WA01
Department of State Police

Capital Budget Summary

Summary of State-owned Projects Funded in Governor's Request
($ in Millions)

Project Title	*Prior Approp.*	*FY 2014 Request*	*Future Estimated*	*Estimated Total*	*DLS FY 2014 Recommd.*
Old Crime Lab (Headquarters Building K) – HVAC Improvements and Reconfiguration	$1.665	$1.612	$0.000	$3.277	$1.612
Tactical Services Facility – Garage	2.773	1.174	0.000	3.947	1.174
State Police Helicopter Replacement	113.900	7.057	12.900	133.875	14.600
Total	**$118.338**	**$9.843**	**$12.900**	**$141.099**	**$17.386**

Fund Source	*Prior Approp.*	*FY 2014 Request*	*Future Estimated*	*Estimated Total*	*DLS FY 2014 Recommd.*
GO Bonds	$118.338	$9.843	$12.900	$141.099	$17.386
Total	**$118.338**	**$9.843**	**$12.900**	**$141.099**	**$17.386**

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Summary of Recommended Bond Actions

		Funds
1.	Helicopter Replacement	$7,543,000 GO
	Increase general obligation (GO) bond funds to allow for the purchase of an eleventh helicopter and restrict $200,000 in GO bond funds until a cost benefit analysis of flight simulator training proposals is submitted.	
2.	Old Crime Lab – Improvements and Reconfiguration	
	Approve.	
3.	Tactical Services Garage	
	Approve.	
4.	Section 12 – Department of State Police Helicopter Replacement	
	Increase general obligation bond funds to allow for the purchase of an eleventh helicopter.	
	Total Reductions	**$7,543,000 GO**

Capital Improvement Program

State-owned Capital Improvement Program
($ in Millions)

Projects	*Prior Auth.*	*2014 Request*	*2015 Est.*	*2016 Est.*	*2017 Est.*	*2018 Est.*	*Beyond CIP*
Old Crime Lab (Headquarters Building K) – HVAC Improvements and Reconfiguration	$1.665	$1.612	$0.000	$0.000	$0.000	$0.000	$0.000
Tactical Services Facility – Garage	2.773	1.174	0.000	0.000	0.000	0.000	0.000
State Police Helicopter Replacement	113.900	7.057	12.900	0.000	0.000	0.000	0.000
Aircrew Training Facility	0.000	0.000	0.300	3.700	0.000	0.000	0.000
Total	**$118.338**	**$9.843**	**$13.200**	**$3.700**	**$0.000**	**$0.000**	**$0.000**

Fund Source	*Prior Auth.*	*2014 Request*	*2015 Est.*	*2016 Est.*	*2017 Est.*	*2018 Est.*	*Beyond CIP*
GO Bonds	$118.338	$9.843	$13.200	$3.700	$0.000	$0.000	$0.000
Total	**$118.338**	**$9.843**	**$13.200**	**$3.700**	**$0.000**	**$0.000**	**$0.000**

Budget Overview

Old Crime Lab (Headquarters Building K) – HVAC Improvements and Reconfiguration

The fiscal 2014 capital budget provides $1.6 million in supplemental general obligation (GO) bond funds to renovate and upgrade the Department of State Police (DSP) old crime lab (headquarters building K), which currently houses the Licensing Division, an electronics shop, and other administrative units. Minor renovations to the building are needed, but the most significant issue is the heating, ventilation, and air conditioning (HVAC) system. The current HVAC system served to prevent cross-contamination of evidence when the building was used as a forensic laboratory, but now that the building is used for administrative purposes the system is not adequate to provide the heating and cooling necessary for personnel.

The DSP Licensing Division has occupied the building since 2007 and is responsible for firearm registrations, handgun permits, private detective licenses, special police commissions, and security guards. The Licensing Division is the most affected by operational interruptions in service brought on by unbearable working conditions due to the legally mandated timeframes required to approve or disapprove firearm registrations; background investigations must be performed within seven days to prevent illegal purchases. The office has been shut down in the past due to a failure of the cooling system. Losing even one business day to complete firearm background checks can severely limit the process.

DSP received a prior appropriation of $1.7 million in fiscal 2010 for the project, but the project has been stalled because informal cost estimates from design professionals indicated that the funding authorized for the project was inadequate to complete the work needed. In fiscal 2012, the Office of Energy Performance and Conservation solicited proposals from energy service companies (ESCOs) to get energy efficient upgrades at the old crime lab with the objective to separate the HVAC improvement from the project to make it more affordable. However, the energy efficiency upgrades could not proceed because the anticipated energy savings were not enough to cover the cost of the project.

The fiscal 2014 recommendation nearly doubles the prior fiscal 2010 authorization for the project; total costs are now $3.3 million. The scope of the project has not changed, but the authorization has increased to more accurately reflect the cost of the approved elements of the project. When the project is complete, DSP will have replaced the HVAC system, the electrical distribution panels, the emergency generator, and the original boilers; removed the laboratory exhaust fans; installed additional windows; and reconfigured the basement for storage space. These improvements should increase the life of the facility and prevent future service disruptions. Based on current plans, design should be completed by December 2013, and construction should be completed by August 2015.

DSP should discuss how the current condition of the building impacts the work environment and operations of the Licensing Division. DSP should also discuss why initial

authorizations for the project were underestimated and whether the fiscal 2014 addition to the authorization will be sufficient.

Tactical Services Facility – Garage

The fiscal 2014 budget provides $1.2 million in supplemental GO bond funds for the construction of a garage for the tactical services facility. This increases the total amount of funding for the project to approximately $3.9 million after accounting for $2.8 million authorized during the 2008 and 2009 sessions. The garage will provide a centralized location to house tactical response vehicles and specialized equipment, which will protect against weather-related damage.

