Transportation Infrastructure Program Annual Capital Plan Report

FFY2023 - FFY2027



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Chief Engineer's Office

Introduction

The mission of the Connecticut Department of Transportation (Department) is to provide a safe and efficient intermodal transportation network that improves the quality of life and promotes economic vitality for the State and the region. In order to achieve this mission, the Department annually prepares a Capital Plan to inform stakeholders about the past year's accomplishments and plans for the upcoming year. Each year, the Department develops a plan to design road, bridge, public transportation and other transportation facilities, to acquire the necessary property interests, and to construct those projects in a way that uses or leverages all the available State and Federal funding.

This report is an update of the Capital Plan that was published in 2022 and includes updates on the Department's implementation of funding, policies, and programs from the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL). The Capital Plan is developed with feedback from stakeholders, including Connecticut's Councils of Governments (COGs).

The data presented in this report is based on the Federal Fiscal Year (FFY - October 1 to September 30) rather than the calendar year or the State Fiscal Year (SFY – July 1 to June 30) because of the major role of federal funds in the overall Capital Program.

Capital Plan Funding

In FY22, the Department programmed approximately \$2.1 billion for all transportation modes – road and bridge, railroad and bus and other public transit – in the Capital Program.

The Department anticipates utilizing approximately \$2.2 billion in total Capital Program funding for all transportation modes in FY23. The 2023 Capital Program includes approximately \$850 million for bus and rail, \$1.3 billion toward the State's highway and bridge infrastructure, and \$50 million in support of the Facilities Program.

Funding is being provided for rail and bus initiatives, such as TIME For CT, the plan to increase train speeds and improve travel times on the passenger rail system; the Stamford Transportation Center; purchasing new rail cars to operate throughout the State; transitioning the transit fleet from diesel-hybrid buses to battery-electric buses; and, deploying new bus stops and a state-wide real-time bus information system.

Overview of Federal Legislation and Funding

Congress passed the Infrastructure Investment and Jobs Act (IIJA) in November 2021, which funds the transportation program for five years (FFY22-26) subject to annual appropriations. The IIJA provides Connecticut with approximately \$5.38 billion in federal transportation funding over the

five years, which is an increase of \$1.6 billion over the levels authorized in the previous federal legislation, the FAST Act. The FFY22 combined Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) program increased approximately 38% over FFY21 levels, and the funding level at the end of the five years (FFY26) is projected to be an increase of approximately 49% over the FFY21 levels. Despite this increase in federal funding, high levels of inflation, labor shortages, and supply chain disruptions are resulting in significant cost increases to perform the same level of work.

The IIJA maintains the FAST Act highway program while providing a focus on safety, bridges, climate change, resiliency, and project delivery. The IIJA also creates more than a dozen new highway programs, including reducing carbon emissions, increasing resiliency, reconnecting communities, and rehabilitating bridges in critical need of repair. For FTA, the IIJA provides new and increased funding for State of Good Repair and Low or No Emission Grants, while continuing the existing structure for FTA programs with significant funding increases. FTA has established four priorities for implementation of the IIJA: Safety, Modernization, Climate, and Equity.

Project Acceleration

This increased federal investment, along with the ongoing robust state-funded program, enables the state to continue to repair and rebuild our roads and bridges; invest in major projects with safety, equity, resiliency, and operational improvements as an emphasis; bring Connecticut's rail assets into a State of Good Repair (SOGR); and, improve speeds on the rail lines. Combined, these investments will help move Connecticut forward in reducing transportation emissions and accelerating investments in a cleaner more equitable and resilient transportation system.

The Department continues to expedite active projects and to initiate new projects in order to obligate the increased available funding. Among the projects being accelerated, that have a total construction value of approximately \$1.37 billion, are the following:

- 58-340: Pavement Rehabilitation and Safety Improvements on I-95 Northbound in Groton, Stonington, and North Stonington,
- 63-726: Rehabilitation of Bridge No. 01469B (Dutch Point Viaduct) carrying I-91 over Connecticut Southern Railroad, SR 598 WB, & TR 803 in Hartford,
- 79-240: I-91/I-691/Route 15 Interchange Improvements to I-91 SB, I-691 EB, & Route 15 SB in Meriden,
- 79-246: I-91/I-691/Route 15 Interchange Improvements to I-91 NB, I-691 WB, & Route 15 NB in Meriden,
- 82-316: Reconfiguration of Route 17 On-Ramp onto Route 9 North in Middletown,
- 135-346: I-95 Resurfacing and Safety Improvements in Stamford,

- 156-181: I-95 Safety and Operational Improvements and Replacement of Bridge Nos. 00161 (over First Avenue) and 00162 (over Metro North Railroad) in West Haven,
- 170-3551 & 170-3557: Pin and Hanger Program to address NBI Bridges Statewide,
- 171-492: Replacement / Rehabilitation of Ten Bridges along the Route 9 and Route 72 Corridors in Berlin, New Britain, and Plainville, and
- 300-214: Track Improvement Mobility Enhancement 1 (TIME-1), New Haven Line between Bridgeport and Stratford

The rail and transit program has accelerated design efforts to position the program to account for the increase in federal funds through the existing FTA program structure as well as the significant increase in Federal Railroad Administration competitive funding opportunities. The Department is also taking steps to expand our internal and external project delivery capabilities to support the expanded transportation program.

New Federal Formula Funding

National Electric Vehicle Infrastructure (NEVI) Formula Program

The NEVI Program provides funding to states to strategically deploy electric vehicle (EV) charging stations and to establish an interconnected network to facilitate data collection, access, and reliability. EV charging stations built using this funding source must be non-proprietary, allow for open-access payment methods, be publicly available and, in the first phase, be located along designated FHWA Alternative Fuel Corridors (AFCs). To receive this funding, the Department has submitted a plan to the U.S. Joint Office of Energy and Transportation detailing how the state intends to expand the EV fast charging network. Connecticut's plan was approved by FHWA on September 14, 2022. For the first phase of funding, CTDOT will oversee a competitive grant for the installation of EV fast chargers in 10 priority zones to meet the NEVI program requirements and complete the build out of fast charging along CT's Alternative Fuel Corridors. FHWA requires planning to begin in 2023 for the use of FY2024 program funds under Phase 2 of the NEVI program.

In the NEVI program, Connecticut received \$7.7 million in FY22 and \$11.2 million for FY23. We expect to receive about \$52.5 million total over five years through the NEVI Program.

Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Program

The PROTECT Program provides formula funding to states and \$1.4 billion in competitive grants to increase the resilience of our transportation system. This includes funding for evacuation routes, coastal resilience, making existing infrastructure more resilient, or efforts to move infrastructure to nearby locations not continuously impacted by extreme weather and natural disasters. Guidance from USDOT for the PROTECT program was released in late July 2022. The Department is

working to identify projects that may be eligible for these funds. The Department is considering culvert replacements, generator replacements, a vulnerability assessment, and other projects. The program will fund the development of a Resilience Improvement Plan that will allow the State to use a greater Federal cost share for projects outlined within the plan, saving matching funds on both formula and grant funded projects. The Department will undertake a vulnerability assessment as a part of resilience planning that will contribute to the development of a resilience project pipeline for funding under PROTECT and other programs.

Connecticut expects to receive \$90 million over the five-year program, including \$17.3 million for FY22 and \$17.6 million for FY23.

Bridge Replacement, Rehabilitation, Preservation, Protection, and Construction Program (Bridge Formula Program)

The Bridge Formula Program (BFP) provides funding for highway bridge replacement, rehabilitation, preservation, protection, and construction projects on public roads, with a focus on asset management. Through this program, states are encouraged to focus BFP funding on projects that improve the condition of in-service highway bridges classified in poor condition and that preserve or improve the condition of in-service highway bridges classified in fair condition. BFP funding is distributed by a statutory formula based on the relative costs of replacing all highway bridges classified in fair condition in a State, and the relative costs of rehabilitating all highway bridges classified in fair condition in a State. Connecticut has 219 BFP eligible bridges in poor condition, according to the 2022 National Bridge Inventory. The following programs and projects are proposed to be funded through this program:

- Bridge Joint Replacement Program,
- Ultra High Performance Concrete (UHPC) Beam End Repairs on Various Bridges,
- Bridge Deck Preservation of Various Bridges,
- NBI Bridge Coating Program (Painting Bridges),
- Concrete Sealing of Interstate Bridges,
- Major Bridge Rehabilitation Program,
- Project 171-492: Major rehabilitation or replacement of nine bridges carrying Route 9 and Route 72, and
- 16 locally owned off-system bridge rehabilitation or replacement projects.

Connecticut received \$121.2 million in both FY22 and FY23 and expects to receive \$605.8 million over the five-year Bridge Formula Program. In addition to these new funds, as part of the 2022 Appropriations Act, Connecticut received \$40 million through the Highway Infrastructure Program for the Bridge Replacement and Rehabilitation Program.

Carbon Reduction Program

Under the Carbon Reduction Program, states are required to develop Carbon Reduction Strategies by November 2023 in consultation with COGs to identify projects and strategies tailored toward reducing carbon dioxide emissions from on-road sources. Eligible projects include: zero emission vehicles and facilities; energy efficient street lighting and traffic control signals; truck stop and port electrification systems to reduce the environmental impacts of freight movement and carbon dioxide emissions at port facilities; and public transportation projects, such as the construction of bus rapid transit corridors or dedicated bus lanes. The Department is initiating projects that are eligible for these funds while concurrently developing a Carbon Reduction Strategy plan. The development of a Carbon Reduction Strategy is an eligible use of program funds. The Department expects to include within the Carbon Reduction Strategy a feasibility assessment of solar for Department properties. The funding is sub-allocated by urbanized areas, similar to the Transportation Alternatives Program. Projects that fall within each sub-allocation will be submitted by the COGs.

Connecticut received \$15.2 million in FY22, \$15.5 million for FY23, and expects to receive \$79 million over the five-year program.

Federal Discretionary Funding

In addition to the formula funds, the IIJA makes more than \$100 billion in competitive federal transportation grants available for Connecticut to pursue. The Department has established a dedicated Grants and Socio-Economics unit in the Bureau of Policy & Planning to support this initiative. This new unit will collaborate closely with and support the Government Relations Office as well as key personnel from all Bureaus regarding grant applications. These discretionary grant programs provide even more opportunities for improvements to CT's transportation system. The Department and transportation stakeholders are monitoring the federal Notice of Funding Opportunities (NOFOs) as they are released by U.S. Department of Transportation (USDOT) and actively applying to relevant opportunities.

In 2022, the Department applied for and received funding from the following federal discretionary grant programs:

- \$20 million: New Haven Line Power Program (FRA 2022 State of Good Repair (SOGR) Grant Program)
- \$20.4 million: Modernization of the SEAT Garage in Norwich, CT (FTA Buses & Bus Facilities Grant Program)
- \$1 million: Planning & Environmental Linkages Study for Bridge No. 32 on I-95 in Stamford (FHWA Bridge Investment Program)
- \$29.6 million: Ansonia, Beacon Falls, & Seymour Train Stations (FTA All Stations Accessibility Program)

• \$158.2 million: Gold Star Memorial Bridge Northbound Structure Rehabilitation Project (FHWA - Bridge Investment Program).

Additional grant funds are also available for COGs and municipalities to apply for, including the Safe Streets and Roads for All (SS4A) Grant Program. In 2022, six municipalities received a total of \$2.4 million in funding from the SS4A program to improve safety for all road users.

Department Priorities and Initiatives

Planning and Environmental Linkages Studies

For many of the State's major initiatives, the Department is conducting Planning and Environmental Linkages (PEL) studies. PEL is a process approach that considers environmental, community and economic goals in the very early planning phase of a transportation program. It is generally conducted before any project construction phasing is identified and before specific problems and solutions are known. The PEL process is used nationally as a tool for pre-NEPA (National Environmental Policy Act) activities.

PEL studies are intended to recommend class(es) of action under NEPA (EA, EIS, etc.) and prioritize or phase identified projects with respect to their importance and anticipated available funding. It is that component, the prioritization and phasing of projects, that is intended to allow the Department to strategically implement targeted investments to improve safety, mobility, and congestion around the State that will serve as a catalyst for future economic growth along our transportation corridors.

The PEL studies currently underway include:

- I-84 / Route 8 Interchange in Waterbury (estimated completion in 2023),
- I-84 in Danbury (estimated completion in 2023),
- Greater Hartford Mobility Study (estimated completion in 2023)
- I-95 from Branford to Rhode Island State Line (estimated completion in 2023),
- I-95 Exits 7-9 including Bridge No. 00032 in Stamford (estimated completion in 2024),
- I-95 from New York State Line to Exit 7 in Greenwich (estimated completion in 2025),
- I-95 Exits 19-27A in Fairfield and Bridgeport (estimated completion in 2025).

Sustainability

The Capital Plan continues to align the Department's goals with the State's sustainability goals, including the goals set forth in Governor Lamont's Executive Orders No. 1 and No. 3, and the most recent Executive Order No. 21-3. The Department is pursuing projects that:

• Reduce greenhouse gas emissions and vehicle miles traveled,

- Improve the health and safety of Connecticut's residents,
- Adapt to changing climate conditions, and
- Protect and improve our natural and community resources.

