

Environmental Matters Committee
April 20, 2017
Suggestions From Greg A. Walker for Forest Drive Sector Study

Traffic issues are the focus of my comments, but other issues are tangential

- (Packet 1): Suggestions on Process and List of Suggested Deliverables from City Staff and Consultants for finished product
- (Packet 2): What The 2009 Comprehensive Plan and State Law Contemplates for the Forest Drive Sector Study
 - New regulations to be moving along in a parallel path but completed before the Forest Drive Sector Study is completed so they can be applied
- (Packet 3) All the data suggests we have a serious traffic issue on the Forest Drive corridor
- (Packet 4) Why Annapolis needs comprehensive working traffic models with community buy-in
- (Packet 5) Work through the "Forest Drive Corridor Improvements – Assessment Template" to have a list of truly viable list of projects on which to focus energy

List of Suggested Deliverables From Forest Drive Sector Study

Process:

- Restart Process to scope the effort and establish deliverables with input from City Planning Commission, other commissions and boards, public, businesses and elected officials. Environment and infrastructure improvements are supposed to be part of the sector study as well as other items. Also, involve all these persons and entities to set parameters for models, agree on geographic scope, attend meetings on updates, drafts, etc... Only allowing comments at a public forum after a slide presentation and time constraints is not useful. The finished product should be a useful daily planning tool to assist with decision making.
- Modeling must include all possible projects and not just approved. This is a planning tool, not a site specific traffic impact study. There must be certainty we do not go into overcapacity without viable fixes that are implemented timely.
- Work with the County and the State as regards roadway issues and traffic. The study needs to encompass Aris T. Allen and Bay Ridge to its terminus. The study needs to encompass Eastport and all City and County lands on which development would likely flow to Forest Drive.

Parallel Projects And Deliverables to be completed and used in the completion of the sector study:

- Get a legal opinion on the required "nexus" to be able to charge impact fees for developments feeding into the corridor as no one developer causes the overall sector traffic issue
- Get a legal opinion on the obligations of the City to adopt new traffic impact regulations and a new Site Design Manual as these are included as "Policies" in the Annapolis Comprehensive Plan.
- Regardless of the result of the legal opinion above, start to develop and finalize the required new regulations to revise how traffic impact studies are performed. *Comprehensive Plan, Policy 9, Chapter 4 - Transportation, Page 60*
- Regardless of the result of the legal opinion above, finish the process already started to complete the required Site Design Manual that will replace the 1986 Parking and Landscaping Manual. *Comprehensive Plan, Policy 2.5, Chapter 7- Environment, Page 96 - New Site Design Manual*
- Work through the "Forest Drive Corridor Improvements - Assessment Template" to have a list of proven viable roadway improvements of other actions to reduce traffic issues
- Involving a team of from City Planning Commission, other commissions and boards, public, businesses and elected officials, refine assumptions and complete the Forest Drive Corridor Model Analysis last updated September 2015. (Wait for new traffic counts being developed by Anne Arundel County. Proceed with understanding it is a model to be modified over time, but can assess worst and best case scenarios now to help with the Forest Drive Sector Study)

What are Some Objectives of the Sector Studies ?

2009 Annapolis Comprehensive Plan
Chapter 3 - Land Use and Economic Development, Page 33

Policy 1. Growth will be directed primarily to four Opportunity Areas, illustrated in Figures 3-7 through 3-10 and reflected in the Future Land Use Map.

Over the next decade, the City will formulate detailed land use and urban design plans or sector studies for each of the four opportunity areas.

1.1 The detailed area plans should identify the necessary role of the City and other public entities in facilitating redevelopment, including, for example, infrastructure improvements and zoning changes.

1.2 Each of the four opportunity areas should be developed as models for ecologically sustainable urban development.

1.3 Each of the four opportunity areas should be seen as vital nodes on the network of public transit routes. Each area should be developed to promote a high transit demand so as to encourage the effective provision of transit city-wide. In other words, the development of the opportunity area and its transit demand should have a positive spillover effect on the quality of transit service. As an example, the development in the Outer West Street Opportunity Area should demand service to such a degree that residents elsewhere in the city benefit by virtue of their proximity to the same bus routes serving Outer West Street.

NOTE: In the ACP, Chapter 10 - Implementation, Page 140, these sector studies were identified as priority action items to be completed by the end of 2012

These guidelines for what should be in the sector study strongly support starting and completing the new traffic impact regulations and the new Site Design Manual called for by the Comprehensive Plan.

Requirement for New Site Design Manual to replace 1986 Manual

Chapter 7- Environment, Page 96 – New Site Design Manual

Policy 2.5 To help achieve the City's environmental goals and ensure high quality development, the City will create a Site Design Manual that will replace the 1986 Parking and Landscaping Manual. The Site Design Manual will provide guidance on design of the landscape on public and private development sites. This will include planting with a preference for water conserving plants and plants tolerant of urban soils, rainwater management, tree preservation, and soil management. Best management practices for handling the impacts of development, use of pervious and impervious paving materials, design of parking areas, lighting, internal circulation, and other matters related to site\development should also be addressed in the Manual.

The Site Design Manual will aim to make the site design process more predictable. The Manual will be coordinated with the City's Green Building standards and other sections of the City Code governing trees and other planting, grading, critical areas, and rainwater.

- *Although the new Site Design Manual was not identified in the ACP as a priority action item to be completed by the end of 2012, it is critical to have in place for the Planning Commission to implement the twelve "Visions" as required by statute. Land Use Code Section 1-205. The new Site Design manual had extensive work done on it in the past and it was nearing completion.*

NOTE: City is required to pass "planned development ordinances and regulations" and other "land use ordinances and regulations" that will further the "Policies," the "timing of the implementation of the plan," the "timing of development" and the "development patterns" as described in the ACP. Maryland Land Use Code Sections 3-303 and 1-304. The promised new Site Design Manual is needed properly to complete a meaningful Forest Drive Sector Study.

Annapolis Comprehensive Plan Policies -- Relevant Prerequisites to the Forest Drive Sector Study Preparation

Requirement for New Regulations on Performing Traffic Impact studies

Chapter 4 - Transportation, Page 60

Policy 9. Conventional methods for evaluating a development project's traffic impacts will be replaced with a more coherent and balanced urban planning-based evaluation of accessibility and mobility. Conventional traffic impact studies are not sensitive to the role of transit service or walking and biking options in an urban community. Nor can they ever be considered a tool for creating mixed use communities where higher density development and options for various forms of travel are to be encouraged. If transit, walking, carpooling, and all other modes of travel are not considered appropriately, a traffic impact study may suggest solutions that effectively over-build the capacity of streets and highways at the expense of the place-making goals of this Plan. A Planning Commission which relies on the results of a conventional traffic impact study might actually act to deny the very development projects which are needed to convert an underutilized suburban pattern into a more economically vibrant one.

9.1 The City will adopt an area-wide approach to the study and monitoring of traffic conditions and projection of travel demand by mode. This will be a plan-based approach and will provide the basis for understanding how future development projects should contribute to an area's transportation performance. Planning for traffic impacts on an area-wide basis recognizes that residents and employees should have choices of alternative routes and modes within an area.