DSP currently lacks sufficient space to house vehicles, weapons, equipment, and supplies for strategic deployment. In particular, DSP lacks proper storage for a multiple incident command vehicle, which was acquired in fiscal 2006 for $1.2 million. This vehicle, as well as many other tactical response vehicles, is kept outdoors and exposed to weather and security risks. In addition, DSP tactical service vehicles and equipment are scattered throughout the State, making strategic deployment difficult. Furthermore, certain facilities currently being used for storage and training, such as spaces utilized by the Office of the State Fire Marshal (OSFM) Bomb Squad and the Canine Unit, will soon no longer be available. The facility proposed could also provide the needed storage and additional space to house these units.

Originally, a pre-engineered corrugated metal facility was considered. However, the cost of such a facility made the project unfavorable, so a wooden pole barn structure was chosen instead. It is expected that, with a robust security system, the wooden pole barn should provide adequate security and weather protection.

Using the $2.8 million authorized in 2008 and 2009, the project was bid under a design-build methodology. Unfortunately, after several attempts to procure a contract including value engineering efforts and program unification, and a change in the program to a pole barn construction, bids exceeded available resources. Further complicating matters was the extensive site development needed to accommodate the garage and a vehicle changeover lot which included the need to acquire additional adjacent land owned by the Department of Public Safety and Correctional Services. Given these challenges, DSP and the Department of General Services have adopted a design-bid-build approach and have estimated the new cost at $3.9 million, requiring $1.2 million in additional authorized GO bonds.

The additional funding proposed in fiscal 2014 was not programmed in the 2012 session *Capital Improvement Program* (CIP). The project will include a wooden pole barn, a storage building, and a carport. The pole barn will house the tactical command and response vehicles, as well as specialized equipment, such as robots, trailers, and threat containment vessels for the OSFM Bomb Squad. Additional storage will be provided for weapons, training materials, and canine supplies. The facility maintenance garage for Waterloo Barracks will also be housed at the new facility, permitting the demolition of the last of the original 1930s DSP field structures. The operating budget impact begins in fiscal 2015 with $9,000 and increases to $82,000 in fiscal 2016 and onward; the operational

impact includes utilities, startup supplies, telephone instruments, and a maintenance mechanic from Waterloo Barracks.

Operating Budget Impact Statement

Executive's Operating Budget Impact Statement
($ in Millions)

	FY 2014	*FY 2015*	*FY 2016*	*FY 2017*	*FY 2018*
Project Name					
Tactical Services Facility – Garage	$0.000	$0.009	$0.082	$0.082	$0.082

State Police Helicopter Replacement

The fiscal 2014 recommendation for the State Police Helicopter Replacement is $7.1 million in GO bond funds. With a pre-authorization of $12.9 million GO bonds in fiscal 2015, this brings the total funding for the new fleet to $133.9 million, a $12.2 million reduction from the programmed estimate included in the 2012 session CIP. GO bonds were programmed to purchase 10 helicopters and a flight training device (FTD) during the 2009 session. The fiscal 2014 recommended funding would complete the purchase of 5 helicopters and begin progress payments on the last helicopter of the replacement fleet. The pre-authorization in fiscal 2015 will complete the payments on the last helicopter and purchase an FTD.

Helicopter Replacement Was Set Back Due to Budget Crunch

Medevac operations began in Maryland in 1970 with a limited fleet of single engine Bell "Jet Ranger" helicopters. A crash involving one of these helicopters in 1986 prompted a review, and, ultimately, the recommendation to upgrade and expand the fleet. The first of Maryland State Police Aviation Command's (MSPAC) current fleet of Dauphin helicopters was purchased in 1989. For almost 10 years, MSPAC operated with a fleet of 12 Dauphin helicopters and 2 fixed winged aircraft. As a result of a September 2008 helicopter accident, MSPAC now operates with 11 helicopters, which are almost 25 years old.

The General Assembly's intent to replace the existing fleet dates back to 2007. Chapter 6 of the 2007 special session provided that a portion ($110 million) of the revenues from the increased sales and use tax in fiscal 2008 be directed to the State Police Helicopter Replacement Fund (SPHRF). However, the Spending Mandate and Revenue Dedication Relief Act of 2008 (Chapter 414 of 2008) modified Chapter 6 to dedicate $50 million, rather than $110 million, to the SPHRF. To replace this funding, Chapter 414 required the Governor to include a total of $70 million

for the purchase of Medevac helicopters in the fiscal 2010, 2011, and 2012 State budgets to come from any budgetary fund that receives sales and use tax; however, the required appropriations could be reduced by the amount of capital debt that is authorized for helicopters or by any contribution, transfer, or financing acquired from the Maryland Automobile Insurance Fund as authorized by an act of the General Assembly.

During the 2008 legislative session, the General Assembly approved $33.6 million pay-as-you-go special funds to procure the first installment of three Medevac helicopters. However, due to budget constraints, the appropriation was cancelled by Chapter 487 of 2009 (the Budget Reconciliation and Financing Act of 2009), which authorized the transfer of the remaining $52.7 million balance from the SPHRF to the general fund. In lieu of these funds, the Maryland Consolidated Capital Bond Loan (MCCBL) of 2009 included $52.5 million in GO bonds to begin the initial purchase of Medevac helicopters. The MCCBL of 2013 brings the total to $133.9 million in GO bonds.

Delivery of the New Fleet Delayed

Delivery of the first two AugustaWestland (AW)139 helicopters was expected in May 2012. During the procurement process, MSPAC requested modifications to the aircraft's searchlight and medical interior. The cost of the modifications was originally anticipated to be $1.1 million per helicopter, but final costs came well under budget at $77,000. Before any helicopters could be delivered to DSP, the Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) had to approve these modifications, which delayed delivery by 9 months. **Exhibit 1** shows the most recent delivery schedule for the helicopters and the FTD. MSPAC took delivery of six helicopters late February 2013 and is expected to take delivery of the next helicopter late March 2013.

