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	34	16	26	218	0	395	21	1190	254	275	877	17
Adj No. of Lanes	0	1	0	2	0	1	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	24	40	906	0	404	350	1304	276	307	1960	38
Arrive On Green	0.07	0.07	0.06	0.26	0.00	0.26	0.03	0.45	0.43	0.13	0.55	0.54
Sat Flow, veh/h	770	362	589	3548	0	1583	1774	2908	616	1774	3551	69
Grp Volume(v), veh/h	76	0	0	218	0	395	21	720	724	275	437	457
Grp Sat Flow(s),veh/h/ln	1720	0	0	1774	0	1583	1774	1770	1754	1774	1770	1851
Q Serve(g_s), s	6.4	0.0	0.0	7.2	0.0	36.8	0.9	56.3	57.7	16.9	21.9	21.9
Cycle Q Clear(g_c), s	6.4	0.0	0.0	7.2	0.0	36.8	0.9	56.3	57.7	16.9	21.9	21.9
Prop In Lane	0.45		0.34	1.00		1.00	1.00		0.35	1.00		0.04
Lane Grp Cap(c), veh/h	116	0	0	906	0	404	350	793	786	307	976	1021
V/C Ratio(X)	0.65	0.00	0.00	0.24	0.00	0.98	0.06	0.91	0.92	0.90	0.45	0.45
Avail Cap(c_a), veh/h	127	0	0	906	0	404	379	797	790	307	976	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	0.0	0.0	43.9	0.0	54.9	21.1	38.2	38.9	45.5	19.8	19.9
Incr Delay (d2), s/veh	10.1	0.0	0.0	0.1	0.0	38.4	0.1	16.1	17.7	27.0	1.5	1.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	3.6	0.0	20.4	0.5	31.0	31.8	13.4	11.1	11.6
LnGrp Delay(d),s/veh	77.9	0.0	0.0	44.1	0.0	93.4	21.2	54.3	56.6	72.5	21.3	21.3
LnGrp LOS	E			D		F	C	D	E	E	C	C
Approach Vol, veh/h		76			613			1465			1169	
Approach Delay, s/veh		77.9			75.8			54.9			33.4	
Approach LOS		E			E			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	85.1		14.1	23.0	69.7		42.0				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	77.0		9.0	18.0	64.0		36.0				
Max Q Clear Time (g_c+I1), s	2.9	23.9		8.4	18.9	59.7		38.8				
Green Ext Time (p_c), s	0.0	18.5		0.0	0.0	4.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			51.7									
HCM 2010 LOS			D									
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
 3: MD 108 & Auto Dr./Signal Bell Ln

MD 108 Erickson
 Total PM w/improvement

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	24	221	72	17	27	125	1301	75	20	1055	72
Future Volume (veh/h)	117	24	221	72	17	27	125	1301	75	20	1055	72
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	117	24	155	72	17	27	125	1301	75	20	1055	72
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	53	341	155	39	42	413	2233	129	312	2119	145
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.20	0.07	0.66	0.66	0.04	0.63	0.61
Sat Flow, veh/h	1054	246	1583	456	183	194	1774	3402	196	1774	3362	229
Grp Volume(v), veh/h	141	0	155	116	0	0	125	676	700	20	555	572
Grp Sat Flow(s),veh/h/ln	1300	0	1583	833	0	0	1774	1770	1828	1774	1770	1822
Q Serve(g_s), s	0.0	0.0	8.8	6.8	0.0	0.0	2.3	21.8	21.9	0.4	17.4	17.5
Cycle Q Clear(g_c), s	10.1	0.0	8.8	16.9	0.0	0.0	2.3	21.8	21.9	0.4	17.4	17.5
Prop In Lane	0.83		1.00	0.62		0.23	1.00		0.11	1.00		0.13
Lane Grp Cap(c), veh/h	344	0	341	236	0	0	413	1162	1200	312	1115	1149
V/C Ratio(X)	0.41	0.00	0.45	0.49	0.00	0.00	0.30	0.58	0.58	0.06	0.50	0.50
Avail Cap(c_a), veh/h	550	0	570	431	0	0	588	1670	1725	361	1497	1542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.1	40.9	0.0	0.0	7.2	9.8	9.8	7.9	10.2	10.3
Incr Delay (d2), s/veh	0.8	0.0	0.9	1.6	0.0	0.0	0.4	2.1	2.1	0.1	1.6	1.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	3.6	0.0	3.9	3.2	0.0	0.0	1.2	11.2	11.6	0.2	9.0	9.3
LnGrp Delay(d),s/veh	36.3	0.0	36.0	42.5	0.0	0.0	7.6	11.9	11.9	8.0	11.8	11.9
LnGrp LOS	D		D	D			A	B	B	A	B	B
Approach Vol, veh/h		296			116			1501				1147
Approach Delay, s/veh		36.2			42.5			11.6				11.8
Approach LOS		D			D			B				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	67.8		25.1	7.2	70.5		25.1				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	15.0	84.0		34.0	5.0	94.0		34.0				
Max Q Clear Time (g_c+I1), s	4.3	19.5		12.1	2.4	23.9		18.9				
Green Ext Time (p_c), s	0.2	28.4		1.0	0.0	40.6		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			15.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary
 4: MD 108 & MD 32 WB Ramps

MD 108 Erickson
 Total PM w/improvement

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	951	46	529	73	983	0	0	1125	226
Future Volume (veh/h)	0	0	0	951	46	529	73	983	0	0	1125	226
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				984	0	529	73	983	0	0	1125	226
Adj No. of Lanes				2	0	1	1	2	0	0	2	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1350	0	602	216	2011	0	0	1455	291
Arrive On Green				0.38	0.00	0.38	0.05	0.57	0.00	0.00	0.49	0.48
Sat Flow, veh/h				3548	0	1583	1774	3632	0	0	3034	588
Grp Volume(v), veh/h				984	0	529	73	983	0	0	675	676
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1770	0	0	1770	1759
Q Serve(g_s), s				32.4	0.0	42.4	2.6	22.6	0.0	0.0	42.4	43.2
Cycle Q Clear(g_c), s				32.4	0.0	42.4	2.6	22.6	0.0	0.0	42.4	43.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.33
Lane Grp Cap(c), veh/h				1350	0	602	216	2011	0	0	876	870
V/C Ratio(X)				0.73	0.00	0.88	0.34	0.49	0.00	0.00	0.77	0.78
Avail Cap(c_a), veh/h				1484	0	662	216	2233	0	0	987	981
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				36.2	0.0	39.3	22.9	17.6	0.0	0.0	28.1	28.6
Incr Delay (d2), s/veh				1.7	0.0	12.1	0.9	0.4	0.0	0.0	4.4	4.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.2	0.0	20.5	1.3	11.2	0.0	0.0	21.7	22.0
LnGrp Delay(d),s/veh				37.9	0.0	51.3	23.8	18.0	0.0	0.0	32.5	33.2
LnGrp LOS				D		D	C	B			C	C
Approach Vol, veh/h					1513			1056			1351	
Approach Delay, s/veh					42.6			18.4			32.8	
Approach LOS					D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		81.4			10.0	71.4		54.9				
Change Period (Y+Rc), s		7.0			6.0	7.0		6.0				
Max Green Setting (Gmax), s		83.0			4.0	73.0		54.0				
Max Q Clear Time (g_c+I1), s		24.6			4.6	45.2		44.4				
Green Ext Time (p_c), s		19.4			0.0	19.3		4.5				
Intersection Summary												
HCM 2010 Ctrl Delay				32.7								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 2010 Signalized Intersection Summary
 6: MD 108 & New Road/Linden Linthicum Lane

MD 108 Erickson
 Total PM w/improvement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	1	117	96	0	137	87	1397	91	87	799	18
Future Volume (veh/h)	96	1	117	96	0	137	87	1397	91	87	799	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1863	1900	1863	1900	1863	1864	1900
Adj Flow Rate, veh/h	104	1	127	104	0	149	95	1518	99	95	868	20
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	0	0	0	2	0	2	2	2	2	2
Cap, veh/h	208	3	377	304	0	379	411	1812	118	212	1901	44
Arrive On Green	0.24	0.24	0.24	0.24	0.00	0.24	0.04	0.54	0.54	0.04	0.54	0.54
Sat Flow, veh/h	1234	12	1573	907	0	1583	1810	3375	219	1774	3538	82
Grp Volume(v), veh/h	104	0	128	104	0	149	95	793	824	95	434	454
Grp Sat Flow(s),veh/h/ln	1234	0	1585	907	0	1583	1810	1770	1824	1774	1770	1849
Q Serve(g_s), s	6.9	0.0	5.6	6.2	0.0	6.6	1.9	31.3	31.9	2.0	12.6	12.6
Cycle Q Clear(g_c), s	18.7	0.0	5.6	11.8	0.0	6.6	1.9	31.3	31.9	2.0	12.6	12.6
Prop In Lane	1.00		0.99	1.00		1.00	1.00		0.12	1.00		0.04
Lane Grp Cap(c), veh/h	208	0	380	304	0	379	411	950	979	212	951	994
V/C Ratio(X)	0.50	0.00	0.34	0.34	0.00	0.39	0.23	0.83	0.84	0.45	0.46	0.46
Avail Cap(c_a), veh/h	208	0	380	304	0	379	549	1590	1639	347	1591	1662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	0.0	26.2	31.1	0.0	26.6	8.9	16.2	16.3	16.5	11.8	11.8
Incr Delay (d2), s/veh	1.9	0.0	0.5	0.7	0.0	0.7	0.3	2.0	2.1	1.5	0.3	0.3
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.5	0.0	2.5	2.2	0.0	2.9	1.0	15.7	16.4	1.2	6.1	6.4
LnGrp Delay(d),s/veh	38.9	0.0	26.8	31.8	0.0	27.3	9.2	18.2	18.4	18.0	12.2	12.2
LnGrp LOS	D		C	C		C	A	B	B	B	B	B
Approach Vol, veh/h		232			253			1712			983	
Approach Delay, s/veh		32.2			29.1			17.8			12.7	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	49.8		25.0	8.6	49.8		25.0				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	75.0		20.0	10.0	75.0		20.0				
Max Q Clear Time (g_c+I1), s	4.0	33.9		20.7	3.9	14.6		13.8				
Green Ext Time (p_c), s	0.1	10.9		0.0	0.1	4.2		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			18.2									
HCM 2010 LOS			B									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↘	↕	↘		↕	↗
Traffic Vol, veh/h	0	0	29	0	0	21	19	1522	54	0	911	17
Future Vol, veh/h	0	0	29	0	0	21	19	1522	54	0	911	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	0	-	-	0	150	-	175	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	32	0	0	23	21	1654	59	0	990	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	-	-	1008	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	4.14	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	2.22	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	0	0	683	-	0	0	-	-
Stage 1	0	0	0	0	0	0	-	-	0	0	-	-
Stage 2	0	0	0	0	0	0	-	-	0	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	683	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0.1	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	683	-	-	-	-	-
HCM Lane V/C Ratio	0.03	-	-	-	-	-
HCM Control Delay (s)	10.4	-	0	0	-	-
HCM Lane LOS	B	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

APPENDIX F

Crash Data – MD SHA



Date : 06/29/2017

To : Mr. Buck Bohmer

Department : Howard County Dept of Public Works

Subject : *Accident Data / Analysis*

Location (s) :

County : Howard Town / Place : Clarksville

Route : MD 108 Log Mile (s) : Various

at Multiple Locations

from _____ to _____

Attached is the accident data/analysis you requested in your e-mail of: 06/27/2017 .