9.2 From a regulatory approach, future development projects will be evaluated against their contribution to an area's transportation performance broadly defined to include safety, transit ridership and cost effectiveness, heavy truck congestion, automobile congestion, bicycle and pedestrian circulation, and the existing nature and purpose of the surrounding road network. The City will develop regulations to implement this provision, which must include ensuring safe facilities for walking and cycling.

NOTE: In the ACP, Chapter 10 - Implementation, Page 140, the new traffic impact regulations were identified as a priority action item to be completed by the end of 2012

NOTE: *City is required to pass "planned development ordinances and regulations" and other "land use ordinances and regulations" that will further the "Policies," the "timing of the implementation of the plan," the "timing of development" and the "development patterns" as described in the ACP. Maryland Land Use Code Sections 3-303 and 1-304. The promised new traffic impact regulations are needed properly to complete a meaningful Forest Drive Sector Study*

No Surprise Traffic Issues are Material Factor of the Forest Drive Corridor

Without a decisive course correction in transportation policy, by 2030, traffic congestion will impede the flow of goods and services, choke the quality of life in the city and its environs, and dim the ambience that attracts millions of yearly visitors. *The ACP, page 42*

"...by 2030 all major radial and cross-town routes will experience severe congestion including significant sections of Forest Drive, Hilltop Lane, Bay Ridge Road, Spa Road, Taylor Avenue, West Street, and Rowe Boulevard." *The ACP, page 44*

The Anne Arundel County General Development Plan predicts in the future the Forest Drive corridor will operate at a Level of Service rating equal to "F." *2009 General Development Plan, Figure 9-3, Page 159 – Transportation Level of Service Forecasts*

The ACP incorporated a separate Policy regarding Traffic on the Forest Drive Corridor. (See Tab 18 Policy 5 from ACP, Chapter 4 – Transportation addressing Forest Drive Issues)

"The City must keep a broad set of options available for dealing with this congestion in the future. If problems grow as forecasted, these options will become increasingly important in engineering an overall solution."

"To adequately address congestion in the Forest Drive corridor it will be necessary to update the prior studies in order to recommend a comprehensive set of improvements..."

"Aggressively lobby the State and the County to begin and complete the study of the 665/ForestDrive/Chinquapin intersection within the next year"

Forest Drive Corridor is at a Critical Crossroads and Decisions Must Be Informed and Based on Sound Engineering and Planning in Coordination with the County and State

The "[Forest Drive] corridor is on the edge of capacity, and we would hope that approval of new developments wouldn't be given if it is likely that they will force Forest Drive into over-capacity operations." *Note from Anne Arundel County Traffic Engineering Division to Annapolis Planning and Zoning assessing proposed Parkside Preserve (formerly Reserve at Quiet Waters) project - August 2011.*

Need Models and Information to make decisions. The Planning Commission, City staff, developers and the public need clarity on the long term traffic issues and the Forest Drive Sector Study MUST address this.

"Although the planning commission is often charged with making short-term decisions, planning commissions must always keep the long-term ramifications of the decision in mind – remember, the primary responsibility of the planning commission is to implement the vision outlined in the comprehensive plan." *Planning Commission Duties and Responsibilities, Maryland Department of Planning, page 17*

Further recent Evidence of an Impending Major Traffic Issue

Annapolis "Policies and Guidelines For Traffic Impact Analysis For Proposed Development in the City of Annapolis" -- Supposed to be Replaced by New Regulations

7. ROADWAY AND INTERSECTION MITIGATION OR IMPROVEMENTS

Mitigation means the construction and/or funding of roadway and/or improvements to off-site road facilities by the developer. Any mitigation plans shall be developed in consultation with the Director of Planning & Zoning and shall be reviewed by the Planning Commission.

Improvements are required if the roadway, the intersection and/or a particular movement will operate below LOS D or worse with the proposed development. Under this condition, the roadway and/or intersection improvements shall bring the level-of-service to at least LOS D.

Improvements will be required if the roadway and/or intersection will operate at LOS E or F for the horizon year(s) without the proposed development, and will be even worse with the proposed development. In this case, the proposed mitigation shall aim to maintain the same level of delay and ensure safety.

- December 2016: University of Maryland PALS presentation to Planning and Zoning staff
Uses old traffic counts, does not include all likely development, and still projects major issues
- September 26, 2016 – Traffic Impact Analysis for Lidl grocery store on County land
Uses newer traffic counts and escalates at 4%, does not include all likely development, and still projects a LOS "E" at the Forest Drive/Spa Road intersection.
Hillsmere/Forest/Bay Ridge likely failing if all development is built in as the recent Anne Arundel County study from 2016 notes both this intersection and the Spa/Forest intersection are already operating at "D" level of service with no new building.
- September 15, 2015 last version of the Forest Drive Corridor Analysis Model
Uses old traffic counts, does not include all likely development, uses a 1% growth rate only escalated for 5 years and still projects major issues with "E" and "F" levels of service at almost every intersection along Forest Drive.



Land Use/Transportation Evaluation for the Forest Drive Corridor

Presented by

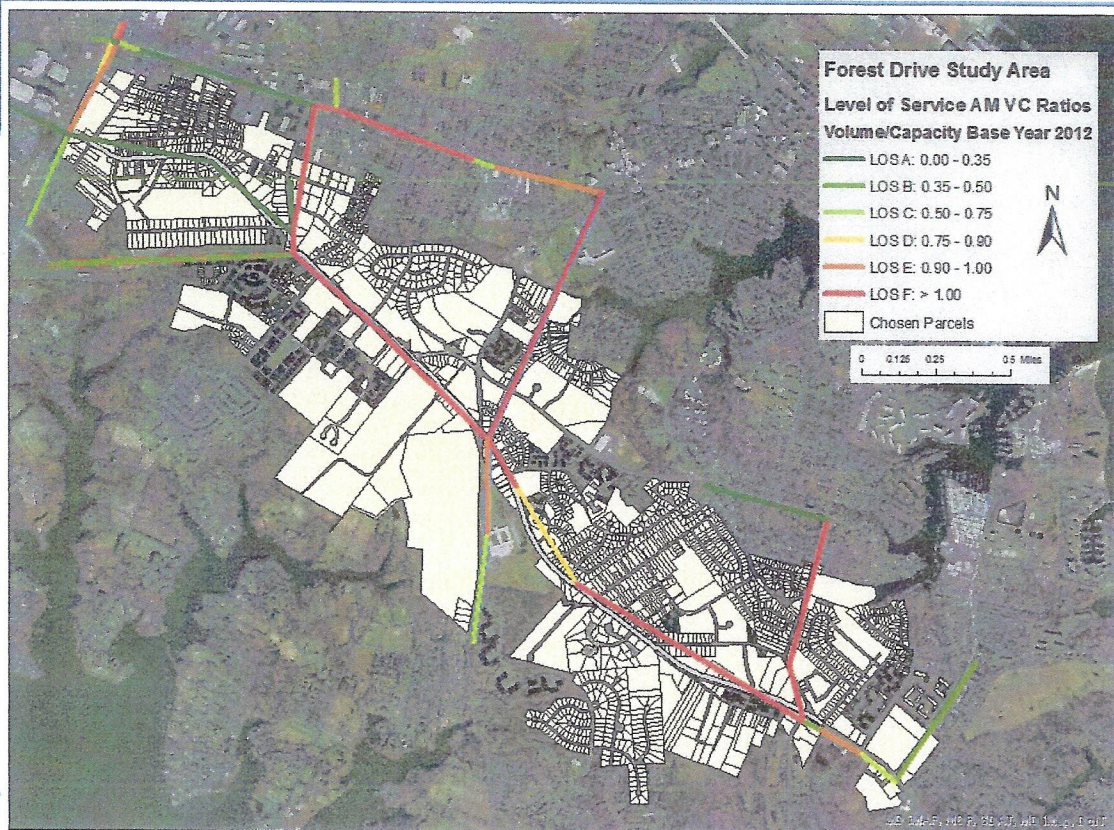
Derek Lombardi, Master of Community Planning Candidate