Exhibit 1
New Helicopter Fleet Delivery Schedule
Fiscal 2013-2015

Helicopters	Delivery Date	Fiscal Year
6	February 2013	2013
1	March 2013	2013
2	July 2013	2014
1	December 2013	2014
FTD	January 2015	2015

FTD: Flight Training Device

Source: Maryland State Police Aviation Command

2011 Helicopter Trooper Base Assessment Study

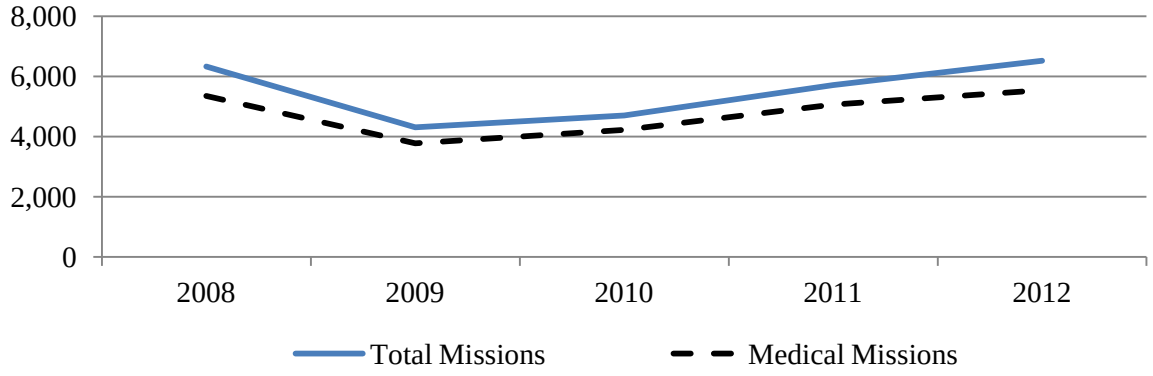
In 2011, an updated helicopter *Base Assessment Study* was submitted to the General Assembly as requested. A number of scenarios were examined, and the report recommended 10 helicopters located at 7 bases, with the relocation of Trooper 1 to Aberdeen. Consistent with the report's findings, the MCCBL of 2013 reflects a total of $133.9 million through fiscal 2015 for the procurement of 10 helicopters and an FTD. The study focused essentially on two goals to determine the number of helicopters and bases necessary for optimal performance: (1) to provide quality and timely air medical services throughout the State of Maryland; and (2) to maintain and extend the life of the helicopter fleet for as long as possible, taking into consideration the costs and benefits to achieve both goals. The study provided expert guidance for a difficult decision regarding the fleet, but the data, assumptions, and resulting recommendation have not been revisited since. The Department of Legislative Services (DLS) has concerns with some of the assumptions and findings in the 2011 *Base Assessment Study*, which were crucial in deciding on 10 helicopters and 7 bases.

Mission Analysis

According to the study, MSPAC averaged 6,800 missions per year from 2001 to 2006, with approximately 5,000 Medevac missions. From 2006 to 2008, missions fell from 7,123 to 4,320, a 2,803 mission decrease, or 39.4%. From 2008 to 2009, missions fell by 1,783, or by 41.3%. The drop starting in 2006 appears to correspond with changes in triage protocols, while the drop in 2008 appears to correspond to the crash of Trooper 2 and efforts to reign in helicopter usage. The triage protocol changes required patients within 30 minutes of a trauma center to be taken by ground transport instead of helicopter, and required emergency medical service (EMS) providers in the field to consult with a trauma center before requesting helicopter transport for less severely injured patients. The study predicted that, barring any future changes to protocols, mission totals beyond 2011 would have an annualized growth rate of less than 3%.

Mission data provided by MSPAC is consistent with the downward trend of missions identified by the study starting in 2006. **Exhibit 2** shows mission trends from fiscal 2008 through fiscal 2012; the mission numbers provided by MSPAC do not match the study because the consultant study used calendar years, while MSPAC uses fiscal years for mission data. MSPAC missions agree with the downward trend identified by the study starting in fiscal 2006, but MSPAC actual missions from fiscal 2009 through 2012 increased by 2,207 to a total of 6,519 missions, or a 51.2% increase. This does not put missions at the same peak levels as before the protocol changes in 2006, but it does put mission totals in the same range before the dramatic drop in 2008. In addition, the growth rate since fiscal 2009 greatly exceeds the 3.0% growth anticipated by the study. Mission growth in the out-years was a factor in determining the need for only 10 helicopters, and the study underestimated this growth.

Exhibit 2
Helicopter Missions
Fiscal 2008-2012



Source: Maryland State Police Aviation Command

Population Growth

Population coverage across the State was another key performance indicator considered by the 2011 *Base Assessment Study*. The mission of MSPAC is to provide coverage in both high density and low density call areas. The study concluded that Maryland's population growth would have a near negligible effect on total missions because it is only expected to grow by 1% per year over the next 10 years. **Exhibit 3** shows the anticipated population growth for Maryland from 2010 through 2035.

Exhibit 3
Maryland Population Growth
Calendar 2010-2035

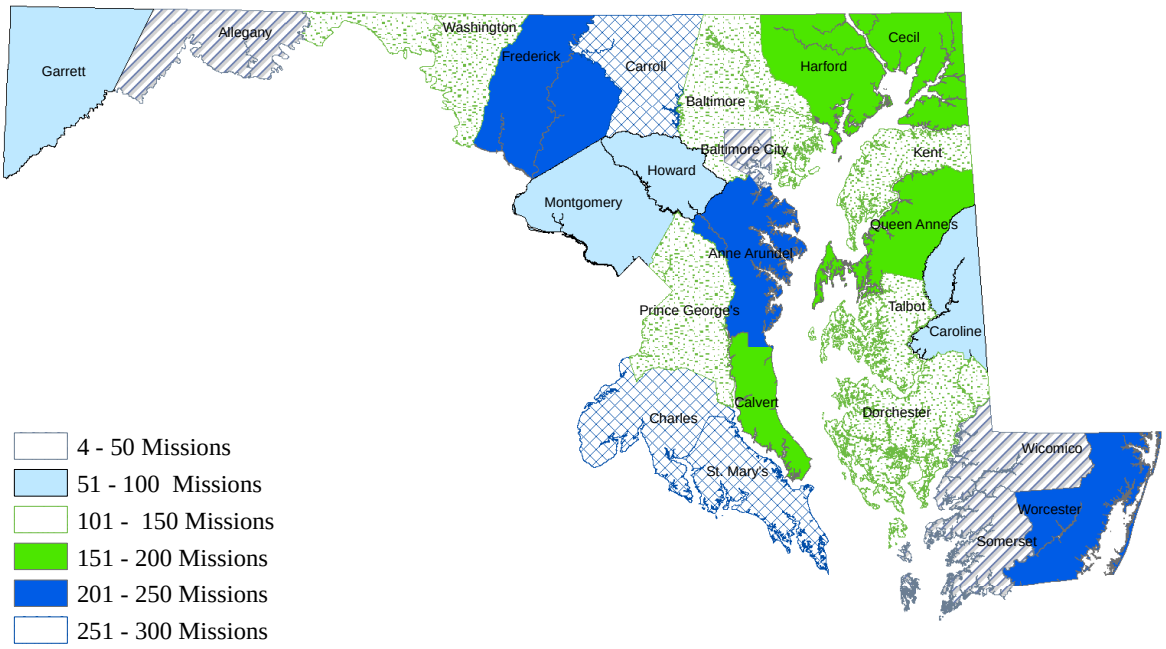
2010	2015	2020	2025	2030	2035	2015-2035	% Change 2015-2035	Avg. Annual Change
5,773,552	5,962,000	6,216,150	6,428,250	6,611,900	6,753,000	791,000	13.3%	39,550

Source: Maryland Department of Planning

Over the 20-year life of the new fleet (2015-2035), the State population will increase to 6.8 million people, which is a 791,000, or 13.3%, increase from the 2015 population. Though the growth rate each year is below 1%, as the study suggested, the areas of the State with the higher

growth rates are the areas where Medevac missions are most concentrated. The counties with the highest growth rates from 2015 to 2035 are Charles, Cecil, Frederick, Kent, Queen Anne's, St. Mary's, and Washington; all of these counties have a growth rate consistently above 1% through 2035. As demonstrated by **Exhibit 4**, these areas have some of the highest Medevac mission numbers in 2012. DLS believes that it is arguable whether population growth has a negligible effect on helicopter missions when considering the increasing population in the next 20 years, particularly growth in rural and suburban areas where Medevac missions are already concentrated. In addition, population growth does not take into account visitors traveling in Maryland to our major cities and the surrounding states.

Exhibit 4
Medevac Missions by County
Calendar 2012



Source: Maryland State Police Aviation Command

Helicopter Response Time

An important consideration in the study for the appropriate number of helicopters and bases to produce the optimal outcome was helicopter response time. Typically, the objective has been to complete Medevac missions within the "Golden Hour." The University of Maryland Medical Center defines the Golden Hour as the hour between injury and delivery of a patient to a trauma center. In August 2008, the DLS Office of Legislative Audits found that MSPAC had not formally defined the Golden Hour and that the accepted definition of the Golden Hour was not consistent with MSPAC's

reporting; MSPAC started the Golden Hour at the time the Systems Communication Center (SYSCOM) called for a helicopter, instead of when the accident occurred. The audit concluded that MSPAC should define the term and ensure its method of measurement conforms to the definition. In 2009, the House EMS Workgroup requested an updated base assessment study with a better performance measure of response time beginning at the time of an accident rather than at the time of a field call for helicopter transport. The 2011 *Base Assessment Study* believed that the best way to measure the Golden Hour would be to start the time at the initial 9-1-1 call, which is when 9-1-1 receives a call reporting the need for medical help. However, the study concluded that this goal was not the best indication of effectiveness of MSPAC's helicopter base deployment strategy.

The study resolved that the time it takes a helicopter to get to a patient after the call from SYSCOM was a better performance measure for MSPAC; the Golden Hour does not directly measure MSPAC performance since a variety of factors can interfere with a helicopter getting a patient to a trauma center within 60 minutes. Also, when taking into consideration the average time elapsed from the 9-1-1 call to request for a helicopter (approximately 20 minutes) and the 10 minutes necessary for pre-flight safety checks, the helicopter is not even in the air until 30 minutes have elapsed, making it very difficult to meet the 60-minute time frame. Therefore, MSPAC's goal is to reach a patient within 25 minutes of SYSCOM notification. Under this performance measure, MSPAC was successful in reaching a patient within 25 minutes of the SYSCOM call 88.5% of the time from 2009 through 2010. **MSPAC should inform the budget committees on how a 25-minute response was determined an appropriate performance measure of MSPAC effectiveness.**

Although there are many variables that affect when a patient is delivered to a trauma center, assessment of the current base strategy could benefit from using average response data and the Golden Hour as a goal. Under the current 7-base strategy and 25-minute response time to a patient, MSPAC has a flight time of 15 minutes to reach a patient. If it is assumed 20 minutes elapse on average from the 9-1-1 call to the request for a helicopter, 10 minutes elapse for pre-flight checks, 15 minutes elapse for flight time, 10 minutes elapse on the ground with the patient, and approximately 15 minutes of flight time elapse en route to a trauma center, then, optimistically, a patient reaches a hospital within 70 minutes of injury. If flight time to a patient was reduced to 10 minutes, then this would more realistically reflect average times for a scene Medevac mission to deliver a patient to a trauma center within 60 minutes of injury. **Exhibit 5** shows estimation of elapsed time under the current 25-minute response measurement versus estimated flight time needed to deliver a patient within the Golden Hour.