Specifically, we are providing the following data for the subject location:

Accident Summary Accident History Accident Rates

Study Worksheet Collision/Line Diagram Other

One Year Two Years Three Years

No reported Accidents 01/01/2013 to 12/31/2016 Combined

Comments:

Should you have any questions, please contact me at (410) 787 - 5842.

Sincerely ,

Robert L. Booker, Jr.

For

cc's:

Mr. George Miller

Crash Analysis Safety Team
Traffic Development & Support Division

32484
Due 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
Cc: John Concannon; Robert Booker; Mark Crampton (SHA); Jagarapu, Krishnakanth; Bowman, Diane J.
Subject: FW: Crash Data Request - MD 108

Bill:

Would you please provide crash data as requested.

Thank you.

Buck Bohmer, BCE, Project Manager

Traffic Engineering Div
Howard County Public Works, Bureau of Highways
9250 Bendix Rd
Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

410-313-2430 (Office)
410-313-5748 (Desk)
410-313-5750 (FAX)

Report a Problem: [TellHoCo](#)

From: Carl Wilson [mailto:cwilson@trafficgroup.com]
Sent: Tuesday, June 27, 2017 9:36 AM
To: Jagarapu, Krishnakanth <kjagarapu@howardcountymd.gov>; Bohmer, Buck <BUBohmer@howardcountymd.gov>
Subject: Crash Data Request - MD 108

Kris/Buck-

We are in the process of preparing a Traffic Impact Study within the MD 108 corridor for the following intersections:

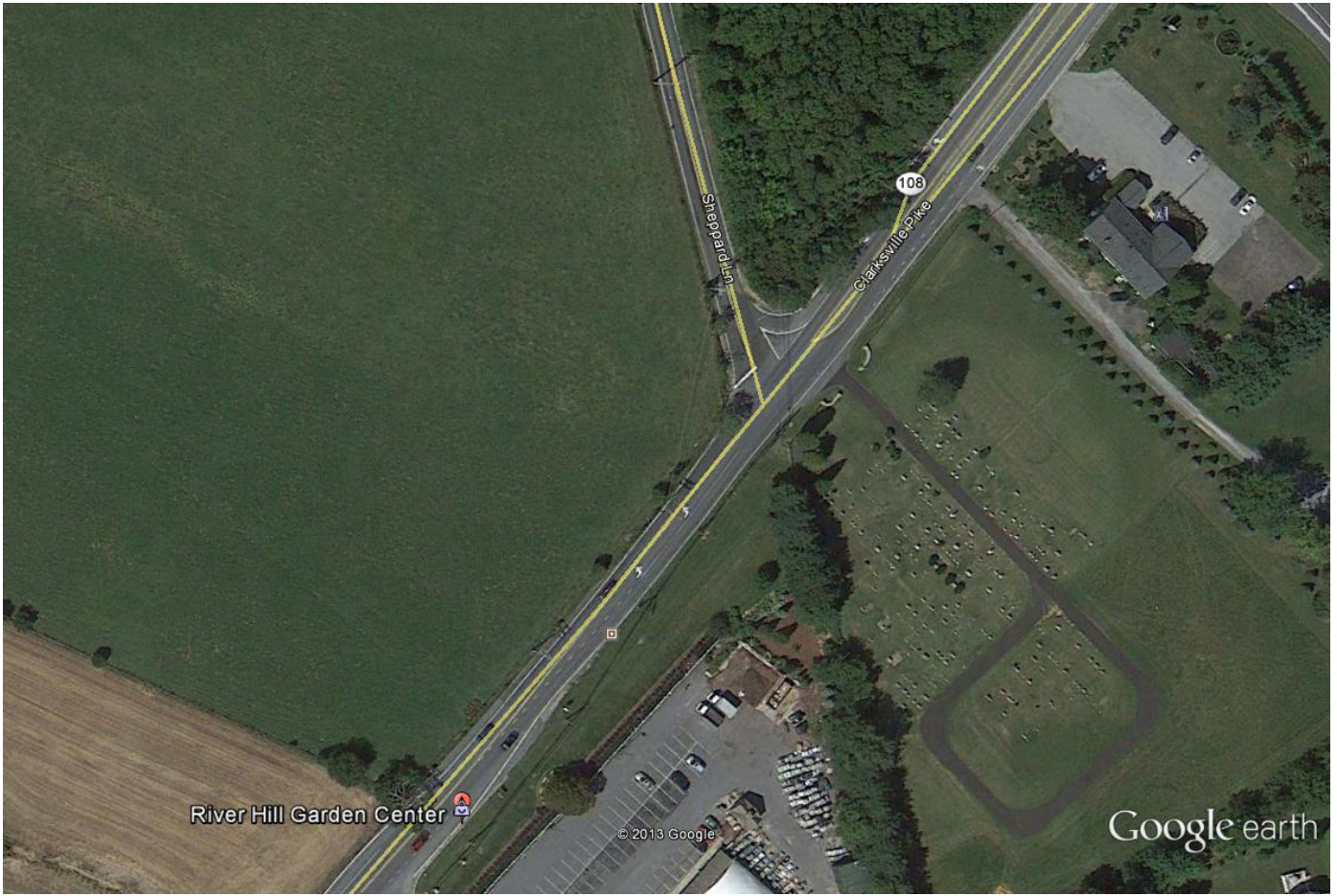
- * MD 108 at Sheppard Lane ^{Co 80P}
- MD 108 at Linden Linthicum Lane
- MD 108 at Great Star Drive
- MD 108 at Auto Drive
- MD 108 at MD 32 Ramps
- MD 108 at Ten Oaks Drive

4.49 @ 2.73_{1/2}

7/2/15
~~# 32484~~
 # 327912

2 RLB
 to G. MILLER

Thank you for your assistance.



Google earth



Location: MD 108 @ SHEPPARD LN
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 4.49 At 2.73 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	0	2	0	0	2
No. Injured	0	2	0	0	2
Prop. Damage	1	0	0	1	2
Total Crashes	1	2	0	1	4
Severity Index	1	8	0	1	Avg 3
Opposite Dir.	0	0	0	0	0
Rear End	0	0	0	0	0
Sideswipe	0	0	0	0	0
Left Turn	0	1	0	0	1
Angle	0	1	0	0	1
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	0	0
Other	1	0	0	1	2
U-Turn	0	0	0	0	0
Backing	1	0	0	1	2
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	0	1	0	0	1
Wet Surface	0	0	0	0	0
Alcohol	0	0	0	0	0
Intersection	1	2	0	1	4
Total Vehicles	2	4	0	2	8
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: MD 108 @ SHEPPARD LN

Logmiles: 4.49 At 2.73 Radius: 150 ft.

County: Howard, D7 Period: January 1, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																
Accidents		2	2	4	SUN	MON	TUE	WED	THU	FRI	SAT	UNK									
Veh Occ		2						1	2	1											
Pedestrian					AVG Severity Index: 3																
MONTH OF THE YEAR													CONDITION	DRIVER	PED						
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	7							
1		1			1	1							Alcohol:								
													Other:	1							
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT							
AM:														1	2	3	4	5	6+	UNK	TOTAL
PM:	1	1			1					1					4						8
VEHICLE TYPE				SURFACE			MOVEMENTS														
Motorcycle/Moped	Tractor Trailer			Wet			NORTH			SOUTH			EAST			WEST					
5 Passenger Vehicle	Passenger Bus			4 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT			
1 Sport Utility Veh	School Bus			Sno/Ice									1	2				1			
1 Pick-Up Truck	Emergency Veh			Mud			OTHER MOVEMENTS														
Trucks (2+3 axles)	1	Other Types		Other			2														
PROBABLE CAUSES													COLLISION TYPES				FATAL	INJURY	PROP	TOTAL	
Influence of Drugs				Improper Lane Change									Opposite Dir		Related:						
Influence of Alcohol				1 Improper Backing									UnRelated:								
Influence of Medication				Improper Passing									Rear End		Related:						
Influence of Combined Subst.				Improper Signal									UnRelated:								
Physical/Mental Difficulty				Improper Parking									Sideswipe		Related:						
Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.									UnRelated:								
Fail to give full Attention				Illegally in Roadway									Left Turn		Related:		1		1		
Lic. Restr. Non-compliance				Bicycle Violation									UnRelated:								
1 Fail to Drive in Single Lane				Clothing Not Visible									Angle		Related:			1		1	
Improper Right Turn on Red				Sleet, Hail, Freezing Rain									UnRelated:								
1 Fail to Yield Right-of-way				Severe Crosswinds									Pedestrian		Related:						
Fail to Obey Stop Sign				Rain, Snow									UnRelated:								
Fail to Obey Traffic Signal				Animal									Parked Vehicle		Related:						
Fail to Obey Other Control				Vision Obstruction									UnRelated:								
Fail to Keep Right of Center				Vehicle Defect									Other Collision		Related:			2		2	
Fail to Stop for School Bus				Wet									UnRelated:								
Wrong Way on One Way				Icy or Snow Covered									F	Bridge	01						
Exceeded Speed Limit				Debris or Obstruction									I	Building	02						
Operator Using Cell Phone				Ruts, Holes or Bumps									X	Culvert/Ditch	03						
Stopping in Lane Roadway				Road Under Construction									E	Curb	04						
Too Fast for Conditions				Traffic Control Device Inop.									D	Guardrail/Barrier	05						
Followed too Closely				Shoulders Low, Soft or High										Embankment	06						
Improper Turn				1 Other or Unknown									O	Fence	07						
													B	Light Pole	08						
													J	Sign Pole	09						
													E	Other Pole	10						
													C	Tree/Shrubbery	11						
													T	Contr. Barrier	12						
													S	Crash Attenuator	13						
													Other Fixed Object				5				
WEATHER				ILLUMINATION				TOTALS													
4 Clear / Cloudy				3 Day				13-16				4									
Foggy				Dawn/Dusk																	
Raining				1 Dark - Lights On																	
Snow / Sleet				Dark - No Lights																	
Other				Other																	

Location: MD 108 @ SHEPPARD LN Logmiles: 4.49 At 2.73 Radius: 150 ft.
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016 Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD0108												
4.490	✓	01172013	Property	01P	Day	Dry			OTHER	Eu	ES	Improper backing
4.490	✓	03142014	1 Injured	04P	Day	Dry			ANGLE	SR	ES	Fail to drive in single lane
4.490	✓	07302014	1 Injured	09P	Night	Dry			LFTRN	EL	WS	Fail to yield right-of-way
CO80												
2.730	✓	06022016	Property	12P	Day	Dry			OTHER	SS	Su	Other or Unknown

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator



Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: MD 108 @ Sheppard Lane
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/28/2017

SHEPPARD LA

MARYLAND
 108

06/02/16-P-12P-D



07/30/14-11-9P-D

03/14/14-11-4P-D

01/17/13-P-1P-D

MARYLAND
 108

CEMETERY

▲ DATE SEVERITY TIME SURFACE
 ▲ NIGHT
 ▲ ALCOHOL X
 ▲ DRUGS ⊗

SEVERITY
 F - Fatalities
 I - Injured
 P - Property Damage
 Only
 SURFACE
 D - Dry Surface
 W - Wet Surface
 I - Icy Surface
 S - Snowy Surface

00 - Not Applicable
 01 - Bridge or Overpass
 02 - Building
 03 - Culvert or Ditch
 04 - Curb
 05 - Guardrail or Barrier
 06 - Embankment
 07 - Fence

08 - Light Support Pole
 09 - Sign Support Pole
 10 - Other Pole
 11 - Tree Shrubbery
 12 - Construction Barrier
 13 - Crash Attenuator
 88 - Other
 99 - Unknown

B - Bicycle
 P - Other Pedalcycle
 C - Other Conveyance
 T - Railway Train
 A - Animal
 O - Other Object
 S - Spilled Cargo
 J - Jackknife

U - Units Separated
 N - Other Non collision
 D - Off Road
 R - Downhill Runaway
 F - Explosion or Fire
 ? - Unknown

▲ U - TURN
 ▲ BACKING
 ▲ OVERTURN
 [] Parked Vehicle
 [P] Pedestrian

template 06-27-06

32455
Due 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
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Subject: FW: Crash Data Request - MD 108

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Thank you.