Investments in public transportation, congestion reduction, safety, complete streets, and active transportation increase the economic and social vibrancy, equity, safety, health, and livability of our communities. Projects that directly reduce our carbon footprint and improve air quality include:

- Solar energy development at our facilities to provide clean electric power and lower utility bills,
- Increasing frequency of existing, and introducing new, public transportation services,
- Continuing investment in multi-use trails to encourage active transportation,
- Investing in roundabouts and road-diets to improve safety for all users, and
- Upgrading the electrical infrastructure at our bus transit garages to accommodate EV charging and beginning to convert the state's transit bus to clean and quiet battery-electric buses (BEBs).

Asset Management

The Department continues to mature in its implementation of Transportation Asset Management (TAM) principles and practices to address the condition and needs of the State's transportation infrastructure. The Department complies with all federal TAM requirements.

The Highway Transportation Asset Management Plan (TAMP) goes beyond the federal mandates and demonstrates the Department's strong commitment toward achieving a SOGR for our transportation system. An asset management strategy for both National Highway System (NHS) bridges and pavements is included in the Highway TAMP in accordance with federal requirements. In addition, the Highway TAMP covers all Department maintained bridges, pavements, traffic signals, signs, sign supports, pavement markings, highway buildings, illumination, retaining walls, drainage culverts, and intelligent transportation systems (Advanced Traffic Management System – ATMS). The Highway TAMP contains information on asset inventory and condition, asset data management, performance objectives, life cycle planning, risk management, financial planning, investment strategies, and process improvements. The Highway TAMP guides the Department to deliver better highway asset performance, while also managing risks.

FTA requirements include development and continued implementation of the Public Transportation Transit TAMP, as well as the Department sponsoring the development of a group TAM Plan for the State's Transit Districts and other small transit providers. Although group plans are not required to have the same level of detail, the group plan was developed in parallel to the

Department's Transit TAMP, including initiatives to facilitate collaboration between the Department and Transit Districts for TAM implementation activities.

The implementation of Asset Management for both highway and transit assets builds on the Department's past management practices. It is intended to provide a more detailed and objective framework that is guiding investment decisions and development of the Capital Program. Both asset management plans and underlying management systems provide an objective, data driven methodology to assess current and future needs required to maintain the State's transportation assets. In 2022, the Department updated both the Highway and Transit TAMPs.

Asset Fact Sheets are developed annually to provide current information on each of the 17 assets covered in the Highway and Transit TAMPs and are available on the Department website. The Asset Fact Sheets provide key information including updated inventory and condition data, and performance projections. The asset management systems utilize condition assessments and deterioration models to predict the effects of age, environmental conditions, and investment upon assets. In so doing, long-term and cost-efficient treatment strategies can be devised to effectively maintain the overall transportation system.

While maintaining our current assets is a priority, the Department is analyzing the state's transportation system to identify strategic investment opportunities to improve safety, reduce congestion, address inequities, enhance our bus and rail systems and service, and provide economic benefits to local regions – and the State as a whole.

Wrong Way Driving

In recent years, the number of wrong way driving occurrences on the State's highways has significantly increased, often with tragic consequences. To address this issue, the Department received \$20 million in state bond funding dedicated to this initiative. The Department has conducted a network screening analysis focused on-ramp locations where on and off-ramps are on the same side of the road, locations where there is a higher risk of experiencing wrong way events. Typical Wrong Way Detection Systems include a 360-degree camera and/or thermal sensors at the ramp intersection to detect vehicles traveling in the wrong direction and wrong-way signs with red LED lights, that are activated and flash when a wrong-way vehicle is detected. Eight Wrong-Way Detection Systems are currently active with nine additional locations coming online in the coming months. Sixteen additional systems will be installed in a construction project during 2023. Over 150 locations are currently being scoped and designed. The Department is also exploring several near-term mitigation strategies to address this critical issue as quickly as possible.

Traffic Signals

Traffic signals are a key asset class in Department's highway transportation network and play a vital role in support of the Department's mission to provide a safe and efficient transportation

network in Connecticut. We operate over 2,500 traffic signals – more than all the other New England state DOTs combined. To improve traffic signal operational efficiency and safety, while reducing delays to motorists, the Department is planning a 10-year program for the systematic upgrade of traffic signal equipment. Targeted investment in our traffic signal system will provide improvements in safety, improved air quality, reduced congestion; and, improve travel efficiency for commuters, transit passengers, and pedestrians across Connecticut. From 2023 – 2026, Department is planning over 1,300 signal upgrades, including: signal modifications for new pedestrian features, upgrades from side street green to concurrent pedestrian crossings, upgrades to vehicle detection, upgrades to detection and controller cabinets, and full traffic signal replacements. These investments will improve the transportation experience for all roadway users at intersections.

Safety

The Department continues to prioritize safety across all transportation modes and throughout all of our programs. The Vision Zero Council, established in 2021 by Public Act 21-28, is an interagency work group tasked with developing statewide policy to eliminate transportation-related fatalities and severe injuries involving pedestrians, bicyclists, transit users, motorists, and passengers. This Council will help to advise the Department, the legislature, and other state agencies, in ways to advance transportation safety in Connecticut.

Safety efforts are also guided by a Strategic Highway Safety Plan (SHSP), which is required by the federal Highway Safety Improvement Program (HSIP). The 5-year plan is developed by safety stakeholders, who collaborate on safety efforts and leverage available resources. The current SHSP was approved in May 2022. Similar safety plans have been prepared and completed for each of the nine COGs in Connecticut. The Department submitted a HSIP implementation plan in June 2022 to the Federal Highway Administration. The plan contains a list of programs and projects to be initiated in Federal Fiscal Year 2023 to reduce fatal and serious injury crashes on Connecticut's public roadways. Overall, it's anticipated that approximately \$38 million of projects will be advanced annually utilizing HSIP funds.

The Department worked with the Connecticut Transportation Safety Research Center at the University of Connecticut (UConn) to develop a state-of-the-art safety management system. The software tool allows network-level screening and diagnosis of CT's roads and safety appurtenances. The tool enhances countermeasure selection and safety effectiveness evaluation for use in project selection and development. As part of the recently passed Federal Infrastructure Investment and Jobs Act, States are required to complete a vulnerable road user safety assessment by November 2023. The software tool is being enhanced to provide this data.