Under the supervision of Dr. Chao Liu and Uri Avin, FAICP

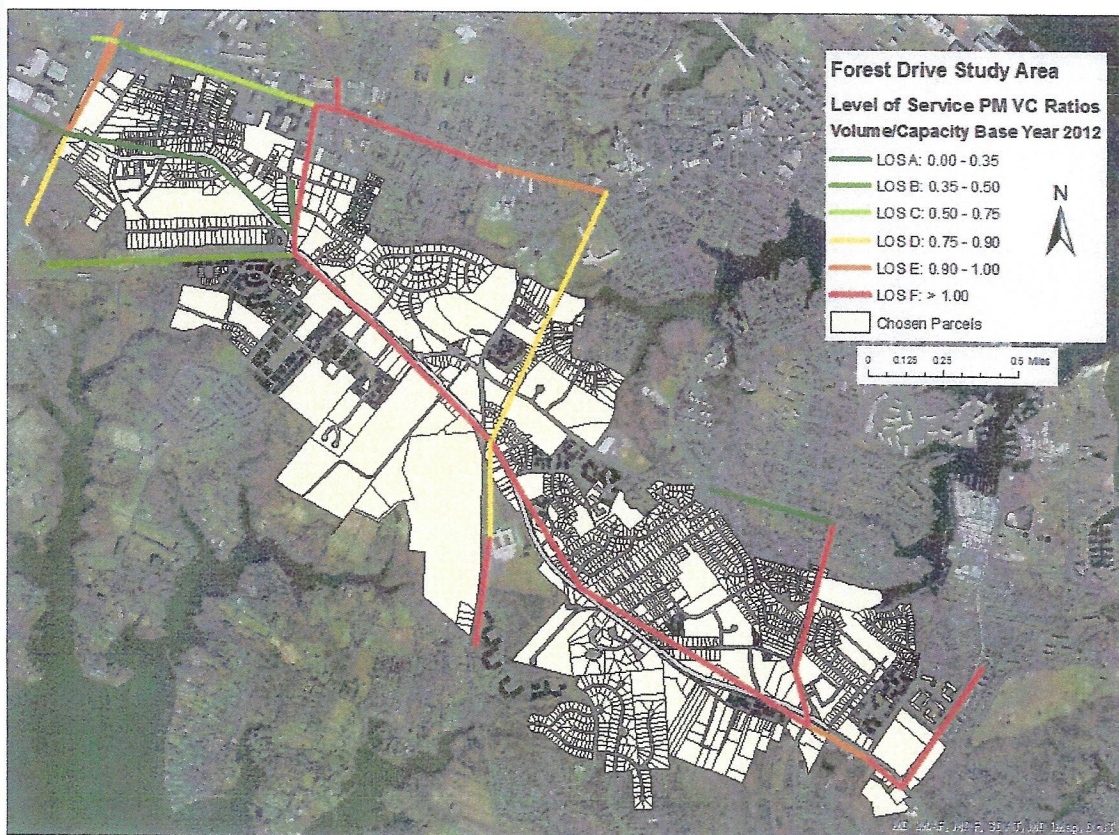
December 2016



Source:
MSTM
2012



Source:
MSTM
2012



List of development projects
Forest Drive corridor, Annapolis
Ordered from the west to east.

Highlighted Projects are NOT included in December 2016 Presentation to University of Maryland PALS staff regarding the Forest Drive Sector Study which shows major roadways at Levels of Service "E" and "F" during both AM and PM peak rush hours

RESIDENTIAL = 1,232 units planned, estimated

Annapolis Towns at Neal Farms/Hayes (50 TH, Dorsey Lane off Solomon Is. Rd.)
Rocky Gorge (48 units, off Aris T. Allen)
Village Greens (89 TH)
Woodside Gardens Newtowne 20 (36 units in 2 apartment buildings)
Crystal Spring's (440 retirement units plus plus 130 non-age-restricted TH plus 144,000 sf)
Primrose Hill (29 units on 4.35 acres, Milkshake Lane off Hilltop)
Enclave at Spa (36 TH on 3.8 acres on Spa Rd.)
Central Park/Elliott Road, aka Pastrana property (45 units on 5 acres at 9 Elliot Road, adjacent to Truxton Park)
Griscom Sq. (12 units, Tyler at Bay Ridge Ave.)
Parkside Preserve (152 units on 40 acres)
Thomas Woods (10 TH on 1.44 acres, near RQW Apts.)
Eastport shopping area (127 apts. plus additional retail space on 7 acres; currently 73,430 sq. ft. single story retail)
Bay Village Assisted Living (92 units on 6.3 acres, Lot #4 behind CVS)
Chesapeake Grove at Bembe Beach, aka Rodgers Property, (45 townhouses on 5 acres on Bembe Beach Rd.)
The Boatyards, Sarles/Petrini (9 units)
Griscom Square, (12 units on 3 acres, Tyler Ave and Bay Ridge Ave)
Sail Loft, Hopkins warehouse (11 residences and 4 retail at Fourth St.)

Plus;

Watergate Apartments - up to 600 new units have been mentioned. Currently 608 apartments. Excluded in total above.

COMMERCIAL/RETAIL/Recreational

Crystal Spring's (TBD)
1503 Forest Dr. 22,680 sq. ft. retail
Eastport shopping area (additional retail space TBD)
Sail Loft (11 residences and 4 retail)
Bay Village Lot #3 restaurant/office building (12,000 sq. ft.)
Lidl grocery, Annapolis Neck LLC, aka Samaras property (35,000 sq. ft. shopping store)
Key School Athletic Facilities in Annapolis Roads community
Annapolis Yacht Club 6th Street sailing center redevelopment and expansion

TRAFFIC IMPACT ANALYSIS

FOR

LIDL ANNAPOLIS
(BAY RIDGE ROAD)

Prepared for:

Lidl US, LLC
3500 S. Clark Street
Arlington, VA 22202

Prepared by:

LENHART TRAFFIC CONSULTING, INC.
TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

*331 Redwood Grove Ct
Millersville, MD 21108*

September 26, 2016



Section 3 Background Conditions

3.1 Approved Background Developments

Background developments were obtained from the Traffic Impact Study for the Bay Village Assisted Living Facility and included the Bay Village Assisted Living Facility. At the request of Anne Arundel County, the proposed Key School Fusco Athletic Park was also included as a background development. The trip generation and assignment for each background development is included in Appendix C. Note that the approximate location of each background development can be found on the individual trip assignment sheets. The combined trips generated by all background developments are shown on Exhibit 4.