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Howard County Public Works, Bureau of Highways
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New E-Mail bubohmer@howardcountymd.gov

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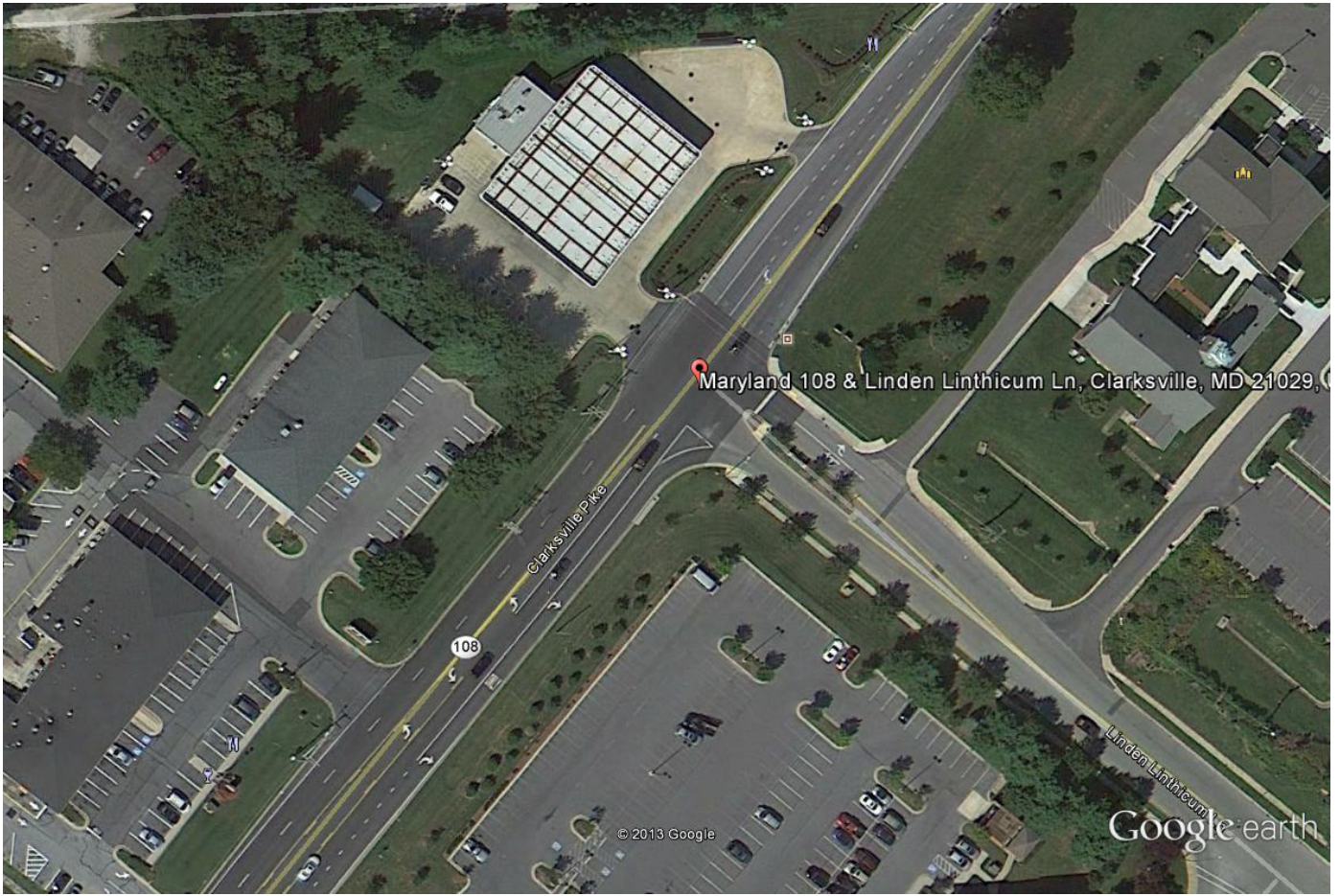
Kris/Buck-

We are in the process of preparing a Traffic Impact Study within the MD 108 for the following intersections:

2/25/16
29414
RLB
to: G. Miller

- MD 108 at Sheppard Lane
- * MD 108 at Linden Linthicum Lane *Co 2567*
- MD 108 at Great Star Drive *4.22 @ 1.000/3*
- MD 108 at Auto Drive
- MD 108 at MD 32 Ramps
- MD 108 at Ten Oaks Drive

Thank you for your assistance.



Google earth



Location: MD 108 @ LINDEN LINTHICUM LN
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 4.22 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	2	0	0	0	2
No. Injured	2	0	0	0	2
Prop. Damage	0	0	0	2	2
Total Crashes	2	0	0	2	4
Severity Index	6	0	0	2	Avg 2
Opposite Dir.	0	0	0	0	0
Rear End	0	0	0	1	1
Sideswipe	0	0	0	0	0
Left Turn	1	0	0	0	1
Angle	0	0	0	1	1
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	1	0	0	0	1
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	0	0	0	0	0
Wet Surface	0	0	0	1	1
Alcohol	0	0	0	0	0
Intersection	2	0	0	2	4
Total Vehicles	3	0	0	5	8
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: MD 108 @ LINDEN LINTHICUM LN
 County: Howard, D7

Logmiles: 4.22 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

Period: January 1, 2013 To December 31, 2016

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK															
Accidents		2	2	4	SUN	MON	TUE	WED	THU	FRI	SAT	UNK								
Veh Occ		2			2		1			1										
Pedestrian					AVG Severity Index: 2															
MONTH OF THE YEAR																				
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK								
	2				1		1													
CONDITION DRIVER PED																				
Normal: 7																				
Alcohol:																				
Other: 1																				
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK							
AM:									1	1										
PM:			1			1														
VEHICLES INVOLVED PER ACCIDENT																				
									1	2	3	4	5	6+	UNK	TOTAL				
									1	2	1					8				
VEHICLE TYPE			SURFACE			MOVEMENTS														
1 Motorcycle/Moped	Tractor Trailer		1 Wet			NORTH			SOUTH			EAST			WEST					
5 Passenger Vehicle	Passenger Bus		3 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT			
Sport Utility Veh	1 School Bus		Sno/Ice			1						2 1 1			2					
Pick-Up Truck	Emergency Veh		Mud																	
Trucks (2+3 axles)	1 Other Types		Other			OTHER MOVEMENTS									1					
PROBABLE CAUSES																				
Influence of Drugs			Improper Lane Change			COLLISION TYPES			FATAL			INJURY			PROP			TOTAL		
Influence of Alcohol			Improper Backing			Opposite Dir			Related:											
Influence of Medication			Improper Passing			UnRelated:														
Influence of Combined Subst.			Improper Signal			Rear End			Related:			1			1					
Physical/Mental Difficulty			Improper Parking			UnRelated:														
Fell Asleep/Fainted, etc.			Passenger Interfere/Obstruct.			Sideswipe			Related:											
1 Fail to give full Attention			Illegally in Roadway			UnRelated:														
Lic. Restr. Non-compliance			Bicycle Violation			Left Turn			Related:			1			1					
Fail to Drive in Single Lane			Clothing Not Visible			UnRelated:														
Improper Right Turn on Red			Sleet, Hail, Freezing Rain			Angle			Related:			1			1					
1 Fail to Yield Right-of-way			Severe Crosswinds			UnRelated:														
Fail to Obey Stop Sign			Rain, Snow			Pedestrian			Related:											
Fail to Obey Traffic Signal			Animal			UnRelated:														
Fail to Obey Other Control			Vision Obstruction			Parked Vehicle			Related:											
Fail to Keep Right of Center			Vehicle Defect			UnRelated:														
Fail to Stop for School Bus			Wet			Other Collision			Related:											
Wrong Way on One Way			Icy or Snow Covered			UnRelated:														
Exceeded Speed Limit			Debris or Obstruction			F	Bridge		01											
Operator Using Cell Phone			Ruts, Holes or Bumps			I	Building		02											
Stopping in Lane Roadway			Road Under Construction			X	Culvert/Ditch		03											
Too Fast for Conditions			Traffic Control Device Inop.			E	Curb		04		1		1							
1 Followed too Closely			Shoulders Low, Soft or High			D	Guardrail/Barrier		05											
Improper Turn			1 Other or Unknown				Embankment		06											
WEATHER			ILLUMINATION			TOTALS														
3 Clear / Cloudy			4 Day			13-16			4											
Foggy			Dawn/Dusk																	
Raining			Dark - Lights On																	
Snow / Sleet			Dark - No Lights																	
1 Other			Other																	
													Other Fixed Object			11				

Location: MD 108 @ LINDEN LINTHICUM LN Logmiles: 4.22 At 0 Radius: 150 ft.
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016 Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD0108												
4.220	✓	06232013	1 Injured	03P	Day	Dry			LFTRN	EL	WS	Fail to yield right-of-way
MD108												
4.200	✓	02232016	Property	08A	Day	Dry			RREND	ES	EL	Followed too closely
4.220	✓	02212016	Property	09A	Day	Wet			ANGLE	NS	WS	Other or Unknown
CO2567												
0.000	✓	08092013	1 Injured	05P	Day	Dry		04	FXOBJ	ER	--	Fail to give full attention

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator



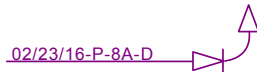
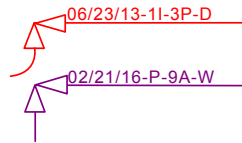
Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: MD 108 @ Linden Linthicum Ln
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/28/2017

Freestate Gas Station
 Entrance

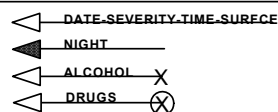


MARYLAND
 108



LINDEN LINTHICUM LN

MARYLAND
 108



SEVERITY

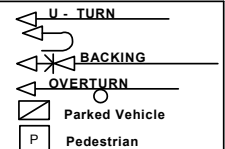
- F - Fatalities
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- Only
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- 12 - Construction Barrier
- 13 - Crash Attenuator
- 88 - Other
- 99 - Unknown

- B - Bicycle
- P - Other Pedalcycle
- C - Other Conveyance
- T - Railway Train
- A - Animal
- O - Other Object
- S - Spilled Cargo
- J - Jackknife

- U - Units Separated
- N - Other Non collision
- D - Off Road
- R - Downhill Runaway
- F - Explosion or Fire
- ? - Unknown



template 06-27-06

#32456
Due 7/19

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Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

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Report a Problem: [TellHoCo](#)

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- MD 108 at Sheppard Lane
- MD 108 at Linden Linthicum Lane
- MD 108 at Great Star Drive
- MD 108 at Auto Drive
- MD 108 at MD 32 Ramps
- MD 108 at Ten Oaks Drive

* MD 108 at Great Star Drive *C02892* *3.98/E @ 1/100/3*

Thank you for your assistance.



