Chesapeake Bay
Fiscal 2018 Budget Overview

Department of Legislative Services
Office of Policy Analysis
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Analysis in Brief

Major Trends

Maryland Not on Track for Calendar 2017 Progress Check for the Urban Sector: Maryland is not on track to meet any targets – nutrient or sediment – in the urban sector in 2017, and the U.S. Environmental Protection Agency has noted that it may increase its oversight of Maryland's stormwater sector if Maryland does not make substantial improvements.

Chesapeake Bay in "Moderate Ecosystem Health": The health of the bay, as measured by the University of Maryland Center for Environmental Science's Chesapeake Bay Report Card, has generally remained the same since 2003. The overall health of the bay improved slightly in 2015, although still receiving an overall score of C, indicating that the bay is in "moderate ecosystem health."

Issues

Overall Chesapeake Bay Restoration Funding: Major changes in Chesapeake Bay restoration funding (between fiscal 2017 and 2018) include an increase of $200.0 million in Water Quality Revolving Loan Fund revenue bonds, $46.1 million in the Biological Nutrient Removal program, and additional transfer tax funding for land preservation programs. These increases are offset partially by a reduction of $52.0 million for the Maryland Transit Administration's Purple Line transit project. **The Department of Legislative Services (DLS) recommends the addition of budget bill language to request that the Administration continue to publish the overall Chesapeake Bay restoration data in the Governor's budget books and provide the electronic data separately.**

New Bay Restoration Financing Ideas Are Being Explored: An Environmental Finance Symposium Report Action Team created after the Chesapeake Bay Environmental Finance Symposium on April 25 through 26, 2016, is exploring three Chesapeake Bay restoration financing ideas: advance a Chesapeake Bay restoration economic development effort, pilot pay for success investment models, and advance public-private partnerships, where appropriate. A Cecil Land Trust project to be funded by the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund will use the pay for success investment model. How to address nutrient and sediment reductions greater than the original pay for success project contract needs to be considered. **DLS recommends that the Administration comment on how nutrient and sediment reductions will be guaranteed in pay for performance agreements, what formal policy will be adopted to address reductions that exceed the original contract amount, and the Environmental Finance Symposium Report Action Team's thoughts on how the three financing ideas it is considering could be implemented in Maryland. In addition, DLS recommends again that the agencies submit information on updated historical spending and projected Chesapeake Bay restoration spending and associated impacts and the overall framework to meet the calendar 2025 requirement of having all best management practices in place to meet water quality standards for restoring the Chesapeake Bay. It is requested that the**

report include an analysis by the University of Maryland Environmental Finance Center on how cost effective the existing State funding sources – such as the Bay Restoration Fund, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, and Water Quality Revolving Loan Fund among others – are being used for Chesapeake Bay restoration purposes.

Stormwater Financial Assurance Plans Filed But Many Rely On Trading: Chapter 124 of 2015 repealed the requirement to enact a fee and instead required the jurisdictions to file a financial assurance plan every two years. The Administration determined that all 10 jurisdictions met the financial assurance plan requirement but 5 of the 10 jurisdictions include nutrient trading as a mechanism for meeting their stormwater remediation plans despite the lack of a formal framework allowing for municipal separate storm sewer system (MS4) permits to be met in this way. **DLS recommends that the Administration comment on the impact of the MS4 jurisdictions relying on nutrient trading to meet their financial assurance plan requirements.**

Nutrient Trading and Aligning for Growth: Maryland is in the midst of completing its nutrient trading plan. Next steps being pursued by the Administration include the following: allowing for stormwater trading, expanding the use of the Bay Restoration Fund to be used for trading purposes, and completing the Aligning for Growth policy. In general, there are three factors that appear to be spurring the use of trading to meet Maryland's commitments under the Total Maximum Daily Load: (1) the elimination of septic system regulations; (2) MS4 permits with trading components determined to be sufficient to meet their financial assurance requirement despite the lack of a formal policy; and (3) the potential benefits of inter-state trading to meet the new loads associated with the Conowingo Dam. **DLS recommends that the Administration comment on its plans for authorizing MS4 nutrient trading, the expansion of the use of the Bay Restoration Fund for nutrient trading, and the next steps for Aligning for Growth.**

Conowingo Dam Loading Adds to Overall Need: The Conowingo Dam has been described as the biggest best management practice on the Susquehanna River. However, the Conowingo Dam has reached an end state in terms of sediment and nutrient storage capacity and is now up for relicensing by the Federal Energy Regulatory Commission (FERC). FERC has determined that licensing is warranted but awaits a Clean Water Act – Section 401 water quality certification from the Maryland Department of the Environment. Maryland, in turn, is waiting for enhanced monitoring, and modeling data has been incorporated into the Chesapeake Bay model as part of the midpoint assessment; this step is expected in spring 2017 and will then necessitate discussions about who is responsible for the new load, when the load needs to be reduced, and how it will be reduced. **DLS recommends that the Administration discuss the magnitude of the increased nutrient and sediment loadings associated with the Conowingo Dam study, the State's likely responsibility for additional load reductions and their timing, the likely cost associated with the proposed action, and how this cost will be borne.**

Recommended Actions

1. Add budget bill language on a Chesapeake Bay restoration framework.

2. Add budget bill language on a Chesapeake Bay restoration report.

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Overview

Past efforts to restore the Chesapeake Bay watershed, which includes parts of Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia, have resulted in insufficient progress and continued poor water quality. However, a regional restoration initiative, required by the federal government and characterized by accountability measures and shorter term program evaluation, is underway. The current bay restoration policy framework is described below.

The Overarching Goal: Chesapeake Bay Total Maximum Daily Load

In December 2010, the U.S. Environmental Protection Agency (EPA) established a Chesapeake Bay Total Maximum Daily Load (TMDL), as required under the federal Clean Water Act and in response to consent decrees in the District of Columbia and Virginia. This TMDL sets the maximum amount of nutrient and sediment pollution that the bay can receive and still attain water quality standards. It also identifies specific pollution reduction requirements; all reduction measures must be in place by calendar 2025, with measures in place to achieve at least 60% of pollution reductions by calendar 2017.

Achieving the Goal: An Accountability Framework for Jurisdictions in the Bay Watershed

Watershed Implementation Plans

As part of the Chesapeake Bay TMDL, bay jurisdictions must develop watershed implementation plans (WIP) that identify the measures being put in place to reduce pollution and restore the bay. WIPs are submitted to EPA for review and evaluation and (1) identify pollution load reductions to be achieved by various source sectors and in different geographic areas; and (2) help to provide "reasonable assurance" that sources of pollution will be cleaned up, which is a basic requirement of all TMDLs. In calendar 2010, each bay jurisdiction submitted a Phase I WIP that details how the jurisdiction plans to achieve its pollution reduction goals under the TMDL. In calendar 2012, the bay jurisdictions submitted Phase II WIPs that establish more detailed strategies to achieve the bay TMDL on a geographically smaller scale. A Phase III WIP, which must be submitted to EPA in calendar 2018, will ensure that all practices are in place by calendar 2025 so that restoration goals can be met.

Maryland is embarking on the development of its Phase III WIP in conjunction with modifying septic system and nutrient management regulations and developing nutrient trading and Aligning for Growth (formerly Accounting for Growth) policies.

Phase III WIP

Phase III WIP implementation is broken up into three planning periods and comes with new expectations regarding the development of local area planning goals and an accounting for the impact of the Conowingo Dam and climate change on loading targets. The three Phase III WIP planning periods are as follows:

- ***Expectations* –** preliminary, formal, and final drafts were due to EPA between June 2016 and April 2017, but EPA has recently changed the schedule to adopt an interim expectations document for which EPA intends to modify accounting for growth, Conowingo Dam, and climate change sections to reflect decisions made by the Principals' Staff Committee at the May 17 and 18, 2017 retreat;

- ***Planning Targets* –** draft and final planning targets are due to EPA between June and December 2017; and

- ***Phase III WIP Documents* –** draft and final Phase III WIP documents are due to EPA between August and December 2018.

Of particular interest to local governments is the potential for the development of local area planning goals. While there is no consensus yet on exactly how these goals would work, the idea is that these goals may be adopted by any local political or programmatic entity (cities, towns, soil conservation districts, *etc*.) for any nonpoint source of nutrient and sediment loading in order to support implementation efforts and provide a framework for tracking progress. The focus is on nonpoint sources of pollution since point sources of pollution – wastewater treatment plants (WWTPs), some stormwater discharges, and concentrated animal feeding operations – are already governed by National Pollutant Discharge Elimination System permits. While EPA has not previously engaged at this level, EPA notes that it does not intend to take any federal actions in regard to the adoption of a local area planning goal.

Two-year Milestones

President Barack H. Obama issued an executive order in May 2009 that directed the federal government to lead a renewed effort to restore and protect the bay and its watershed. At the same time, the bay jurisdictions committed to achieving specific, short-term bay restoration "milestones" in order to assess progress toward achieving nitrogen, phosphorus, and sediment reduction goals. Generally, milestones are goals to be reached in two-year increments; they include implementation actions – best management practices (BMP) – and program enhancement actions. As a part of this effort, bay jurisdictions must submit pollution reduction progress and program action information to EPA. Although the bay jurisdictions developed the milestones prior to the establishment of the TMDL, the milestones have been incorporated into the TMDL process as a series of checkpoints for assessing progress toward achieving the pollution reduction goals in the TMDL.