Complete Streets & Active Transportation

Complete Streets is a means to provide safe access for all users (pedestrians, persons using mobility aids, bicyclists, transit users and vehicle operators) by providing a comprehensive, integrated, and connected multi-modal network of transportation options. The Department has implemented a Complete Streets Policy that includes training, design guidance, funding, and data collection. The Department plans to monitor the output through performance measures. Over the last five years an average of 3.75 percent of the annual budget has been used to create and enhance walkways, bikeways, and various associated amenities. The Department awarded 61 projects in SFY22 that included elements for pedestrians or bicyclists, such as sidewalks, ramps, pedestrian signals, pushbuttons, signs, and pedestrian/bicycle trails. The total dollars expended for these items was \$41.1 million in SFY 2022, which is 4.34 percent of the SFY22 total funds awarded for the construction, restoration, rehabilitation, or relocation of roads in the state.

In conjunction with the Department's Maintenance Resurfacing Program, Americans with Disabilities Act (ADA) curb ramps and sidewalks are installed as part of the roadway reconstruction to ensure pedestrian access. Approximately \$3.28 million dollars was spent in SFY2022.

Through the federal Transportation Alternatives (TA) Set-Aside, Connecticut received \$14 million from the IIJA in FY22, up from \$9 million in previous years. The BIL also added a provision to the TA Set-Aside requiring that a competitive process be used for project prioritization and selection. Projects should be in high-need areas, such as low-income, transit-dependent, rural or other areas. The Department is continuing its coordination with the COGs to fully program this increase in funding.

The Community Connectivity Grant Program provides construction funding for local initiatives that will improve safety and accessibility for bicyclists and pedestrians in and around community centers, encouraging more people to use these healthy and environmentally sustainable modes of transportation. The fourth round of funding was awarded in February 2022. Including this fourth round of funding, 104 awards totaling more than \$38 million has been invested in Connecticut's towns and cities under the program during the past four years. In February 2023, the Department announced the next solicitation of grant applications for the program. The Department anticipates awarding grants of \$12 million in FY23 and FY24.

In order to support additional complete streets and other safety efforts, the Department has set aside \$5 million annually to be used for short-term complete streets projects to supplement existing programs. The Department is also updating our Complete Streets Policy to include more definitive requirements for pedestrian, bicycle and transit provisions into the design of Department's projects. This policy update has been initiated and is expected to be ready for approval in the first half of 2023. The Department is updating its Complete Streets Policy and design guidance to ensure that there are consistent and conforming designs across the state.

Financing of the Capital Program

Available Funds

The Capital Program is funded with a mix of state and federal funding. Historically, federal monies accounted for seventy to eighty percent (70-80%) of the Department's Capital Program. However, this has changed in recent years with an influx of state bond funding for programs such as:

- Fix-it-First Road and Fix-it-First Bridge,
- Local Transportation Capital Improvement Program (LOTCIP),
- Transportation Rural Improvement Program, and
- Funds provided through Public Act 15-1, Connecticut's infrastructure improvement program.

These additional state investments have increased the State's participation percentage to approximately fifty to sixty percent (50-60%) of the total Capital Program funding, depending on the year (See Figure A).

Special Transportation Fund

The Special Transportation Fund (STF) is a dedicated fund used for transportation purposes. The primary purpose of the fund is to support the financing of state highway and public transportation improvements, as well as the ongoing operations of the Department and the Department of Motor Vehicles (DMV). Recently, the STF has realized an increase in revenues due to higher than anticipated sales tax interest income and a decrease in expenditures due to temporary federal support for transportation operations and personnel vacancies in the agencies. According to the January 20, 2023, forecast from the Office of Policy and Management (OPM), the STF is projected to end SFY2023 with an operating surplus of \$237.7 million, and the STF fund balance on June 30, 2023, is projected to be \$635 million.

Role of Federal Funds

While state funding has taken on a more prominent role in recent years, federal funds still play a critical role in transportation funding for Connecticut. The Department has four major sources of federal funding, all of which fall under the umbrella of USDOT: the FHWA, the FTA, the Federal Railroad Administration (FRA) and the National Highway Traffic Safety Administration (NHTSA).

The Department prepares a Statewide Transportation Improvement Program (STIP) in collaboration with our stakeholders. The STIP lists all proposed highway and public transit projects to be undertaken utilizing Federal Highway and Federal Transit Administration funding. The STIP is multimodal and includes investments in various modes including transit, highways,

and bicycle facilities. The STIP is the means of implementing the goals and objectives identified in the State long-range and metropolitan transportation plans. Only those projects for which construction and operating funds can reasonably be expected to be available are included.

The Capital Plan assumes a federal funding level of approximately \$1.1 billion. This includes anticipated FHWA, FTA, FRA, and NHTSA funding. Total new formula and discretionary federal funding received for FFY 2022 was \$1.24 billion (\$848m FHWA, \$249m FTA, \$126m FRA and \$14m NHTSA). This also included \$50.0 million of additional funding that was received from FHWA near year-end as part of an annual redistribution of additional funding. The Department's demonstrated ability to immediately utilize the additional federal funds resulted in a successful application to FHWA.

Management of FHWA Funding

The FHWA is the largest federal funding source for the Department's transportation program and is the primary funding source for highways and bridges. With annual funding from FHWA exceeding \$800 million, the strategic management and utilization of FHWA funds is critical to the Department's Capital Program. Federal funds are distributed to the Department through specific federal-aid programs, each of which has defined eligibility criteria. These criteria are primarily based on geographic area, roadway classification, asset condition, and type of improvement.

FHWA regulations require the Department to "obligate" or commit all regular formula funds authorized for use in any given FFY in that specific year. The Department has consistently obligated all its available Federal funding. This makes the Department eligible to ask for more funds prior to the end of the fiscal year. In fact, over the last five years, the Department received and obligated \$279 million in additional Federal funds. These funds came from other states or unused obligations and federal holdbacks.

In FFY 2022, the Department was extremely successful in its request, receiving and obligating \$50 million over and above its original allocation of federal monies. The Department also uses a federal financial tool called Advance Construction (AC), particularly for large multi-year projects, which essentially provides for a phased approach to project funding. This mechanism allows the State to request and receive approval to construct a federal-aid project in advance of the availability of authorized federal funds.

Management of FTA Funding

The FTA is the primary federal funding source for the Department's Public Transportation Infrastructure program. Annual funding from FTA now exceeds \$250 million and has five annual program apportionments. The strategic management and utilization of FTA funds, while paying close attention to funding eligibility requirements, is critical to the Public Transportation Capital Program. FTA requirements and procedures for the management of all FTA grant programs are governed by FTA's Master Agreement. This is the official FTA document containing federal requirements applicable to the FTA recipient and the administration of FTA grants. The Master Agreement is incorporated by reference and is made part of each FTA grant.

The Department is the designated recipient for all FTA programs and is responsible for service and planning decisions for rail, fixed-route bus, and complementary paratransit service in the urbanized areas of the State.

For most regular formula funds authorized, FTA allows four years for funds to be obligated so the funding may be carried forward. This allows for larger projects to be financed with two or more years of apportionment. Additionally, as the designated recipient, the Department programs and plans the formula funding from Section 5307 (the largest FTA source of funds) and creates a funding pool from which capital projects in regions around the State are funded.

The Department does not utilize a formula to reallocate Section 5307 formula funds to the bus operators, rather the funding pool allows for a cooperative, non-discriminatory allocation of funds to different regions based on annual needs. The disbursement of these funds is approved by the MPOs in the Statewide Transportation Improvement Program (STIP). Sub-area split agreements that reflect the annual disbursement of funds by region are created by the Department and executed by the operators from each region. This program allows local transit operators to fund major projects for which they may otherwise have never accumulated adequate funds.

FTA requires the recipients of federal funds to develop a finance plan to complete large projects. To achieve this, the Department uses a federal financial tool called Pre-Award Authority, particularly for large multi-year programs, providing for a phased approach to project funding. This mechanism allows the State to request and receive approval to construct a federal-aid project in advance of the availability of authorized federal funds.

Management of FRA Funding

The Infrastructure Investment and Jobs Act (IIJA) is providing unprecedented federal funding for rail improvement projects through the Federal Railroad Administration (FRA). Over the next five years, FRA is greatly expanding programs and creating new programs to enhance and support the nation's rail network. The programs are administered through the discretionary competitive grant process. The Department continues to monitor the federal NOFOs as they are released by USDOT and FRA in order to maximize federal participation in the capital program. As these opportunities become actual grant awards, projects are incorporated into the Capital Plan in accordance with the award.

The Department continues to work with FRA on projects supported through the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program such as Windsor Locks Station and Enfield Station. Additionally, the Department continues to work with FRA on projects supported through the SOGR program including Replacement of the WALK moveable bridge in Norwalk, and the New Haven Line Power Program through the SOGR Grant Program.

Additionally, projects located on the Northeast Corridor (NEC) between Washington, D.C. and Boston, and as identified in FRA's NEC Project Inventory, will be evaluated and ultimately selected for an award based on the discretionary grant application process through the Federal-State Partnership for Intercity Passenger Rail Grant Program.

The management of FRA funds requires the Department to adhere to both programmatic and administrative laws, regulations, policies, and procedures to effectively implement and manage projects awarded by FRA in accordance with the conditions of the grant agreement.

Each FRA grant consists of six attachments with individual templates covering Standard Terms and Conditions, Specific Grant Program Terms and Conditions, Project Statement of Work, Project Schedule, Project Budget, and Project Performance Measures. Each grant and project are also supplemented with all applicable environmental review documents, engineering design, and agreements with project stakeholders.

The Capital Construction Program

The Department's Capital Construction Program is a subset of the overall capital funding program. The Capital Construction Program is multimodal, with highway and bridge construction constituting much of the program. The Capital Construction Program does not include equipment procurement, such as rail cars or replacement buses. It does, however, include projects such as the catenary replacement program, track speed improvements, and rail station construction.

Connecticut's infrastructure needs, like most states throughout the nation, exceed the financial resources to address them all. Therefore, having a clearly defined project purpose and need and committing the State's financial resources to the most critical transportation deficiencies is more important than ever. One of the main priorities of the Capital Construction Program is preservation of our existing multimodal assets and maintaining them through a systematic Asset Management Program.

For planning purposes, roughly twenty five percent (25%) of the Capital Construction Program funding is utilized for preliminary engineering and the purchase of property rights for projects. The remainder of the Capital Construction Program funding is dedicated to the construction phase. The construction phase includes:

- The amount of the awarded construction contract,
- Plus a contingency budget for extra work and change orders,
- Plus the Department's costs to manage and oversee the work (known as incidentals),

• *Plus* any utility relocation costs.

A summary of the project delivery statistics for the previous two years, in addition to the estimated figures for FFY 2023, are shown in the table below.

		FFY 21	FFY 22	FFY 23*
Number of Design/Bid/Build Projects		75	61	66
Total Construction Cost of Design/Bid/Build Projects	5	\$760	\$875	\$860
Number of Alternative Contracting Projects		1	3	4
Alternative Contracting Project Cost	_	\$85	\$458	\$348
	Total:	\$845	\$1,333	\$1,208

Notes:

All dollar amounts are in millions.

Values only represent Department advertised contracts.

*FFY 23 figures are estimated.

From the table above, it's important to note that the number and dollar amount of projects fluctuates on an annual basis. In some years there are many smaller projects being advertised; in other years, a large project may be delivered that will be paid for over several years. The Department advances as many identified capital projects to construction as can be fiscally supported.

The Department manages and funds a multitude of capital projects and programs not captured above. These other programs include:

- Town advertised projects and funding programs such as the Federal and State Local Bridge Programs, LOTCIP, Town-aid Road Grants, and Community Connectivity Grants,
- Preservation projects utilizing contractors selected through DAS contracts,

- Projects directly performed by AMTRAK and Metro-North on the Department's behalf, and
- Preservation projects utilizing contractors selected through DAS contracts.

The Department's overall Capital Plan includes all these elements in addition to the projects directly bid through its Contracting Unit. In FFY2022, the Department administered 316 projects at a value of \$1.77 Billion. In FFY2023, the Department anticipates administering 341 projects with a value of \$1.69 Billion. See Figure B and Figure C for more detail.

In addition to the values above, the Department is responsible for developing and administering contracts for rolling stock for transit operations and fleet and equipment purchases to support operations.

The attached 5-year Capital Plan project listing contains information on the specific projects and programs contemplated for FFY23 - FFY27 as well as anticipated funding for each. This project listing contains projects that are expected to be financed with available funding. The document, Projects Scheduled for Advertising, lists the specific projects and scheduled advertising date to be bid in FFY23. The document is updated monthly and can be found on the Department's website.

Overall, the Department's Capital Program has been expanding over the years, consistent with the increased transportation investment levels. For example, in 2020 the value of design/bid/build projects was \$608 million. While the Department has been benefiting from these increased investment levels, the full benefit of this increase has been offset by the increased cost (inflation) of capital projects and the continuing deterioration of our existing assets over time. FHWA's official measure of highway and bridge construction costs, the National Highway Construction Cost Index, indicated that these costs increased 25% in the latest one year timeframe (Quarter 2 of 2022 as compared to Quarter 2 of 2021).

Mode Specific Accomplishments and Plans for the Future

Public Transportation Capital Program

Bus

The Bus Capital Program supports transit services around the state including state-owned CT*transit* that operates in eight urban areas. The program also provides funding for vehicles, facilities and other infrastructure supporting both fixed route and paratransit services operated by transit districts in urban and rural areas around the state. Before the COVID pandemic, these services together served 40 million customers per year.

At the direction of Governor Lamont per Executive Order 21-3, the Department is transitioning from diesel-hybrid buses to battery-electric buses. An initial twelve battery-electric buses were

ordered and delivered at the CT*transit* Hamden division. The Hamden facility is simultaneously in the process of designing and upgrading the on-site infrastructure to get to 100% electrification by 2029. The CT*transit* Stamford Division has broken ground on major improvements to support the bus electrification effort, with construction completion expected by Spring of 2023 and are presently in design for 100% electrification, with a construction start date of Fall 2023. A second order of battery-electric buses was placed for an additional 49 buses. These buses will be distributed among Greater Bridgeport Transit Authority, CT Transit (Hartford, New Haven & Stamford Divisions), CT Transit Waterbury, Milford Transit District, Middletown Area Transit, and Windham Regional Transit District. The 49-bus order is anticipated to be received and placed into revenue service by the 2nd quarter of 2024.

The CT*transit* Waterbury Division will be a one-for-one replacement of ten existing diesel 35-foot buses. Equally as important is the preparation of the CT*transit* Waterbury Division to handle the future one hundred percent (100%) electrification of the transit bus and paratransit fleet. Major project elements include a large expansion of the facility's electrical service, installation of facility switchgear and breaker panels to support the charging of the 10 BEBs and 10 DC fast chargers.

CT*fastrak* continues to provide a valued customer experience and provides a catalyst for economic development in many communities. The Department continues to advance a first in the nation pilot project that tests the performance and operation of full size, automated BEB in revenue service on CT*fastrak*. This demonstration project will deploy three 40' New Flyer Excelsior Charge BEBs equipped with increasing levels of driving automation. Automated driving capabilities include steering, accelerating and braking, precision docking at CT*fastrak* station platforms, and vehicle platooning.

Previously, the Department in cooperation with the Greater New Haven Transit District, City of New Haven, and South Central Regional COG completed a comprehensive plan for improved bus service in the greater New Haven area, called *Move New Haven*. Some initial recommendations to expand weekend and late-night bus service were implemented in 2021. Work continues to advance the proposed bus rapid transit (BRT) routes along Grand & Dixwell Avenues as well as Whalley Avenue. The Department and the City of New Haven will partner on the design for both BRT lines which will feature new bus stations, neighborhood connectivity projects and transit signal priority. The BRT projects are expected to qualify for future federal grant opportunities to build, operate and maintain the new lines.

Other bus capital initiatives include upgraded bus stops, signs, and shelters statewide to provide improved safety, comfort, and convenience for customers.

<u>Rail</u>

The cornerstone of the future rail program is TIME For CT, a comprehensive multi-year \$8-10 billion plan to upgrade rail speeds and improve rail travel time throughout Connecticut. The plan

will rebuild rail bridges including four moveable bridges, straighten track curves, upgrade rail signals, and improve drainage. These improvements, plus new rail cars and new train schedules, will save 25 minutes from New Haven to New York City by 2035. The first Track Improvement and Mobility Enhancement (TIME) infrastructure project is now in the engineering phase and will reduce travel time and improve track speed in the Bridgeport/Stratford area. This project includes the replacement of five railroad bridges, track and curve improvements, and infrastructure upgrades to the signal, communications, and catenary system. The projects will increase maximum authorized speeds to 90 mph between Milford and Bridgeport. Overall, the Rail Capital Program includes investments in Connecticut's six passenger rail lines. The program reprioritizes investment from capacity projects to travel time improvement, customer experience and reliability programs.

The New Haven Rail Yard (NHRY) capital investment program is continuing with the recent construction of the East End Connector and West End Yard projects which added increased flexibility for operations in and out of the Component Change Out (CCO) Shop, and more electrified storage/maintenance tracks for 77 cars in the west end of the yard. Major rehabilitation projects are in development for: demolition/replacement of the old Wheel Mill Facility to provide a second reliable wheel truing facility; and rehabilitation of the Car and Diesel Maintenance Facility. These facilities require immediate attention to be able to support new rail cars and an expanded locomotive fleet.

The Department continues the overhaul program of the GP40 diesel locomotives that operate on the Hartford Line and Shore Line East service. All twelve GP40 locomotives are expected to be delivered and returned to service in 2023. Metro-North Railroad received initial deliveries of new M8 rail cars from Kawasaki Rail Car in 2021. The remaining new M8 rail cars for the New Haven Line are expected to be delivered and placed into service in 2023.

In addition to the ongoing locomotive overhaul program and new M8s, new rail cars are needed for Hartford Line service, including Amtrak and CT*rail* trains that operate on the line. In 2022, the M8 train service started operating on the Shore Line East.

Another major project involves the WALK Bridge. This is the oldest movable bridge along the New Haven Line and the Northeast Corridor, which is the busiest commuter rail line in the nation. Construction of CP243, a new railroad interlocking east of Norwalk, will facilitate train movements and reduce delays during construction of the bridge. The project is advancing on schedule. Work on the Danbury Dock Yard, which provides a turnaround location for trains, will further reduce train traffic on the bridge. The project is nearing completion. The design for Walk Bridge was completed in 2022 and the start of construction is scheduled for this year. A separate but coordinated project under the TIME program will replace four fixed bridges in Norwalk and upgrade the East Norwalk Railroad Station. The replacement of the Housatonic River (Devon)

movable bridge is also underway. In 2023, planning for the replacement of the movable rail bridge over the Saugatuck River and Cos Cob River will also begin.

Investment in modernizing the Waterbury Branch Line will continue in 2023, building on the recent completion of a new signal system and passing sidings, and nearly 50% increase in rail service. Currently, high-level platforms are being designed for five stations on the line, with a relocated station in Naugatuck. Also, engineering will get underway on the conversion of the former baggage room at Waterbury Station to a customer waiting area as well as a historically sensitive restoration of the external canopy, doors, and trim outside the baggage room.

Since the start of the pandemic, the ridership on the Hartford Line has been recovering at a higher rate than any other rail service in the state. Expansion of this successful service continues with the completion of short high-level platforms in Windsor that will meet current and future service needs. Also, in 2023, construction began on the new Windsor Locks Station. The project will replace the low-level platform located on the outskirts of Windsor Locks with a high-level platform, with full passenger amenities, located in the center of town. Plans are also underway for the installation of a single platform to provide service at Enfield.

The Department continues to pursue Federal discretionary grant funding to support rail transportation in the State. The Department will apply for grant funding for projects located on the NEC under the Federal-State Partnership for Intercity Passenger Rail Program (FSP Program) for Fiscal Year 2022 and 2023. Under this grant program, only projects listed on the NEC Project Inventory, published by FRA, are eligible for an award. The Department is submitting applications for all eligible projects in accordance with the published NEC Inventory List.

Maritime

The Department continues to operate the two Connecticut River ferries, the Rocky Hill/Glastonbury Ferry and the Chester/Hadlyme Ferry. Routine repairs to vessels continue. The Department has applied for a Connecticut DEEP grant to purchase an all-electric ferry for the Chester-Hadlyme ferry service. The Department is also evaluating a new off-board digital fare system to eliminate the handling of cash onboard the vessels.

Highway and Bridge Capital Program

Highway and Bridge

The Highway and Bridge Construction Program is the largest modal component of the Capital Construction Program. As noted earlier in this report, Connecticut is heavily dependent on federal funding for all modes. The 2023 Capital Construction Program funding plan includes a variety of projects, from small local bridges and intersection improvements to the continuation of major projects. The Department works to develop a mix of projects that address the transportation mobility and safety needs of the entire state. This also produces a program that can be designed and constructed by firms of various sizes and specialties.

Note: The lists provided below are not intended to be all encompassing. They are typically higher dollar value Capital projects on the major state roadways. Safety, minor reconstruction, and complete streets projects are described elsewhere within their individual write-ups and within the comprehensive year by year project listing.

A sizeable portion of the money available for the 2022 Capital Construction Program was used on several major initiatives, such as:

- 40-141: Reconstruction of the Route 82 Swing Bridge in Haddam / East Haddam,
- 44-156: I-95 at Route 161 Improvements in East Lyme,
- 53-190: Trail Connections to Putnam Bridge Walkway in Glastonbury,
- 58-340: Pavement Rehabilitation and Safety Improvements on I-95 Northbound in Groton, Stonington, and North Stonington,
- 156-181: I-95 Safety and Operational Improvements and Replacement of Bridge Nos. 00161 (over First Avenue) and 00162 (over Metro North Railroad) in West Haven,
- 165-509: Rehabilitation of Bridge No. 00454 (Dexter Coffin) in Windsor Locks, and
- 171-484: UHPC Beam End Repairs on Various Bridges.

Looking towards 2023, significant capital planning or engineering initiatives include:

- Continued planning for improved mobility in the Greater Hartford area,
- Improvements in the vicinity of I-84/ Route 7 in Danbury,
- Long-term improvements on I-95 Branford to Rhode Island,
- Long-term operational improvements vicinity of I-95/ Milford Connector / Route 1,
- Long term operational improvements on I-95 vicinity of Bridge 32 in Stamford,
- Advancing the preliminary engineering for the Route 7/15 Interchange, and
- Planning for improvements on I-95 in Bridgeport and Fairfield.

Construction will continue in 2023 on the:

- 36-184: Reconstruction of Route 34 in Derby,
- 36-203: Reconstruction of Route 8 in Derby,
- 42-317: Reconstruction of Route 2 in East Hartford,
- 82-316: Route 9 and Route 17 Improvements in Middletown,
- 94-256: Phase 1 of the Repairs to the I-95 Gold Star Bridge in New London,
- 96-204: Reconstruction of Route 34 vicinity of I-84 in Newtown,
- 102-295: Reconstruction of I-95 in Norwalk/Westport, and
- 102-296: Route 15 (Merritt Parkway) Corridor Improvements in Norwalk and Westport.

The Department's projected outlook for new construction commitments in 2023 include:

- 15-339: Rehabilitation of Bridge No. 02475 (Stratford Avenue Lift Bridge) in Bridgeport,
- 34-358: Preservation of Various Bridge Decks on I-84 in Danbury,
- 58-307: Resurfacing and Safety improvements to I-95 SB in Groton / North Stonington,
- 56-316: I-95 Pavement Preservation from NY State Line to Exit 6 in Stamford
- 63-726: Rehabilitation of Bridge No. 01469B (Dutch Point Viaduct) carrying I-91 over Connecticut Southern Railroad, SR 598 WB, & TR 803 in Hartford,
- 79-246: I-91/I-691/Route 15 Interchange Improvements to I-91 NB, I-691 WB, & Route 15 NB in Meriden
- 97-95: Replacement of Retaining Walls on US 44,
- 135-346: I-95 improvements vicinity of Exit 7 in Stamford, and
- Other various Innovative Bridge Program Projects throughout the state.

The Department's projected outlook for new construction commitments in 2024 through 2027 include:

- 28-207: Reconstruction of Route 2 in Colchester,
- 80-128: Improvements to Routes 63, 64 and I-84 in Middlebury,
- 82-318: Traffic Signal Removal and Improvements to Route 9 in Middletown,
- 85-146: Corridor Improvements on CT 85 in Montville / Salem,
- 92-689: Route 15 (Wilbur Cross Parkway) Operational Improvements at Interchange 59 in New Haven,
- 94-235: Continued Rehabilitation and Improvements to the Gold Star Bridge in New London,
- 79-240: I-91/I-691/Route 15 Interchange Improvements to I-91 SB, I-691 EB, & Route 15 SB in Meriden
- 102-358: Reconstruction of the Route 7/15 interchange, and
- Breakout projects from the various Planning and Environmental Linkages studies noted above.

Bicycle / Pedestrian / Trails

The Department continues to manage a more flexible approach to the funding of Bicycle/Pedestrian projects to close some of the existing gaps in the statewide trail network. Toward this goal, the Department is facilitating completion of a network of interconnected, statewide trails under the Multi-use Trail Implementation Plan. This program is focused on the East Coast Greenway (ECG), which is classified as a trail of statewide significance. The goal is to establish clear priorities that will close the most critical gaps and create long continuous portions of the statewide trail network.

Construction is complete on a segment of the ECG in the towns of Pomfret and Putnam for the construction of two bridges and three underpasses (Project No. 111-124). In addition, Construction is nearly complete to extend the ECG south in New Haven under Project No. 92-621. Construction is underway to extend the Norwalk River Valley Trail (Project No. 102-350) as well as for trails connecting the Putnam Bridge to Wethersfield and Glastonbury.

Design activities are complete on the following sections of the ECG: in Southington (Project No. 131-203) and in Plainfield/Sterling (Project No. 108-189). Design activities are underway on the following projects along various segments of the ECG:

- Project No. 30-97 in Coventry and Columbia,
- Project No. 109-173 in Plainville, and
- Project No. 111-126 in Pomfret and Putnam.

The Office of Engineering is also working with the Towns of Bloomfield and Simsbury to construct a segment of the ECG under the LOTCIP program.

The new federal transportation legislation provides many opportunities for enhancing the commitment to these types of improvements. The Department's TA working group will be initiating new projects as a result of the 2022 TA Program Project Solicitation and will coordinate with the COGs to evaluate the prospective candidates that resulted from this process.

Americans with Disabilities Act (ADA) Engineering Coordination

The Department has established an ADA Engineering Coordination Unit (ECU) to oversee the implementation of the Department's federally required ADA Transition Plan, assess technical infeasibility of ADA implementation, and conduct public outreach. The ECU addresses ADA related complaints in the State Right-Of-Way, assists designers in bringing facilities into ADA compliance, and documents locations where future scopes of work need to incorporate ADA compliant improvements. The ECU maintains the Department's curb ramp inventory and compliance database. Coordination across other State agencies, the Department bureaus, FHWA and Council of Governments (COGs) is underway. The ADA ECU is conducting a statewide

compliance assessment of the 169 municipalities to gauge what efforts are being made at the local level, and to identify what support or training may be needed. Working with the CT Training and Technical Assistance Center (T2 Center) at the UConn and other organizations, the ADA ECU assists with trainings and outreach on requirements related to ADA.

Conclusion

The Department's Capital Program continues to be focused on an asset management approach, while also planning for and designing affordable system enhancements that can fit within our fiscally constrained program. Emphasis areas include improving pedestrian and vehicular safety, upgrading the condition and technology of the state's traffic signal system, developing projects and programs that directly reduce our carbon footprint and other air emissions, targeted improvements to our highway system to reduce congestion and improve mobility, and implementing corridor improvements along the New Haven Line to reduce commuter time to and from New York City.

Large transportation infrastructure improvements take many years to proceed from planning through design and finally to construction; therefore, a consistent and long-term vision is necessary to achieve desired results.

The federal component of the transportation Capital Program is expanding with passage of the IIJA and provides a higher base funding level for future transportation reauthorizations. The state capital funding stream from the Special Transportation Fund (STF) is stable and the State continues to submit competitive grant applications to bring more federal monies back to Connecticut.

The Department of Transportation's goal is to optimize the capital funding for all its transportation modes and to continuously improve its ability to deliver maximum infrastructure improvements for each dollar expended. The Department achieves this in the following ways:

- Obtaining and using all the federal funds allocated to the state,
- Receiving tens of millions of dollars of funds other states could not obligate on schedule,
- Working with the Governor's Office, the Legislature and other state and federal agencies to identify and/or create additional sources of funding and to be successful in competitive discretionary grant programs,
- Using advance construction on major projects while managing financial risk and deploying a mixture of projects to meet the many needs of the state,
- Managing the Capital Program by allocating its resources in a manner that optimizes output. At the same time creating a variety of jobs and economic benefits: engineering, legal, public safety, materials production, and sale,

- Improving project delivery to increase the Department's capacity to provide the State with higher quality transportation improvements,
- Addressing the transportation needs of the State in an equitable manner while accounting for resiliency and climate change,
- Enhancing transportation investment strategies through strategic planning and using an asset management approach to maintain our transportation infrastructure, and
- Using more durable materials to reduce future maintenance and rehabilitation costs,

The Department will continue to balance the priorities for the Capital Program using a data-driven decision-making framework to assess a variety of criteria including asset management, safety, sustainability, and economic vitality.

Although the outlook is good, the projected costs of some of the planned major highway and rail transportation improvements (I-84 Waterbury, I-84 and I-91 Hartford, I-95 East and West, I-84 Danbury, and Moveable Bridges on the New Haven Line) likely exceed the projected fiscal resources of the current Capital Program. These large investments are critical to the State's economic vitality; therefore, the State must plan carefully to provide the necessary support for our transportation infrastructure now, and into the future.

Capital Plan Project Listing

The attached 5-year Capital Plan project listing contains information on the specific projects and programs contemplated for FFY23 - FFY27 as well as anticipated funding for each. This project listing contains projects that are expected to be financed with available funding. This project listing is continuously being expanded as we initiate projects supported by the higher funding levels and new programs in the IIJA.

Figure A

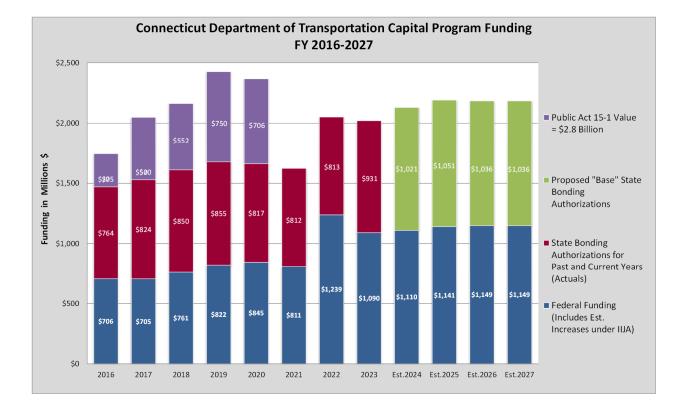


Figure B

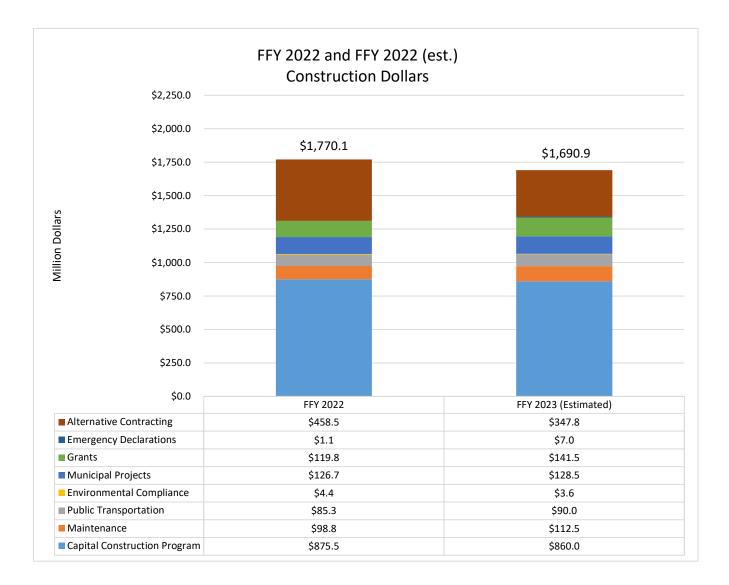


Figure C