Google Earth



Location: MD 108 @ GREAT STAR DR
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 3.98 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	0	3	0	0	3
No. Injured	0	6	0	0	6
Prop. Damage	2	2	2	5	11
Total Crashes	2	5	2	5	14
Severity Index	2	12	2	5	Avg 5
Opposite Dir.	0	0	0	0	0
Rear End	0	2	1	1	4
Sideswipe	0	0	0	0	0
Left Turn	2	3	1	3	9
Angle	0	0	0	0	0
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	1	1
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	1	0	1
Night Time	2	1	0	1	4
Wet Surface	1	1	0	2	4
Alcohol	0	0	0	0	0
Intersection	2	5	2	5	14
Total Vehicles	4	13	4	10	31
Total Trucks	0	0	1	0	1
Truck %	0.0	0.0	25.0	0.0	3.2

Comments:

Location: MD 108 @ GREAT STAR DR

Logmiles: 3.98 At 0 Radius: 150 ft.

County: Howard, D7 Period: January 1, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																				
Accidents		3	11	14	SUN	MON	TUE	WED	THU	FRI	SAT	UNK													
Veh Occ		6			1		2	6	2		3														
Pedestrian					AVG Severity Index: 5																				
MONTH OF THE YEAR													CONDITION	DRIVER	PED										
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	26											
1		2	1	3		1	2	2	1		1		Alcohol:												
													Other:	5											
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT											
AM:								2		1				1	2	3	4	5	6+	UNK	TOTAL				
PM:	2		1	1	1	1	1	1	1		2			1	11	1		1			31				
VEHICLE TYPE				SURFACE			MOVEMENTS																		
Motorcycle/Moped		Tractor Trailer		4 Wet			NORTH			SOUTH			EAST			WEST									
18	Passenger Vehicle	Passenger Bus		10 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT							
5	Sport Utility Veh	School Bus		Sno/Ice					3	1				11	1			9	2						
2	Pick-Up Truck	Emergency Veh		Mud																					
1	Trucks (2+3 axles)	6 Other Types		Other			OTHER MOVEMENTS 4																		
PROBABLE CAUSES													COLLISION TYPES		FATAL	INJURY	PROP	TOTAL							
Influence of Drugs				Improper Lane Change									Opposite Dir	Related:											
Influence of Alcohol				Improper Backing									UnRelated:												
Influence of Medication				Improper Passing									Rear End	Related:		2	2	4							
Influence of Combined Subst.				Improper Signal									UnRelated:												
Physical/Mental Difficulty				Improper Parking									Sideswipe	Related:											
Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.									UnRelated:												
2	Fail to give full Attention	Illegally in Roadway									Left Turn	Related:		1	8	9									
Lic. Restr. Non-compliance				Bicycle Violation									UnRelated:												
Fail to Drive in Single Lane				Clothing Not Visible									Angle	Related:											
Improper Right Turn on Red				Sleet, Hail, Freezing Rain									UnRelated:												
3	Fail to Yield Right-of-way	Severe Crosswinds									Pedestrian	Related:													
Fail to Obey Stop Sign				Rain, Snow									UnRelated:												
Fail to Obey Traffic Signal				Animal									Parked Vehicle	Related:											
Fail to Obey Other Control				Vision Obstruction									UnRelated:												
Fail to Keep Right of Center				Vehicle Defect									Other Collision	Related:											
Fail to Stop for School Bus				Wet									UnRelated:												
Wrong Way on One Way				Icy or Snow Covered									F	Bridge	01										
Exceeded Speed Limit				Debris or Obstruction									I	Building	02										
Operator Using Cell Phone				Ruts, Holes or Bumps									X	Culvert/Ditch	03										
Stopping in Lane Roadway				Road Under Construction									E	Curb	04										
1	Too Fast for Conditions	Traffic Control Device Inop.									D	Guardrail/Barrier	05												
1	Followed too Closely	Shoulders Low, Soft or High										Embankment	06												
1	Improper Turn	6 Other or Unknown									O	Fence	07												
													B	Light Pole	08										
													J	Sign Pole	09										
													E	Other Pole	10										
													C	Tree/Shrubbery	11										
													T	Contr. Barrier	12										
													S	Crash Attenuator	13										
													Other Fixed Object		17	1	1								
WEATHER	ILLUMINATION			TOTALS																					
11	Clear / Cloudy	10 Day		13-16		14																			
	Foggy	Dawn/Dusk																							
2	Raining	4 Dark - Lights On																							
	Snow / Sleet	Dark - No Lights																							
1	Other	Other																							

Location: MD 108 @ GREAT STAR DR

Logmiles: 3.98 At 0 Radius: 150 ft.

County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD108												
3.980	✓	07132013	Property	07P	Night	Wet			LFTRN	ES	WL	Other or Unknown
3.980	✓	08282013	Property	08P	Night	Dry			LFTRN	WL	ES	Improper turn
3.980	✓	01082014	Property	07A	Day	Dry			LFTRN	WL	ES	Fail to yield right-of-way
3.980	✓	05102014	4 Injured	12P	Day	Dry			LFTRN	WL	ES	Fail to yield right-of-way
3.980	✓	05142014	Property	10P	Night	Wet			LFTRN	ES	WL	Other or Unknown
3.980	✓	05222014	1 Injured	02P	Day	Dry			RREND	WS	WS	Other or Unknown
3.980	✓	10012014	1 Injured	06P	Day	Dry			RREND	ES	ES	Followed too closely
3.980	✓	04292015	Property	07A	Day	Dry			LFTRN	WL	ES	Other or Unknown
3.980	✓	03192016	Property	10P	Night	Wet			LFTRN	WL	ES	Other or Unknown
3.980	✓	09072016	Property	05P	Day	Dry			LFTRN	WL	ES	Fail to give full attention
3.980	✓	12222016	Property	09A	Day	Dry			LFTRN	WL	ES	Fail to yield right-of-way
CO2892												
0.000	✓	09152015	Property	03P	Day	Dry			RREND	NS	NS	Other or Unknown
0.000	✓	03132016	Property	12P	Day	Wet		88	FXOBJ	ER	--	Too fast for conditions
0.000	✓	08092016	Property	04P	Day	Dry			RREND	NS	NR	Fail to give full attention

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator



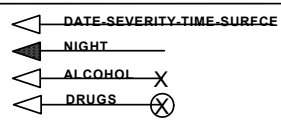
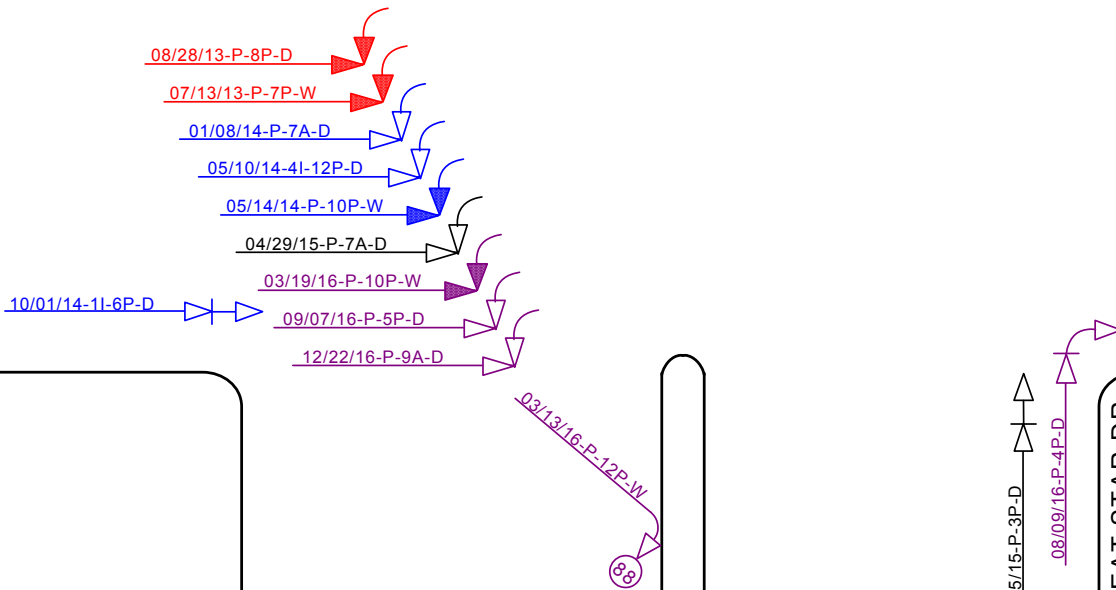
Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: MD 108 @ Great Star Dr
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/28/2017

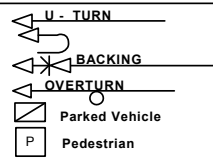
MARYLAND
 108



05/22/14-11-2P-D



SEVERITY		SURFACE		Other	
F - Fatalities	00 - Not Applicable	D - Dry Surface	08 - Light Support Pole	B - Bicycle	U - Units Separated
I - Injured	01 - Bridge or Overpass	W - Wet Surface	09 - Sign Support Pole	P - Other Pedalcycle	N - Other Non collision
P - Property Damage	02 - Building	I - Icy Surface	10 - Other Pole	C - Other Conveyance	D - Off Road
Only	03 - Culvert or Ditch	S - Snowy Surface	11 - Tree Shrubbery	T - Railway Train	R - Downhill Runaway
	04 - Curb		12 - Construction Barrier	A - Animal	F - Explosion or Fire
	05 - Guardrail or Barrier		13 - Crash Attenuator	O - Other Object	? - Unknown
	06 - Embankment		88 - Other	S - Spilled Cargo	
	07 - Fence		99 - Unknown	J - Jackknife	



template 06-27-06

32457

Due 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
Cc: John Concannon; Robert Booker; Mark Crampton (SHA); Jagarapu, Krishnakanth; Bowman, Diane J.
Subject: FW: Crash Data Request - MD 108

Bill:

Would you please provide crash data as requested.

Thank you.