Federal Review and Contingency Actions

EPA reviews each jurisdiction's progress toward its two-year milestones. If a jurisdiction's plans are inadequate, or if its progress is insufficient, EPA may take action to ensure pollution reductions, including increasing oversight of State-issued pollution permits, requiring additional pollution reductions, prohibiting new or expanded pollution discharges, redirecting federal grants, and revising water quality standards to better protect local and downstream waters. The change in federal administrations may impact the federal government's willingness to use the tools available for enforcing Chesapeake Bay restoration actions.

Chesapeake Bay Watershed Agreement

In June 2014, a new Chesapeake Bay Watershed Agreement was signed by representatives from the bay jurisdictions, as well as the Chesapeake Bay Commission and EPA. This agreement sets forth a collaborative plan for restoring and protecting the bay watershed and its living resources. Among other things, the agreement sets a goal to reduce pollutants to the bay by meeting the calendar 2017 and 2025 restoration goals and improving the capacity for monitoring and assessing progress. The agreement indicated that strategies for implementing the agreement's goals should be developed by June 2015. On July 23, 2015, the 25 strategies were released at the Chesapeake Executive Council meeting. Each of the 25 strategies covered 1 or more of the 31 Watershed Agreement outcomes. As mentioned above, at the October 5, 2016 Executive Council Meeting, members agreed to sign a resolution to support local government engagement including acknowledging current efforts by local governments and the benefits of future actions at the local level.

Reaching the Goal: Progress to Date

Bay restoration is characterized by the implementation of BMPs that reduce nutrient (nitrogen and phosphorus) and sediment loading. EPA issued its Interim Evaluation of Maryland's 2014-2015 and 2016-2017 Milestones on June 17, 2016, which reflects the progress on BMP implementation. The results of implementing BMPs are reflected in the University of Maryland Center for Environmental Science's Chesapeake Bay Report Card. The report card compares seven indicators – dissolved oxygen, nitrogen, phosphorus, chlorophyll a, water clarity, aquatic grasses, and benthic community – to scientific goals. The current status of BMP implementation and bay health is outlined below.

BMPs

- ***All Agreement Jurisdictions:*** The modeled results from BMP implementation reflect that the bay jurisdictions are on track to attain the watershedwide 2017 targets for phosphorus and sediment but not for nitrogen. In fact, the nitrogen reduction is currently projected to be only 46% as opposed to the 60% reduction target.

- ***Maryland:*** The modeled results reflect that Maryland met its statewide phosphorus and sediment targets for the 2014-2015 milestone period, but missed its nitrogen target – only the wastewater sector is on target. For the 2016-2017 milestone period, Maryland is on track to meet nitrogen, phosphorus, and sediment targets and is on track to meet phosphorus and sediment targets for 2025. However, Maryland is not on track to meet any targets in the urban sector in 2017, and EPA noted that it may increase its oversight of Maryland's stormwater sector if Maryland does not make substantial improvements.

Health

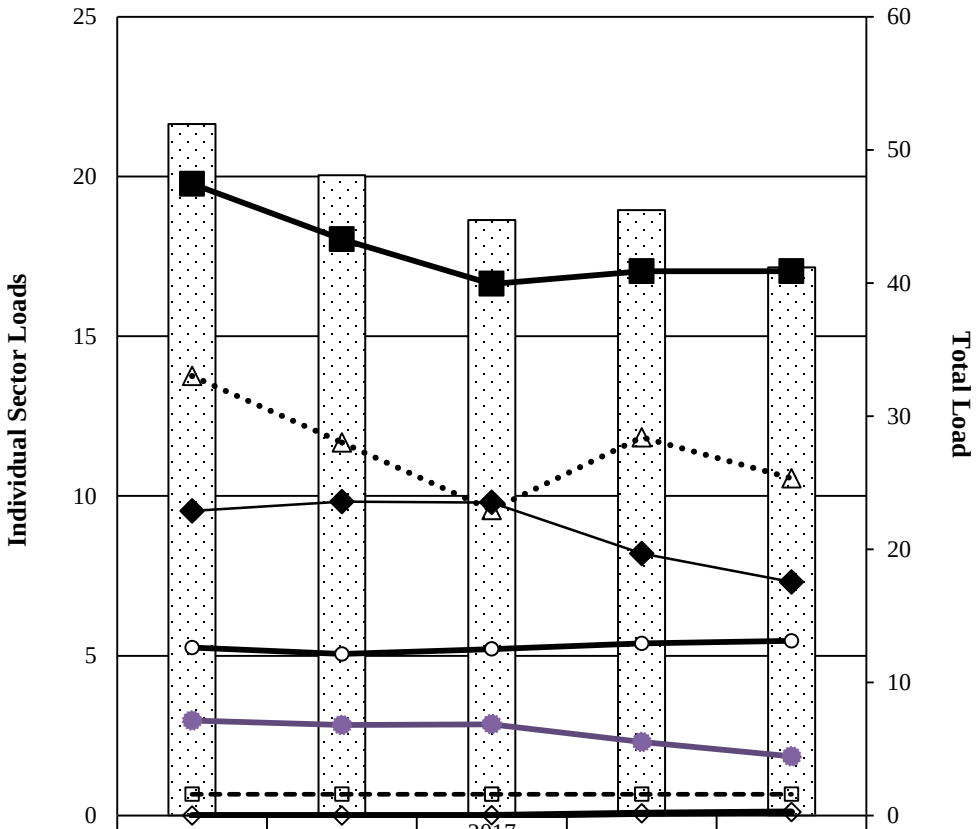
The health of the bay, as measured by the report card, has generally remained the same since 2003. The overall health of the bay improved slightly in 2015, although still receiving an overall score of C, indicating that the bay is in "moderate ecosystem health."

Future Milestones and Targets

EPA primarily evaluates progress toward meeting the TMDL by reviewing a jurisdiction's combined pollution reductions among the various pollution sources. The State must establish pollution control measures by calendar 2025 that, based on calendar 2009 levels, will reduce nitrogen loads to the bay by 20.7%, phosphorus loads by 14.9%, and sediment loads by 3.3%.

Exhibits 1, **2**, and **3** show nitrogen, phosphorus, and sediment loads, respectively, by sector for calendar 2009 and 2015, the two-year milestones plan for 2017, the 2017 EPA target, and the 2025 EPA target. In all cases, Maryland's total 2017 milestones loads for nitrogen, phosphorus, and sediment are below the 2017 target loads, which was noted by EPA in its June 17, 2016 interim evaluation. In addition, the 2017 milestones loads for each sector are less than the 2017 target with the exception of the urban and septic nitrogen loads. However, the wastewater nitrogen loads for the 2017 milestones are 2.2 million pounds below the 2017 target due to the expectation that the majority of the 67 major WWTPs will be upgraded by 2017, which can temporarily be used to cover for the combined 2.2 million pounds that the urban and septic nitrogen loads exceed their 2017 target.

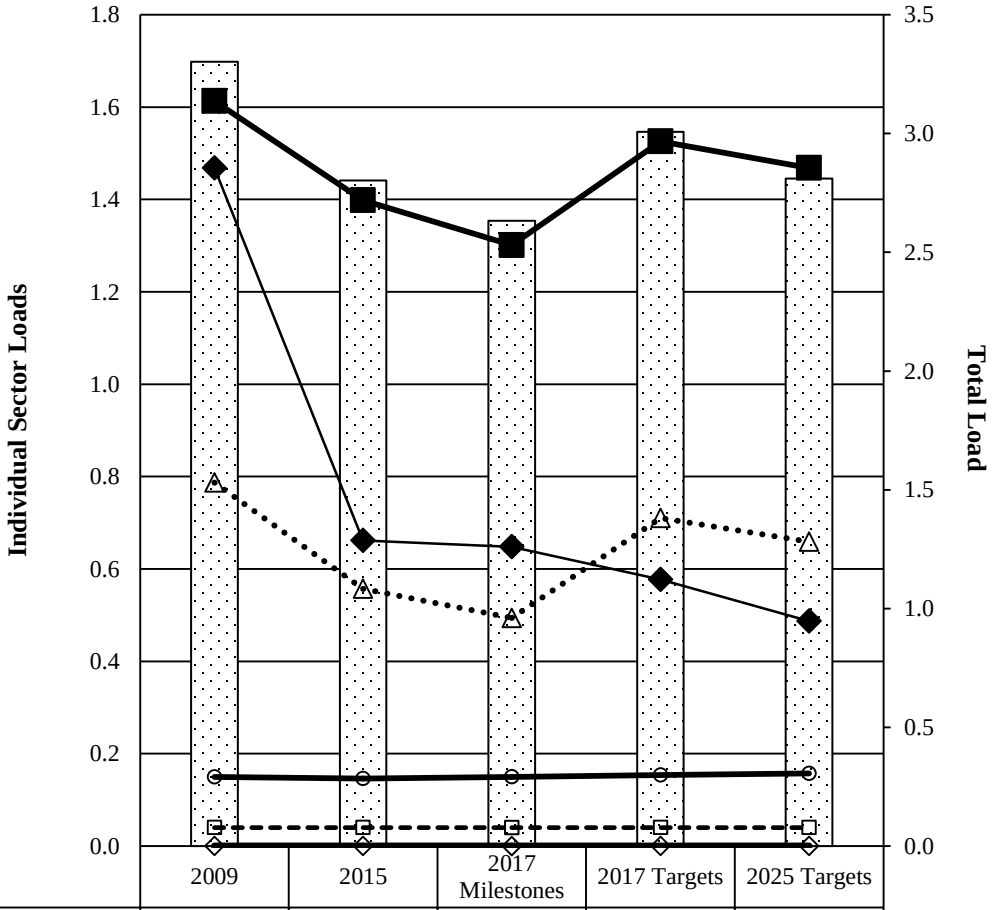
Exhibit 1
Maryland's Nitrogen Reduction Goals
(Million Pounds Per Year)
Calendar 2009-2025



