

# **APPENDIX A**

## **Previous Studies Recommendations Matrix**

Ref ID	Report Title	Year Published	REPORT OBJECTIVE	PEDESTRIAN	BICYCLE	AUTOMOBILE	TRANSIT BUS	OTHER
A	Howard County Rt 1 Rev Study Phase 1	2001	Overview of Route 1 Corridor and to recommend improvements to it. Report encourages participation and involvement in future planning.	<ul style="list-style-type: none"> <li>Recommends open space and landscaping, pedestrian connections and forest conservation buffers</li> <li>Lacks pedestrian safety, with wide roadway, lacking sidewalks and pathways, pedestrian traffic signals, illumination</li> <li>US 1/MD 175 intersection and vicinity, enhanced crosswalks and medians with pedestrian signals</li> <li>Pedestrian and bicycle improvements at US 1/Guilford Rd intersection, US 1/ Whiskey Bottom Rd to PG County, US 1/ Howard Rd/ Corridor Rd/ to Gorman Rd.</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation to improve bicycle access with adequate shoulders or bike paths</li> <li>Provide bike amenities</li> <li>Educate public re bicycle safety</li> <li>US 1/Guilford Rd, protected pedestrian and bicycle improvements</li> </ul>	<ul style="list-style-type: none"> <li>Traffic safety and mobility improvement</li> <li>US 1/MD 175 intersection and vicinity, traffic signal preemption control, red-light camera candidate location; traveler advisory information system</li> <li>US 1/Whiskey Bottom Rd to PG County, partial grade separation at Whiskey Bottom; red-light automated enforcement; sight distance improvements, develop streetscape to reduce vehicle speed and combine access locations.</li> <li>Signal and intersection improvements at US 1/Montgomery Road intersection south of MD 100, US 1 south of MD 100, US 1/Howard Rd/ Corridor Rd/ to Gorman Rd and US 1 north of Old Washington Blvd</li> </ul>	<ul style="list-style-type: none"> <li>Gaps exist in current transit service</li> <li>Many neighborhoods and employment centers do not interconnect and many are not within easy walking distance of US 1</li> <li>MARC rail system used by CRX mainly, should expand MARC train service</li> <li>Provide transit amenities and expand marketing</li> </ul>	Built environment and streetscape improvements
B	Howard County Rt 1 Rev Study Phase 2	2002	Overview of Route 1 Corridor and to recommend improvements to it. Report concentrates on tools and incentives for implementing recommendations	<ul style="list-style-type: none"> <li>Create vibrant pedestrian-oriented centers</li> <li>Use traffic calming devices, sign placements and street furniture to provide safe pedestrian environment and promote walking</li> <li>Access improvement for pedestrians around rail stations and bus stops encourages higher ridership</li> </ul>	<ul style="list-style-type: none"> <li>Provide bicycle access to rail stations and bus stops to increase ridership</li> <li>improve capacity and safety for bicycle access</li> </ul>	<ul style="list-style-type: none"> <li>improve streetscape elements to create safer and more attractive environment for vehicles</li> <li>Expand part of road from 4 to 8 miles, possibly for HOV if appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Ridership can improve with improving amenities for pedestrians and cyclists coming to transit stops</li> <li>Potentially increase transit ridership by providing convenient access to transit stations close to high intensity office and residential development</li> <li>Provide frequent and high visibility bus transit</li> <li>Educate re transit routes</li> <li>Encourage increase in long-range connection to DC and Baltimore metro areas</li> </ul>	
C	US 1 Corridor Improvement Strategy Reconnaissance Survey	2006	<ul style="list-style-type: none"> <li>Study examines US 1 from Prince George's/Howard County Line to Baltimore/ Howard County Line</li> <li>Provide guidance on means to develop transportation infrastructure</li> <li>Suggest guidance for new policies and standards</li> <li>Define agency actions at various scales to make changes strategically on US 1</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian sidewalks may be provided but pedestrian scale connections are lacking</li> <li>Sidewalk and Pedestrian crossing improvements</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle facilities are provided intermittently along US 1</li> </ul>	<ul style="list-style-type: none"> <li>Many intersections are approaching capacity (most notably US 1/MD 175)</li> <li>Road widening projects on roads in study area</li> <li>Safety/ geometric/ drainage improvements on roads in study area</li> </ul>	<ul style="list-style-type: none"> <li>Continued support of initiatives to improve transit use is encouraged</li> </ul>	<ul style="list-style-type: none"> <li>Development expected in study area, many underway are industrial and residential in nature</li> <li>Study area lacks consistent land use</li> <li>Lack of aesthetic appeal and safety and operational stress is becoming more apparent</li> </ul>