Buck Bohmer, BCE, Project Manager

Traffic Engineering Div
Howard County Public Works, Bureau of Highways
9250 Bendix Rd
Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

410-313-2430 (Office)
410-313-5748 (Desk)
410-313-5750 (FAX)

Report a Problem: [TellHoCo](#)

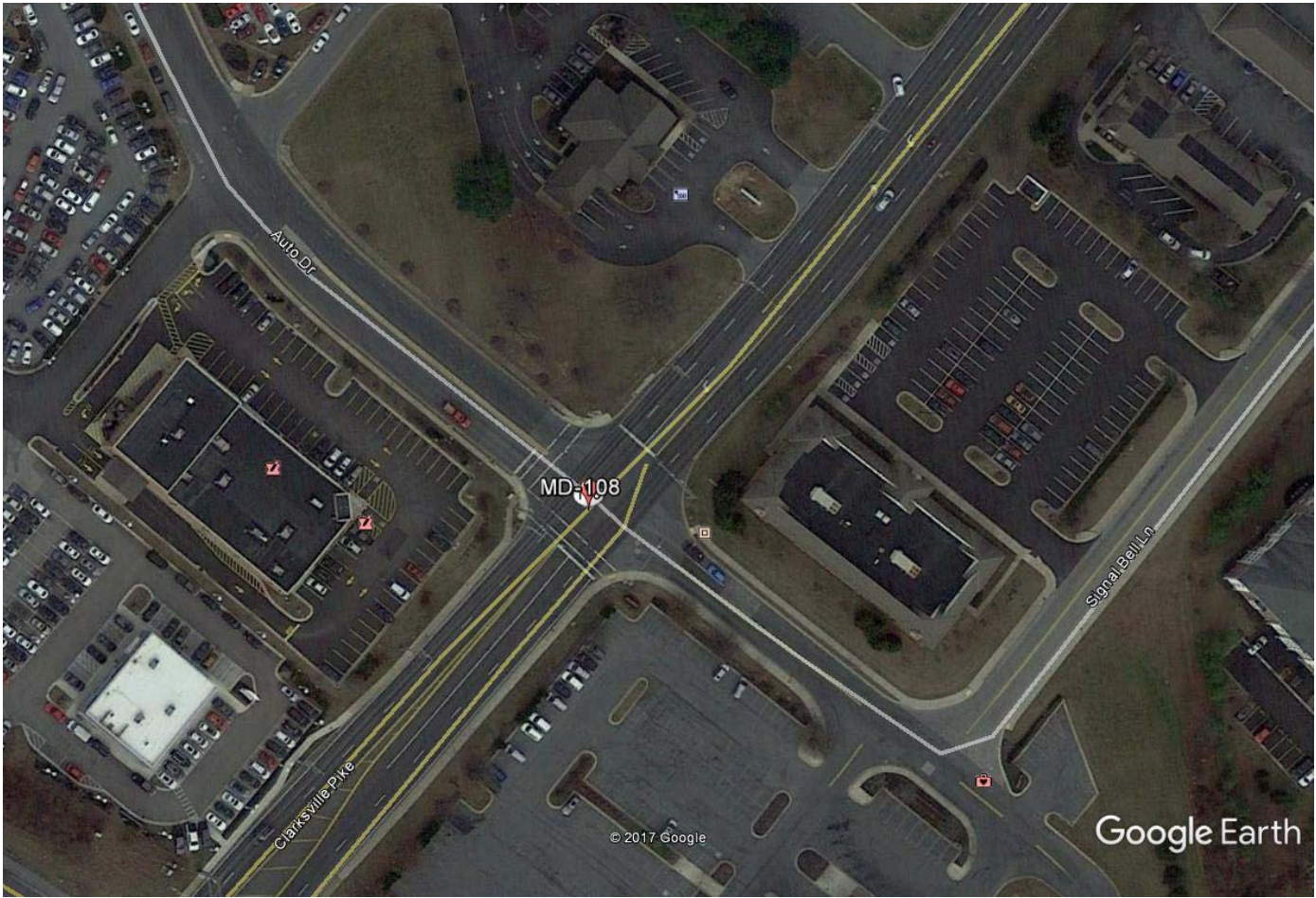
From: Carl Wilson [mailto:cwilson@trafficgroup.com]
Sent: Tuesday, June 27, 2017 9:36 AM
To: Jagarapu, Krishnakanth <kjagarapu@howardcountymd.gov>; Bohmer, Buck <BUBohmer@howardcountymd.gov>
Subject: Crash Data Request - MD 108

Kris/Buck-

We are in the process of preparing a Traffic Impact Study within the MD 108 corridor. Can you please provide crash data for the following intersections:

- MD 108 at Sheppard Lane
- MD 108 at Linden Linthicum Lane
- MD 108 at Great Star Drive
- * MD 108 at Auto Drive Co 2744 3.85/E @ 1,000 IN & 1,000/S
- MD 108 at MD 32 Ramps Co 3046
- MD 108 at Ten Oaks Drive signal Bell Ln

Thank you for your assistance.



Google Earth



Location: MD 108 @ AUTO DR & SIGNAL BELL LN
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 3.85 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	2	2	0	0	4
No. Injured	4	2	0	0	6
Prop. Damage	0	0	0	1	1
Total Crashes	2	2	0	1	5
Severity Index	9	6	0	1	Avg 4
Opposite Dir.	0	0	0	0	0
Rear End	1	1	0	0	2
Sideswipe	0	0	0	0	0
Left Turn	1	1	0	0	2
Angle	0	0	0	1	1
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	0	0
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	0	0	0	0	0
Wet Surface	1	0	0	0	1
Alcohol	0	0	0	0	0
Intersection	2	2	0	1	5
Total Vehicles	4	5	0	2	11
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: MD 108 @ AUTO DR & SIGNAL BELL LN Logmiles: 3.85 At 0 Radius: 150 ft.
 County: Howard, D7 Period: January 1, 2013 To December 31, 2016 Note: Year 2016 data may be incomplete and unedited

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																			
Accidents		4	1	5	SUN	MON	TUE	WED	THU	FRI	SAT	UNK												
Veh Occ		6			1		2		2															
Pedestrian					AVG Severity Index: 4																			
MONTH OF THE YEAR													CONDITION	DRIVER	PED									
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	9										
1							1		3				Alcohol:											
													Other:	1										
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT										
AM:											1	1		1	2	3	4	5	6+	UNK	TOTAL			
PM:					1		1	1							4	1					11			
VEHICLE TYPE				SURFACE			MOVEMENTS																	
Motorcycle/Moped		Tractor Trailer		1 Wet			NORTH			SOUTH			EAST			WEST								
7	Passenger Vehicle	Passenger Bus		4 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT						
	Sport Utility Veh	School Bus		Sno/Ice			1	2					1	2		1	3							
	Pick-Up Truck	1	Emergency Veh	Mud																				
	Trucks (2+3 axles)	3	Other Types	Other			OTHER MOVEMENTS									1								
PROBABLE CAUSES													COLLISION TYPES		FATAL	INJURY	PROP	TOTAL						
Influence of Drugs				Improper Lane Change									Opposite Dir	Related:										
Influence of Alcohol				Improper Backing									UnRelated:											
Influence of Medication				Improper Passing									Rear End	Related:		2	2							
Influence of Combined Subst.				Improper Signal									UnRelated:											
Physical/Mental Difficulty				Improper Parking									Sideswipe	Related:										
Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.									UnRelated:											
1	Fail to give full Attention	Illegally in Roadway									Left Turn	Related:		2	2									
	Lic. Restr. Non-compliance	Bicycle Violation									UnRelated:													
	Fail to Drive in Single Lane	Clothing Not Visible									Angle	Related:		1	1									
	Improper Right Turn on Red	Sleet, Hail, Freezing Rain									UnRelated:													
1	Fail to Yield Right-of-way	Severe Crosswinds									Pedestrian	Related:												
	Fail to Obey Stop Sign	Rain, Snow									UnRelated:													
	Fail to Obey Traffic Signal	Animal									Parked Vehicle	Related:												
	Fail to Obey Other Control	Vision Obstruction									UnRelated:													
	Fail to Keep Right of Center	Vehicle Defect									Other Collision	Related:												
	Fail to Stop for School Bus	Wet									UnRelated:													
	Wrong Way on One Way	Icy or Snow Covered									F	Bridge	01											
	Exceeded Speed Limit	Debris or Obstruction									I	Building	02											
	Operator Using Cell Phone	Ruts, Holes or Bumps									X	Culvert/Ditch	03											
	Stopping in Lane Roadway	Road Under Construction									E	Curb	04											
1	Too Fast for Conditions	Traffic Control Device Inop.									D	Guardrail/Barrier	05											
1	Followed too Closely	Shoulders Low, Soft or High										Embankment	06											
	Improper Turn	1 Other or Unknown									O	Fence	07											
											B	Light Pole	08											
											J	Sign Pole	09											
											E	Other Pole	10											
											C	Tree/Shrubbery	11											
											T	Contr. Barrier	12											
											S	Crash Attenuator	13											
											Other Fixed Object		23											
WEATHER	ILLUMINATION			TOTALS																				
4 Clear / Cloudy	5 Day			13-16		5																		
	Foggy																							
1 Raining	Dark - Lights On																							
	Dark - No Lights																							
	Other																							

Location: MD 108 @ AUTO DR & SIGNAL BELL LN
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 3.85 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD108												
3.850	✓	10032013	3 Injured	06P	Day	Dry			LFTRN	WL	ES	Fail to yield right-of-way
3.850	✓	10142014	1 Injured	10A	Day	Dry			LFTRN	EL	WS	Fail to give full attention
3.850	✓	08022016	Property	07P	Day	Dry			ANGLE	ES	NL	Other or Unknown
3.880	✓	10132013	1 Injured	11A	Day	Wet			RREND	WS	WS	Too fast for conditions
CO3046												
0.000	✓	01162014	1 Injured	04P	Day	Dry			RREND	NS	NS	Followed too closely

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator

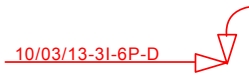
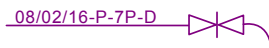
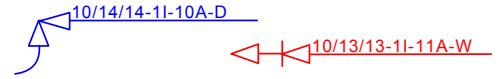


Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: MD 108 ~ Auto Dr & Signal Bell Ln
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/28/2017

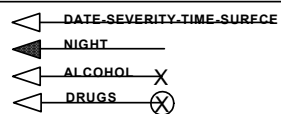
AUTO DR

MARYLAND
 108



SIGNAL BELL LN

MARYLAND
 108

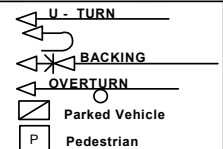


SEVERITY
 F - Fatalities
 I - Injured
 P - Property Damage
 Only
 SURFACE
 D - Dry Surface
 W - Wet Surface
 I - Icy Surface
 S - Snowy Surface

00 - Not Applicable
 01 - Bridge or Overpass
 02 - Building
 03 - Culvert or Ditch
 04 - Curb
 05 - Guardrail or Barrier
 06 - Embankment
 07 - Fence
 08 - Light Support Pole
 09 - Sign Support Pole
 10 - Other Pole
 11 - Tree Shrubbery
 12 - Construction Barrier
 13 - Crash Attenuator
 88 - Other
 99 - Unknown

B - Bicycle
 P - Other Pedalcycle
 C - Other Conveyance
 T - Railway Train
 A - Animal
 O - Other Object
 S - Spilled Cargo
 J - Jackknife

U - Units Separated
 N - Other Non collision
 D - Off Road
 R - Downhill Runaway
 F - Explosion or Fire
 ? - Unknown



template 06-27-06

#32458
DUE 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
Cc: John Concannon; Robert Booker; Mark Crampton (SHA); Jagarapu, Krishnakanth; Bowman, Diane J.
Subject: FW: Crash Data Request - MD 108

Bill:

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Thank you.

