

FB04
Department of Information Technology – Capital

Capital Budget Summary

State-owned Capital Improvement Program
(\$ in Millions)

Projects	Prior Auth.	2020 Request	2021 Est.	2022 Est.	2023 Est.	2024 Est.	Beyond CIP
Public Safety Communication System	\$318.407	\$30.840	\$8.600	\$5.000	\$5.000	\$6.000	\$0.000
Total	\$318.407	\$30.840	\$8.600	\$5.000	\$5.000	\$6.000	\$0.000

Fund Source	Prior Auth.	2020 Request	2021 Est.	2022 Est.	2023 Est.	2024 Est.	Beyond CIP
GO Bonds	\$198.110	\$30.840	\$8.000	\$4.000	\$4.000	\$5.000	\$0.000
PAYGO GF	24.400	0.000	0.000	0.000	0.000	0.000	0.000
PAYGO FF	0.400	0.000	0.000	0.000	0.000	0.000	0.000
Other ¹	92.497	0.000	0.600	1.000	1.000	1.000	0.000
Total	\$318.407	\$30.840	\$8.600	\$5.000	\$5.000	\$6.000	\$0.000

CIP: *Capital Improvement Program*

FF: federal funds

GF: general funds

GO: general obligation

PAYGO: pay-as-you-go

¹ State Highway Administration projects included in prior years. Source of out-year funds is unknown.

Key Observations

- Fiscal 2020 authorizations include \$21.7 million in general obligation bonds to complete construction of the Public Safety Communication System in Southern Maryland and the nation’s capital area.
- Prior construction supported upgrading T1 telecommunications technology to Ethernet networking technology. The capital budget bill authorizes \$8.1 million in fiscal 2020 and \$8 million in fiscal 2021.
- As the system has become operational, deficiencies and gaps have been detected. The *Capital Improvement Program* (CIP) adds \$16.6 million from fiscal 2021 to 2024 for site improvements to address this.

Summary of Recommended Bond Actions

1. Public Safety Communication System
Approve.
2. SECTION 12 – Department of Information Technology – Public Safety Communication System
Approve preauthorization of \$8.0 million in general obligation bonds for fiscal 2021.

Budget Overview

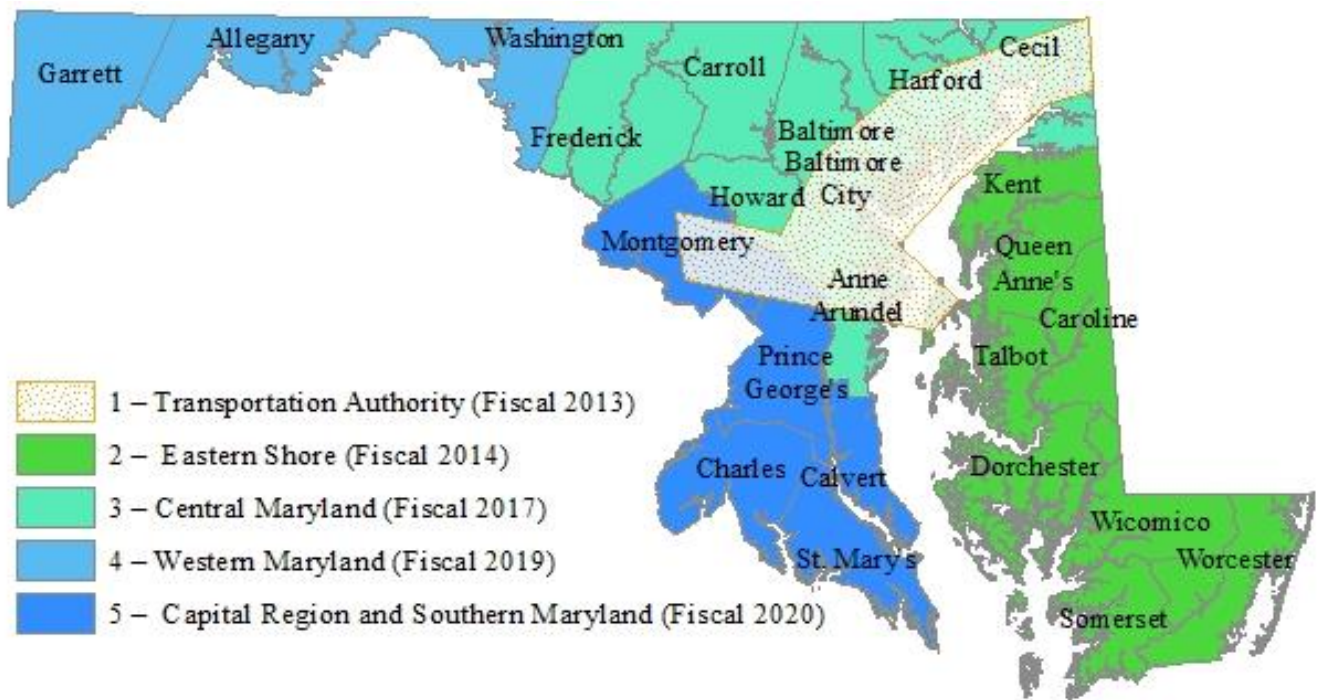
The Department of Information Technology (DoIT) fiscal 2020 capital budget includes only one project, the Public Safety Communication System project. This provides an integrated statewide public safety wireless communication system and a primary radio communication system for public safety first responders throughout the State. The system uses the Public Safety 700 megahertz (MHz) spectrum licensed to the State by the Federal Communications Commission. The program is also referred to as Maryland First Responders Interoperable Radio System Team (FiRST).

The State has a contract with Motorola to build and renovate infrastructure for this project. Once completed, this radio system will be the primary operating radio system for all State agencies, providing a communications platform for State agencies and allowing for seamless interoperability among State users and first responders at all levels of government. Interoperable communications is the ability for first responders to transmit voice and data communications in real time, regardless of agency or jurisdictional boundary.

Exhibit 1 shows the construction schedule by regions. The regions are:

- region 1 is the Maryland Transportation Authority and Baltimore City that became operational in fiscal 2013;
- region 2 is the Eastern Shore that was deployed in fiscal 2013 and 2014;
- region 3 is Central Maryland in which Baltimore, Cecil, Carroll, Frederick, and Harford counties became operational in fiscal 2016, while Anne Arundel and Howard counties became operational in fiscal 2017;
- region 4 is Western Maryland in which Washington County became operational in December 2017, Allegany County in July 2018, and Garrett County in December 2018; and
- region 5 is the nation’s capital area and Southern Maryland, which is expected to be deployed between September 2019 and September 2020.

Exhibit 1
Schedule for Implementing Maryland FiRST
Fiscal Years Regions Become Operational



FiRST: First Responders Interoperable Radio System Team

Source: Department of Information Technology, January 2019

2019 CIP Increases Proposed Authorizations

In the 2018 CIP, the Administration included final construction funding required for region 5. At the time, it was clear that additional costs would be required, but these costs had not yet been estimated or recognized by the Administration in the 2018 CIP. **Exhibit 2** shows that \$33.7 million has been added to the 2019 CIP for this project.

Exhibit 2
Public Safety Communication System Capital Costs
Added to the *Capital Improvement Program*
Fiscal 2020-2024
(\$ in Thousands)

	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Total</u>
2018 CIP	\$21,740	\$0	\$0	\$0	\$0	\$21,740
2019 CIP ¹	30,840	8,600	5,000	5,000	6,000	55,440
Difference	\$9,100	\$8,600	\$5,000	\$5,000	\$6,000	\$33,700

CIP: *Capital Improvement Program*

¹ Fiscal 2021 includes a preauthorization of \$8 million.

Source: 2019 *Capital Improvement Program*

The \$21.7 million in the 2018 CIP supports the completion of region 5. Due to cost containment, funding for the system has repeatedly been delayed. For example, the 2015 CIP proposed completing the project in fiscal 2018. This CIP does not delay the project and fully funds region 5.

Exhibit 3 shows that the funds have been added to support:

- coverage and site improvements;
- upgrading to Ethernet technology; and
- replacing a tower in Dorchester County.

Exhibit 3
Improvements to the Public Safety Communication System
Fiscal 2020-2024
(\$ in Thousands)

	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Total</u>
Additional Towers and Backhaul Hardening	\$0	\$600	\$5,000	\$5,000	\$6,000	\$16,600
Ethernet Conversion	8,100	8,000	0	0	0	16,100
Dorchester County Tower	1,000	0	0	0	0	1,000
Total	\$9,100	\$8,600	\$5,000	\$5,000	\$6,000	\$33,700

Source: Department of Information Technology; Department of Budget and Management

Out-year Authorizations for Coverage and Site Improvements

The system’s infrastructure consists of a backbone of approximately 170 transmitter sites that include towers, shelters, radio equipment, and data communications equipment. The system provides on-street and in-building coverage for many small or moderately sized buildings. Now that the system is operational, DoIT is able to gather system coverage data. The department has found some deficiencies that are addressed in the CIP.

DoIT also advises that additional towers are needed in some areas that have coverage gaps. The authorization includes \$13 million to support nine notional sites. DoIT refers to the sites as notional because costs to develop the site can vary substantially depending on geography and available assets. These costs include the costs to build the tower and shelter, purchasing and installing equipment, and backhaul. DoIT makes every attempt to build towers on State-owned properties to minimize the cost of purchasing or leasing property.

Another area to address is stabilizing system backhaul. The 700 MHz system uses towers to transmit data over large distances. Users are given radios to transmit voice and data information. Backhaul connects the end user to the tower with fiber optic cables and microwave. The Maryland FiRST system uses microwave and fiber as backhaul. Microwave technology is line of sight, which can be interrupted. After a system begins operations, inefficiencies are often discovered, such as bottlenecks, sites without redundant paths, and sites requiring additional capacity. The CIP includes \$3 million from fiscal 2022 to 2024 to improve backhaul.

Fiscal 2020 and 2021 Authorizations to Convert to Ethernet

The additional cost to convert backhaul from T1 to Ethernet is \$16.1 million, \$8.1 million in fiscal 2020 and \$8 million preauthorized in fiscal 2021. Ethernet conversion is needed because the contractor, Motorola, will no longer support T1 technology after calendar 2019. If the system is not upgraded, it will be unable to receive new software releases and upgrades, such as security patches and bug fixes. As equipment malfunctions and ages, replacement equipment may not be available.

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The first four regions were designed to use T1 technology, which has a long range and can transit both voice and data information. Ethernet technology has a shorter range and can only transmit data. Since voice can be transformed into data and backhaul distances are short, Ethernet can support all that T1 supports. The speed of Ethernet, which is over 100 megabits per second, is a significant advantage over T1, which transmits 1.5 megabits per second. Ethernet will also allow the system to carry much more data. DoIT advises that Ethernet is now the preferred method for radio backhaul.

Fiscal 2020 Tower Replacement in Dorchester County

When building the system, the State was required to construct a substantial number of new towers. To keep costs down, it is common for communications systems to share resources by leasing space and installing equipment on existing towers. This could include leasing the land or leasing space on an existing tower. The lease arrangement can end, which requires the State to make other arrangements.

This has happened in Dorchester County. The county will sell the land on which a tower is located, so the State will acquire a new transmitter in the Cambridge area. The capital budget includes \$1 million to support a new antenna and supporting structures, such as equipment sheds and equipment. The objective is to build the structure on State or county land, so no land will need to be purchased. The county will be joining the system as a primary user, so it is in their interest to have coverage in Cambridge.

Operating Budget Impact Statement

Executive’s Operating Budget Impact Statement – State-owned Projects

Fiscal 2020-2024

(\$ in Millions)

	2020	2021	2022	2023	2024
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Public Safety Communication System					
Estimated Operating Cost	\$0.000	\$2.833	\$1.512	\$0.930	\$0.434
Estimated Equipment Replacement	0.000	2.000	2.000	2.000	3.000
Estimated Staffing	0.000	0.000	0.000	0.000	0.000

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The fiscal 2020 allowance includes \$10.7 million in operating costs for the Maryland FiRST radio program. The budget also includes 6 regular positions to operate the program. Costs shown in the table are incremental increases in addition to fiscal 2020 budgeted expenses. Cost increases are primarily attributable to inflation, expiring warranties,¹ and anticipated equipment replacement.² No additional staffing is anticipated.

Preauthorizations and Deauthorizations

Exhibit 4 shows that \$8 million is provided in fiscal 2021. Preauthorizations allow the project to move forward and the Board of Public Works to approve construction if the entire authorization is not provided in the budget year. In this case, the funds support additional costs associated with upgrading the T1 connectivity currently in place at many region 1 to 4 sites with newer Ethernet technology.

Exhibit 4
Preauthorizations
Fiscal 2021-2024
(\$ in Millions)

<u>Project</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Reason</u>
Public Safety Communication System	\$8.0	\$0	\$0	\$0	Funds are needed to complete Ethernet conversion that will be under contract before the funds are authorized in fiscal 2021.

Source: Department of Budget and Management, 2019 *Capital Improvement Program*

¹ There is a two-year warranty on the equipment. After two years, the State purchases service contracts, resulting in cost increases two years after the beginning of operations in an area.

² The notional lifecycle replacement schedule for digital subscriber unit radios is 5 to 7 years. However, due to the high cost of each unit, it is recommended that a 7- to 10-year replacement cycle be followed. The estimate begins to replace equipment in fiscal 2021.

GO Bond Recommended Actions

1. Approve \$30,840,000 in general obligation bonds to continue construction of the statewide Public Safety Communication System. The authorization supports completion of region 5, upgrading to Ethernet technology, and replacing a tower in Dorchester County.
2. Approve \$8,000,000 in general obligation bonds for fiscal 2021 to continue construction of the statewide Public Safety Communication System. These funds continue the conversion to Ethernet technology.