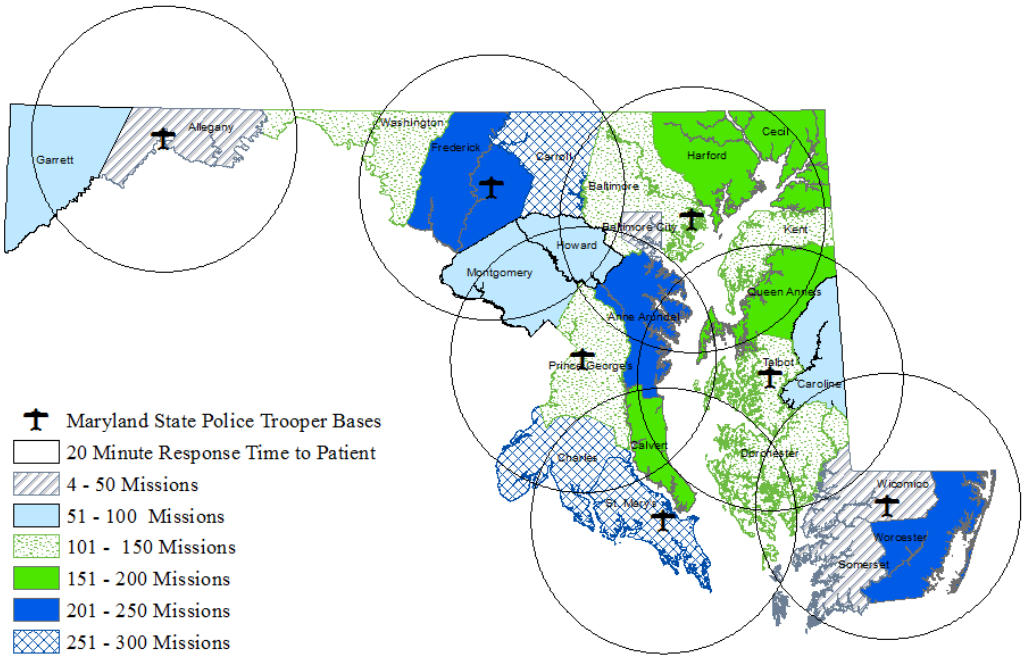
Exhibit 5
Estimation of Elapsed Time: 25-minute Response vs. Golden Hour Response

	25-minute Response	Golden Hour Response
9-1-1 Call to SYSCOM	20	20
Pre-Flight Safety Checks	10	10
Flight to Patient	15	10
Patient Preparation	10	10
Flight to Trauma Center	15	10
Total	70	60

Source: Maryland State Police Aviation Command; Department of Legislative Services

A 20-minute response to a patient from the SYSCOM call for helicopter transport, using average time elapsed for the various stages of scene Medevac, would place a patient at a trauma center within 60 minutes of injury. To reduce the flight time to a patient from 15 minutes to 10 minutes would mean the boundaries for helicopter bases must shrink, as shown by **Exhibit 6.** Flying at 167 knots, the speed of the AW-139 as provided by MSPAC, a helicopter can cover approximately 48 miles in 15 minutes. If the time is reduced to 10 minutes, a helicopter can cover approximately 32 miles. As seen in Exhibit 6, there is less overlap of helicopter coverage as well as a large gap over Western Maryland. The gap occurs in Washington County, which had 134 Medevac missions in 2012. A particular concern in Washington County is Interstate 70, which experiences heavy traffic, high speeds, and unpredictable weather through mountainous terrain. Even before reducing flight time for the Golden Hour response, this gap existed. **MSPAC should discuss how these geographic gaps in coverage could be addressed.**

Exhibit 6
MSPAC 20-minute Response from SYSCOM Call



SYSCOM: Systems Communication Center

Source: Maryland State Police Aviation Command; Department of Legislative Services

Using the revised 20-minute response time as success and under the current seven-base strategy utilized by MSPAC, this produces only a 66.5% success rate in reaching the patient within 20 minutes. **Exhibit 7** provides the response times for MSPAC from 2009-2010. Although the study would suggest that this measurement is unrealistic, it could also be possible the current deployment of helicopter bases does not achieve optimal results. Perhaps more bases or strategic deployment would enable better coverage and response.

Exhibit 7
MSPAC Response Time
Calendar 2009-2010

Response Time	% of Mission Volume
<0:15:00	33.1%
0:15:00-0:19:59	33.4%
0:20:00-0:24:59	22.1%
0:25:00-0:29.59	8.4%
> 0:30:00	3.1%
Success Rate	**66.5%**

MSPAC: Maryland State Police Aviation Command

Source: Maryland State Police Aviation Command

Helicopter Availability and Coverage Overlap

Mission overlap occurs when multiple calls are made to the same helicopter base area, causing the need for another helicopter or mode of transport to respond. According to the study, 669 days were monitored for mission overlap, and 195 of those days had overlap, which is 29.1% of the total monitored time. The study concluded that only 7.4% of total medical missions were meaningfully impacted by mission overlap, causing delay of service as another transport was provided. Considering that there were 5,538 medical missions in 2012, applying the same rate would mean that 410 of those missions would have been meaningfully impacted by mission overlap. In addition, based on data from the study, 66% of missions impacted by mission overlap do not reach a patient within the 25-minute response time; if the 20-minute response time was applied instead, even fewer missions would make it in time. Since rural counties are primary users of Medevac services, a helicopter is more likely to be out for an extended period of time on a call, decreasing helicopter availability. One possibility would be to open another base, as was utilized before the 2008 helicopter crash. Alternatively, the study suggested that mission overlap issues could be addressed by placing helicopters at strategic locations during peak hours based on mission analysis. DLS agrees with this contention and suggests an additional helicopter may be needed to provide that flexibility.

Part 135 Training Restrictions

Based on the recommendation of the 2011 *Base Assessment Study*, MSPAC, in coordination with the Maryland Department of Transportation (MDOT) is in the process of procuring an FTD. The FTD is a training simulator which would allow 75% of pilot training, as well as training for paramedics, to be conducted in the simulator. A full-motion simulator is also under consideration,

which would allow 100% of Part 135 required training to be conducted, saving even more blade time. With either the FTD or full-motion simulator, certain types of training will still be required in the helicopter (*i.e.*, initial pilot training, check rides, hoist missions, and certain mission-specific missions). The study points out that once MSPAC is Part 135 certified, training conducted in the helicopter cannot be halted to take an emergency call, as is currently allowed by MSPAC as a public aircraft. Therefore, when a helicopter is being used for training purposes, it cannot respond to calls until the training is complete. So, despite less training in the helicopter, new restrictions will mean any training conducted in the helicopter will take it out of service. This change may have an impact on the ability to handle missions, especially considering MSPAC may have to conduct initial and recurrent training for 70 pilots instead of 50 if 2 pilots are required to fly.

Back-up Assumptions

The study argues that the use of a flight simulator for training reduces the number of helicopters needed. The assumption is that each base will always have a primary aircraft and back-up aircraft. In the private sector, the number of air worthy alternative helicopters necessary to cover maintenance and training is usually one helicopter for every six or seven primary aircraft (which is a 15% back-up factor). Currently, MSPAC is operating with a 33% back-up factor, or four back-up helicopters. The study says four back ups are needed with the current fleet due to age and because all training is currently being conducted in the helicopter. With a flight simulator to save blade time, the study assumes that only three helicopters would be needed as back-up. However, the private market can only be offered in comparison because most private helicopters do not provide the wide variety of services that MSPAC helicopters offer. MSPAC provides scene Medevac, interfacility transport, medical outreach, law enforcement missions, search, rescue, firefighting, Department of Natural Resources missions, aerial surveillance, homeland security checks, and disaster assessment. MSPAC helicopters undergo different environments and scenarios frequently, and the demand is coming from multiple missions. **Exhibit 8** provides a categorical breakdown of total MSPAC missions from fiscal 2008 through 2012.

Exhibit 8
Categorical Breakdown of Total Helicopter Missions
Fiscal 2008-2012

	2008	2009	2010	2011	2012
Total Missions	6,326	4,312	4,706	5,712	6,519
Medical Missions	5,347	3,774	4,223	5,059	5,538
Law Enforcement	715	461	445	617	896
Homeland Security	264	77	27	35	66
Disaster Assessment	0	0	11	11	19

Source: Maryland State Police Aviation Command

The exhibit demonstrates an increase in law enforcement and disaster assessment missions. It is possible these types of missions will continue to increase given the advantages of the AW-139, which will make more law enforcement missions possible. Homeland security missions decreased in 2008 when MSPAC started conducting incidental critical infrastructure checks, which usually involves flying over a high-target area on a return flight from a medical mission. Taking into account the varying demands for helicopters, it may be more prudent to purchase four back-up helicopters instead of three.

Maintenance Reduction

Another critical argument of the study was the reduction in maintenance with the new fleet versus the current fleet. The new AW139s will benefit from the decentralized maintenance concept implemented by MSPAC in 2011, which produced a 16% reduction in flight time. Previously, most maintenance was conducted centrally at Martin State Airport, which required helicopters to be flown for maintenance. In addition, wear and tear of the new fleet should be reduced due to training being conducted in a flight simulator. A FTD would save 600-650 flight hours each year, while a full motion simulator would save approximately 850 flight hours. Ten helicopters would have a useful life of approximately 24 years while 11 helicopters would have a useful life of 27 years with an FTD to reduce blade-time for training. With a full-motion simulator, 10 helicopters would have a useful life of 27 years, while 11 helicopters would have a useful life of 29 years. **Exhibit 9** illustrates these scenarios. Considering the current Dauphin fleet will be approximately 27 years old by the time it is replaced, this may be a good life span goal for the new fleet. Obviously, the new fleet will have greater capability than the current fleet, so some of the maintenance advantages could actually be offset due to greater usage of the fleet.

Exhibit 9
Anticipated Life-span of the AW139 Fleet

	10 Helicopters	11 Helicopters
Annual Flight Hours per Helicopter	340	309
Annual Flight Hours per Helicopter with FTD*	280	255
Annual Flight Hours per Helicopter with Full Motion Simulator**	255	232
Revised Life Span with FTD (years)	24.3	26.7
Revised Life Span with Full Motion Simulator (years)	26.7	29.3

AW: AugustaWestland
FTD: Flight Training Device

Note: Average annual flight hours are assumed at 3,400 for the entire fleet. Life span of one helicopter is assumed 6,800 flight hours, approximately 20 years.

*If training is conducted in an FTD, then 600 flight hours for the entire fleet are reduced.
**If training is conducted in a full motion simulator, then 850 flight hours for the entire fleet are reduced.

Source: Maryland State Police Aviation Command

Over time, the new helicopters will increasingly be out of service due to required, complex inspections that will limit Medevac availability, as is the case with the current fleet. Eventually, the fleet will age and, considering that six helicopters have been delivered simultaneously, more than half of the fleet may approach the major overhauls required by the FAA at 3,500 and 5,000 hours at roughly the same time. If you compare these overhauls to the 5,000 hour overhaul that the Dauphin fleet undergoes, a helicopter may be down for 8-10 months during this time. Therefore, having additional back-up helicopters may be necessary to continue operations during these periods of extensive downtime.

An Eleventh Helicopter Should Be Purchased

The study recommended seven bases and 10 helicopters, with Trooper 1 located at Aberdeen Proving Grounds. This option was considered superior based upon higher call density coverage, response times, and single geographic coverage, while population coverage and overlap decreased only slightly.

DLS recommends that 11 helicopters be purchased, leaving the number of bases to the discretion of MSPAC based on mission trends. DLS makes this recommendation for the following reasons:

- missions are growing at a faster pace than originally predicted by the 2011 *Base Assessment Study*, which will put more pressure on the new fleet than anticipated;

- population is anticipated to grow in areas that already experience the most Medevac calls over the next 20 years;

- the current 7-base deployment strategy leaves gaps in geographic coverage and is not based on achieving the Golden Hour response time to a patient throughout the State;

- the current 7-base deployment strategy experiences coverage overlap issues, which can impact the delivery of hundreds of patients to a trauma center;

- Part 135 certification will require helicopters be taken out of service to conduct training, which is currently not required;

- the recommendation of 3 back-up helicopters does not seem to consider the diversity of MSPAC missions and increasing demands to conduct law enforcement and disaster assessment missions; and

- considering the current fleet will not be replaced until it is approximately 27 years old, the State should strive to extend the life of the new fleet to approximately that time frame.

An eleventh helicopter would relive workload stress, provide flexibility to ensure the best possible patient care, and extend the life of the fleet.

The study also concluded that seven bases and 10 helicopters with a "plus-one" helicopter option had increased benefits, but was cost-prohibitive. The study found that operating a "plus-one" helicopter would allow additional flexibility to stand-up a helicopter at different locations during peak hours to provide EMS services where it is most needed, but operate an additional helicopter 12 hours a day for 4 days a week would cost $1.4 million annually. DLS disagrees with the cost estimate provided by the study based on revised costs provided by MSPAC. DLS also believes that 11 helicopters would be needed to produce the benefits described by the study, which suggested operating the "plus-one" helicopter with only 10 helicopters.

According to MSPAC, direct costs to operate a helicopter are $2,108 per flight hour. The average total annual flight hours from 2010 through 2012 for MSPAC is approximately 3,400 hours, or 340 hours per helicopter; 11 helicopters would be 309 hours per helicopter. Under these assumptions, operating an additional helicopter would have a direct cost of $650,000 each year. The study produced a very inflated cost assumption of $13,771 per flight hour for helicopter operation. This cost was intended to include 2 pilots, 2 medics, and the cost of personnel, facilities, maintenance, and equipment. In addition, the study assumed that 41 additional pilots would be needed to provide 24/7 coverage with 2 pilots, but MSPAC has stated that only 20 additional pilots will be necessary. Therefore, the high costs identified by the study may have been overstated. With the revised costs, the benefits may now outweigh the costs for an additional helicopter.

With the current 11 Dauphins, MSPAC is able to move a helicopter to strategic locations for critical events or peak hours. For instance, MSPAC was able to stand up an eighth helicopter to assist during Hurricane Irene; an eighth helicopter was also put in service for the tenth anniversary of 9/11 and several Camp David events. In addition, MSPAC moved Trooper 5 out to Garrett County temporarily due to a seasonal influx of visitors to the Deep Creek area. With 11 helicopters, MSPAC is able to make these strategic decisions. It is uncertain whether MSPAC will have this same degree of flexibility with 10 helicopters.

A Decision Is Needed for Fiscal 2014

The Maryland Institute for Emergency Medical Services Systems and MSPAC have accepted the 2011 *Base Assessment Study's* findings with the proviso that a recommendation on whether an eleventh helicopter is warranted should be made following the integration of the new helicopters into MSPAC. Unfortunately, due to the delay in delivery, integration of the fleet has been pushed back several times. Putting off the decision would mean increased costs as the purchase is subject to inflation (the cost for one helicopter has already increased from $12.1 million in the initial order to $12.6 million for the final helicopter purchase). Waiting also increases the risk of integrating different versions of the helicopter in the future, as is currently the case for the DSP Dauphin fleet. As a result of the mixed fleet, there is a lack of standardization which requires more complex training for pilots and mechanics who must understand the slight differences between each helicopter – potentially in an emergency situation. It is for these reasons that DLS recommends a decision be made in regards to the new fleet in the 2013 capital budget bill.

Cost of Purchasing an Eleventh Helicopter

Exhibit 10 compares the costs associated with buying 10 versus 11 helicopters. If all other factors are unchanged, the purchase of 1 additional helicopter requires an additional $7.5 million in fiscal 2014 and $5.0 million in fiscal 2015, or $12.6 million total to purchase the eleventh helicopter simultaneously with the tenth helicopter. This would increase the fiscal 2014 authorization from $7.1 million to $14.6 million and the fiscal 2015 pre-authorization from $12.9 million to $18.0 million. The total cost of the fleet would increase from $133.9 million to $146.5 million.

Exhibit 10
Cash Flow for 10 Helicopters vs. 11 Helicopters
Fiscal 2014-2015

	10 Helicopters	11 Helicopters	Difference
Fiscal 2014	$7,057,000	$14,600,000	$7,543,000
Fiscal 2015	12,900,000	17,950,000	5,050,000
Total Fiscal 2014-2015	19,957,000	32,550,000	12,593,000
Total Costs	**$133,900,000**	**$146,493,000**	**$12,593,000**

Source: Maryland Consolidated Capital Bond Loan of 2013; Maryland Department of Transportation

MSPAC may only need 10 helicopters to provide the high level of Medevac and law enforcement services expected of the agency in the short term, but purchasing the fleet is a 20- to 30-year decision. Anticipating the variables that will impact the demand for EMS services is crucial in this decision. The 2011 *Base Assessment Study* attempts to take these variables into consideration, but now, with additional knowledge and experience, some of those assumptions may no longer be valid. **For the reasons stated in this analysis, DLS recommends that the legislature authorize the purchase of an eleventh helicopter.**

Summary of Other Projects in the Capital Improvement Program

Projects Deferred in Fiscal 2014

Aircrew Training Facility

The 2012 session CIP programmed $350,000 in fiscal 2014 and $4.2 million in fiscal 2015 for the aircrew training facility in Carroll County. The project would construct an aircrew training facility to house a helicopter FTD in order to conduct initial and recurrent aircrew training and related

functions on the new AW helicopters. The facility would allow consolidation of pilot and paramedic training into one central location and provide classroom and dormitory spaces. Currently, training is conducted in the helicopters at MSPAC Headquarters at Martin State Airport in Middle River; the FTD should reduce time spent in the helicopter for training, resulting in less wear-and-tear.

Funding for the design of the aircrew training facility has been deferred to fiscal 2015 to accommodate the evaluation of suitable locations for the facility, as described in **Exhibit 11**. This deferral will most likely cause a change in the schedule for the FTD as well. Currently, the FTD is scheduled to be in use starting in fiscal 2015. Since the aircrew training will house the FTD, logically the facility would need to be built first. To address this scheduling conflict, either the facility would need to be accelerated or the FTD would have to be deferred, which would mean training would continue to be conducted in the helicopters.

Exhibit 11
Projects Deferred
Fiscal 2014

Project	Description	Reason for Deferral
Aircrew Training Facility	Construct an aircrew training facility to house a helicopter flight training device in order to conduct initial and recurrent training for the Augusta Westland helicopters.	Funding has been deferred to accommodate the agency's evaluation of suitable locations for the facility.

Source: Department of Budget and Management, Fiscal 2014 *Capital Improvement Program*

Though the facility was planned for Carroll County, there is ongoing discussion regarding the most suitable location. According to MSPAC, Sykesville and Frederick were considered the top two location choices. The Public Safety Education and Training Center in Sykesville has ample classroom, office, and dormitory space for public safety training as well as a state-of-the-art driving training facility and is the centralized training center for public safety. The intent was to build the aircrew training facility to house the FTD as well as hangar space for a helicopter to be available for training purposes at Sykesville. However, the site at Sykesville would be near wetlands, so an environmental impact study would add costs. In addition, because the training center is located in a residential area, a community outreach campaign would be necessary to try to allay local concerns that adding helicopter training would increase noise interference impacting the surrounding neighborhood. It is believed that the outreach campaign would be cost-prohibitive and have little chance of success.

Frederick Airport was a competing location for the aircrew training facility and FTD. Since the FTD would be located at an airport with this option, this would eliminate the need for an environmental impact study, outreach to the community, and additional hangar space construction.

At the time this analysis was written, it was possible that this location may no longer be available due to private interest in the land.

Training is currently conducted in the helicopter at Martin State Airport in Middle River. This location has been left out of the discussion for the aircrew training facility and the FTD due to the risk of water damage. Martin State Airport is located very close to a waterway and the area is subject to flooding during storms. There was fear that the FTD could be damaged; building the FTD off the ground to avoid water damage has also been considered cost prohibitive. In addition, the 2011 *Base Assessment Study* recommended that Trooper 1, stationed at Martin State Airport, be relocated to Aberdeen Proving Grounds, which was deemed a better location based on mission data and response times; it was not logical to build the FTD at a base soon to be relocated. Despite the recommendation from the study, at this time moving the base has been determined cost-prohibitive and MSPAC is in negotiations to re-sign a long-term lease at Martin State Airport. Therefore, recent discussion suggests it may be possible to place the FTD at Martin State Airport. If the FTD is built at Martin State Airport, construction could be done without the aircrew training facility while keeping the device above the ground floor. There will be costs to build the FTD above ground, but these costs are expected to be far less than the current cost to build the aircrew training facility. Not to mention, this would keep the FTD at MSPAC Headquarters, which may be the most logical location.

The request for information (RFI) for the project went out in 2012 and has been received by MDOT, the agency running the procurement. The RFI contained an "alternate proposal" option to allow proposals besides building an FTD, such as sharing a full-motion simulator with other states. The request for proposal (RFP) should go out in May 2013 and is due back within 90 days, around August 2013. MDOT anticipates signing a contract by October for a flight simulator. **DLS recommends restricting $200,000 of GO bond funds for the State Helicopter Replacement project until a report of the cost estimates for the FTD proposals to be reviewed in May 2013 are submitted to the budget committees.**

Pre-authorizations and De-authorizations

The fiscal 2014 recommendation includes a pre-authorization of $12.9 million in fiscal 2015 for the State Police Helicopter Replacement, as shown in **Exhibit 12**. The pre-authorization in fiscal 2014 would complete the procurement costs of the last helicopter and purchase the FTD.

Exhibit 12
Pre-authorizations and De-authorizations

Pre-authorizations				
Project	**FY 15**	**FY 16**	**FY 17**	**Reason**
State Police Helicopter Replacement	$12.9	$0.0	$0.0	To continue the purchase of helicopters as initially authorized by the MCCBL of 2009.

MCCBL: Maryland Consolidated Capital Bond Loan

Source: Department of Budget and Management, Fiscal 2014 *Capital Improvement Program*

GO Bond Recommended Actions

1. Increase general obligation (GO) bond funds to allow for the purchase of an eleventh helicopter and restrict $200,000 in GO bond funds until a cost benefit analysis of flight simulator training proposals is submitted.

WA01A	Helicopter Replacement	$ 14,600,000

Add the following language:

Helicopter Replacement. Provide funds to acquire new helicopters to upgrade the quality of the State helicopter fleet, provided that $200,000 of general obligation bond funds may not be expended until the Maryland Department of Transportation, in conjunction with the Maryland State Police Aviation Command, has provided the budget committees with a complete cost benefit analysis of the proposals submitted for providing flight simulator training. The report shall be submitted by October 1, 2013, and the budget committees shall have 45 days to review and comment following receipt of the report.

Allowance	**Change**	**Authorization**
7,057,000	7,543,000	14,600,000

Explanation: This action specifies that general obligation bond funds may be used in fiscal 2014 for the purchase of an eleventh helicopter, and that $200,000 of GO bonds may not be expended until a cost benefit analysis of flight simulator training proposals is submitted.

Information Request	**Authors**	**Due Date**
Cost benefit analysis of flight simulator proposals	Maryland Department of Transportation Maryland State Police Aviation Command	October 1, 2013

2. Approve $1,612,000 general obligation bond authorization for the State Police Headquarters Building K (old crime lab) project that will allow for heating, ventilation, and air conditioning improvements and building reconfiguration.

3. Approve $1,174,000 general obligation bond authorization for the State Police Tactical Services Facility project that will allow for the construction of a garage to store specialized vehicles and equipment.

4. ZF5400 Section 12 – Department of State Police Helicopter Replacement.... $ 0

Amend the following language:

WA01 Department of the State Police
(Statewide)

(A) Helicopter Replacement: Provide funds to acquire new helicopters to upgrade the quality of the State helicopter fleet ..... ~~12,900,000~~ 17,950,000

Explanation: This action specifies that general obligation bond funds may be used for the purchase of an eleventh helicopter.