Buck Bohmer, BCE, Project Manager

Traffic Engineering Div
Howard County Public Works, Bureau of Highways
9250 Bendix Rd
Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

410-313-2430 (Office)
410-313-5748 (Desk)
410-313-5750 (FAX)

Report a Problem: [TellHoCo](#)

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Sent: Tuesday, June 27, 2017 9:36 AM
To: Jagarapu, Krishnakanth <kjagarapu@howardcountymd.gov>; Bohmer, Buck <BUBohmer@howardcountymd.gov>
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- MD 108 at Great Star Drive
- MD 108 at Auto Drive
- * MD 108 at MD 32 Ramps 4/6
- MD 108 at Ten Oaks Drive

3.69

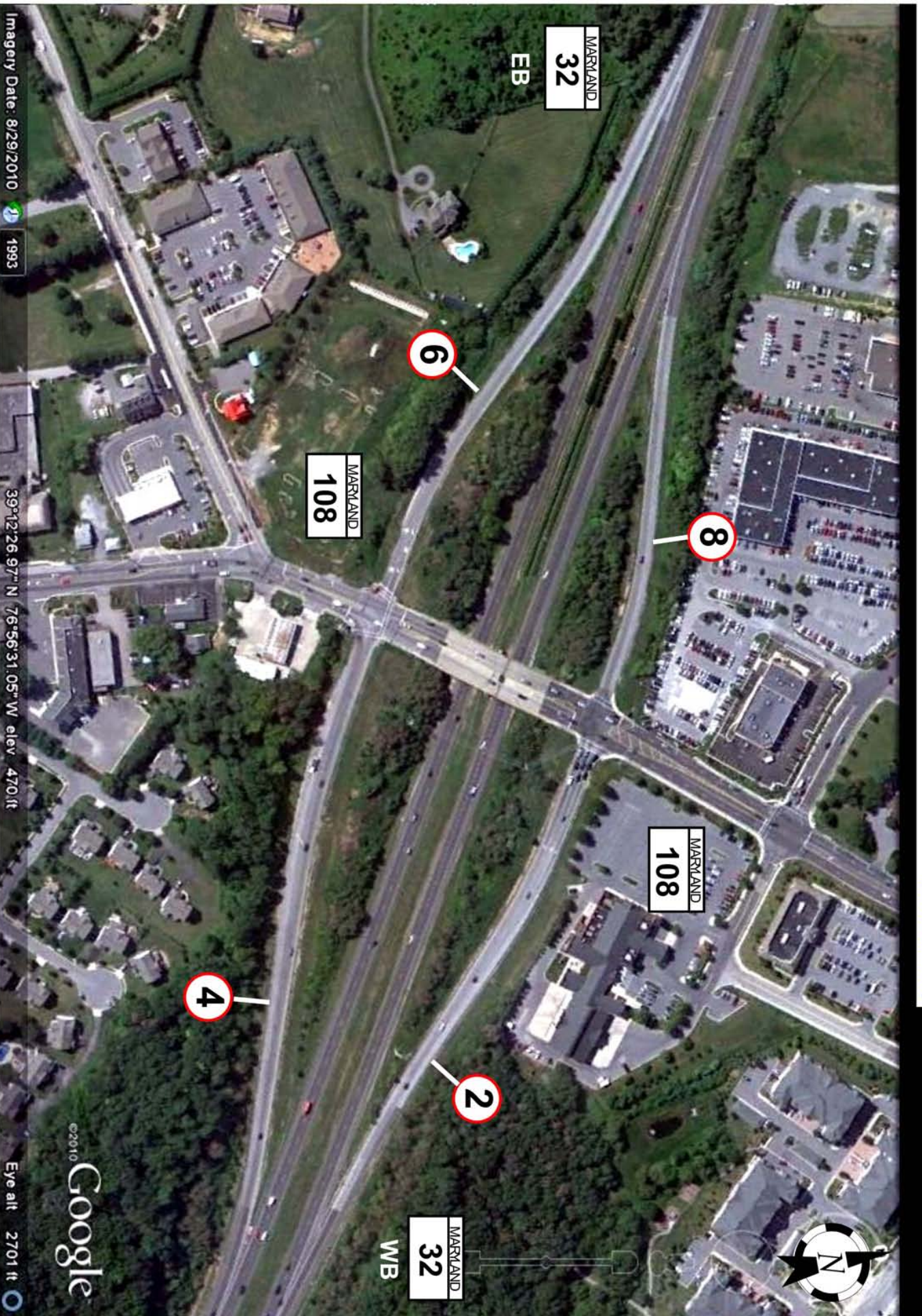
Thank you for your assistance.

Photo: 2010

Howard County

MD32 At:
MD108 Clarksville Pike

IC: 1319
[Return to Index](#)





Google Earth



Location: IC #1319; MD 32 @ MD 108, Rps 4 & 6
 County: Howard, D7

Period: January 01, 2013 To December 31, 2016

Logmiles: 3.69 At -1 Radius: 500 ft.

Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	1	0	1	0	2
No. Injured	1	0	3	0	4
Prop. Damage	2	0	0	1	3
Total Crashes	3	0	1	1	5
Severity Index	4	0	4	1	Avg 2
Opposite Dir.	0	0	0	0	0
Rear End	0	0	0	0	0
Sideswipe	1	0	0	0	1
Left Turn	2	0	1	1	4
Angle	0	0	0	0	0
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	0	0
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	1	0	0	0	1
Wet Surface	2	0	0	0	2
Alcohol	0	0	0	0	0
Intersection	3	0	1	1	5
Total Vehicles	6	0	2	2	10
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: IC #1319; MD 32 @ MD 108, Rps 4 & 6
 County: Howard, D7

Logmiles: 3.69 At -1 Radius: 500 ft.
 Note: Year 2016 data may be incomplete and unedited

Period: January 1, 2013 To December 31, 2016

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																
Accidents		2	3	5	SUN	MON	TUE	WED	THU	FRI	SAT	UNK									
Veh Occ		4			1			3		1											
Pedestrian					AVG Severity Index: 2																
MONTH OF THE YEAR													CONDITION	DRIVER	PED						
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	10							
		1	1	1					1		1		Alcohol:								
													Other:								
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT							
AM:								1	1		1			1	2	3	4	5	6+	UNK	TOTAL
PM:								1	1						5						10
VEHICLE TYPE			SURFACE			MOVEMENTS															
Motorcycle/Moped	Tractor Trailer		2 Wet			NORTH			SOUTH			EAST			WEST						
8 Passenger Vehicle	Passenger Bus		3 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT				
1 Sport Utility Veh	School Bus		Sno/Ice					5		1											
1 Pick-Up Truck	Emergency Veh		Mud			OTHER MOVEMENTS															
Trucks (2+3 axles)	Other Types		Other																		
PROBABLE CAUSES													COLLISION TYPES				FATAL	INJURY	PROP	TOTAL	
Influence of Drugs			Improper Lane Change			Opposite Dir			Related:												
Influence of Alcohol			Improper Backing			UnRelated:															
Influence of Medication			Improper Passing			Rear End			Related:												
Influence of Combined Subst.			Improper Signal			UnRelated:															
Physical/Mental Difficulty			Improper Parking			Sideswipe			Related:					1	1						
Fell Asleep/Fainted, etc.			Passenger Interfere/Obstruct.			UnRelated:															
Fail to give full Attention			Illegally in Roadway			Left Turn			Related:				2	2	4						
Lic. Restr. Non-compliance			Bicycle Violation			UnRelated:															
1 Fail to Drive in Single Lane	Clothing Not Visible		Angle			Related:															
Improper Right Turn on Red	Sleet, Hail, Freezing Rain		UnRelated:																		
2 Fail to Yield Right-of-way	Severe Crosswinds		Pedestrian			Related:															
Fail to Obey Stop Sign	Rain, Snow		UnRelated:																		
Fail to Obey Traffic Signal	Animal		Parked Vehicle			Related:															
1 Fail to Obey Other Control	Vision Obstruction		UnRelated:																		
Fail to Keep Right of Center	Vehicle Defect		Other Collision			Related:															
Fail to Stop for School Bus	Wet		UnRelated:																		
Wrong Way on One Way	Icy or Snow Covered		F			Bridge			01												
Exceeded Speed Limit	Debris or Obstruction		I			Building			02												
Operator Using Cell Phone	Ruts, Holes or Bumps		X			Culvert/Ditch			03												
Stopping in Lane Roadway	Road Under Construction		E			Curb			04												
Too Fast for Conditions	Traffic Control Device Inop.		D			Guardrail/Barrier			05												
Followed too Closely	Shoulders Low, Soft or High		O			Embankment			06												
1 Improper Turn	Other or Unknown		B			Fence			07												
			J			Light Pole			08												
			E			Sign Pole			09												
			C			Other Pole			10												
			T			Tree/Shrubbery			11												
			S			Contr. Barrier			12												
						Crash Attenuator			13												
						Other Fixed Object							30								
WEATHER	ILLUMINATION			TOTALS																	
3 Clear / Cloudy	4 Day			13-16		5															
Foggy	Dawn/Dusk																				
1 Raining	1 Dark - Lights On																				
Snow / Sleet	Dark - No Lights																				
1 Other	Other																				

Location: IC #1319; MD 32 @ MD 108, Rps 4 & 6

Logmiles: 3.69 At -1 Radius: 500 ft.