3.2 Background Traffic Volumes

The existing adjusted peak hour volumes were combined with the trips generated by the background developments to obtain the background peak hour volumes shown on Exhibit 5.


3.3 Results of Background Level of Service Analysis

The results of the CLV background level of service analyses are shown on Exhibit 9a, and reveal that all study intersections are currently operating at a LOS "D" or better with the exception of Forest Drive & Spa Road which operates at LOS "E" during both the AM and PM peak hours. In addition, the intersection of Forest Drive & Bay Ridge Road/Hillsmere Drive operates with a CLV greater than 1,300 during the AM peak hour. As a result, HCS analysis was conducted at these intersections and reveals that the intersection of Forest Drive & Spa Road operates at LOS "C" during both the AM and PM peak hours, and the intersection of Forest Drive & Bay Ridge Road/Hillsmere Drive operates at LOS "C" during the AM peak hour. Exhibit 9b contains the results of the HCS analyses for all study intersections.

Level-of-Service Results

Morning Peak Hour	Existing CLV	Background CLV	Total CLV	LOS D or Better
1). Forest Drive & Spa Road	D / 1410	E / 1485	E / 1500	N
2). Forest Drive & Bay Ridge Road/Hillsmere Drive	C / 1296	D / 1340	D / 1365	Y
3). Bay Ridge Road & Georgetown Road/Site Access	A / 957	A / 975	B / 1022	Y
4). Bay Ridge Road & Edgewood Road	A / 869	A / 891	A / 901	Y
Evening Peak Hour	Existing CLV	Background CLV	Total CLV	LOS D or Better
1). Forest Drive & Spa Road	D / 1423	E / 1531	E / 1561	N
2). Forest Drive & Bay Ridge Road/Hillsmere Drive	B / 1129	C / 1207	C / 1282	Y
3). Bay Ridge Road & Georgetown Road/Site Access	A / 814	A / 874	B / 1039	Y
4). Bay Ridge Road & Edgewood Road	A / 720	A / 794	A / 813	Y

NOTES: 1. The intersection of Forest Drive & Spa Road operates at LOS E using CLV analysis during both the AM and PM peak hour; however, using the HCS methodology, the intersection operates at LOS D or better.

Traffic Impact Analysis	Results of CLV Level-of-Service Analyses	Exhibit 9a
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE AVENUE, SUITE 214 SEVERNA PARK, MD 21157 www.lenharttraffic.com		

List of development projects
Forest Drive corridor, Annapolis
Ordered from the west to east.

Highlighted Projects are NOT included in September 2016 Traffic Impact Study for the proposed Lidl grocery store which shows existing levels of service at "D" and future levels at "E" for the Spa Road/Forest Drive intersection.

RESIDENTIAL = 1,232 units planned, estimated

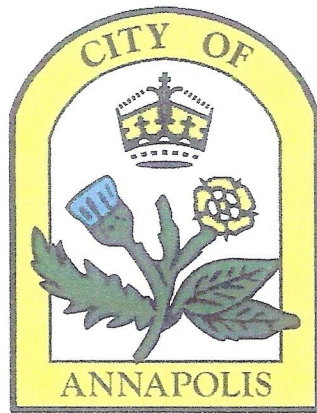
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Key School Athletic Facilities in Annapolis Roads community
Annapolis Yacht Club 6th Street sailing center redevelopment and expansion



Forest Drive Corridor Analysis Model

City of Annapolis

Draft
September 2015

TRAFFIC CONCEPTS, INC.

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

September 10, 2015

Ms. Sally Nash
Department of Planning & Zoning
City of Annapolis
145 Gorman Street, 3rd Floor
Annapolis, MD 21401

RE: Forest Drive Corridor
Revised Synchro/SimTraffic Analysis

Dear Ms. Nash:

As requested, Traffic Concepts, Inc. has revised the previously submitted study dated June 18, 2015 of the Forest Drive/Bay Ridge Road corridor. The study has been revised to reflect the recent Anne Arundel County change to 140 second cycle lengths at the signals along the corridor. The study analyzes the signalized intersections from Chinquapin Round Road to Arundel on the Bay Road utilizing the Synchro and SimTraffic software programs.

The Synchro program uses the Transportation Research Board's Highway Capacity Manual analysis methodology for capacity calculations. Factors include a wide range of parameters such as signal cycle lengths and phasing, split timing, signal coordination, offsets, lane use, etc. Synchro is a macroscopic analysis that uses equations to determine delay and queue length. Results include the level of service designation for the overall intersection as well as individual movements at each intersection based on average delay estimates. As requested by Anne Arundel County during their review, the results of this analysis are reported using the "Highway Capacity Manual 2000".

The SimTraffic analysis is a microscopic model. In SimTraffic each vehicle in the traffic system is individually traveled through the model. Driver behavior characteristics are assigned to each vehicle and the variation of each vehicles behavior is simulated in a manner reflecting real world operation. The intention of this study is to use SimTraffic to provide a queuing and blocking report. The SimTraffic simulations are an average of five (5) runs, with each run conducted for 3 minutes using the 95th percentile adjustment plus an additional 15 minutes with no adjustments.

Base traffic signal and intersection design parameters as well as existing traffic volumes through the corridor were supplied by Anne Arundel County. Since the traffic counts were conducted in 2011, we have added a 1.0% growth rate for a period of four (4) years in order to reach current year (2015) volumes (See Existing-Adjusted Traffic Volumes exhibit). Based on Maryland State Highway Administration traffic count data (a copy is attached), traffic volumes along MD 665 have actually decreased over the last 5 years. However, in order to create a worst-case traffic scenario, we have applied a growth factor of 1%. As mentioned the Synchro (HCM 2000) program was used to evaluate the capacity under existing conditions. We have used the SimTraffic program to determine the travel times along the corridor as well as the queuing and blocking at individual intersections. The results of the analyses are shown on the attached chart. As noted, all signalized intersections along the corridor operate at acceptable levels of service ("A" through "C") under existing traffic conditions using the Synchro (HCM 2000) program.

There are several developments proposed along this corridor that will impact the current operating condition of the roadway. These projects include the following:

1. Stop & Shop – 8 vehicle fueling position gasoline station
2. Quiet Waters Preserve – 72 townhomes and 86 single-family homes
3. Village Greens – 89 townhomes
4. Rocky Gorge – 31 townhomes and 17 single-family homes
5. Bay Village – pharmacy (built), restaurant and office space
6. 1503 Forest Drive – general office and specialty retail space
7. Crystal Springs – mixed use development
8. Rodgers Property – 45 townhomes

A map is attached showing the location of these developments. Also attached is a detailed list of the uses and proposed trip generation for each of these developments. The impact of each development was distributed through the corridor as shown on the attached exhibits. In addition to the impact of these developments, we have assumed a growth rate of 1% will occur along the corridor. We have added the growth rate for a 5-year period along with the impact of the eight (8) developments noted above to the existing traffic volumes. The result is shown on the attached exhibit titled "Total Future Traffic Volumes".