D	City of Laurel Analysis of Transit Oriented Developments: Operational Analyses Summary	2012	<ul style="list-style-type: none"> <li>Identify roadway network improvements required to mitigate the development impacts beyond improvements shown in the TOD TIS</li> <li>Study focuses on US 1 north of Prince George's County and south of Whiskey Bottom Road</li> </ul>			<ul style="list-style-type: none"> <li>Study finds five study intersections to operate at LOS E or worse with Development conditions</li> <li>Study recommends two improvement scenarios that will improve intersections to operate at LOS D or better</li> </ul>		<ul style="list-style-type: none"> <li>Study depicts impacts of three TODs on various intersections in study area</li> </ul>
E	Laurel Park Traffic Impact Study with Limited MD 198 Access; Anne Arundel County, MD	2008	<ul style="list-style-type: none"> <li>Report presents TIA for redevelopment of Laurel Park, focusing on site bounded on the northwest by the CSX Railroad/Anne Arundel-Howard County line, on the south by MD 198, east Brock Bridge Road, north by Whiskey Bottom Road and on west by Patuxent River/Anne Arundel-Prince George's County line</li> <li>TIS report describes intersection LOS in the study prior to expansion and after the addition with the project completion</li> <li>Report proposes improvements and describes outcome</li> </ul>			<ul style="list-style-type: none"> <li>Several intersections will operate at LOS E or worse; study recommends changing signal phasing, adding lanes, adding turn lanes and shifting lane uses at various intersections</li> </ul>		
F	Laurel Park Station Mid Inc. - Howard County Traffic Impact Study; Howard County, MD	2010	<ul style="list-style-type: none"> <li>Report presents revised TIA for the MID Inc. Howard County Project, Laurel Park Station</li> <li>Property boundary is defined by Whiskey Bottom Road on the north, Prince George's County line on the south, MARC/CSX train line on the east and Anne Arundel county lines in southern Howard County, MD</li> <li>TIS describes existing conditions and analyzes what future projects can do to LOS at intersection</li> </ul>			<ul style="list-style-type: none"> <li>Although under existing conditions, study area intersections operate with acceptable LOS, under total future conditions intersection of US 1/Whiskey Bottom Road will operate at unacceptable LOS "F" during peak hours, US 1 Northbound/North Site Access will operate at unacceptable LOS "F" during PM peak hours. Recommendations are to construct turn lanes at US 1/Whiskey Bottom Road; Signalize and reconfigure the intersection at US 1 Northbound/North Site Access; and modify existing site access to allow inbound only at US 1 southbound/north site access and outbound only at US 1 southbound/ south site access.</li> </ul>		
G	Laurel Park Phased Traffic Impact Study; Anne Arundel County, MD	2011	<ul style="list-style-type: none"> <li>Traffic assessment for proposed phased improvements for Laurel Park located west of Brockbridge Road east of Patuxent River north of MD 198, in the Maryland City area of Anne Arundel County</li> <li>TIS shows recommended roadway improvements</li> </ul>			<ul style="list-style-type: none"> <li>Intersection improvements to increase LOS rating, however none on US 1</li> </ul>		
H	Laurel Transit Oriented Development, PG County, MD	2011	This traffic study analyzes the impact of development of the proposed apartment and parking spaces that is located on the existing parking lot for the Laurel MARC Station, in the southeast quadrant of US 1 northbound (Second Street) & Main Street			<ul style="list-style-type: none"> <li>Study shows relocation of existing parking lot to east of railroad tracks and construction of TOD on existing lot, will not affect the traffic condition in and around the station adversely</li> <li>Two intersections looked at on US 1 include US 1 and Main Street and US 1 NB Site Access for project, southwest of Main Street</li> </ul>		
J	Route 1 Manual	2009	<ul style="list-style-type: none"> <li>Manual covers Route 1 Corridor in Howard County, which includes all property in the County east of Interstate 95</li> <li>The Manual implements the zoning regulations and provides direction for preparing subdivision and site development plans in various districts along corridor</li> </ul>	<ul style="list-style-type: none"> <li>Increase safety of pedestrians, enhance pedestrian accommodations and connectivity, improve pedestrian access to amenities</li> <li>Through the Corridor Activity Center Districts (CAC districts are defined throughout the corridor in this report), concentrate areas of pedestrian-oriented mixed use developments to complement nearby residential communities</li> <li>Specific recommendations include:                             <ul style="list-style-type: none"> <li>installing wide sidewalks in CE-CLI and CAC-CLI Districts along Route 1 with green strip between curb and sidewalk adding 2-foot wide stamped concrete band adjacent to both curbs of one-way section of US 1 in North Laurel</li> </ul> </li> <li>Enhance visibility at crosswalks to distinguish pedestrian from automobile network, On Route 1 crosswalks in the right-of-way, parallel and perpendicular to Route 1, the approved crosswalk is white thermoplastic striping</li> <li>TOD Districts where major pedestrian links to MARC stations, wide sidewalks and building setbacks are required</li> <li>Study recommends street tree placement along all public right-of-way and on Route 1 specifically, plant street trees parallel to applicable required on-site landscape buffer trees to provide staggered double row of trees</li> <li>Provide pedestrian amenities—trash receptacles, benches, bicycle storage, street lights and gathering area—on Route 1, use comparable design for bus shelters</li> <li>In the TOD and CAC Districts, provide light fixtures, on Route 1 use the required arm fixture</li> <li>Parking areas should be placed away from pedestrian oriented TOD and CAC districts</li> <li>Provide safe opportunities for walking within Route 1 properties and define paved pedestrian connections</li> <li>CAC districts require open space and pedestrian amenity areas</li> <li>Create a pedestrian amenity area with at least 5% of the net site area in CE and 10% in TOD and CAC</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle connectivity on Route 1 is essential to achieving goals of revitalization on Route 1</li> <li>Promote use of bicycles</li> <li>Provide bicycle storage facilities</li> <li>Provide bike lanes that comply with current SHA bicycle lane policy</li> <li>Provide bicycle parking areas in areas of concentrated pedestrian activity and at MARC train stations in the TOD developments</li> <li>Provide bike parking near office and commercial development</li> </ul>	<ul style="list-style-type: none"> <li>Increase safety of vehicular traffic, improve vehicular access to amenities</li> <li>Specifically in TOD areas where pedestrian activity is encouraged, for safety reasons, properties in the Route 1 corridor should be designed with limited number of curb cuts, consolidated entrances and articulate them for ease of identity, consider using one-way vehicular access to properties to limit driveway width</li> <li>In TOD and CAC areas, with roadway improvements, provide off-peak on-street parking where allowed</li> <li>Construct interconnecting streets</li> <li>Where off-peak on-street parking is allowed, place 2' wide band of concrete pavers next to curb</li> <li>Establish 134' o-w for main line of Route 1, except where it must be greater</li> <li>Prohibit loading at front of building</li> </ul>	<ul style="list-style-type: none"> <li>Promote use of transit and alternate modes of transportation</li> <li>Provide street furniture at bus stops/shelters</li> </ul>	<ul style="list-style-type: none"> <li>Recommendations include improving visual appearance of corridor's streetscape, enhance the value of development in corridor, establish design character for development in defined districts, achieve better land use and function</li> <li>In CE, TOD and CAC Districts, locate parking areas at side or rear of buildings, use landscaping to define parking areas</li> </ul>
K	MD 175 Corridor	2010	US 1/MD 175 Corridor Feasibility Study			<ul style="list-style-type: none"> <li>Intersection modification, slip lanes proposed to be signal controlled at intersection inbound and outbound from 175 east to Route 1</li> <li>Modification of lane configuration on Route 1 to add double left turn storage at intersection of Crestmount Road, also extending Crestmount Road to 175, this would include proposed signal at Crestmount Road and 175</li> </ul>		

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M	US 1 @ Selnick Drive Extension (Structure) Traffic Study	2009	Report assesses the traffic impacts of extending Selnick Drive via a bridge structure to US 1 at US 1's existing unsignalized intersection with Troy Hill Drive. Study area includes US 1 from MD 103 to Ducketts Lane, a total length of 1.62 miles.	Recommendations for pedestrian accommodations at signal of Troy Hill Drive (North) and US 1, signal will eventually be necessary to accommodate planned pedestrian/bicycle connectivity and future extension of roadway east of US 1 into CAC zone. Provide pedestrian and bicycle facilities and transit accommodations consistent with recommendations of US 1 Corridor Improvement Strategy, 2006	Recommendations for pedestrian accommodations at signal of Troy Hill Drive (North) and US 1, signal will eventually be necessary to accommodate planned pedestrian/bicycle connectivity and future extension of roadway east of US 1 into CAC zone. Provide pedestrian and bicycle facilities and transit accommodations consistent with recommendations of US 1 Corridor Improvement Strategy, 2006	Four alternative plans were taken into consideration for US 1 Access. Based on study, following recommendations are made: - Amberton Drive close to US 1 provide median consistent with planned US 1 improvements, and restrict movements of Private Drive/eStorage access to US 1 to right in/right out only - Troy Hill Drive (south)/Selnick Drive Extension, provide actuated-coordinated in-system signal that includes pedestrian/bicycle accommodations that are consistent with recommendations presented in the US 1 Corridor Improvement Strategy 2006, provide acceleration and deceleration lanes to accommodate NB US 1 traffic to and from Selnick Drive Extended, and provide 250-ft dual left-turn lanes and shared through-right lane on structure of WB approach to US 1, provide 250-ft SB US 1 left-turn lane, maintain existing 250-ft EB and NB left-turn lanes - Troy Hill Drive North and US 1 maintain existing SB US 1 deceleration lane and right-turn channelization to accommodate traffic from SB US 1, maintain existing acceleration/deceleration auxiliary lane between Troy Hill Drives (North and South) to accommodate SB US 1 traffic and maintain existing SB US 1 right-turn channelization and acceleration lane to accommodate traffic from Troy Hill Drive (South) to SB US 1.	Provide pedestrian and bicycle facilities and transit accommodations consistent with recommendations of US 1 Corridor Improvement Strategy, 2006	
N	US 1 at Assateague Sidewalk Improvements	2010	Conceptual design draft shows proposed road and intersection improvements on Assateague Drive, intersection of Assateague Drive and Washington Boulevard and Crestmount Road	Recommendations to add pedestrian signal heads and push buttons, add raised crosswalk and proposed curb ramp, proposed sidewalk and buffer		Recommendation to add stop bar at intersection of US 1 and Assateague Drive and Crestmount Road		
P	Market Analysis and Strategic Implementation Analysis: US Route 1 and Snowden-River Pkwy / Dobbin Rd Corridors	2011	US 1 study area for this report is the corridor segment in Howard County, MD. Report recommends economic modifications along US 1 and Snowden-River Pkwy / Dobbin Rd corridors to make them more favorable for economic growth and better positioning of their benefit toward the County objective.			Study shows a potentially new roadway connection between Snowden River Parkway and Route 1, bridging over I-95. In the Gateway area and along Snowden River corridor, traffic will increase with redevelopment, roadway connectivity is a critical means to reduce traffic congestion on existing roadways such as US 1.	Report recommends enhancing transit and roadway capacity in order to help connect and activate several large, key parcels on Route 1 by adding a new regional transit corridor. The proposed transit line is envisioned as a Bus Rapid Transit (not on Route 1, crossing Route 1 close to CSX tracks and industrial properties in the Route 1 and SRP area, this would require acquiring ROW).	This study suggests the CAC and CE zoning districts along Route 1 may actually be counterproductive to its future development and positioning. Study notes these zones do not readily support the type of business support infrastructure that may help Route 1 compete for potential future demand. These districts increase the difficulty for flex/industrial development which is central to economic engine of the corridor. Recommendations include segmentation of Route 1 Corridor to understand existing conditions and plan for future land use opportunities, make changes to County-wide housing policies in order to increase overall likelihood of future commercial development along Route 1, and revisiting the existing zoning classes on Route 1 in order to the possible need to successfully capture future demand from Cybersecurity and BRAC.
R	Morris Place Traffic Impact Analysis	2014	Review of the access to the proposed mixed use development that will have site accesses from two roads which intersect with US 1. Subject property is located west of Cemetery Lane, west of US 1 and south of MD 103 in Howard County, MD. Study analyzes US 1 intersections with MD 103, Business Parkway, Cemetery Lane and Montevideo Road.			Developer is looking to make safety improvements at the intersection of US 1 and Cemetery Lane. This would mean modifying the intersection to a right-in/right-out only along US 1 at Cemetery Lane. Left turn movements would be redirected to Business Parkway, providing a safer signalized intersection. Based on the TIS by Howard County, the developer is required to improve the intersection of US 1/MD 103. The potential improvement is to provide an exclusive westbound left turn lane along MD 103 and US 1. The improvement will help the intersection operate at LOS "E"		
S	Troy Sports Park Traffic Impact Analysis	2014	TIA reviews access to proposed sports park from Troy Hill Drive (south) via US 1, north of MD 100. Study analyzes US 1 intersections with Ducketts Lane, MD 100 Eastbound and Westbound Ramps, Troy Hill Drives (north and south) and Amberton Drive/Hillside Road			Analysis shows acceptable traffic conditions at six of the seven study intersections during the weekday evening peak hour with intersection of US 1 and Amberton Drive/Hillside Road projected to operate at LOS "F" during that time. All study intersections are projected to maintain a mid-day Saturday peak hour LOS "A" or "B" conditions. Howard County's "Route 1 Manual" proposes a six lane divided cross section for US 1 which would cause a projection for the road to operate at LOS "C" or better during both weekday evening and Saturday mid-day peak hours. Study looked at storage capacity and the only intersection of concern is NB US 1 left turn lane at Troy Hill Drive (south) which will not provide sufficient storage capacity. A TMP should be prepared for events which will cause this and potentially include a police control at US 1/Troy Hill Drive (south) intersection.		
T	Duval Property Traffic Impact Analysis	2014	TIA reviews effect of proposed development located along south side of Whiskey Bottom Road, east of US 1 in southeastern Howard County, MD. US 1 & Whiskey Bottom Road (a signalized intersection) was identified for purposes of Adequate Public Facilities.			Study determines intersections will continue to operate at an acceptable LOS under future conditions.		
U	Crossroads Town Centre Traffic Impact Study	2015	Study examines effects of development plan for site west of US 1, north of MD 32 in Howard County, MD. Study looked at US 1 intersections with Guilford Road, Westbound MD 32 off-ramp/site access and Howard Street/Corridor Road			Study suggests adding a signalized traffic controlled access to the site near Guilford Rd, north of MD 32, where there is currently an unsignalized left-in/right-out access along US 1. Report concluded study intersections will continue to operate at acceptable level of service under future conditions, while simultaneously reducing out-of-direction travel and weaving maneuvers.		
V	Adequate Road Facilities Test Evaluation for Dorsey Run Center	2016	Report is done for proposed Dorsey Run Center located in the northwest quadrant of Montevideo Road and Dorsey Run intersection in Elkridge. The "Impact Area" is defined as an area up to 1.5 road miles in all directions. This includes US 1 at Montevideo Road.			US 1 and Montevideo Road intersection falls due to Blue Stream and Elkridge Village Center construction phases. The addition of the Dorsey Run Center will also add some traffic to intersection. Intersection will operate at LOS F for PM peak hour of background and total traffic conditions.		
W	Floreys Road Property Adequate Road Facilities Test Evaluation	2016	Study reviews effect of proposed development at the end of Floreys Road, east of Hanover Road.			Study concludes that intersection will continue to operate at acceptable LOS "D" or better in the total projected traffic volumes.		
X	HCLS Elkridge Branch & 50+ Cntr Traffic Impact Study	2016	Study summarizes trip generation and traffic operations associated with the proposed project which will replace the existing library at 6540 Washington Boulevard and will upgrade and expand facilities with a new parking lot. Report focuses on two US 1 signals at Rowanberry Drive and Loudon Avenue, and an unsignalized intersection at US Route 1 and Hunt Club Road.			Report concluded that study intersections will continue to operate at adequate LOS in total traffic conditions.		
Y	Laurel Park Station Phase II Traffic Impact Study, Howard County, MD	2016	Study focuses on the Phase II of the project on the surrounding road network. Study area for subject analysis includes the following Route 1 intersections, US 1 and Whiskey Bottom Road, Davis Avenue, N, Laurel Road, North Site access (Columbia Street), and South Site Access (Laurel Park Driveway)	Based on characteristics of subject site and surrounding uses, proposed pedestrian facilities will adequately serve the anticipated pedestrian activity.		Under total future conditions all study intersections will continue to operate at acceptable LOS in accordance with Howard County Standards		
Z	The Settlement at Savage Mill Traffic Impact Study	2016	Study reviews traffic impacts generated by proposed development north and west of the existing Historic Savage Mill parking lot. The plan focuses on analysis of traffic control for two signals on US Route 1 at Howard Street and Gorman Road.			Report concluded that study intersections meet Howard County requirement of LOS "D" with the site traffic at projected build-out in 2018.		
AA	Adequate Road Facilities Test Evaluation for the Troy Hill Corporate Center	2015	Report is done for proposed Troy Hill Corporate Center located along the east side of Troy Hill Drive Service Road in Elkridge, Maryland. The development will house 3,500 SF restaurant and 11,000 SF of retail space. The "Impact Area" is defined as an area up to 1.5 road miles in all directions. This includes US 1 at Ducketts Lane and MD 100 westbound off ramp.			A review of Total Design Year Peak Hour volume shows that the key intersections considered in this study will operate at an acceptable Level-of-Service during all the Design Year weekday AM and PM Peak Hour conditions therefore, the proposed development will have no adverse impact on the surrounding area roadway system.		