	2009	2015	2017 Milestones	2017 Targets	2025 Targets
Total	51.9	48.1	44.7	45.5	41.2
Agriculture	19.8	18.0	16.6	17.0	17.0
Urban Runoff	9.5	9.8	9.8	8.2	7.3
Wastewater + Combined Sewer Overflow	13.8	11.7	9.6	11.8	10.6
Septic	3.0	2.8	2.9	2.3	1.9
Forest	5.3	5.1	5.2	5.4	5.5
Non-tidal Water Deposition	0.7	0.7	0.7	0.7	0.7
Reserve	0.0	0.0	0.0	0.1	0.1

Source: Chesapeake Bay Program

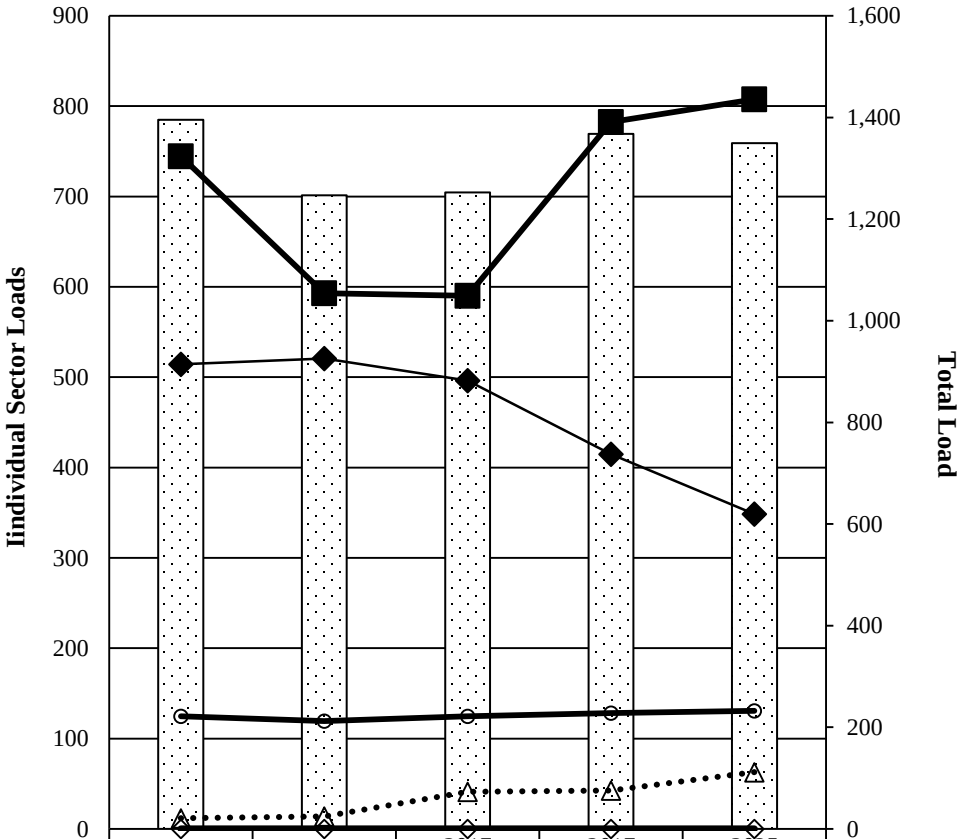
Exhibit 2
Maryland's Phosphorus Reduction Goals
(Million Pounds Per Year)
Calendar 2009-2025



	2009	2015	2017 Milestones	2017 Targets	2025 Targets
Total	3.3	2.8	2.6	3.0	2.8
Agriculture	1.6	1.4	1.3	1.5	1.5
Urban Runoff	1.5	0.7	0.6	0.6	0.5
Wastewater + Combined Sewer Overflow	0.8	0.6	0.5	0.7	0.7
Forest	0.2	0.1	0.2	0.2	0.2
Non-tidal Water Deposition	0.0	0.0	0.0	0.0	0.0
Reserve	0.0	0.0	0.0	0.0	0.0

Source: Chesapeake Bay Program

Exhibit 3
Maryland's Sediment Reduction Goals
(Million Pounds Per Year)
Calendar 2009-2025



	2009	2015	2017 Milestones	2017 Targets	2025 Targets
Total	1,395.1	1,247.0	1,252.4	1,367.8	1,349.7
Agriculture	744.4	593.0	589.9	782.4	807.7
Urban Runoff	514.1	520.7	496.4	414.7	348.5
Wastewater + Combined Sewer Overflow	11.9	14.0	41.3	42.5	62.9
Forest	124.7	119.4	124.8	128.2	130.6
Reserve	0.0	0.0	0.0	0.0	0.0

Source: Chesapeake Bay Program

Recent Regulatory Highlights

Two recent sets of regulations have been adopted that are potentially critical to Maryland's Chesapeake Bay restoration efforts. The regulations address the universal requirement for septic system installations and nutrient management plans for agricultural operations.

Septic System Regulation

The Maryland Department of the Environment (MDE) adopted a new septic system regulation that became effective on November 24, 2016. According to MDE, the purpose of the regulation is to remove the universal requirement that Best Available Technology for Removal of Nitrogen (BAT) systems be installed outside the Chesapeake and Atlantic Coastal Bays Critical Area (critical area) for all new construction or replacement septic systems. Under the regulation, BAT systems are still required outside of the critical area if the system has a design flow of 5,000 gallons per day or greater, or if the local jurisdiction enacts code to require BAT systems outside of the critical area in order to protect public health or the waters of the State. MDE estimates that approximately 703 fewer BAT systems may be installed annually in the State as a result of the regulation. In addition, the Administration notes that there may be an increase of approximately 50,000 pounds of nitrogen over the next 10 years.

To the extent that the regulation makes it more difficult for the State and local governments to achieve and maintain the nitrogen reductions required under the TMDL, additional reductions from other sectors may be needed. For instance, according to MDE, a home utilizing a septic system causes 3 to 6 times as much nitrogen pollution as a home on public sewer when comparing the discharge to surface waters and, without the current restrictions on the installation of septic systems to serve new residential development, the Maryland Department of Planning (MDP) projects that future septic systems could account for three-fourths of new nitrogen pollution in Maryland over the next 25 years. On the other hand, Chapter 149 of 2012 (Sustainable Growth and Agricultural Preservation Act) could reduce the development of homes built on septic systems over time. In addition, it appears that land converted from agricultural use to another type of use will likely reduce loadings.

Nutrient Management Plan Regulations

The Maryland Department of Agriculture (MDA) proposed new nutrient management plan regulations that became effective on January 2, 2017. The regulations alter requirements under MDA's Nutrient Management Program, applicable to regulated agricultural operations. The proposed action extends and makes statewide the annual winter deadline and prohibition for spreading nutrients to fertilize farm fields from November 15 to December 15. In addition, it removes the requirement that no till agricultural operations incorporate nutrients in the soil of farm fields during spring and fall applications. Lastly, it provides an emergency exception to the winter application prohibition that allows agricultural operators to spread nutrients in winter on farm fields. This last provision is intended to provide meaningful relief for dairy farms that cannot afford costs of additional nutrient storage needed to comply with current regulations. Further, it is also intended to prevent the overflow of storage structures in order to prevent point source winter pollution.

Transportation Stormwater Management

Funding for stormwater management sector improvements associated with State transportation infrastructure represents $1.5 billion, or approximately 10%, of the total estimated WIP implementation cost. The State Highway Administration (SHA) owns more than 2,500 stormwater management facilities and nearly 17,000 lane miles of roadway located throughout the State. After many years of discussion regarding the lack of transportation funding for new infrastructure, Chapter 429 of 2013 (the Transportation Infrastructure Investment Act) was enacted. Chapter 429 increased transportation funding by increasing motor fuel taxes and transit fares. Chapter 429 also required that the Governor include specified annual appropriations in the budget bill (between fiscal 2015 and 2019) totaling $395.0 million for SHA to use to comply with the WIP. Chapter 489 of 2015 (Budget Reconciliation and Financing Act of 2015) authorized the Transportation Trust Fund (TTF) to be used to fund the WIP in fiscal 2016 only, which reflects $65.0 million in funding. Subsequently, the Administration adopted, and the General Assembly supported, a policy of authorizing the TTF as the fund source for the $395.0 million mandated cost of complying with the WIP.

Exhibit 4 reflects the most recent SHA WIP funding estimate, which in the fiscal 2017 to 2022 *Consolidated Transportation Program* is $750.4 million, including $178.9 million expended prior to fiscal 2017, and $74.5 million added in fiscal 2022. As shown in **Exhibit 5**, special funds comprise the largest share of the projected fund sources, accounting for 87% of the planned funding, followed by federal funds (7%) and general obligation (GO) bonds (6%); no general funds are reflected because of the decision to use the TTF to comply with the WIP, as noted previously in this analysis.

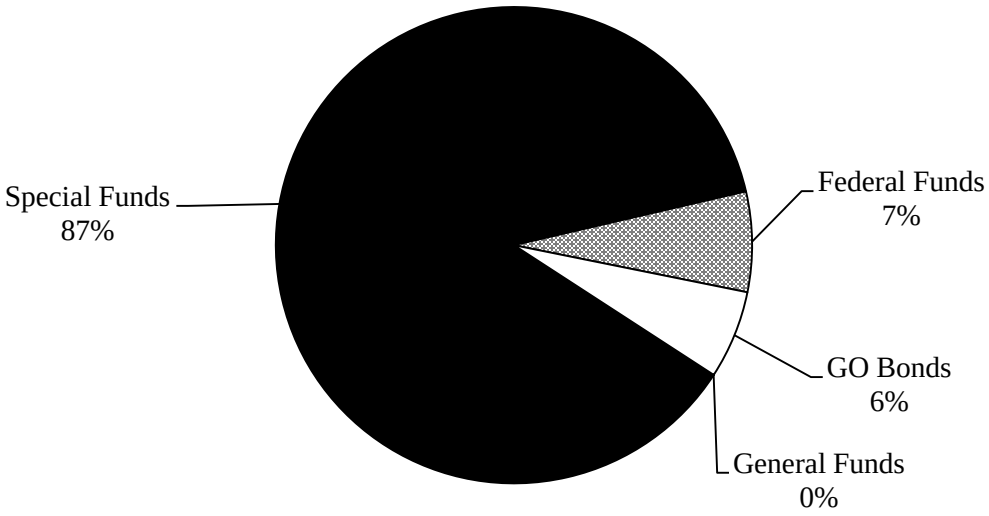
Exhibit 4
SHA Watershed Implementation Plan
Fiscal 2017-2022
($ in Thousands)

Source	Prior Auth.	2017	2018	2019	2020	2021	2022	Total
Special Funds	$82,906	$85,000	$113,900	$111,500	$103,500	$83,100	$74,500	$654,406
Federal Funds	50,994	0	0	0	0	0	0	50,994
GO Bonds	45,000	0	0	0	0	0	0	45,000
Total	**$178,900**	**$85,000**	**$113,900**	**$111,500**	**$103,500**	**$83,100**	**$74,500**	**$750,400**

GO: general obligation
SHA: State Highway Administration

Source: Maryland Department of Transportation; Fiscal 2017 to 2022 *Consolidated Transportation Program*

Exhibit 5
SHA Watershed Implementation Plan
Total Program Funding Sources



GO: general obligation
SHA: State Highway Administration

Source: Maryland Department of Transportation; Fiscal 2017 to 2022 *Consolidated Transportation Program*

Issues

1. Overall Chesapeake Bay Restoration Funding

The current state of Chesapeake Bay restoration funding may be reviewed at three levels:

- ***Overall Chesapeake Bay Restoration*** – actions that include environmental education, land preservation, transit projects, and nutrient and sediment reduction among others;

- ***Two-year Milestones*** – actions for nutrient and sediment reduction only; and

- ***Chesapeake and Atlantic Coastal Bays 2010 Trust Fund*** – actions for nutrient and sediment reduction from nonpoint sources only using certain revenues.

Overall Chesapeake Bay Restoration

Section 39 of the fiscal 2017 budget bill expressed the General Assembly's intent that the Department of Natural Resources (DNR), the Department of Budget and Management (DBM), and MDE submit two reports on Chesapeake Bay restoration expenditures, as follows:

- ***Overall Chesapeake Restoration Spending*** – operating and capital expenditures by agency, fund type, and particular fund source based on programs that have over 50% of their activities directly related to Chesapeake Bay restoration for the fiscal 2016 actual, fiscal 2017 working appropriation, and fiscal 2018 allowance; and

- ***Two-year Milestones*** – two-year milestones funding by agency, BMP, fund type, and particular fund source along with associated nutrient and sediment reductions for fiscal 2015 to 2018.

The overall Chesapeake Bay restoration expenditures exhibit was first included in the Governor's Budget Books in fiscal 2009. The purpose of the exhibit is to understand the overall scope of Chesapeake Bay restoration funding. The current version of overall Chesapeake Bay restoration funding is Appendix S of the *Maryland Budget Highlights* book and is shown in **Exhibit 6**.

Exhibit 6
Overview of Maryland's Funding for Chesapeake Bay Restoration
Fiscal 2014-2018

	2014 Actual	2015 Actual	2016 Actual	2017 Approp.	2018 Allowance	2017-2018 $ Change	2017-2018 % Change
Agency/Program Total Funds							
Department of Natural Resources	$101,327,759	$110,595,649	$84,660,768	$99,581,977	$99,641,084	$59,107	0.1%
Program Open Space	27,065,000	15,072,000	24,210,428	19,118,428	30,976,662	11,858,234	62.0%
Rural Legacy	13,512,000	16,034,000	10,082,149	17,663,385	23,913,725	6,250,340	35.4%
Department of Planning	5,069,335	5,410,045	5,439,791	5,563,061	5,121,487	-441,574	-7.9%
Maryland Department of Agriculture	41,995,484	46,884,891	44,036,219	46,893,197	42,180,923	-4,712,274	-10.1%
Maryland Agricultural Land Preservation Foundation	35,712,218	22,850,007	24,726,722	22,975,176	34,497,423	11,522,247	50.2%
Maryland Department of the Environment	301,151,064	281,255,048	546,309,366	276,165,519	511,634,247 [1]	235,468,728	85.3%
Maryland State Department of Education	416,945	416,945	416,945	416,945	416,945	0	0.0%
Maryland Higher Education	20,387,021	35,136,275	19,916,834	20,508,165	14,832,985	-5,675,180	-27.7%
Maryland Department of Transportation	172,258,000	338,284,342	230,430,909	480,724,219	446,123,871	-34,600,348	-7.2%
Total	**$718,894,826**	**$871,939,202**	**$990,230,131**	**$989,610,072**	**$1,209,339,352**	**$219,729,280**	**22.2%**
Fund Type							
General Fund	$31,983,477	$32,802,957	$48,673,415	$45,132,506	$35,184,993	-$9,947,513	-22.0%
Special Fund	309,761,628	276,779,365	338,028,907	331,104,176	338,988,586	7,884,410	2.4%
Federal Fund	57,695,355	54,269,686	54,285,340	57,212,186	54,267,497	-2,944,689	-5.2%
Reimbursable Funds	7,985,344	25,226,577	25,562,453	32,628,820	30,898,420	-1,730,400	-5.3%
Current Unrestricted	11,573,308	23,733,937	11,729,446	12,496,196	11,950,205	-545,991	-4.4%
Current Restricted	8,813,713	11,402,338	8,187,388	8,011,969	2,882,781	-5,129,188	-64.0%

	2014 Actual	2015 Actual	2016 Actual	2017 Approp.	2018 Allowance	2017-2018 $ Change	2017-2018 % Change
General Obligation and Revenue Bonds	118,824,000	109,440,000	273,332,273	22,300,000	289,043,000 [1]	266,743,000	1,196.2%
Maryland Department of Transportation Funds	172,258,000	338,284,342	230,430,909	480,724,219	446,123,871	-34,600,348	-7.2%
Total	**$718,894,826**	**$871,939,202**	**$990,230,131**	**$989,610,072**	**$1,209,339,353**	**$219,729,281**	**22.2%**
Spending Category							
Land Preservation	$77,321,632	$54,779,325	$59,863,593	$61,124,644	$91,004,178	$29,879,534	48.9%
Septic Systems	29,249,269	21,445,045	25,890,960	21,063,061	21,621,487	558,426	2.7%
Wastewater Treatment	262,525,003	249,916,427	512,339,242	244,454,892	479,153,742 [1]	234,698,850	96.0%
Urban Stormwater	81,342,596	33,200,345	9,582,588	12,266,472	12,103,062	-163,410	-1.3%
Agricultural BMPs	41,995,484	46,884,891	62,126,219	64,837,061	60,016,923	-4,820,138	-7.4%
Oyster Restoration	15,179,640	11,888,853	11,084,013	8,276,141	7,644,859	-631,282	-7.6%
Transit and Sustainable Transportation	135,027,000	338,284,342	230,430,909	480,724,219	446,123,871	-34,600,348	-7.2%
Living Resources	43,871,479	66,250,974	41,311,657	58,839,081	57,778,448	-1,060,633	-1.8%
Education and Research	20,803,966	35,553,220	23,583,779	24,175,110	18,609,930	-5,565,180	-23.0%
Other	11,578,757	13,735,780	14,017,171	13,849,390	15,282,852	1,433,462	10.4%
Total	**$718,894,826**	**$871,939,202**	**$990,230,131**	**$989,610,071**	**$1,209,339,352**	**$219,729,281**	**22.2%**

BMP: Best Management Practice

[1] Reflects $180.0 million of Maryland Department of the Environment revenue bonds in fiscal 2016 and $260.1 million in fiscal 2018.

Note: This presentation only includes State agency programs that have over 50% of their activities directly related to Chesapeake Bay restoration. In addition, funding related to salaries and fringe benefits does not reflect health insurance or increment adjustments. Though not reflected in the exhibit, the Maryland Department of Agriculture's fiscal 2018 allowance does include $11.2 million in Bay Restoration Fund funding for cover crops and $2.0 million in Exelon animal waste to energy alternative compliance payment funding.

Source: Department of Budget and Management; Department of Legislative Services

The major changes between the fiscal 2017 working appropriation and the fiscal 2018 allowance reflected in the overall Chesapeake Bay restoration spending are as follows.

- ***MDE*** – increases by $235.5 million primarily due an increase of $200.0 million in Water Quality Revolving Loan Fund revenue bonds, $46.1 million in the Biological Nutrient Removal Program in revenue bonds, $2.0 million for operating grants to jurisdictions with wastewater treatment plants upgraded to Enhanced Nutrient Removal technology, and $1.0 million for septic grants, which is offset partially by a decrease of $20.0 million for the Bay Restoration Fund Program. The change between fiscal 2017 and 2018 is complicated somewhat by the reversion of $6.8 million in general funds in fiscal 2017 for the Water Quality Revolving Loan Fund that provides the 20% match to federal funds; this necessitates double the appropriation to be provided in fiscal 2018 to match the federal funding that capitalizes the revolving loan fund.

- ***Program Open Space, Rural Legacy, Maryland Agricultural Land Preservation Foundation*** – increases by $29.6 million due to an increase in the transfer tax revenue estimate relative to fiscal 2017, fiscal 2016 overattainment funding, and a reduced transfer of transfer tax special funds to the State's General Fund relative to fiscal 2017. Program Open Space's share of the increase is $11.9 million, which is comprised of $14.6 million in additional transfer tax revenue, which is reduced by a reduction of $2.75 million for the federal fund appropriation. The Rural Legacy Program increase of $6.3 million reflects increased transfer tax revenue; the $5.0 million mandated general obligation bond authorization is provided in both fiscal 2017 and 2018, which has not always been the case. The Maryland Agricultural Land Preservation Foundation increase of $11.5 million reflects an increase of $12.8 million in transfer tax revenue, a decrease of $1.1 million for the county participation, and a decrease of $0.2 million for administration.

- ***MDA*** – decreases by $4.7 million, primarily due to the Administration's inadvertent omission of $11.2 million in Bay Restoration Fund funding for cover crops from Appendix S, and the omission of $2.0 million in Exelon animal waste to energy alternative compliance payment funding appropriated from the Animal Waste Technology Fund, which is offset partially by an increase of $8.0 million in GO bonds for the Maryland Agricultural Water Quality Cost-Share Program, although there is $1.1 million in general fund deficiency appropriation for fiscal 2017 that is not accounted for, which reduces the increase to $6.9 million.

- ***Maryland Department of Transportation*** – decreases by $34.6 million, primarily due to a $52.0 million reduction for the Maryland Transit Administration's Purple Line transit project, which is offset partially by an increase of $27.6 million for TMDL implementation projects including stormwater retrofits, stream restoration, grass swales, new stormwater management, and tree planting.

- ***Maryland Higher Education*** – decreases by $5.7 million, which is comprised primarily of funding reductions of $4.4 million for the University of Maryland Baltimore County (UMBC) and $1.1 million for the University of Maryland, College Park (UMCP). UMBC's funding

reflects a reduction for research on the impact of climate variability on the urban water cycle and nutrient export ($1.6 million), evaluating the effectiveness of bio-augmentation in order to treat polychlorinated biphenyls-impacted sediments ($1.0 million), phase III of the Baltimore Ecosystem Study ($0.8 million), and green infrastructure for urban landscapes ($0.6 million). UMCP's reduction is primarily a reduction of $0.7 million for Chesapeake Bay Program stormwater improvement activities.

Two-year Milestones Funding

As noted earlier, Section 39 of the fiscal 2017 budget also expressed the intent that DNR, DBM, and MDE submit information about two-year milestones funding and nutrient reduction. The data was not provided in time for inclusion in this analysis.

Chesapeake and Atlantic Coastal Bays 2010 Trust Fund

Chapter 6 of the 2007 special session (HB 5) established a Chesapeake and Atlantic Coastal Bays 2010 Trust Fund to be used to implement the State's tributary strategy. The fund is financed with a portion of existing revenues from the motor fuel tax and the sales and use tax on short-term vehicle rentals. Subsequently, Chapters 120 and 121 of 2008 established a framework for how the trust fund money must be spent by specifying that it be used for nonpoint source pollution control projects and by expanding it to apply to the Atlantic Coastal Bays.

Exhibit 7 shows the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund history, including revenues, transfers, and expenditures. Fiscal 2018 reflects the second year that funding has not been transferred and thus available revenues for programs have exceeded $50.0 million as originally projected for the fund. Of note, the fiscal 2016 revenue has declined from $51.42 million in last year's analysis to $50.38 million. Similarly, the fiscal 2017 revenue estimate has declined from $53.0 million to $50.8 million. However, there was a $3.21 million canceled encumbrance that was accounted for in fiscal 2016 that helps to make up for the lower revenue estimates.

Fiscal 2018 Allocation

Exhibit 8 provides an overview of the currently planned trust fund allocations for fiscal 2018 as compared with fiscal 2017. Of note, the exhibit only reflects special funds from the motor fuel tax and short-term rental vehicle tax since no general obligation bond capital funding is provided in the Governor's capital budget, which was provided in fiscal 2013, 2014, and 2015. Final decisions on allocations typically are made by the BayStat agencies after the final funding levels have been determined.

Exhibit 7

Chesapeake and Atlantic Coastal Bays 2010 Trust Fund History

Fiscal 2009-2018 Est.

($ in Millions)

Appropriation	2009	2010	2011	2012	2013	2014	2015	2016	2017 Est.	2018 Est.
Opening Balance	**$0.0**	**$3.6**	**$5.8**	**$3.2**	**$3.4**	**$3.4**	**$0.0**	**$2.1**	**$4.2**	**$1.5**
Revenue	**$38.2**	**$41.5**	**$43.1**	**$41.8**	**$44.3**	**$49.4**	**$52.9**	**$50.4**	**$50.8**	**$51.3**
Transfers to the GF										
Chapter 414 of 2008	-$25.0									
Chapter 487 of 2009		-$21.5								
Chapter 484 of 2010		-10.5	-$22.1							
Chapter 397 of 2011			-1.0	-$20.2	-$15.1	-$11.5	-$8.1	-$4.6		
Chapter 1 of 2012 First Special Session					-8.0					
Chapter 464 of 2014						-10.4	-6.2			
Chapter 489 of 2015								-8.6		
Subtotal GF Transfers	***-$25.0***	***-$32.0***	***-$23.1***	***-$20.2***	***-$23.1***	***-$21.9***	***-$14.3***	***-$13.3***	***$0.0***	***$0.0***
GF Revenue					-$2.8					
Available Revenue	**$13.2**	**$13.1**	**$25.9**	**$24.9**	**$27.5**	**$30.9**	**$38.6**	**$39.2**	**$55.0**	**$52.8**

Appropriation	2009	2010	2011	2012	2013	2014	2015	2016	2017 Est.	2018 Est.
Spending										
MDA	-$6.9	-$3.9	-$12.3	-$13.2	-$14.5	-$15.6	-$19.6	-$19.6	-$19.6	-$19.6
MDE	-1.8	-1.7	-2.1	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8
DNR	-0.8	-1.7	-8.2	-10.4	-10.3	-14.8	-16.2	-17.9	-33.1	-31.0
Subtotal Agency Spending	***-$9.6***	***-$7.3***	***-$22.6***	***-$23.6***	***-$24.8***	***-$31.1***	***-$36.5***	***-$38.3***	***-$53.5***	***-$51.3***
Returned Funding – MDE				**$1.9**		**$0.1**				
Encumbrance Cancellations				**$0.3**	**$0.8**	**$0.1**		**$3.2**		
Available Balance	**$3.6**	**$5.8**	**$3.2**	**$3.4**	**$3.4**	**$0.0**	**$2.1**	**$4.2**	**$1.5**	**$1.5**

DNR: Department of Natural Resources
GF: General Fund
MDA: Maryland Department of Agriculture
MDE: Maryland Department of the Environment

Notes: Under transfers, the $10.5 million transferred by Chapter 484 of 2010 included $8.0 million in fiscal 2010 revenues and $2.5 million in fund balance. Fiscal 2013 reflects a $2.8 million general fund deficiency appropriation in order to backstop an estimated decrease in revenues. Chapter 464 of 2014 transferred $2.4 million from fund balance and $8.0 million in revenues in fiscal 2014. Fiscal 2017 revenue has been adjusted to reflect the current estimate. Numbers may not sum due to rounding.

Source: Department of Natural Resources; Department of Legislative Services

Exhibit 8
Chesapeake and Atlantic Coastal Bays 2010 Trust Fund
Planned Expenditures
Fiscal 2017-2018
($ in Millions)

	2017	2018	Difference 2017-2018
Maryland Department of Agriculture			
Agency Technical Assistance	$3.3	$3.3	$0.0
Cover Crops	11.3	11.3	0.0
Conservation Reserve Enhancement Program Incentive	0.5	0.5	0.0
Manure to Energy Projects with Proven Technology	1.5	1.7	0.2
Manure Transport	0.8	0.8	0.0
Grants to Farmers	2.0	2.0	0.0
Governor's Phosphorus Management Tool Initiative	0.3	0.2	-0.2
Subtotal	***$19.6***	***$19.6***	***$0.0***
Maryland Department of the Environment			
Stormwater Permit Expediters	$0.8	$0.8	$0.0
Subtotal	***$0.8***	***$0.8***	***$0.0***
Department of Natural Resources			
Agency Direct Costs	$0.8	$0.8	$0.0
Strategic Monitoring (UM)	0.4	0.4	0.0
Implementation Tracking (DoIT)	0.2	0.2	0.0
Targeted Pooled Monitoring	0.3	0.3	0.0
Innovative Technology (UM)	1.0	1.0	0.0
Nutrient and Sediment Reduction on State Lands (Natural Filters)	6.0	6.0	0.0
Cost-effective Nonpoint Source Projects (Targeted)[1]	23.7	21.5	-2.2
Field Restoration Specialist	0.8	0.8	0.0
Subtotal	***$33.1***	***$31.0***	***-$2.2***
Total	**$53.5**	**$51.3**	**-$2.2**

DoIT: Department of Information Technology
UM: University of Maryland

[1] Annually, the BayStat agencies issue competitive solicitations to target specific opportunities or challenges as identified. Historically, this included the Stream Restoration Challenge, Urban Tree Canopy, and Local Implementation grants.

Source: Department of Natural Resources; Department of Legislative Services

Fiscal 2017 and 2018 Highlights

Overall, there are relatively few changes in the fiscal 2017 and 2018 allocations of the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund. In fiscal 2017, there is a deficiency appropriation for $500,000 in order to provide for additional targeted cost-effective nonpoint source projects – the competitively solicited projects that make up the largest single allocation of funding. The changes between fiscal 2017 and 2018 are as follows.

- ***Cost-effective Nonpoint Source Projects (Targeted)*** – The largest funding change is a decrease of $2.2 million for cost-effective nonpoint source projects. This funding represents competitively solicited projects and receives $21.5 million in fiscal 2018.

- ***Governor's Phosphorus Management Tool*** – There is a reduction of $150,000 for the Governor's Phosphorus Management Tool, providing for a total of $150,000. The funding is provided to support the economic study of utilization of the phosphorus management tool in multiple farm settings, technical assistance through nutrient management advisors for farmers to plan the transition to the phosphorus management tool, and implementation of management changes.

- ***Manure to Energy Projects with Proven Technology*** – Funding increases by $150,000 for a total of $1.7 million for the Animal Waste Technology Fund. Funding is provided in order to support technologies that use excess animal waste – such as for energy production. The Animal Waste Technology Fund also receives an additional $1.0 million from the Exelon waste-to-energy alternative compliance payment revenues for a total of $2.0 million in fiscal 2018 from that source.

- ***Agency Direct Costs Increase*** – There is an increase of $20,000 for a total of $770,000 in agency direct costs, which reflects 1.5% of the $51.3 million revenue estimate. The funding is generally used to provide fiscal oversight; manage grant programs including solicitation development, project review, contract, and project development and management; and coordination within the Executive Branch and with the General Assembly.

The Department of Legislative Services (DLS) recommends the addition of budget bill language to request that the Administration continue to publish the overall Chesapeake Bay restoration data in the Governor's Budget Books and provide the electronic data separately.

2. New Bay Restoration Financing Ideas Are Being Explored

Fiscal 2017 budget bill language requested the submission of a report on historical and projected Chesapeake Bay restoration spending and associated impacts and the overall framework to meet the calendar 2025 requirement of having all best management practices in place to meet water quality standards for restoring the Chesapeake Bay. The requested report included insights from both the July 2015 report *Maryland's Chesapeake Bay Restoration Financing Strategy Final Report* and the

August 2016 report *Chesapeake Bay Environmental Finance Symposium: Recommendations and Final Report*.

Watershed Implementation Plan Cost

Maryland's restoration cost for the Phase II WIP informs its overall financing strategy. The State's Phase II WIP included a $14.4 billion restoration cost estimate for the fiscal 2010 through 2025 time period. In the fiscal 2015 operating budget bill, budget bill language originally included the intent that a report be submitted including projected fiscal 2017 to 2025 annual spending for restoration. In July 2015, the UMCP Environmental Finance Center released a financing strategy covering the intent of the fiscal 2015 budget bill language. The July 2015 report, *Maryland's Chesapeake Bay Restoration Financing Strategy Final Report*, included estimated costs and revenues, as shown in **Exhibit 9** for the 2010 through 2025 time period. Overall, the Environmental Finance Center estimated a $7.8 billion financing gap, primarily in the areas of onsite wastewater (septic systems) and urban stormwater. The updated report on historical and projected Chesapeake Bay restoration spending submitted in December 2016 notes a remaining funding gap between fiscal 2017 and 2025 of $5.1 billion, but indicates that the gap can be closed if the State temporarily loans the excess wastewater sector allocation to meet the expected shortfall in the stormwater and septic sectors, holds MS4 permit holders to their requirements, and uses the Bay Restoration Fund and Chesapeake and Atlantic Coastal Bays 2010 Trust Fund as cost effectively as possible.

Exhibit 9
Watershed Implementation Plan Financing Gap
Calendar 2010-2025
($ in Billions)

Sector	Estimated Costs	Estimated Revenue Flows	Financing Gap
Point Source Wastewater	$2,430	$2,430	$0
Onsite Wastewater	3,700	297	3,403
Agriculture	928	738	190
Urban Stormwater	7,388	3,203	4,185
Total	**$14,446**	**$6,668**	**$7,778**

Source: Environmental Finance Center

The UMCP Environmental Finance Center in collaboration with the Chesapeake Bay Program held the Chesapeake Bay Environmental Finance Symposium on April 25 through 26, 2016. The symposium was driven by a Chesapeake Executive Council resolution that encouraged the identification of innovative approaches to leverage or incentivize private investment in bay restoration. Subsequent to the symposium, an Environmental Finance Symposium Report Action Team was created. The EPA Chesapeake Bay Program Principals' Staff Committee recently selected three of the

symposium's recommended actions to focus on in order to have the Environmental Finance Symposium Action Team write a report by March 2017 about the chosen financing ideas. The financing ideas chosen are as follows:

- ***Core Recommendation 1 – Advance a Chesapeake Bay Restoration Economic Development Effort:*** the idea is to encourage the development of innovative technologies for cleaning up the Chesapeake Bay;

- ***Theme Recommendation 1 – Pilot Pay for Success Investment Models:*** the idea is to spur the development of a system in which people compete to provide the lowest cost nutrient and sediment reductions; and

- ***Theme Recommendation 3 – Advance Public-private Partnerships, Where Appropriate:*** the idea is to encourage the development of public-private partnerships that allow for large-scale work, such as the shift from government-led stormwater reductions that are done on a project-by-project basis and may take up to six months to procure to a model in which a large number of projects can be procured at one time, such as what is being implemented by Corvias Solutions in Prince George's County.

The pay for success or performance model is of particular concern for budgeting purposes because it can be implemented directly by the State through programs such as the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, which was created in order to fund cost-effective nonpoint source pollution reduction projects. An example is the contract for the first phase of a project with the Cecil Land Trust in which the Cecil Land Trust will work with the private firm Ecosystem Investment Partners to identify approximately 8,215 linear feet of stream needing restoration and 24.8 acres needing riparian buffers within one farm property in the headwater stream segments of Principio Creek in Cecil County. The pay for performance aspect is due to the fact that the State will pay for pounds of nitrogen ($794 per pound), phosphorus ($2,675 per pound), and sediment ($3,680 per ton) reduced and not simply for best management practices to be implemented. In addition, the State will reserve a portion of the payment until the agreed upon loads are reduced.

There is the possibility that more nutrient and sediment pounds may be reduced by the Cecil Land Trust project than are agreed upon. While this is beneficial to the State, it is not clear how this might be handled in terms of paying for more than the originally agreed upon amount. DNR indicates that in the event this should happen, the State will address whether there is a way to credit the partner on a prorated basis per pound of nutrient and sediment reduced above the contract delivery amount. This might involve including compensation for such excess reductions in future awards. DNR acknowledges that encouraging innovation and efficiency needs to be balanced with making sure the State's funding is not tied to open-ended financing agreements.

DLS recommends that the Administration comment on how nutrient and sediment reductions will be guaranteed in pay for performance agreements, what formal policy will be adopted to address reductions that exceed the original contract amount, and the Environmental Finance Symposium Report Action Team's thoughts on how the three financing ideas it is

considering could be implemented in Maryland. In addition, DLS recommends again that the agencies submit information on updated historical spending and projected Chesapeake Bay restoration spending and associated impacts and the overall framework to meet the calendar 2025 requirement of having all BMPs in place to meet water quality standards for restoring the Chesapeake Bay. It is requested that the report include an analysis by the University of Maryland Environmental Finance Center on how cost effective the existing State funding sources – such as the Bay Restoration Fund, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, and Water Quality Revolving Loan Fund among others – are being used for Chesapeake Bay restoration purposes.

3. Stormwater Financial Assurance Plans Filed But Many Rely On Trading

The federal Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States. The National Pollutant Discharge Elimination System (NPDES), a component of the CWA, regulates stormwater discharges from municipal separate storm sewer systems (MS4). There are 10 local jurisdictions and SHA in Maryland that hold NPDES Phase I MS4 permits (Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's counties, and Baltimore City). In the 2012 legislative session, the General Assembly passed legislation, Chapter 151, which required these 10 jurisdictions to establish a local stormwater remediation fee to assist in financing the implementation of the local MS4 permits, including the requirement of each permit to meet the stormwater-related targets under the Chesapeake Bay TMDL. Subsequently, Chapter 124 of 2015 repealed the requirement to enact a fee and instead required the jurisdictions to file a financial assurance plan every two years. The first financial assurance plans were submitted on July 1, 2016, and MDE submitted its first annual summary report on the financial assurance plans in October 2016. While MDE determined that the financial assurance plans list sufficient revenue to support stormwater remediation activities, a number of the plans rely on nutrient trading despite the lack of a final State nutrient trading policy and the explicit authority to engage in nutrient trading to meet MS4 permits. MDE notes that the explicit authority will be in place once regulations and the nutrient trading policy are in place and either the NPDES MS4 permit is modified or a preemptive consent decree is issued.

Financial Assurance Plans

Chapter 124 of 2015 (Watershed Protection and Restoration Programs – Revisions) required financial assurance plans to be filed with MDE by July 1, 2016, and every two years thereafter on the anniversary of the date the permit was issued. The plan must identify all local actions that will be required for the jurisdiction to comply with its Phase I MS4 permit, as well as the funding sources that will support those efforts, including a five-year projection of costs and revenues for permit compliance. The plan must also identify the specific actions and expenditures implemented in the previous fiscal years. For a first financial assurance plan filed by July 1, 2016, funding in the plan is sufficient if it includes dedicated revenues, funds, or sources of funds to meet 75% of the projected costs of compliance with the impervious surface restoration plan requirements of the MS4 permit for the following two years. A subsequent financial assurance plan may be deemed sufficient if it includes dedicated funds to meet 100% of the projected two-year costs of compliance with the impervious

surface restoration plan requirements. A local jurisdiction may not file a financial assurance plan until the local governing body holds a public hearing and approves the plan. A financial assurance plan must be made publicly available on MDE's website within a specified timeframe.

All of the jurisdictions governed by MS4 permits – SHA and Phase II MS4 permittees are not required to file a financial assurance plan – submitted their financial assurance plans, including Montgomery County, which was not required to submit a plan. In addition, all jurisdictions had their financial assurance plans approved by the local governing body.

Current and Project Restoration

Exhibit 10 compares the impervious surface restoration plan data through fiscal 2016 and separately for fiscal 2017 through 2018, the two-year planned restoration period. Of note, 5 of the 10 jurisdictions have acreage baselines that are pending acceptance by MDE, which reduce the confidence in the numbers shown. As shown in the exhibit, the average cost per acre is anticipated to increase going forward in 6 of the 10 jurisdictions, which may indicate the depletion of the most cost-effective activities. In addition, a substantial amount of activity is represented for fiscal 2017 through 2018. Finally, it appears that the public-private partnership Prince George's County has with Corvias Solutions for stormwater remediation has yet to make substantial progress, given that only 2.3% of the 6,105 acres to be restored have been completed so far.

Exhibit 10
Restoration Completed and Projected to Meet Impervious Surface Restoration Plan Requirements
Through Fiscal 2018

Jurisdiction	Acres Required to be Restored (Impervious Acre Baseline)	Acre Baseline Accepted by MDE (Y/P/N)[1]	Acres Restored		Cost		Average Cost Per Acre		Restoration	
			Through 2016	Additional 2017-2018	Through 2016	Additional 2017-2018	Through 2016	Additional 2017-2018	Complete Through 2016	Projected Additional 2017-2018
Anne Arundel	5,862	Y	649	4,201	$6,596,505	$77,301,728	$10,159	$18,403	11.1%	71.7%
Baltimore City	4,291	Y	2,372	3,758	10,561,649	28,916,682	4,454	7,694	55.3%	87.6%
Baltimore	6,036	Y	1,203	5,128	11,388,763	111,198,575	9,467	21,686	19.9%	85.0%
Carroll	1,344	P	1,123	458	12,576,575	12,090,000	11,199	26,411	83.6%	34.1%
Charles	1,410	P	223	1,238	6,592,038	25,921,551	29,508	20,937	15.8%	87.8%
Frederick	1,013	P	161	320	10,192,516	17,622,629	63,491	55,140	15.8%	31.5%
Harford	1,883	P	487	1,586	5,793,000	18,040,000	11,887	11,375	25.9%	84.2%
Howard	2,044	P	157	750	12,838,020	44,661,270	81,771	59,509	7.7%	36.7%
Montgomery	3,777	Y	1,780	1,571	75,031,122	116,102,260	42,152	73,894	47.1%	41.6%
Prince George's	6,105	Y	139	3,854	3,563,000	101,007,378	25,633	26,210	2.3%	63.1%
Total	**33,765**		**8,294**	**22,864**	**$155,133,187**	**$552,862,073**	**$18,704**	**$24,180**	**24.6%**	**67.7%**

[1] The Acre Baseline Accepted by the Maryland Department of the Environment is specified as either Yes (Y), Pending (P), or No (N). The average costs per acre and restoration complete totals were recalculated in order to account for a 1,100 acre difference between the total acres restored over fiscal 2017 and 2018 and the original data. This difference appears to reflect that the total was not adjusted when it was determined that Anne Arundel County's plan included a best management practice that had not been approved.

Source: Maryland Department of the Environment; Department of Legislative Services

Financial Assurance Requirements

Exhibit 11 reflects all of the jurisdictions that met MDE's requirement for reporting at least 75% of two-year costs being available. Trading is not currently allowed by the MS4 permits. However, a number of counties are proposing in their stormwater financial assurance plans to trade with WWTPs for up to half of the needed reductions in their five-year stormwater permits:

- ***Anne Arundel*** – 2,044 acres, or 35% of its requirement;
- ***Baltimore*** – 1,000 acres, or 17% of its requirement;
- ***Charles –*** 705 acres, or 47% of its requirement;
- ***Frederick –*** 256 acres, or 25% of its requirement; and
- ***Harford –*** 940 acres, or 41% of its requirement.

In addition, some of the jurisdictions are relying on grant funding that may not transpire. **DLS recommends that the Administration comment on the impact of the MS4 jurisdictions relying on nutrient trading to meet their financial assurance plan requirements.**

Exhibit 11
Fulfillment of Revenue Requirement for Two-year Costs
Through Fiscal 2016
($ in Millions)

Jurisdiction	Cost	Revenue	Percent of Cost Covered	Meets 75% Requirement (Y/N)
Anne Arundel	$115.0	$121.1	105%	Y
Baltimore City	97.7	79.4	81%	Y
Baltimore	92.4	89.5	97%	Y
Carroll	17.7	18.1	102%	Y
Charles	27.3	28.7	105%	Y
Frederick	11.4	11.4	100%	Y
Harford	20.3	23.0	113%	Y
Howard	44.7	40.8	91%	Y
Montgomery	116.1	116.1	100%	Y
Prince George's	139.4	103.9	75%	Y
Total	**$681.9**	**$632.0**	**93%**	

Note: The Maryland Department of the Environment notes that cost and revenue information was obtained from the Impervious Surface Restoration Plan Revenue worksheet.

Source: Maryland Department of the Environment

4. Nutrient Trading and Aligning for Growth

The Maryland Water Quality Trading Advisory Committee has been meeting regularly since January 2016 on the State's nutrient trading policy, which informs what is now called Aligning for Growth. The January 2016 *Draft Maryland Trading and Offset Policy and Guidance Manual – Chesapeake Bay Watershed* has been updated with a draft September 2016 document, which reflects a greater focus on trading to meet stormwater permits.

Nutrient trading has shifted from a way to *maintain* the TMDL cap to a way to *meet* the TMDL cap. In particular, it has become a way to meet inexpensively, and perhaps temporarily, the load reductions necessary from the stormwater sector. For instance, as noted previously in this analysis, Anne Arundel, Baltimore, Charles, Frederick, and Harford counties are proposing in their stormwater financial assurance plans to trade with WWTPs for up to half of the needed reductions in their five-year stormwater permits, as required by Chapter 124 of 2015 (Watershed Protection and Restoration Programs – Revisions). However, it remains to be seen whether these trades will include capacity credits that a WWTP may generate as a result of being under its permitted capacity, or performance credits that it may generate as a result of the WWTP treating nitrogen at 3 mg/L instead of the permitted level of 4 mg/L.

In addition to completing the water quality trading manual, the next steps for the Administration on nutrient trading are outlined as follows.

- ***Trading Policy Allowing Stormwater Trading:*** The Administration has determined that the financial assurance plans for the State's 10 largest jurisdictions list sufficient revenue to support stormwater remediation activities even though the jurisdictions' current Phase I MS4 stormwater permits do not currently allow for stormwater trading. Therefore, the Administration, in addition to adopting regulations to allow stormwater trading to occur, will need to do one of the following if the Phase I MS4 jurisdictions do not come up with other BMPs in place of trading: (1) modify the MS4 permits; (2) implement a compliance action such as a consent decree; or (3) wait until the next permit cycle.

- ***Bay Restoration Fund Expansion:*** The Bay Restoration Fund has been proposed as a means to start nutrient trading by expanding the authorized uses of the fund to include the purchase of cost-effective nitrogen and phosphorus nutrient credits (HB 325 of 2016; failed).

- ***Aligning for Growth:*** The offset of new or increased development is the goal of the Aligning for Growth policy, but the policy has many complications, including the possibility of the need for detailed site-by-site accounting of development, which would require the involvement of local stormwater planners. On the other hand, a detailed site-by-site offset evaluation process may be unnecessary if the current thinking holds that forest and agricultural land converted to urban and septic system use lowers nutrient and sediment loading. This lowering of loading is partially due to the requirement of stormwater environmental site design for new development.

There are three factors that appear to be spurring the use of trading to meet Maryland's commitments under the TMDL: the elimination of septic system regulations; MS4 permits with trading components being deemed sufficient for meeting the financial assurance requirement despite the lack of a formal policy; and the potential benefits of interstate trading to meet the new loads associated with the Conowingo Dam. In terms of the septic sector, the septic system regulations may be replaced with a requirement for developers to choose between installing septic systems with BAT, paying a fee-in-lieu, or buying credits that would provide a direct role for trading. MS4 jurisdictions are seen as the major source of demand for nutrient credits, and thus are assumed to be a major component of a trading scheme. Finally, interstate trading could allow for the purchase of less expensive nutrient credits in the Susquehanna River watershed, which would both spur Pennsylvania's restoration efforts that have been somewhat lacking and provide for inexpensive credits by states both inside and outside of the Susquehanna River watershed.

DLS recommends that the Administration comment on its plans for authorizing MS4 nutrient trading, the expansion of the use of the Bay Restoration Fund for nutrient trading, and the next steps for Aligning for Growth.

5. Conowingo Dam Loading Adds to Overall Need

The Conowingo Dam – a peaking hydroelectric facility that uses reservoir storage to generate electricity during peak electricity demand periods – has been described as the biggest BMP on the Susquehanna River. However, the Conowingo Dam, owned by Exelon Corporation, and two other dams in the Lower Susquehanna River – Safe Harbor, owned by Brookfield Renewable, Inc., and Holtwood, owned by Pennsylvania Power and Light – have reached an end state in terms of sediment storage capacity. In addition, the Conowingo Dam is in the midst of relicensing by the Federal Energy Regulatory Commission (FERC); its license expired on September 1, 2014, and it will receive automatic one-year renewals until it is relicensed. However, relicensing is on hold until the Administration determines whether it will grant a Clean Water Act – Section 401 water quality certification, which is required before FERC can act on an application for licensing. The water quality certification, in turn, is on hold until enhanced monitoring and modeling data has been incorporated into the Chesapeake Bay model as part of the midpoint assessment; this step is expected in spring 2017.

U.S. Army Corps of Engineers and MDE Report on the Lower Susquehanna

In March 2016, the *Lower Susquehanna River Watershed Assessment* report was released. The report noted that the three hydroelectric dams in the Lower Susquehanna River – Safe Harbor, Holtwood, and Conowingo – have reached an end state in terms of sediment storage capacity. The dams have now entered a dynamic equilibrium in which flooding events cause scouring – sediment removal – and then the sediment builds up again over inter-flood periods. Other report findings are as follows: (1) nutrients, not sediments, have the greatest impact on Chesapeake Bay aquatic life; (2) the watershed is the principal source of sediment; (3) sediment management strategies were considered to reduce sediment from future storm, or scour, events; and (4) before calendar 2017, future research is needed to quantify the full impact on Chesapeake Bay aquatic resources and water quality from the changed conditions in the Lower Susquehanna River's dams and reservoirs. The next step, as noted

previously, is to incorporate the enhanced monitoring and modeling study funded by $3.5 million from Exelon into the next Chesapeake Bay model and the midpoint assessment in order to determine the impacts on the Chesapeake Bay, which will occur in spring 2017.

Conowingo Dam Nutrient Implications

The spring 2017 study will inform how EPA will assign the new nutrient and sediment loads from the Conowingo Dam as part of the 2017 midpoint assessment, and as informed by the inclusion of the new data in the revised Chesapeake Bay watershed model. Of note, these are new loads that will be added to the overall reductions needed to meet the TMDL. This raises the following points:

- ***New Load Assignment –*** the possibilities for assigning the new loads include the default option of dividing up the load between Pennsylvania (76.2%), New York (22.8%), and Maryland (1.0%) by the percentage of their landmass in the Susquehanna River watershed; dividing up the load between Pennsylvania, New York, and Maryland along with additional allocations to Maryland and Virginia because they are the prime beneficiaries of Chesapeake Bay restoration; and dividing up the loads between all Chesapeake Bay Agreement signatories (Maryland will need to work with Exelon on any responsibility the company will bear);

- ***Load Reduction Timing*** – it needs to be determined whether the load reduction needs to be addressed before or after the 2025 TMDL deadline to have all practices in place to restore the Chesapeake Bay; and

- ***Load Reduction Method*** – the Administration advertised a request for information to identify cost-effective dredging solutions, including beneficial and/or innovative uses, on August 1, 2016, and is evaluating the 13 responses to the 750 letters sent out with an eye to developing a request for proposals, which will address the dredging proposals received from all 13 respondents and the beneficial reuse proposals for the dredged material received from 2 respondents – a lightweight aggregate for road material or an additive to be put on farmland and road fill.

DLS recommends that the Administration discuss the magnitude of the increased nutrient and sediment loadings associated with the Conowingo Dam study, the State's likely responsibility for additional load reductions and their timing, the likely cost associated with the proposed action, and how this cost will be borne.

Recommended Actions

1. Add the following section:

SECTION XX. AND BE IT FURTHER ENACTED, That it is the intent of the General Assembly that the Maryland Department of Planning, the Department of Natural Resources, the Maryland Department of Agriculture, the Maryland Department of the Environment, and the Department of Budget and Management provide a report to the budget committees by December 1, 2017, on Chesapeake Bay restoration spending. The report shall be drafted subject to the concurrence of the Department of Legislative Services (DLS) in terms of both electronic format to be used and data to be included. The report should include:

(1) fiscal 2017 annual spending by fund, fund source, program, and State government agency; associated nutrient and sediment reduction; and the impact on living resources and ambient water quality criteria for dissolved oxygen, water clarity, and "chlorophyll a" for the Chesapeake Bay and its tidal tributaries to be submitted electronically in disaggregated form to DLS;

(2) projected fiscal 2018 to 2025 annual spending by fund, fund source, program, and State government agency; associated nutrient and sediment reductions; and the impact on living resources and ambient water quality criteria for dissolved oxygen, water clarity, and "chlorophyll a" for the Chesapeake Bay and its tidal tributaries to be submitted electronically in disaggregated form to DLS;

(3) an overall framework discussing the needed regulations, revenues, laws, and administrative actions and their impacts on individuals, organizations, governments, and businesses by year from fiscal 2017 to 2025 in order to reach the calendar 2025 requirement of having all best management practices in place to meet water quality standards for restoring the Chesapeake Bay to be both written in narrative form and tabulated in spreadsheet form that is submitted electronically in disaggregated form to DLS;

(4) an analysis of the various options for financing Chesapeake Bay restoration including public-private partnerships, a regional financing authority, nutrient trading, technological developments, and any other policy innovations that would improve the effectiveness of Maryland and other states' efforts toward Chesapeake Bay restoration; and

(5) an analysis by the University of Maryland Environmental Finance Center on how cost effective the existing State funding sources – such as the Bay Restoration Fund, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, and Water Quality Revolving Loan Fund among others – are being used for Chesapeake Bay restoration purposes.

Explanation: This language expresses the intent that the Maryland Department of Planning (MDP), the Department of Natural Resources (DNR), the Maryland Department of Agriculture (MDA), the Maryland Department of the Environment (MDE), and the Department of Budget and Management (DBM) provide a report by December 1, 2017, on recent and projected Chesapeake Bay restoration spending and associated impacts and the overall framework to meet the calendar 2025 requirement of having all best management practices in place to meet water quality standards for restoring the Chesapeake Bay. In addition, the language expresses the interest that the report include information on policy innovations that improve the effectiveness of Maryland and other states' efforts toward Chesapeake Bay restoration and an analysis of how cost effectively the State funding sources are being used.

Information Request	**Authors**	**Due Date**
Historical and projected Chesapeake Bay restoration spending	MDP DNR MDA MDE DBM	December 1, 2017

2. Add the following section:

SECTION XX. AND BE IT FURTHER ENACTED, That it is the intent of the General Assembly that the Department of Budget and Management, the Department of Natural Resources, and the Maryland Department of the Environment provide a report on Chesapeake Bay restoration spending. The report shall be drafted subject to the concurrence of the Department of Legislative Services (DLS) in terms of both electronic format to be used and data to be included. The scope of the report is as follows: Chesapeake Bay restoration operating and capital expenditures by agency, fund type, and particular fund source based on programs that have over 50% of their activities directly related to Chesapeake Bay restoration for the fiscal 2017 actual, fiscal 2018 working appropriation, and fiscal 2019 allowance to be included as an appendix in the fiscal 2019 budget volumes and submitted electronically in disaggregated form to DLS.

Explanation: This language expresses the intent that the Department of Budget and Management (DBM), the Department of Natural Resources (DNR), and the Maryland Department of the Environment (MDE) provide at the time of the fiscal 2019 budget submission information on Chesapeake Bay restoration spending for programs that have over 50% of their activities directly related to Chesapeake Bay restoration.

Information Request	Authors	Due Date
Summary of Chesapeake Bay restoration spending for programs that have over 50% of their activities directly related to Chesapeake Bay restoration	DBM DNR MDE	Fiscal 2019 State budget submission