Using these total future traffic volumes, we have re-analyzed the Forest Drive/Bay Ridge Road corridor using the Synchro and SimTraffic programs. We have developed three separate Future Condition scenarios. We will discuss each of these scenarios below:

Future Condition – No Road Improvements

Under this scenario, we have assumed all background developments as built out, however, we have assumed no road improvements associated with any of these developments. This scenario is conducted to determine a base and worst-case condition (assuming these developments would be built out but would not provide any road improvements).

Future Condition – Adequate Public Facilities Improvements

Under this scenario, the impact of all developments noted above is included as well as all improvements necessary for each development to meet the current Adequate Public Facilities Law. A list of all improvements included is noted below.

Background #2 Quiet Waters Preserve will be installing a traffic signal at the intersection of Forest Drive *at* Annapolis Neck Road/Martha Court.

Background #7 Crystal Springs will be installing a traffic signal at the intersection of Forest Drive *at* the Crystal Springs main access. They will also be constructing a 400' long right turn lane along eastbound Forest Drive at the Spa Road intersection. In addition, they will be widening along Spa Road in order to provide three outbound lanes at the Forest Drive intersection (marked as two left turn lanes, and one shared thru/right turn lane).

This scenario also includes improvements at the Forest Drive *at* Hillsmere Drive/Bay Ridge Avenue intersection. It has not been determined which development along the corridor will be providing these improvements, however, they will be provided and assigned to an individual development accordingly. These improvements include widening and remarking southbound Bay Ridge Avenue to provide more storage for the turn bays.

Future Condition – Possible Future Improvements

This scenario includes all background developments and their associated improvements as noted above, but also includes additional improvements that have been noted as possible future improvements that could be done by others. These improvements have been suggested to improve the operation of the corridor but are not required by the background developments included in this analysis. These improvements could be done by future development projects, or possibly by County and/or City funds. The improvements could also be funded by transportation impact fees collected from the proposed developments.

These improvements include widening of Chinquapin Round Road to provide four outbound lanes at the Forest Drive intersection. This would allow for a triple left movement and a dedicated right turn lane. Also, the existing westbound Forest Drive right turn lane at this intersection could be extended back to Louis Drive.

This scenario also includes widening to provide an additional through lane along westbound Forest Drive from east of Spa Road to tie into the existing three lane section recently constructed by Anne Arundel County. Improvements also include widening along eastbound Forest Drive to provide for four through lanes from east of Chinquapin Round Road to the existing four-lane section west of the Hilltop Lane intersection.

These improvements also include constructing an additional 200' of storage to the existing eastbound Forest Drive right turn lane at Hillsmere Drive.

The attached Exhibits 1 & 2 show the improvements noted above (both APF improvements and possible future improvements).

Conclusions

The results of all scenarios noted above are shown on the attached chart. As shown, with all offsite improvements completed, the signalized intersections along the corridor will operate at overall acceptable levels of service ("A" through "D") using the Synchro (HCM 2000) program. The City of Annapolis traffic impact study guidelines require that the overall intersection operate at an acceptable "D" or better level of service to determine adequacy. The attached chart shows the delay and level of service for each approach at the study intersections as well as the overall intersection delay/level of service. As noted, several of the side road approaches operate at "E" and "F" levels of service. This is to be expected for side road approaches along a corridor such as Forest Drive/Bay Ridge Road. When signal cycle lengths reach 140 seconds and the majority of the cycle time is given to the mainline (in order to achieve progression), the side road approaches are given a small portion of the cycle length. Therefore, the side road approaches are forced to wait the majority of the cycle length, typically longer than the 55 seconds that will generate an "E" level of service. The side road approaches could be improved, but at the expense of the Forest Drive/Bay Ridge Road progression.

We would also note that the County has implemented a system timing operation which adjusts timing and offset patterns for the corridor based on real-time traffic flow conditions. This same system was also recently incorporated along the Riva Road corridor, which resulted in a 10-15% improvement in overall delay times. This system timing will have a positive impact to the overall operation and cannot be replicated using the Synchro program. Therefore, actual operating conditions should be improved above what this analysis has reported.

Ms. Sally Nash
September 10, 2015
Page 5 of 5

If you have any questions or require additional information, please do not hesitate to contact our office at your convenience.

Sincerely,

TRAFFIC CONCEPTS, INC.



By: Kenneth W. Schmid, Vice President
KSchmid@traffic-concepts.com

M:\2873

September 2015

Prepared By: Traffic Concepts, Inc.

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INTERSECTION	EXISTING CONDITION		FUTURE CONDITION NO IMPRS		FUTURE CONDITION APF IMPRS		FUTURE CONDITION ALL IMPRS		
	AM	PM	AM	PM	AM	PM	AM	PM	
Forest Drive @ Chinquapin Round Rd	Eastbound	14.9(B)	23.3(C)	15.5(B)	32.0(C)	15.5(B)	32.0(C)	13.3(B)	20.6(C)
	Westbound	11.8(B)	20.5(C)	11.6(B)	24.7(C)	11.7(B)	26.0(C)	8.7(A)	18.8(B)
	Southbound	34.3(C)	38.7(D)	40.1(D)	41.5(D)	40.1(D)	41.5(D)	38.7(D)	39.5(D)
	Overall Intersection	15.5(B)	25.2(C)	16.3(B)	30.8(C)	16.4(B)	31.4(C)	13.9(B)	23.5(C)
Forest Drive @ Bywater Road	Eastbound	67.9(E)	65.0(E)	68.9(E)	63.7(E)	68.9(E)	63.7(E)	68.9(E)	63.7(E)
	Westbound	70.9(E)	0.0(A)	70.9(E)	0.0(A)	70.9(E)	0.0(A)	70.9(E)	0.0(A)
	Northbound	15.0(B)	8.6(A)	58.0(E)	13.2(B)	58.9(E)	13.0(B)	56.7(E)	11.6(B)
	Southbound	12.2(B)	8.7(A)	15.8(B)	31.4(C)	15.8(B)	31.4(C)	16.2(B)	16.3(B)
	Overall Intersection	19.0(B)	12.3(B)	43.5(D)	26.3(C)	43.9(D)	26.2(C)	42.9(D)	17.6(B)
Forest Drive @ S Cherry Grove Ave	Eastbound	6.2(A)	10.0(A)	6.2(A)	83.1(F)	6.2(A)	82.1(F)	6.3(A)	9.5(A)
	Westbound	7.0(A)	15.2(B)	8.9(A)	14.8(B)	8.6(A)	13.9(B)	8.1(A)	16.7(B)
	Northbound	60.9(E)	61.2(E)	61.8(E)	61.8(E)	61.8(E)	61.8(E)	61.8(E)	61.8(E)
	Southbound	66.4(E)	108.6(F)	67.9(E)	132.3(F)	67.9(E)	132.3(F)	67.9(E)	85.4(F)
	Overall Intersection	9.6(A)	15.7(B)	11.0(B)	53.9(D)	10.8(B)	53.1(D)	10.6(B)	15.9(B)
Forest Drive @ Hilltop Lane	Eastbound	14.3(B)	5.4(A)	14.4(B)	3.8(A)	14.4(B)	4.9(A)	15.4(B)	6.6(A)
	Westbound	8.9(A)	12.5(B)	12.5(B)	16.9(B)	20.0(B)	15.3(B)	11.3(B)	20.0(B)
	Southbound	45.8(D)	35.4(D)	46.0(D)	35.3(D)	46.0(D)	35.3(D)	46.0(D)	35.3(D)
	Overall Intersection	17.0(B)	13.2(B)	18.2(B)	13.2(B)	21.5(C)	13.3(B)	18.1(B)	15.6(B)
Forest Drive @ Proposed Access for Crystal Springs	Eastbound	N/A	N/A	N/A	N/A	5.0(A)	8.9(A)	7.1(A)	10.0(B)
	Westbound	N/A	N/A	N/A	N/A	2.5(A)	12.7(B)	0.6(A)	12.6(B)
	Northbound	N/A	N/A	N/A	N/A	68.5(E)	81.0(F)	63.9(E)	81.0(F)
	Overall Intersection	N/A	N/A	N/A	N/A	6.0(A)	17.6(B)	5.5(A)	18.6(B)