County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD108												
3.690	✓	03202013	1 Injured	08P	Night	Wet			LFTRN	SL	NS	Improper turn
3.690	✓	12062013	Property	07A	Day	Wet			LFTRN	SL	NS	Fail to obey other control
3.690	✓	05132015	3 Injured	07P	Day	Dry			LFTRN	SL	NS	Fail to yield right-of-way
3.740	✓	04172013	Property	08A	Day	Dry			SDSWP	NR	NS	Fail to drive in single lane
3.740	✓	10232016	Property	10A	Day	Dry			LFTRN	SL	NS	Fail to yield right-of-way

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator

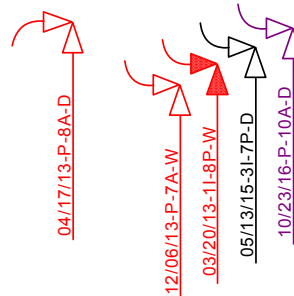


Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: IC #1319; MD 32 @ MD 108, Rps 4 & 6
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/29/2017

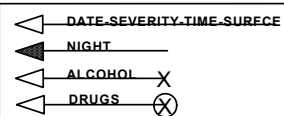
MARYLAND
 108

RAMP 6



RAMP 4

MARYLAND
 108



SEVERITY

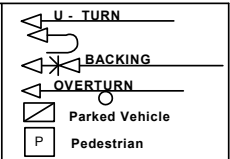
- F - Fatalities
- I - Injured
- P - Property Damage
- Only
- SURFACE
- D - Dry Surface
- W - Wet Surface
- I - Icy Surface
- S - Snowy Surface

- 00 - Not Applicable
- 01 - Bridge or Overpass
- 02 - Building
- 03 - Culvert or Ditch
- 04 - Curb
- 05 - Guardrail or Barrier
- 06 - Embankment
- 07 - Fence

- 08 - Light Support Pole
- 09 - Sign Support Pole
- 10 - Other Pole
- 11 - Tree Shrubbery
- 12 - Construction Barrier
- 13 - Crash Attenuator
- 88 - Other
- 99 - Unknown

- B - Bicycle
- P - Other Pedalcycle
- C - Other Conveyance
- T - Railway Train
- A - Animal
- O - Other Object
- S - Spilled Cargo
- J - Jackknife

- U - Units Separated
- N - Other Non collision
- D - Off Road
- R - Downhill Runaway
- F - Explosion or Fire
- ? - Unknown



template 06-27-06

32459
Due 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
Cc: John Concannon; Robert Booker; Mark Crampton (SHA); Jagarapu, Krishnakanth; Bowman, Diane J.
Subject: FW: Crash Data Request - MD 108

Bill:

Would you please provide crash data as requested.

Thank you.

Buck Bohmer, BCE, Project Manager

Traffic Engineering Div
Howard County Public Works, Bureau of Highways
9250 Bendix Rd
Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

410-313-2430 (Office)
410-313-5748 (Desk)
410-313-5750 (FAX)

Report a Problem: [TellHoCo](#)

From: Carl Wilson [mailto:cwilson@trafficgroup.com]
Sent: Tuesday, June 27, 2017 9:36 AM
To: Jagarapu, Krishnakanth <kjagarapu@howardcountymd.gov>; Bohmer, Buck <BUBohmer@howardcountymd.gov>
Subject: Crash Data Request - MD 108

Kris/Buck-

We are in the process of preparing a Traffic Impact Study within the MD 108 corridor. Can you please provide crash data for the following intersections:

- MD 108 at Sheppard Lane
- MD 108 at Linden Linthicum Lane
- MD 108 at Great Star Drive
- MD 108 at Auto Drive
- * MD 108 at MD 32 Ramps 2/8
- MD 108 at Ten Oaks Drive

3.78

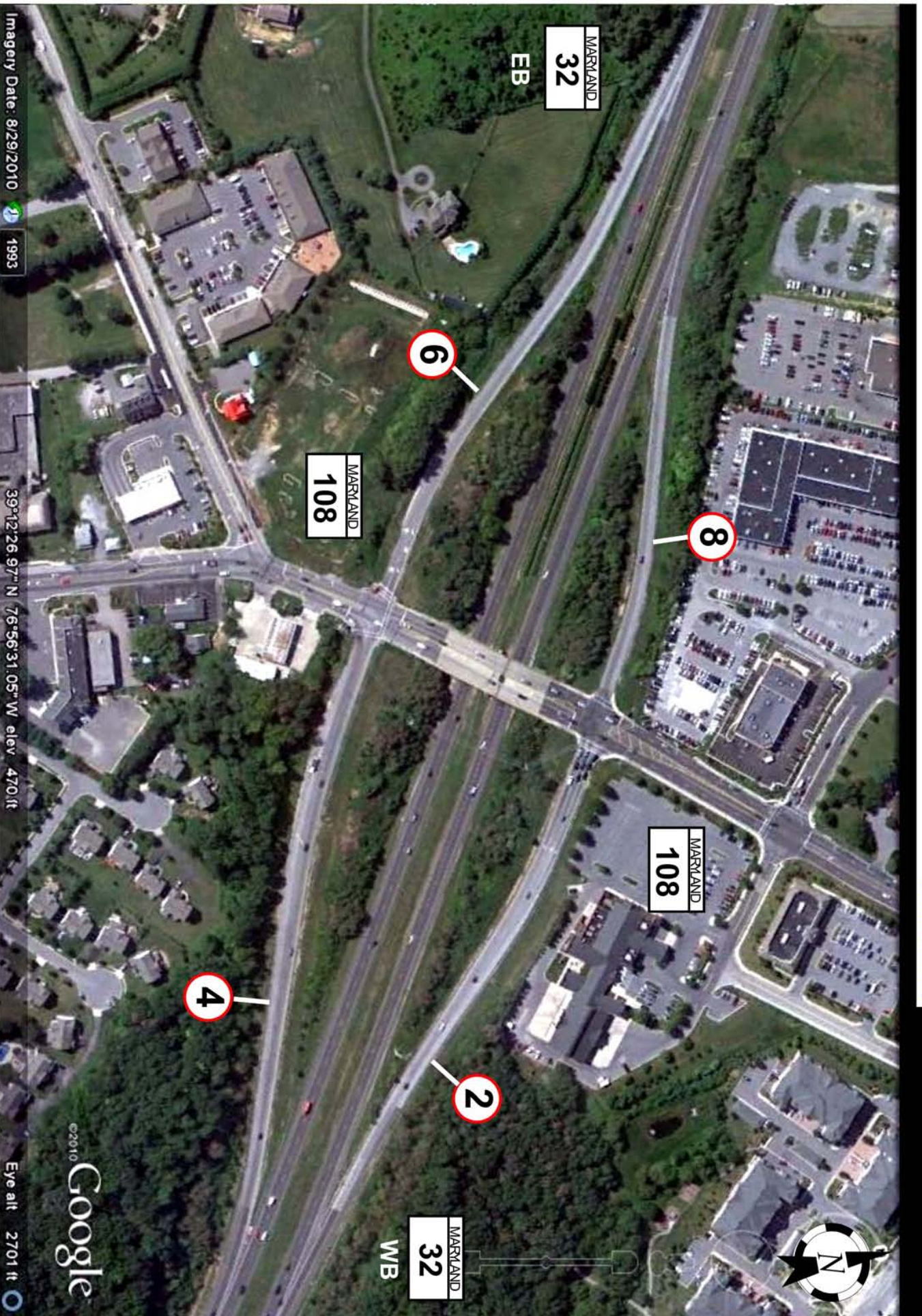
Thank you for your assistance.

Photo: 2010

Howard County

MD32 At:
MD108 Clarksville Pike

IC: 1319
[Return to Index](#)



Imagery Date: 8/29/2010 1993

39°12'26.97" N 76°56'31.05" W elev. 470.1ft

©2010 Google
Eye alt 2701 ft

MD State Highway Administration
Traffic Development Support Division



Google Earth

feet
meters



Location: IC #1319; MD 32 @ MD 108; Rps 2 & 8
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 3.78 At -1 Radius: 500 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	2	0	1	0	3
No. Injured	3	0	1	0	4
Prop. Damage	1	1	1	1	4
Total Crashes	3	1	2	1	7
Severity Index	7	1	3	1	Avg 3
Opposite Dir.	0	0	0	0	0
Rear End	0	0	0	0	0
Sideswipe	0	0	0	0	0
Left Turn	1	1	1	0	3
Angle	2	0	1	1	4
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	0	0
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	3	0	1	0	4
Wet Surface	1	0	1	1	3
Alcohol	0	0	0	0	0
Intersection	3	1	2	1	7
Total Vehicles	6	2	4	2	14
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: IC #1319; MD 32 @ MD 108; Rps 2 & 8
 County: Howard, D7

Logmiles: 3.78 At -1 Radius: 500 ft.
 Note: Year 2016 data may be incomplete and unedited

Period: January 1, 2013 To December 31, 2016

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																
Accidents		3	4	7	SUN	MON	TUE	WED	THU	FRI	SAT	UNK									
Veh Occ		4			2	1	1	1	1	1											
Pedestrian					AVG Severity Index: 3																
MONTH OF THE YEAR													CONDITION	DRIVER	PED						
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	13							
	1	2		1	1					1	1		Alcohol:								
													Other:								
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT							
AM:		1						1						1	2	3	4	5	6+	UNK	TOTAL
PM:			1					1	1	1	1				7						14
VEHICLE TYPE				SURFACE			MOVEMENTS														
Motorcycle/Moped		Tractor Trailer		3 Wet			NORTH			SOUTH			EAST			WEST					
13	Passenger Vehicle	Passenger Bus		4 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT			
	Sport Utility Veh	School Bus		Sno/Ice			3	3			4					3	1				
	Pick-Up Truck	1	Emergency Veh	Mud			OTHER MOVEMENTS														
	Trucks (2+3 axles)	Other Types		Other																	
PROBABLE CAUSES													COLLISION TYPES				FATAL	INJURY	PROP	TOTAL	
Influence of Drugs				Improper Lane Change									Opposite Dir		Related:						
Influence of Alcohol				Improper Backing									UnRelated:								
Influence of Medication				Improper Passing									Rear End		Related:						
Influence of Combined Subst.				Improper Signal									UnRelated:								
Physical/Mental Difficulty				Improper Parking									Sideswipe		Related:						
Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.									UnRelated:								
Fail to give full Attention				Illegally in Roadway									Left Turn		Related:		1	2	3		
Lic. Restr. Non-compliance				Bicycle Violation									UnRelated:								
Fail to Drive in Single Lane				Clothing Not Visible									Angle		Related:		2	2	4		
Fail to Drive in Single Lane				Clothing Not Visible									UnRelated:								
Improper Right Turn on Red				Sleet, Hail, Freezing Rain									Pedestrian		Related:						
2	Fail to Yield Right-of-way	Severe Crosswinds									UnRelated:										
Fail to Obey Stop Sign				Rain, Snow									Parked Vehicle		Related:						
1	Fail to Obey Traffic Signal	Animal									UnRelated:										
2	Fail to Obey Other Control	Vision Obstruction									Other Collision		Related:								
Fail to Keep Right of Center				Vehicle Defect									UnRelated:								
Fail to Stop for School Bus				Wet									F	Bridge	01						
Wrong Way on One Way				Icy or Snow Covered									I	Building	02						
Exceeded Speed Limit				Debris or Obstruction									X	Culvert/Ditch	03						
Operator Using Cell Phone				Ruts, Holes or Bumps									E	Curb	04						
Stopping in Lane Roadway				Road Under Construction									D	Guardrail/Barrier	05						
Too Fast for Conditions				Traffic Control Device Inop.										Embankment	06						
Followed too Closely				Shoulders Low, Soft or High									O	Fence	07						
1	Improper Turn	1 Other or Unknown									B	Light Pole	08								
WEATHER				ILLUMINATION				TOTALS				J	Sign Pole	09							
3	Clear / Cloudy	2 Day				13-16				7	E	Other Pole	10								
	Foggy	1 Dawn/Dusk									C	Tree/Shrubbery	11								
2	Raining	4 Dark - Lights On									T	Contr. Barrier	12								
1	Snow / Sleet	Dark - No Lights									S	Crash Attenuator	13								
1	Other	Other										Other Fixed Object				37					

Location: IC #1319; MD 32 @ MD 108; Rps 2 & 8

Logmiles: 3.78 At -1 Radius: 500 ft.