September 2015

Prepared By: Traffic Concepts, Inc.

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INTERSECTION	EXISTING CONDITION		FUTURE CONDITION NO IMPRS		FUTURE CONDITION APF IMPRS		FUTURE CONDITION ALL IMPRS		
	AM	PM	AM	PM	AM	PM	AM	PM	
Forest Drive @ Spa Road	Eastbound	13.5(B)	5.8(A)	17.3(B)	32.7(C)	20.4(C)	7.7(A)	23.7(C)	8.1(A)
	Westbound	21.3(C)	4.8(A)	46.0(D)	10.7(B)	31.6(C)	12.9(B)	15.7(B)	11.9(B)
	Northbound	80.7(F)	82.2(F)	116.9(F)	109.9(F)	82.0(F)	94.1(F)	60.6(E)	94.1(F)
	Southbound	78.5(E)	73.0(E)	97.5(F)	93.5(F)	97.5(F)	82.3(F)	67.8(E)	82.3(F)
	Overall Intersection	30.1(C)	17.1(B)	49.5(D)	37.6(D)	39.6(D)	24.3(C)	28.0(C)	24.2(C)
Forest Drive @ Gemini Drive	Eastbound	62.7(E)	62.2(E)	62.7(E)	62.2(E)	62.7(E)	62.2(E)	62.7(E)	62.2(E)
	Westbound	58.3(E)	58.0(E)	58.0(E)	58.0(E)	58.0(E)	58.0(E)	58.0(E)	58.0(E)
	Northbound	2.2(A)	7.2(A)	7.9(A)	13.5(B)	3.8(A)	2.1(A)	2.9(A)	10.5(B)
	Southbound	3.7(A)	1.3(A)	4.3(A)	1.6(A)	5.1(A)	2.5(A)	3.9(A)	2.1(A)
	Overall Intersection	5.5(A)	5.4(A)	8.7(A)	9.1(A)	6.8(A)	5.4(A)	5.8(A)	8.3(A)
Forest Drive @ Youngs Farm Road	Eastbound	64.7(E)	66.7(E)	64.5(E)	65.2(E)	64.5(E)	65.2(E)	64.5(E)	65.2(E)
	Westbound	65.8(E)	66.8(E)	66.1(E)	65.3(E)	66.1(E)	65.3(E)	66.1(E)	65.3(E)
	Northbound	1.9(A)	1.0(A)	3.3(A)	4.4(A)	2.8(A)	1.6(A)	2.3(A)	2.7(A)
	Southbound	1.6(A)	2.8(A)	2.4(A)	1.5(A)	2.0(A)	2.7(A)	3.4(A)	1.9(A)
	Overall Intersection	2.8(A)	2.5(A)	3.9(A)	3.1(A)	3.4(A)	2.6(A)	3.8(A)	2.6(A)
Forest Drive @ Tyler Avenue	Eastbound	9.4(A)	4.0(A)	10.3(B)	1.9(A)	11.6(B)	6.5(A)	10.0(B)	1.4(A)
	Westbound	5.1(A)	1.5(A)	6.3(A)	1.6(A)	7.0(A)	2.3(A)	7.5(A)	1.6(A)
	Northbound	65.2(E)	64.3(E)	65.8(E)	64.4(E)	65.8(E)	64.4(E)	65.8(E)	64.4(E)
	Southbound	53.0(D)	58.9(E)	52.6(D)	59.4(E)	52.6(D)	59.4(E)	52.6(D)	59.4(E)
	Overall Intersection	10.3(B)	5.9(A)	11.2(B)	4.5(A)	12.1(B)	7.4(A)	11.7(B)	4.2(A)
Forest Drive @ Annapolis Neck Road	Eastbound	N/A	N/A	N/A	N/A	2.7(A)	1.3(A)	1.8(A)	2.3(A)
	Westbound	N/A	N/A	N/A	N/A	3.1(A)	2.0(A)	5.0(A)	2.0(A)
	Northbound	N/A	N/A	N/A	N/A	68.5(E)	67.8(E)	68.5(E)	67.8(E)
	Southbound	N/A	N/A	N/A	N/A	57.2(E)	62.0(E)	57.2(E)	62.0(E)
	Overall Intersection	N/A	N/A	N/A	N/A	5.4(A)	3.1(A)	6.1(A)	3.6(A)

FOREST DRIVE CORRIDOR ANALYSIS – HCM 2000 RESULTS

September 2015

Prepared By: Traffic Concepts, Inc.

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INTERSECTION	EXISTING CONDITION		FUTURE CONDITION NO IMPRS		FUTURE CONDITION APP IMPRS		FUTURE CONDITION ALL IMPRS	
	AM	PM	AM	PM	AM	PM	AM	PM
Forest Drive @ Bay Ridge Avenue/ Hillsmere Drive	27.0(C)	14.4(B)	16.5(B)	20.8(C)	23.1(C)	26.4(C)	32.1(C)	22.0(C)
	16.7(B)	11.6(B)	16.7(B)	13.2(B)	15.0(B)	14.6(B)	15.3(B)	14.9(B)
	60.3(E)	62.6(E)	60.6(E)	67.7(E)	60.6(E)	67.7(E)	60.6(E)	67.7(E)
	63.5(E)	63.6(E)	64.7(E)	67.9(E)	64.7(E)	67.9(E)	64.7(E)	67.9(E)
	34.5(C)	29.4(C)	30.9(C)	33.7(C)	32.6(C)	36.4(D)	35.8(D)	34.6(C)
Bay Ridge Road @ Georgetown Road	5.4(A)	6.5(A)	6.3(A)	8.1(A)	5.8(A)	8.1(A)	6.6(A)	8.1(A)
	3.6(A)	5.9(A)	2.8(A)	7.7(A)	3.2(A)	7.5(A)	3.0(A)	7.5(A)
	63.0(E)	62.9(E)	62.8(E)	62.8(E)	62.8(E)	62.8(E)	62.8(E)	62.8(E)
	9.1(A)	9.8(A)	9.1(A)	11.3(B)	9.1(A)	11.2(B)	9.3(A)	11.3(B)
Bay Ridge Road @ Edgewood Road	8.3(A)	7.0(A)	12.9(B)	13.9(B)	15.4(B)	13.2(B)	14.2(B)	12.8(B)
	9.5(A)	17.9(B)	21.4(C)	30.0(C)	21.5(C)	30.6(C)	21.5(C)	30.6(C)
	126.8(F)	0.0(A)	83.2(F)	66.7(E)	83.2(F)	66.7(E)	83.2(F)	66.7(E)
	56.9(E)	38.0(D)	47.1(D)	41.6(D)	47.1(D)	41.6(D)	47.1(D)	41.6(D)
	17.7(B)	16.8(B)	23.1(C)	24.8(C)	24.2(C)	24.6(C)	23.7(C)	24.4(C)
Bay Ridge Road @ Arundel on the Bay Road								
	11.4(B)	27.5(C)	13.9(B)	28.6(C)	13.9(B)	28.6(C)	13.9(B)	28.6(C)
	62.2(E)	26.1(C)	61.8(E)	28.3(C)	61.8(E)	28.3(C)	61.8(E)	28.3(C)
	16.5(B)	7.5(A)	16.1(B)	13.5(B)	15.0(B)	12.4(B)	15.2(B)	12.3(B)
	23.7(C)	15.9(B)	24.6(C)	20.1(C)	24.1(C)	19.5(B)	24.2(C)	19.4(B)
Travel Time for Corridor (Average of 5 Runs)	204.0	206.9	249.1	320.8	253.9	293.5	227.8	277.9

List of development projects
Forest Drive corridor, Annapolis
Ordered from the west to east.

Highlighted Projects are NOT included in September 2015 Draft of the Forest Drive Corridor Analysis Model shows future levels of service at "E" and "F" at numerous movements along the corridor. This includes failing levels of service at Spa Road even if all the planned improvements are viable and installed.

RESIDENTIAL = 1,232 units planned, estimated

Annapolis Towns at Neal Farms/Hayes (50 TH, Dorsey Lane off Solomon Is. Rd.)
Rocky Gorge (48 units, off Aris T. Allen)
Village Greens (89 TH)
Woodside Gardens Newtowne 20 (36 units in 2 apartment buildings)
Crystal Spring's (440 retirement units plus plus 130 non-age-restricted TH plus 144,000 sf)
Primrose Hill (29 units on 4.35 acres, Milkshake Lane off Hilltop)
Enclave at Spa (36 TH on 3.8 acres on Spa Rd.)
Central Park/Elliott Road, aka Pastrana property (45 units on 5 acres at 9 Elliot Road, adjacent to Truxton Park)
Griscom Sq. (12 units, Tyler at Bay Ridge Ave.)
Parkside Preserve (152 units on 40 acres)
Thomas Woods (10 TH on 1.44 acres, near RQW Apts.)
Eastport shopping area (127 apts. plus additional retail space on 7 acres; currently 73,430 sq. ft. single story retail)
Bay Village Assisted Living (92 units on 6.3 acres, Lot #4 behind CVS)
Chesapeake Grove at Bembe Beach, aka Rodgers Property, (45 townhouses on 5 acres on Bembe Beach Rd.)
The Boatyards, Sarles/Petrini (9 units)
Griscom Square, (12 units on 3 acres, Tyler Ave and Bay Ridge Ave)
Sail Loft, Hopkins warehouse (11 residences and 4 retail at Fourth St.)

Plus:

Watergate Apartments - up to 600 new units have been mentioned. Currently 608 apartments. Excluded in total above.

COMMERCIAL/RETAIL/Recreational

Crystal Spring's (TBD)
1503 Forest Dr. 22,680 sq. ft. retail
Eastport shopping area (additional retail space TBD)
Sail Loft (11 residences and 4 retail)
Bay Village Lot #3 restaurant/office building (12,000 sq. ft.)
Lidl grocery, Annapolis Neck LLC, aka Samaras property (35,000 sq. ft. shopping store)
Key School Athletic Facilities in Annapolis Roads community
Annapolis Yacht Club 6th Street sailing center redevelopment and expansion

Goal at the end of the Forest Drive Sector Study: Have a Plan. Avoid creating an overcapacity situation that cannot be remedied, or the remedy is far off from when overcapacity arises

Solution: Develop a Working Model:

1. GET ACCURATE TRAFFIC COUNTS TODAY (They do not exist)
2. GET ESTIMATED RANGES FOR FUTURE GROWTH – run worst case scenarios
3. IDENTIFY FEASIBLE ROAD IMPROVEMENTS (engineering, costs, benefits, etc...)
4. DETERMINE HOW THEY WILL BE PAID FOR
5. IMPROVE ROADS, FIRST, BEFORE BEGINNING DEVELOPMENT THAT TIPS TO OVERCAPACITY

Benefits of a Working Model to Planning:

- You can change inputs at low cost to reassess over time
- You can create a nexus between multiple developments and assess fees (the first development to tip it over should not pay everything)
- You get clarity on viable remedies as opposed to assumptions (*e.g., long planned Forest Drive corridor Relief Road; get remedies that are not useful or impractical off the list*)
- You shift more costs to developers and not taxpayers (*you know what to ask developers for*)
- You accelerate getting placed on capital improvement projects

Possible Downside: You might not like the answers.

Benefits of Inter- governmental Cooperation to Model:

* share costs * accelerate completion to benefit all * one stop answers for developers

- **County concerns:** its authority and obligation to deny and/or condition any new access onto Forest Drive so as to "...preserve and maintain the public health, safety, welfare, and convenience." *Anne Arundel County Code; Article 13 – Public Works; Title 3 – Permits for Use of County Rights-of-Way*
- **City Concerns:** Improve Tax Base and also Maintain Quality of Life and Safety

Intergovernmental Coordination – ACP, Chapter 10 - Integration, Page 137

"...impacts of growth are regional, rather than local, in nature. ...transportation patterns, ... and the effects of growth and change are issues that cross the boundaries of the community... In addition, cooperation is now more important than ever due to increasing service demands and limited resources

Packet 5

FOREST DRIVE CORRIDOR IMPROVEMENTS - ASSESSMENT TEMPLATE

“FDCAM” - Forest Drive Corridor Analysis Model - September 10, 2015 “Draft”
 “ACP” - Potential improvement / issue identified in 2009 Annapolis Comprehensive Plan or elsewhere
 “MIF Existing Conditions Report” - Anne Arundel County March 2016 Major Intersections/Important Facilities Study
 “MIF Corridor Toolbox” - Anne Arundel County May 2016 Major Intersections/Important Facilities Study

Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
New traffic signal (or other intersection improvements) at Forest and Annapolis Neck Road/Martha Court for Parkside Preserve (FDCAM)	FDCAM classifies as a required “Adequate Public Facilities Improvement”				Parkside Preserve Project Developer (FDCAM)	Presumably all improvements installed before construction commences
New traffic signal at Forest and Crystal Spring Farm Road as main entrance to development on Masque Farm (FDCAM)	FDCAM classifies as required “Adequate Public Facilities Improvement”				Masque Farm land Project Developer (FDCAM)	
400 Foot right turn from eastbound Forest onto Spa Road and another turn lane from Spa (FDCAM)	FDCAM classifies as required “Adequate Public Facilities Improvement”	September 2016 Traffic Impact study for Lidl grocery confirms “D” now and “E” with minimal new development (does not build in any Eastport growth)	2016 MIF Existing Conditions report rates the intersection operates at level of service “D” today		Masque Farm land Project Developer (FDCAM)	

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Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
Connecting Masque Farm development entrance on Spa Road to traffic light at Gemini and Forest Drive (ACP, Chapter 4 – Policy 3	9/24/2014 Five-Year Comp Plan update says City wants to “provide some measure of redundancy through improving interconnectivity”	Some condemnation or building acquisition is likely necessary – Stand alone development of Providence Point may preclude this			Masque Farm land Project Developer(s) assumed to pay for this	
Additional 200 feet of storage to existing right turn off Forest onto Hillsmere Dr. (FDCAM)	FDCAM classifies as required “Adequate Public Facilities Improvement”				FDCAM says unknown at this time but will “be assigned to individual developments accordingly”	
Widening along northbound Hillsmere Dr. to provide a double left turn movement (FDCAM)	FDCAM classifies as required “Adequate Public Facilities Improvement”				FDCAM says unknown at this time but will in the future “be assigned to individual developments accordingly”	
Widening and remarking southbound Bay Ridge at Forest, more storage/ turn bays (FDCAM)	FDCAM classifies as required “Adequate Public Facilities Improvement”		2016 MIF Existing Conditions report rates the intersection operates at level of service “D” today		FDCAM says will in the future “be assigned to individual developments accordingly”	

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April 2017 Version

Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
Extend back to Louis Drive the right turn lane from Forest onto northbound Chinquapin Round (FDCAM)	FDCAM classifies as "Possible Future Improvements that could be done by others"	"Aggressively lobby the State and the County to begin and complete the study of the 665/Forest Drive/Chinquapin intersection within the next year." 2009 Comp Plan, Chapter 4- Policy 5, page 55.	Nothing to date: 9/24/2014 Five-Year ACP update says: "Coordinate the study of the 665/Forest Drive/Chinquapin intersection with SHA." This study was to be completed in 2010.		Unknown at this time – FDCAM says could be paid by City, County, future developments or impact fees on already proposed developments	
Widening Forest Dr. to provide another through lane westbound from Spa Road to Hilltop Lane (FDCAM)	FDCAM classifies as "Possible Future Improvements that could be done by others"		MIF Corridor Toolbox completed by Anne Arundel County May 2016 does not recommend widening Forest Drive		Unknown at this time – FDCAM says could be paid by City, County, future developments or impact fees on already proposed developments	

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Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range – estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
Potential "Relief Road" mentioned in 1998 and 2009 Comp Plan to run along the south of Forest Drive and merge into Aris T. Allen (665)	Only a high level scoping study was performed in 1999. No further studies were done, but the project was still listed as a possible project for 15 years	9/24/2014 ACP update says: "At this time it has been determined that the Forest Drive Relief Road is not feasible."	County and State have never indicated any willingness to advance this concept	\$10 million in 1999 estimate		
Any other roads to build or extend so as to parallel Forest Drive to provide some redundancy and relief for keeping traffic off Forest Dr.? (e.g., Gemini to Spa in ACP)	9/24/2014 ACP update says since "relief road" is not feasible, City wants to "provide some measure of redundancy through improving interconnectivity"	City has suggested road from the light at Gemini connecting to Spa Road and connecting to Skipper Lane	MIIF Corridor Toolbox from May 2016 suggests parallel connectors at the Spa Road/Gemini site through Masque Farm lands			
"Request that the County consider the use of traffic circles in lieu of traffic signals on Forest Drive." 2009 ACP, Chapter 4-Transportation Policy 5, page 55.		9/24/2014 ACP update says: "Traffic circles are not a feasible option for Forest Drive"				

"EDCAM" - Forest Drive Corridor Analysis Model - September 10, 2015 "Draft"
 "ACP" - Potential improvement / issue identified in 2009 Annapolis Comprehensive Plan or elsewhere
 "MIIF Existing Conditions Report" - Anne Arundel County March 2016 Major Intersections/Important Facilities Study
 "MIIF Corridor Toolbox" - Anne Arundel County May 2016 Major Intersections/Important Facilities Study

Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
County to install adaptive control technology (cameras) on signals	Marginal improvements in traffic flow at non-peak times - MILF Corridor Toolbox from May 2016 lists as "Highly Recommended" and reset every two years	Installation completed in fall 2014, minor tweaking will continue, but County Public Works says it will not improve levels of service at peak times			Federal grant and matching County funds	
Real time changeable message signs: 2016 MILF Corridor Toolbox lists as "Highly Recommended"						
Sporting Event and Evacuation Planning: 2016 MILF Corridor Toolbox lists as "Highly Recommended"						

"FDGAM" - Forest Drive Corridor Analysis Model - September 10, 2015 "Draft"
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April 2017 Version

Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
Promote Transit Use, add or modify existing service: 2016 MIF Corridor Toolbox lists as “Highly Recommended”						
Promote Carpooling/HOV lanes: 2016 MIF Corridor Toolbox lists as “Highly Recommended”						
Employer based incentives and vanpools/rideshare: 2016 MIF Corridor Toolbox lists as “Highly Recommended”						
Pedestrian and Bicycle enhancements: 2016 MIF Corridor Toolbox lists as “Highly Recommended”						

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Proposed Road Improvement or Issue	Anticipated Traffic Benefit as per a final traffic study and designs	Status of determining if realistic (e.g., rights of way, engineered)	Status of Coordination with County or State as needed	Cost range estimates – not final design and bids	Source(s) of Funding – developer(s), impact fees, City, County, State	Timing for addition to capital project lists and ultimate completion time range
Access management and consolidate driveway access to Forest Drive: 2016 MIF Corridor Toolbox lists as “Highly Recommended”						
Bus or light rail/limited stops: 2016 MIF Corridor Toolbox lists as “Possible”						
Time of day controls/hot lanes: 2016 MIF Corridor Toolbox lists as “Possible”						
Reversible Lanes: 2016 MIF Corridor Toolbox lists as “Possible”						
Study ways to improve safety on Aris T. Allen (665)			2016 MIF Existing Conditions report says accidents are “significantly higher than statewide average”			

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