County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD108												
3.690	✓	03202013	1 Injured	08P	Night	Wet			LFTRN	NL	SS	Improper turn
3.740	✓	06132013	Property	01A	Night	Dry			ANGLE	NS	WL	Fail to obey other control
3.740	✓	11122013	2 Injured	09P	Night	Dry			ANGLE	NS	WL	Fail to obey other control
3.780	✓	12072014	Property	03P	Day	Dry			LFTRN	NL	SS	Fail to obey traffic signal
3.780	✓	02022015	1 Injured	07A	Day	Wet			ANGLE	SS	WS	Fail to yield right-of-way
3.780	✓	03132015	Property	10P	Night	Dry			LFTRN	NL	SS	Fail to yield right-of-way
3.780	✓	05292016	Property	07P	Day	Wet			ANGLE	NS	WL	Other or Unknown

Fixed Object: 01 = Bridge	02 = Building	03 = Culvert/Ditch	04 = Curb	05 = Guardrail/Barrier	06 = Embankment	07 = Fence
08 = Light Pole	09 = Sign Post	10 = Other Pole	11 = Tree/Shrubbery	12 = Construction Barrier	13 = Crash Attenuator	

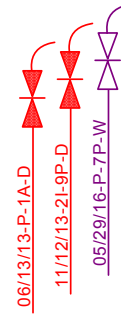
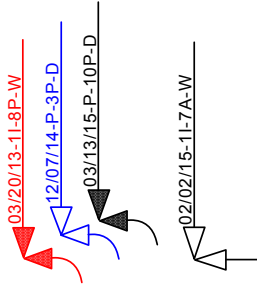


Office of Traffic & Safety
 Traffic Development & Support Division
 Crash Analysis Safety Team

Location: IC #1319; MD 32 @ MD 108, Rps 2 & 8
 County: HOWARD
 Study Period: 01/01/2013 to Approx. 12/31/2016
 Analyst: Robert L. Booker, Jr. Date: 06/29/2017

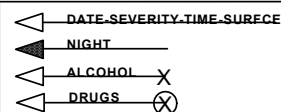
MARYLAND
 108

RAMP 8



RAMP 2

MARYLAND
 108



SEVERITY

F - Fatalities
 I - Injured
 P - Property Damage

Only SURFACE

D - Dry Surface
 W - Wet Surface
 I - Icy Surface
 S - Snowy Surface

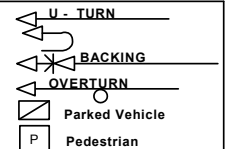
00 - Not Applicable
 01 - Bridge or Overpass
 02 - Building
 03 - Culvert or Ditch
 04 - Curb
 05 - Guardrail or Barrier
 06 - Embankment
 07 - Fence

08 - Light Support Pole
 09 - Sign Support Pole
 10 - Other Pole
 11 - Tree Shrubbery
 12 - Construction Barrier
 13 - Crash Attenuator
 88 - Other
 99 - Unknown

B - Bicycle
 P - Other Pedalcycle
 C - Other Conveyance
 T - Railway Train
 A - Animal
 O - Other Object
 S - Spilled Cargo
 J - Jackknife

U - Units Separated
 N - Other Non collision
 D - Off Road
 R - Downhill Runaway
 F - Explosion or Fire
 ? - Unknown

template 06-27-06



32460
DUE 7/19

William Macleod

From: Bohmer, Buck <BUBohmer@howardcountymd.gov>
Sent: Tuesday, June 27, 2017 10:33 AM
To: William Macleod
Cc: John Concannon; Robert Booker; Mark Crampton (SHA); Jagarapu, Krishnakanth; Bowman, Diane J.
Subject: FW: Crash Data Request - MD 108

Bill:

Would you please provide crash data as requested.

Thank you.

Buck Bohmer, BCE, Project Manager

Traffic Engineering Div
Howard County Public Works, Bureau of Highways
9250 Bendix Rd
Columbia, MD 21045

New E-Mail bubohmer@howardcountymd.gov

410-313-2430 (Office)
410-313-5748 (Desk)
410-313-5750 (FAX)

Report a Problem: [TellHoCo](#)

From: Carl Wilson [mailto:cwilson@trafficgroup.com]
Sent: Tuesday, June 27, 2017 9:36 AM
To: Jagarapu, Krishnakanth <kjagarapu@howardcountymd.gov>; Bohmer, Buck <BUBohmer@howardcountymd.gov>
Subject: Crash Data Request - MD 108

Kris/Buck-

We are in the process of preparing a Traffic Impact Study within the MD 108 for the following intersections:

- MD 108 at Sheppard Lane
- MD 108 at Linden Linthicum Lane
- MD 108 at Great Star Drive
- MD 108 at Auto Drive
- MD 108 at MD 32 Ramps
- MD 108 at Ten Oaks Drive *0558*

3.65 @ 1.00/IN

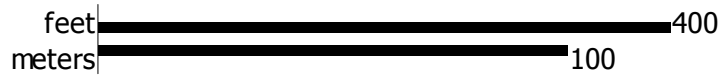
10/20/16
31035

40
RLB
to M. KIM

Thank you for your assistance.



Google Earth



Location: MD 108 @ TEN OAKS RD
 County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Logmiles: 3.65 At 0 Radius: 150 ft.
 Note: Year 2016 data may be incomplete and unedited

YEAR >>	2013	2014	2015	2016	Total
Fatal	0	0	0	0	0
No. Killed	0	0	0	0	0
Injury	0	0	0	1	1
No. Injured	0	0	0	1	1
Prop. Damage	1	0	1	0	2
Total Crashes	1	0	1	1	3
Severity Index	1	0	1	2	Avg 1
Opposite Dir.	0	0	0	0	0
Rear End	1	0	1	0	2
Sideswipe	0	0	0	0	0
Left Turn	0	0	0	0	0
Angle	0	0	0	1	1
Pedestrian	0	0	0	0	0
Parked Veh.	0	0	0	0	0
Fixed Object	0	0	0	0	0
Other	0	0	0	0	0
U-Turn	0	0	0	0	0
Backing	0	0	0	0	0
Animal	0	0	0	0	0
Railroad	0	0	0	0	0
Fire / Expl.	0	0	0	0	0
Overturn	0	0	0	0	0
Truck Related	0	0	0	0	0
Night Time	0	0	0	0	0
Wet Surface	1	0	0	0	1
Alcohol	0	0	0	0	0
Intersection	1	0	1	1	3
Total Vehicles	2	0	4	2	8
Total Trucks	0	0	0	0	0
Truck %	0.0	0.0	0.0	0.0	0.0

Comments:

Location: MD 108 @ TEN OAKS RD

Logmiles: 3.65 At 0 Radius: 150 ft.

County: Howard, D7 Period: January 1, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

SEVERITY	FATAL	INJURY	P-DAMAGE	TOTAL	DAY OF THE WEEK																			
Accidents		1	2	3	SUN	MON	TUE	WED	THU	FRI	SAT	UNK												
Veh Occ		1			1		1			1														
Pedestrian					AVG Severity Index: 1																			
MONTH OF THE YEAR													CONDITION	DRIVER	PED									
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	5										
			1					1	1				Alcohol:											
													Other:	3										
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT										
AM:								1						1	2	3	4	5	6+	UNK	TOTAL			
PM:		1					1								2		1				8			
VEHICLE TYPE				SURFACE			MOVEMENTS																	
Motorcycle/Moped		Tractor Trailer		1 Wet			NORTH			SOUTH			EAST			WEST								
5	Passenger Vehicle	Passenger Bus		2 Dry			LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT						
1	Sport Utility Veh	School Bus		Sno/Ice			1						4			1								
Pick-Up Truck		Emergency Veh		Mud																				
Trucks (2+3 axles)		2 Other Types		Other			OTHER MOVEMENTS 2																	
PROBABLE CAUSES													COLLISION TYPES				FATAL	INJURY	PROP	TOTAL				
Influence of Drugs				Improper Lane Change									Opposite Dir		Related:									
Influence of Alcohol				Improper Backing									UnRelated:											
Influence of Medication				Improper Passing									Rear End		Related:		2	2						
Influence of Combined Subst.				Improper Signal									UnRelated:											
Physical/Mental Difficulty				Improper Parking									Sideswipe		Related:									
1 Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.									UnRelated:											
1 Fail to give full Attention				Illegally in Roadway									Left Turn		Related:									
Lic. Restr. Non-compliance				Bicycle Violation									UnRelated:											
Fail to Drive in Single Lane				Clothing Not Visible									Angle		Related:		1	1						
Fail to Drive in Single Lane				Clothing Not Visible									UnRelated:											
Improper Right Turn on Red				Sleet, Hail, Freezing Rain									Pedestrian		Related:									
Fail to Yield Right-of-way				Severe Crosswinds									UnRelated:											
Fail to Obey Stop Sign				Rain, Snow									Parked Vehicle		Related:									
1 Fail to Obey Traffic Signal				Animal									UnRelated:											
Fail to Obey Other Control				Vision Obstruction									Other Collision		Related:									
Fail to Keep Right of Center				Vehicle Defect									UnRelated:											
Fail to Stop for School Bus				Wet									F		Bridge	01								
Wrong Way on One Way				Icy or Snow Covered									I		Building	02								
Exceeded Speed Limit				Debris or Obstruction									X		Culvert/Ditch	03								
Operator Using Cell Phone				Ruts, Holes or Bumps									E		Curb	04								
Stopping in Lane Roadway				Road Under Construction									D		Guardrail/Barrier	05								
Too Fast for Conditions				Traffic Control Device Inop.											Embankment	06								
Followed too Closely				Shoulders Low, Soft or High									O		Fence	07								
Improper Turn				Other or Unknown									B		Light Pole	08								
													J		Sign Pole	09								
													E		Other Pole	10								
													C		Tree/Shrubbery	11								
													T		Contr. Barrier	12								
													S		Crash Attenuator	13								
															Other Fixed Object		43							
WEATHER	ILLUMINATION			TOTALS																				
2 Clear / Cloudy	2 Day			13-16		3																		
Foggy	1 Dawn/Dusk																							
1 Raining	Dark - Lights On																							
Snow / Sleet	Dark - No Lights																							
Other	Other																							

Location: MD 108 @ TEN OAKS RD

Logmiles: 3.65 At 0 Radius: 150 ft.

County: Howard, D7 Period: January 01, 2013 To December 31, 2016

Note: Year 2016 data may be incomplete and unedited

MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	Movement		Probable Cause
										V1	V2	
MD108												
3.650	✓	04122013	Property	07A	Day	Wet			RREND	ES	ES	Fell asleep, fainted, etc.
3.650	✓	09012015	Property	03P	Day	Dry			RREND	ES	ES	Fail to give full attention
3.650	✓	10162016	1 Injured	06P	Day	Dry			ANGLE	WS	NS	Fail to obey traffic signal

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
 08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator