Connecticut Department of Transportation

CT transit
CT rail
CT fastrak
CT ferry

2018-2021

Public Transportation Transit Asset Management Plan

Tier I Plan in accordance with 49 CFR §625.5

September 2018

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546

Office of the
Commissioner

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October 1, 2018

Mr. Peter Butler, Acting Regional Administrator
U. S. Department of Transportation
Federal Transit Administration
Kendall Square
55 Broadway, Suite 920
Cambridge, MA 02142-1093

Dear Mr. Butler:

Subject: Notification of Compliance with 49 CFR 625
Transit Asset Management Rule
Public Transportation Transit Asset Management Plan (Tier 1 Providers)
Transit Asset Management Group Plan (Tier 2 Providers)

The Connecticut Department of Transportation (Department) has completed the development of Transit Asset Management Plans (TAMPs) for Tier 1 and Tier 2 Providers to comply with the TAM Final Rule deadline of October 1, 2018.

Both TAMPs include Fiscal Year 2018 State of Good Repair (SGR) performance goals that pertain to SGR measures for revenue vehicles, service vehicles, rail guideway and facility asset classes.

TAMPs will be shared with Connecticut's eight Metropolitan Planning Organizations for inclusion into their amended Metropolitan Transportation Plans after October 1, 2018.

Should you have any questions, please contact Ms. Sharon Okoye, Public Transportation Asset Management Lead, at (860) 594-2367.

Sincerely,

James Redeker
Commissioner

cc: Mr. Matthew Keamy, FTA Program Management Office
Ms. Leah Sirmin, FTA Planning and Program Development
Mr. Sergio Coronado, FTA Planning and Program Development (Tribes)
Transit Districts

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Message from the Commissioner

It is my pleasure, as Commissioner of the Connecticut Department of Transportation (CTDOT), to present the State's initial Public Transportation Transit Asset Management Plan (TAMP). This plan goes beyond federal mandates and demonstrates a strong commitment to achieving a State of Good Repair for our transportation system. Connecticut's transportation system is multimodal and supports the economy by enabling the efficient movement of people, goods, and services. Connecticut is a vital transportation link between northern New England and New York, New Jersey and the Mid-Atlantic states. The transportation system also links our communities; helping connect neighborhoods, towns, and cities. In order for Connecticut's economy to function properly and grow, the transportation system must be maintained and updated.

This document presents a plan developed in partnership with CTDOT Public Transportations' statewide service providers, to achieve a systematic and comprehensive asset management system for the State's public transportation assets to provide safe and reliable service for the citizens of Connecticut.

Implementation of this plan will align with the Department's priority to maintain and preserve the transportation system.

James P. Redeker

Commissioner

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Disclaimer

The Connecticut Department of Transportation (CTDOT) has prepared this Transit Asset Management Plan (TAMP) in accordance with 49 CFR 625.5 and pursuant to the further guidance and direction of the Federal Transit Administration. The TAMP presented here is our plan to ultimately achieve a systematic and comprehensive asset management system for Connecticut's public transportation assets.

New federal regulations for tracking and reporting system performance for transit assets will require changes to our current practices by Connecticut's service providers. In some cases asset condition reported herein are based on professional judgement in the absence of technical data. CTDOT has developed a documented approach for future data collection consistent with FTA guidance which will be reflected in the next TAMP update.

CTDOT will initiate in-depth inspections of its public transportation assets and will further update the TAMP periodically. Future TAMP updates will revise investment recommendations as the asset condition data requires.

For further information or questions about this document, please contact Sharon Okoye at 860-594-2367 or Sharon.Okoye@ct.gov.

Connecticut Department of Transportation

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Connecticut Department of Transportation
Public Transportation Transit Asset Management Plan

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List of Acronyms

AIM	Asset Inventory Module
ARAN	Automatic Road Analyzer
ARSA	Amended and Restated Service Agreement
BMS	Bridge Management System
CPI	Consumer Price Index
CSS	Context-Sensitive Solutions
CTC	Centralized Traffic Control
CTDOT	Connecticut Department of Transportation
EMU	Electric Multiple Units
FAST	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FMS	Facilities Management Solution
FTA	Federal Transit Administration
Group-TAMP	Transit Asset Management Group Plan
HL	Hartford Line
IRI	International Roughness Index
ITS	Intelligent Transportation Systems
LRTP	Long Range Transportation Plan
LCP	Life Cycle Planning
MAP-21	Moving Ahead for Progress in the 21st Century
MCI	Motor Coach Industries
MDBF	Mean Distance Between Failures
MNR	Metro North Railroad
MOW	Maintenance of Way
MPO	Metropolitan Planning Organization

MTA	Metropolitan Transit Authority
NBI	National Bridge Inventory
NBT	New Britain Transportation Company
NEC	Northeast Corridor
NHL	New Haven Line
NTD	National Transit Database
PT-TAMP	Public Transportation Transit Asset Management Plan
OCS	Overhead Contact System
PCI	Pavement Condition Index
PI	Prioritization Index
PTC	Positive Train Control
RBIM	Railroad Bridge Inspection Manual
RBMP	Railroad Bridge Management Program
ROW	Right-of-Way
SLE	Shore Line East
SGR	State of Good Repair
SQL	Structured Query Language
STIP	Statewide Transportation Improvement Program
TAM	Transit Asset Management
TAPT	Transit Asset Prioritization Tool
TCRP	Transit Cooperative Research Program
TERM	Transit Economic Requirements Model
TYNA	Twenty Year Needs Assessment
ULB	Useful Life Benchmark

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CHAPTER 1

Introduction

The Connecticut Department of Transportation has created this Transit Asset Management Plan to document the agency's asset management processes and policies, summarize the inventory and condition of transit assets, prioritize State of Good Repair investments, and construct a blueprint for transportation asset management improvements moving forward. This document is also designed to meet Federal Transit Administration's transit asset management requirements. This document builds on past practices and accomplishments in maintaining Connecticut's transportation infrastructure while also emphasizing the importance of implementing a plan to maintain our infrastructure today and in the future.

Connecticut Department of Transportation

PUBLIC TRANSPORTATION TRANSIT ASSET MANAGEMENT PLAN

Welcome

Transit asset management (TAM) is a strategic and systematic process of taking care of assets, with a focus on both engineering and economics and is based upon collection of quality data. The TAM process identifies a structured sequence of work to better maintain transit capital assets in a State of Good Repair (SGR) over their lifecycle at a minimum cost.

In Connecticut, the practices of asset management are needed to address the condition of our infrastructure as many of our assets have aged beyond their intended life expectancy. This aging infrastructure combined with increased demands on the transportation network and limited funding strongly substantiates the need to implement asset management practices.

The Connecticut Department of Transportation (CTDOT) has created this Public Transportation Transit Asset Management Plan (PT-TAMP) to summarize CTDOT's transit assets, lay out the agency's asset management processes, and identify priority SGR investments. The PT-TAMP enhances CTDOT's ability to communicate with the Metropolitan Planning Organizations (MPOs) and State Legislators regarding the performance of the existing transit system and benefits of strategic investments to achieve and maintain the system in SGR. CTDOT is also the sponsor of a group plan for Tier II transit service providers in Connecticut.

A separate document has been developed to address the highway assets maintained by CTDOT as mandated by the Federal Highway Administration. Eventually, CTDOT intends to merge the documents into a comprehensive asset management plan for the entire department.

Federal Legislative Context

Federal authorization (initially Moving Ahead for Progress in the 21st Century or MAP-21 and more recently Fixing America's Surface Transportation or FAST Act) requires that recipients and subrecipients of federal financial assistance develop TAM plans.

Transit providers may be required to either develop their own TAM plan or participate in a Group TAM plan depending on whether they are Tier I or Tier II. In 49 CFR 625.5, the Federal Transit Administration (FTA) defines Tier I and Tier II providers:

- *Tier I provider* means a recipient that owns, operates, or manages either (1) one hundred and one (101) or more vehicles in revenue service during peak regular service across all fixed route modes or in any one non-fixed route mode, or (2) rail transit.

- *Tier II provider* means a recipient that owns, operates, or manages (1) one hundred (100) or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (2) a subrecipient under the 5311 Rural Area Formula Program, (3) or any American Indian tribe.

A sponsor must develop a Group TAM plan for Tier II transit providers, while Tier I providers must develop their own TAM plans. Tier II providers may also choose to forgo the Group TAM plan and develop individual plans. A Tier I TAM plan must include the following nine elements, while a Group plan must include only elements 1 thru 4:

1. Capital asset inventory
2. Condition assessment
3. Description of analytical processes or decision support tools
4. Investment prioritization
5. TAM and SGR policy
6. TAM plan implementation strategy
7. Key TAM activities
8. List of resources to implement the plan
9. Outline of how a provider will monitor, update, and evaluate the plan

Each provider, Tier I or Tier II, must designate an accountable executive who is responsible for accepting and approving the TAM plan and SGR targets.

A Group TAM plan must include a list of participants in the plan. The sponsor must coordinate development of a Group TAM plan with each participant's accountable executive and must make the completed plan available to all participants.

A TAM plan must cover a period of four years. The initial TAM plan must be completed by October 1, 2018, and the plan must be updated every four years.

Agency Overview

CTDOT owns, operates and maintains a multi-modal transportation network composed of highway assets and transit assets. CTDOT owns or subsidizes nearly all of Connecticut's public transportation services, including commuter rail, bus, bus rapid transit, paratransit, and ferry

services. CTDOT is a Tier I agency and provides over 43 million annual passenger trips on bus and ADA service and more than 41 million annual passenger trips on rail service.

CTDOT is unique compared to other DOT's in that CTDOT is a transit service provider within the State of Connecticut. As part of its service delivery model, CTDOT brands its own transit services throughout the state for bus, ferry, and rail operations.

CTDOT has direct capital responsibility for billions of dollars of transit assets in Connecticut, but contracts out the operation of transit service to private companies. To meet the requirements for developing a TAM plan, established in the final rule on TAM by FTA, CTDOT is obligated to collect data, manage, and report on transit assets throughout the state.

The following sections summarize CTDOT transit services.

Bus Network

CT transit

CTDOT owns the local bus systems in Hartford, New Haven, Stamford, Waterbury, New Britain, Bristol, Meriden and Wallingford, and operates them under the CTtransit brand name. CTDOT has a contract with First Transit to operate the services in Stamford, New Haven and Hartford and with other private providers for services in New Britain, Bristol, Waterbury, Meriden and Wallingford. In all eight of these service areas the state is fully responsible for all operating deficits and capital costs. Additionally, CTDOT contracts with First Transit and four private companies for the operation of express bus services to Hartford.

CTtransit Hartford Division operates over 30 local and 12 express bus routes. Local routes operate 7 days a week, serving 26 towns in the Capital Region. CTtransit's Hartford Division makes connections with Middletown Area Transit, and the CTtransit New Britain division.

CTtransit New Haven Division operates 7 days a week over 22 local routes, connecting with other state-owned or subsidized bus services in Meriden, Wallingford, Milford, and the lower Naugatuck Valley areas, as well as with the New Haven Line and Shore Line East rail services.

CTtransit Stamford Division operates 15 local bus routes 7 days a week. CTtransit Stamford buses connect with other state-subsidized services in Norwalk, with the New Haven Line in several locations, the Harlem Line on Metro-North Railroad, and with Bee-Line buses in Westchester County New York. The Stamford Division also operates the I-BUS, an express service between downtown Stamford and White Plains, New York.

CTtransit Waterbury Division operates fixed route and ADA paratransit services in the Waterbury area through a contract with the North-East Transportation Company Incorporated, LLC. Fixed route and paratransit bus service is provided to Waterbury, Watertown, Middlebury, Wolcott, Prospect and Naugatuck Monday through Saturday.

CTtransit New Britain Division and Bristol Division are serviced through contract with New Britain Transportation Company (NBT) which operates 10 bus routes in Berlin, New Britain, Cromwell, Newington, Plainville, Bristol and Meriden. Fixed route bus service operates Monday through Saturday. Also, DATTCO operates fixed route service in New Britain on the East Street and South Street routes through contracted services. Complementary Americans with Disabilities Act (ADA) service is operated by First Transit and administered by the Greater Hartford Transit District.

CTtransit Meriden Division and Wallingford Division operates fixed route services in their respective areas through a contract with North-East Transportation Company Inc. LLC, with 4 local routes. Complementary ADA services are also operated by North-East Transportation Company Inc. LLC.

CT fastrak

CTfastrak, one of Connecticut's primary transit system assets is a dedicated bus rapid transit line along a 9.4-mile corridor between downtown New Britain and downtown Hartford. The system was launched in March 2015 and operates 7 days a week under CTtransit Hartford. CTfastrak permits bus access at intermediate points, so that circulator buses that provide service on routes in surrounding neighborhoods can then use the busway corridor, thus providing a one-seat ride. In addition, CTfastrak includes express, shuttle, circulator, and connecting feeder bus service to surrounding Towns.

Ferry

CT ferry

CTDOT owns and operates two historic Connecticut River ferries; one that connects Rocky Hill to Glastonbury (CT Route 160) and another that connects Chester to Hadlyme (CT Route 148). The Rocky Hill-Glastonbury Ferry is a tug (CUMBERLAND) and barge (HOLLISTER III) operation that can carry 3-4 cars at a time. The nation's oldest continuously operating ferry service crosses the Connecticut River between Rocky Hill and Glastonbury.

The Rocky Hill - Glastonbury Ferry is a unique element in the Region's transportation services. The ferry plays a special role in serving local vehicular traffic between Rocky Hill and Glastonbury, and it plays an important role for bicyclists. The ferry operates seasonally from May 1st to Oct 31st, 7 days a week.

The Chester - Hadlyme Ferry (SELDEN III) is a typical double ended ferry boat that can carry 9 cars and 49 passengers between Chester and Hadlyme. The Selden III, was built in 1949. It is an open, self-propelled craft, 65 feet long and 30 feet wide. The ferry operates seasonally from April 1st to Nov 30th, 7 days a week.

Rail Network

CT rail

The rail network in Connecticut consists of 628.5 miles of guideway, divided into two main classifications: Passenger Rail and Freight Rail. CTDOT has varying levels of responsibility to oversee the safe and efficient movement of trains across all rail lines throughout the State that carries people, goods, and services on a daily basis.

CTDOT provides three main passenger rail services across Connecticut that serve numerous towns across most regions. These services are the New Haven Line, Shore Line East (SLE), and the Hartford Line (HL), and are all governed by unique contract agreements. These services collectively within the State of Connecticut are referred to as CT-rail.

The New Haven Line is a commuter rail service that has been in existence since 1983, operated under an agreement called the Amended and Restated Service Agreement (ARSA). CTDOT is part of this joint operating agreement with the Metropolitan Transportation Authority (MTA), which established Metro North Railroad (MNR) in part to operate service along the New Haven Line and maintain infrastructure along the 72-mile segment between New Haven and Grand Central in New York, along with three additional Branch Line Services (New Canaan, Danbury, and Waterbury). As part of the agreement, each agency owns fixed infrastructure along the route within their respective States, and splits ownership of the rolling stock that operates along these routes. MNR additionally operates service

and maintains infrastructure along the Harlem Line and Hudson Line in New York State for the MTA. CTDOT and MNR are subject to FTA's TAM requirements for infrastructure they hold capital responsibility to regarding these services.

SLE is a commuter rail service that originated in 1990, providing service along a portion of the Northeast Corridor (NEC) from New Haven to New London. The service is fully subsidized by CTDOT, with Amtrak under contract to operate the service as well as perform maintenance throughout the system. Amtrak owns all fixed infrastructure along this route, while CTDOT owns the rolling stock and is the lessee to five of the seven SLE stations that are owned by Amtrak. While Amtrak is not subject to FTA regulations for the TAM program, CTDOT is still obligated to report on its owned rolling stock and stations that are leased to them.

The Hartford Line is a high-speed intercity passenger rail system that opened in June of 2018, providing expanded service between New Haven, Hartford, and Springfield, MA. The new line provides up to 17 round trips per day along the 62 mile route and includes recent major infrastructure investment to upgrade the line to support frequent service. While Amtrak owns all fixed infrastructure along this route, CTDOT has supplemented significant investment into this corridor, and has a need to track infrastructure spending and asset condition to sustain levels of service. Because this line is defined by FTA as intercity, it is not subject to FTA TAM regulations.

CTDOT also owns five additional freight rail routes within Connecticut, and supports in total 10 different freight operators that run on a combination of state-owned and privately owned freight routes. Although CTDOT has a financial interest and some capital responsibility for freight rail networks, these assets are also exempt from FTA TAM requirements and are also not reflected within this initial plan. For more information on Asset Management for these assets, please refer to CTDOT's State Rail Plan and Freight Plan.

Agency Structure Regarding TAM

Organizational alignment and support for TAM is a key element for program success. The PT-TAMP-building and updating process itself brings together the agency's stakeholders, disciplines, and business processes to work towards a common understanding of the transportation asset management mission and objectives, explained in detail in chapter two.

CTDOT is organized into five bureaus: Engineering & Construction; Finance & Administration; Highway Operations; Policy & Planning; and Public Transportation. The Bureau of Engineering & Construction leadership

initiated this effort to implement TAM to improve decision-making processes throughout the agency.

As part of this effort, CTDOT designated key TAM roles, formed a TAM Steering Committee, and staffed a Transportation Asset Management Group. The current agency structure for TAM is presented in Figure 1-1.

The Agency Sponsor for TAM is the Deputy Commissioner of Transportation and Chief Operating Officer. The Agency Chairperson for TAM is the Division Chief of Facilities and Transit.

The TAM Steering Committee includes representatives from the Commissioner's Office and all five bureaus. The role of each member of this committee is to support and recognize the value of TAM for CTDOT and the State of Connecticut. The Committee acts as a liaison to bureaus and divisions to ensure that each area's interests are properly represented and to ensure each area is supporting the TAM initiatives.

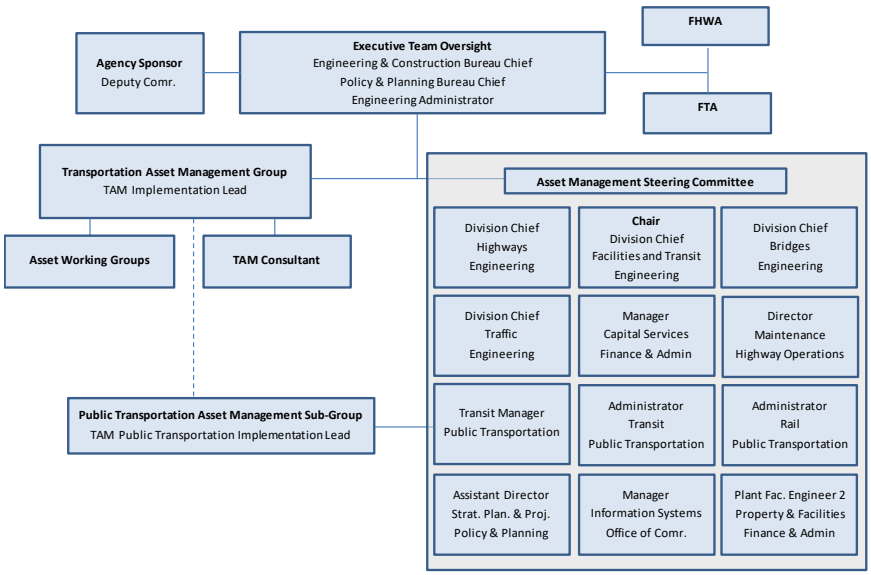

Figure 1-1. CTDOT TAM Organizational Structure

The Bureau of Public Transportation has a Transit Asset Management Unit (PT TAM Unit) within the Office of Program Management that reports to the Bureau Chief. The PT TAM Unit is responsible for preparing the Tier I and Tier II TAM Plans, collaborating with contracted transit providers for National Transit Database (NTD) reporting requirements for PT-TAMP, and coordinating with the agency lead for future development of CTDOT's multimodal TAM plan. An Implementation Committee will be created to support future TAM implementation activities. The current Bureau of Public Transportation structure for TAM is presented in Figure 1-2.

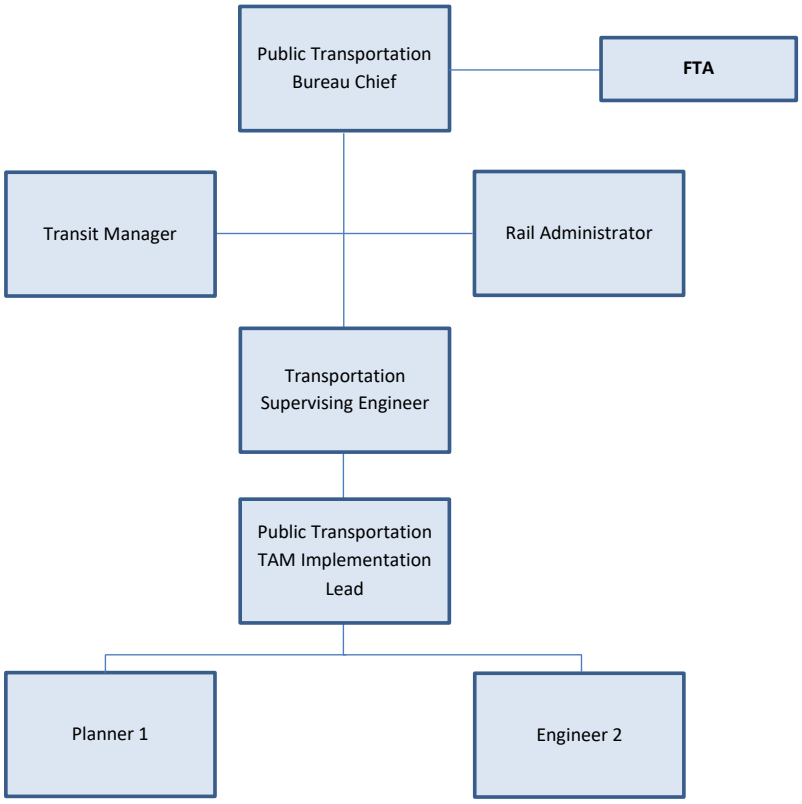

Figure 1-2. Bureau of Public Transportation TAM Organizational Structure

PT-TAMP

Purpose of the PT-TAMP

The PT-TAMP is a federally-required document intended to document TAM practices and processes at CTDOT. The PT-TAMP will help CTDOT manage transit assets to enhance safety, reduce maintenance costs, increase reliability, and improve performance. TAM will help CTDOT maintain the transportation system in SGR with the most efficient use of financial resources.

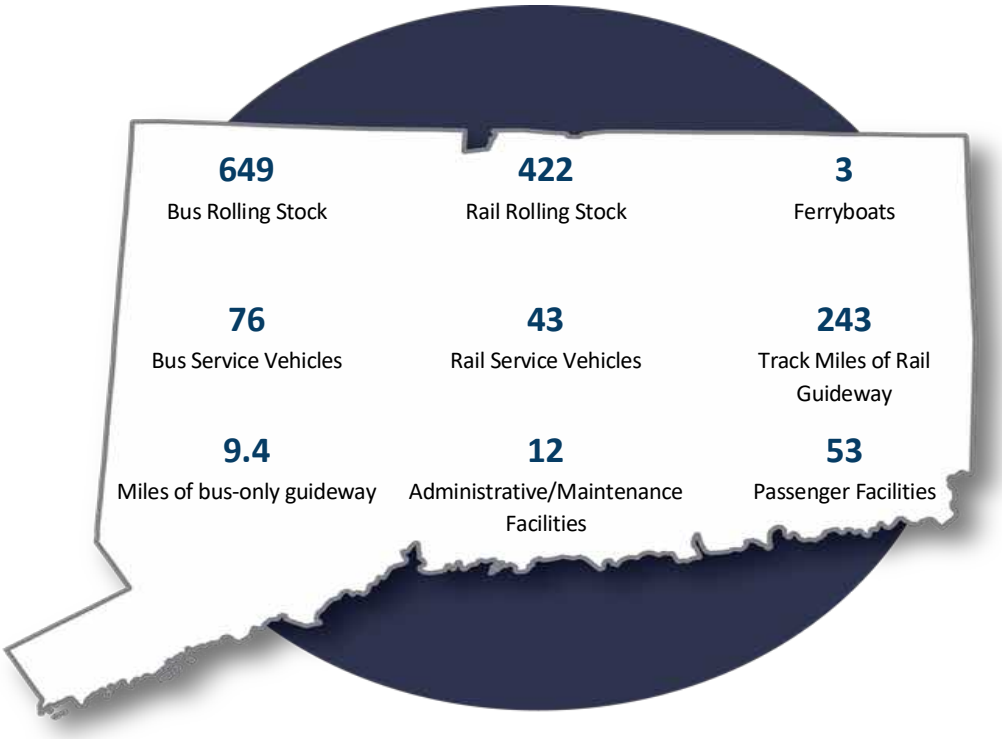

Figure 1-3. CTDOT PT-TAMP Inventory Summary

Scope of the PT-TAMP

CTDOT is a Tier I transit provider offering service across multiple modes, including bus, bus rapid transit, rail, and ferry. This PT-TAMP covers assets across the four categories defined by FTA: rolling stock, equipment, infrastructure, and facilities. A summary of transit assets in this plan is shown in Figure 1-3.

CTDOT, a multi-modal agency, has also completed its initial Highways Transportation Asset Management Plan in accordance with Federal Highway Administration (FHWA) requirements.

Awareness of other CTDOT plans, such as those listed below, is important for context and alignment with the PT-TAMP.

Related CTDOT Plans

Transportation Infrastructure Capital Plan Report
http://www.ct.gov/dot/cwp/view.asp?a=1383&Q=454340

Let's Go CT!
http://www.transformct.info

Statewide Transportation Improvement Program
http://www.ct.gov/dot/cwp/view.asp?a=3529&q=447186

Statewide Long-Range Transportation Plan
http://www.ct.gov/dot/cwp/view.asp?a=1383&q=259760

State Freight Plan
http://www.ct.gov/dot/cwp/view.asp?a=4719&Q=561266

State Rail Plan
http://www.ct.gov/dot/cwp/view.asp?a=1386&q=437648

CTDOT Highway Transportation Asset Management Plan
http://www.ct.gov/dot/lib/dot/documents/dplansprojectsstudies/plans/ctdot-tamp-fhwa-certified-20180724.pdf

PT-TAMP Building Process

The PT-TAMP building process began in July 2017. A wide range of CTDOT organizational units and representatives from the contracted CTDOT transit service providers in addition to FTA were involved in the development of this PT-TAMP.

The PT TAM Unit reviewed existing asset hierarchies and developed new asset hierarchies, developed approaches for assessing asset condition, and modeled SGR needs. Documents produced during these initial stages laid the foundation for the writing of the PT-TAMP. Asset fact sheets were also developed as part of the PT-TAMP building process to provide quick reference summaries for each asset highlighting the asset's inventory and condition, targets, and needs. Fact sheets for rolling stock, rail infrastructure, facilities, and equipment are in Appendix A.

CTDOT also formed working groups of relevant staff for the Tier I plan, including representatives from CTDOT, Hartford-New Haven-Stamford organization (CTtransit), and MNR. The working groups supported the development of the PT-TAMP and met periodically to review and provide feedback on the PT-TAMP development process.

This PT-TAMP is a living document that will be reviewed and updated every four years.

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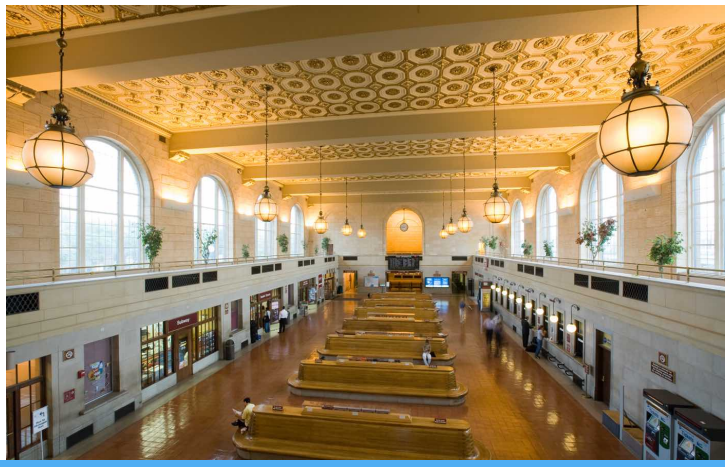
CHAPTER 2

Goals and Objectives



Identifying goals and objectives is an important step in developing transit asset management practices and processes at an agency. CTDOT has established agency-wide goals and objectives that apply across CTDOT divisions, districts, and modes of travel. These goals and objectives help focus agency operations, drive improved performance, and influence investments in transit assets. CTDOT's TAM goals and objectives constitute a commitment to maintaining assets in a state of good repair. This commitment will yield benefits for riders by improving transit service and for the agency by reducing costs.

Overview

CTDOT's mission and vision are guiding principles that shape TAM policy and transit goals and objectives. Goals and objectives help define and guide the TAM program at CTDOT and are an integral part of the PT-TAMP. Goals are broad statements of ideas to reach a desired outcome or ideal state of the transit system in Connecticut. Objectives should be SMART: specific, measurable, achievable, realistic, and timely steps that will help make progress towards attaining those goals.

This chapter presents CTDOT's mission, vision, and goals and objectives. The chapter also defines SGR and identifies existing state performance measures and TAM objectives that will be used to develop TAM policies.

Federal Legislative Context

FTA requires Tier I providers to include a TAM and SGR policy in their TAM Plan. FTA defines TAM policy as "a transit provider's documented commitment to achieving and maintaining SGR for all of its capital assets. The TAM policy defines the transit provider's TAM objectives and defines and assigns roles and responsibilities for meeting those objectives."

SGR is defined by FTA as "the condition in which a capital asset is able to operate at a full level of performance." The FTA final rule on transit asset management further defines SGR in §625.41:

> "A capital asset is in a state of good repair if it meets the following objective standards:
>
> - The capital asset is able to perform its designed function
> - The use of the asset in its current condition does not pose an identified unacceptable safety risk
> - The life-cycle investment needs of the asset have been met or recovered, including all scheduled maintenance, rehabilitation, and replacements."

State of Good Repair

The condition in which a capital asset is able to operate at a full level of performance.

Goals and Objectives

The highest-level guiding principles at CTDOT are the vision and mission. These principles influence transportation goals and objectives across the agency.

Vision and Mission

Connecticut strives to achieve a nationally competitive transportation system that is multi-modal, resilient, and long-lasting; addresses capacity issues; and helps the economy.

CTDOT Vision & Mission

CTDOT's vision is to lead, inspire, and motivate a progressive, responsive team, striving to exceed customer expectations.

CTDOT's mission 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.

CTDOT's Bureau of Public Transportation has its own mission which closely aligns with the overall CTDOT mission.

Bureau of Public Transportation Mission

The **mission** of the **Bureau of Public Transportation** is for the development, maintenance, and operation of a safe and efficient system of motor carrier, rail facilities and maritime assets for the movement of people and goods, such as Bus Transit, Rail Operations, Ferries, State Pier Facilities and Ridesharing programs.

CTDOT Values

- Measurable results
- Customer service
- Quality of life
- Accountability & integrity
- Excellence

CTDOT's vision and mission are further detailed in the 2018 Long-Range Transportation Plan (LRTP) vision.

Long-Range Transportation Plan Vision

- The economy is strong because improved and sustained multimodal and intermodal transportation contribute to an environment in which businesses and people thrive.
- Travel is safe and high safety standards are sustained on all modes of transport.
- Transportation infrastructure is in a state of good repair.
- Transportation services provide efficient mobility for people and goods, both within and beyond state borders.
- Congestion is managed.
- The natural environment is protected, air quality is good, and energy is conserved.
- Urban, suburban, and rural centers are transformed into livable communities that provide opportunities for walking and bicycling and are enhanced by accessible transportation systems.

CTDOT views maintaining condition of its transportation infrastructure as critical to its mission. One of the key goals in the LRTP is:

- Infrastructure in a state of good repair to improve reliability and reduce costs to users.

Maintaining asset condition also supports other goals mentioned in the LRTP, including:

- Economic growth with efficient and effective transportation for people and goods
- Safe and secure travel for people and goods for all modes
- Resilient transportation systems

Maintaining transit assets in a SGR helps support CTDOT goals and TAM objectives. In addition to CTDOT's vision, mission, and LRTP goals, the agency has devoted particular attention to pursing TAM policy and practices.

Summary of TAM Objectives

CTDOT has adopted a set of TAM objectives that are aligned with the vision and mission of the agency. These objectives are helping to steer CTDOT as it develops, refines, and implements TAM policies, processes, and practices.

Long-Range Transportation Plan

CTDOT's federally required LRTP covers years 2018-2050 and serves as a framework for near- and long-term transportation decision making. The plan encourages performance-based planning and programming and supports the implementation of TAM at CTDOT.

CTDOT has also incorporated transit providers TAM objectives to ensure consistency and garner their further support of the States TAM program.

TAM Objectives

- Attain the best asset conditions achievable, given available resources
- Deliver an efficient and effective asset management program that preserves, expands, and modernizes the state's transportation infrastructure
- Enhance communications and ensure transparency about capital programming prioritization and investment decisions
- Achieve and maintain compliance with federal asset management rules
- Maintain federal and state funded assets in SGR
- Ensure safety of customers through asset management
- Pursue other funding sources to sustain the State's TAM program

Performance measures, targets, and SGR modeling capabilities are being developed to help achieve CTDOT TAM objectives. These tools, systems, and practices are being linked so that CTDOT can operate more effectively and make progress towards federal requirements and state goals.

CTDOT currently has a performance measures initiative called "On The Move", that provides a series of performance measure reports that focus on results and accountability. The measures link to CTDOT's core mission and are reviewed by CTDOT's Performance Measures Standing Committee to determine their usefulness in helping CTDOT make strategic decisions for managing its assets. The measures are communicated to CTDOT through an online performance dashboard. In addition to monitoring existing Performance Measures related to asset management, CTDOT will incorporate the new TAM performance measures required by NTD into the Dashboard to ensure assets are constantly in SGR. The Dashboard currently has existing state performance measures tied to Public Transit Assets, and can be found at: http://www.ct.gov/dot/cwp/view.asp?a=3815&q=448402.

Applied to transit assets, the above goals and objectives translate into a commitment to make investments, where possible, to achieve and maintain a SGR for transit assets. These assets include revenue vehicles, equipment, infrastructure, and facilities. Asset inventory and condition are described in chapter three Inventory and Condition.

CTDOT Bureau of Public Transportation plays a major role for supporting these objectives for transit assets. Further details on roles and responsibilities are included in chapter seven, Implementation and Monitoring.

CHAPTER 3

Inventory and Condition

Inventory and condition data are the building block upon which investment decisions are made. Inventory and condition data are also valuable for communicating the extent of CTDOT's assets and the state of those assets. Accurate inventory and condition data support asset management practices such as predicting asset conditions, projecting funding needs, and prioritizing investments.

Overview

This chapter presents a summary of CTDOT's transit asset inventory and its condition. CTDOT's PT-TAMP addresses rail, bus, and ferryboat revenue vehicles, equipment, infrastructure, and rail and bus facilities.

Federal Legislative Context

FTA requires that a Tier I provider's TAMP include an inventory and condition assessment of all capital assets for which the provider has direct capital responsibility. The inventory and condition assessment must be at a level of detail sufficient to model asset condition and support investment prioritization.

As part of the TAM plan rule, transit providers are also required to set performance targets for performance measures defined by FTA in 49 CFR §625.43. These are listed below.

FTA SGR Performance Measures for Capital Assets

- **Rolling Stock**: The performance measure for rolling stock is the percentage of revenue vehicles within a particular asset class that have either met or exceeded their useful life benchmark (ULB). ULB is maximum age of an asset based on operational characteristics (age, mileage, environment) before it is replaced or enters into SGR backlog.
- **Equipment**: The performance measure for non-revenue, support-service and maintenance vehicles equipment is the percentage of those vehicles that have either met or exceeded their ULB.
- **Infrastructure**: The performance measure for rail fixed guideway is the percentage of track segments with speed restrictions.
- **Facilities**: The performance measure for facilities is the percentage of facilities within an asset class, rated below condition 3 on the FTA Transit Economic Requirements Model (TERM) scale.[1]

Each year, a transit provider must set targets with a one-year horizon based on the most recent data and expected funding. These targets are reported annually to the NTD, as defined by 49 CFR Section 630. A provider must also

Useful Life Benchmark

ULB is the maximum age of an asset based on operational characteristics (age, mileage, environment) before it is replaced or enters into SGR backlog.

[1] See chapter four for full definition of TERM

coordinate with states and Metropolitan Planning Organizations (MPOs) in the setting of performance targets.

Connecticut PT-TAMP Assets

Connecticut's multi-modal transportation system consists of a wide variety of physical assets, as depicted in Figure 3-1.

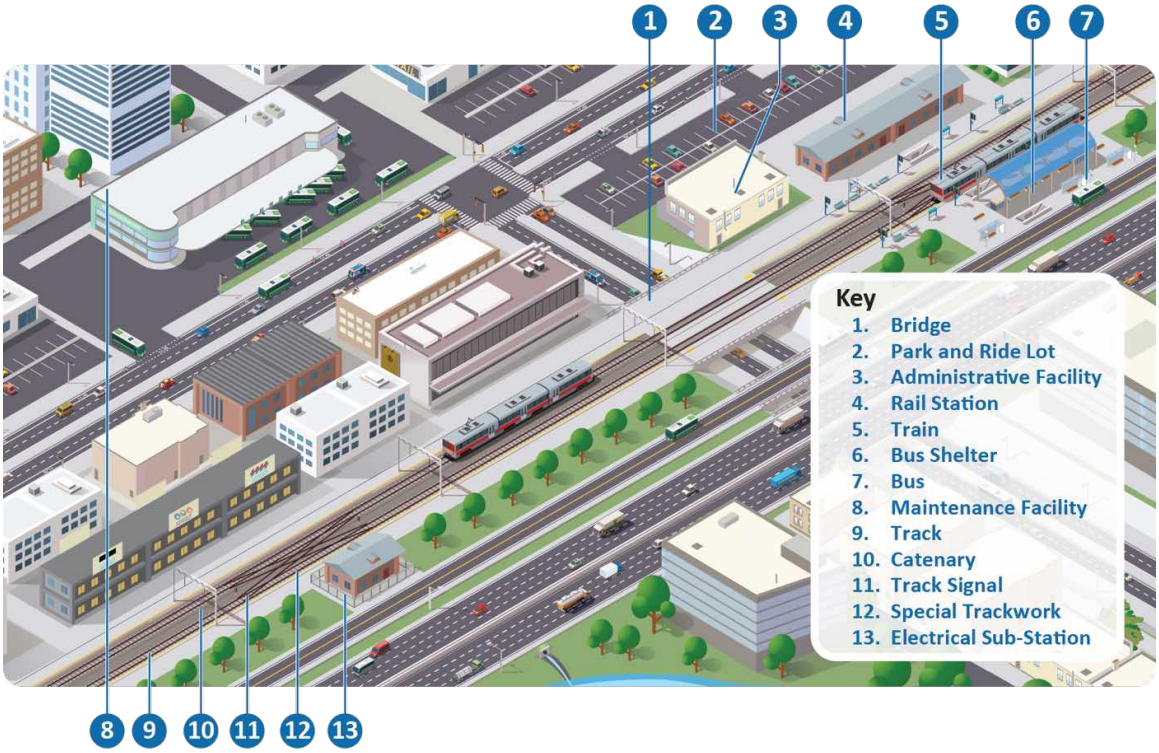


Figure 3-1. Transportation Assets in Connecticut

This plan focuses on four transit asset categories: rolling stock, equipment, infrastructure, facilities. These are the four asset categories defined by FTA and required for inclusion in the PT-TAMP. CTDOT has broken down the four asset categories into asset classes. CTDOT owns or operates rail, bus, and ferry passenger service; equipment; rail and bus rapid transit infrastructure; and passenger and maintenance facilities. The PT-TAMP asset hierarchy is presented in Figure 3-2.

Figure 3-2. PT-TAMP Asset Hierarchy

CTDOT Transit System Summary

Assets included in this plan are as follows[2]:

- 649 buses
- 422 rail vehicles
- 3 ferryboats
- 119 service vehicles
- 243 track miles of rail guideway
- 9.4 miles of bus-only guideway
- 12 administrative / maintenance facilities
- 53 passenger facilities

[2] Data as of 3/20/18

Bus

Tier I and Tier II bus service in Connecticut is shown in Figure 3-3.

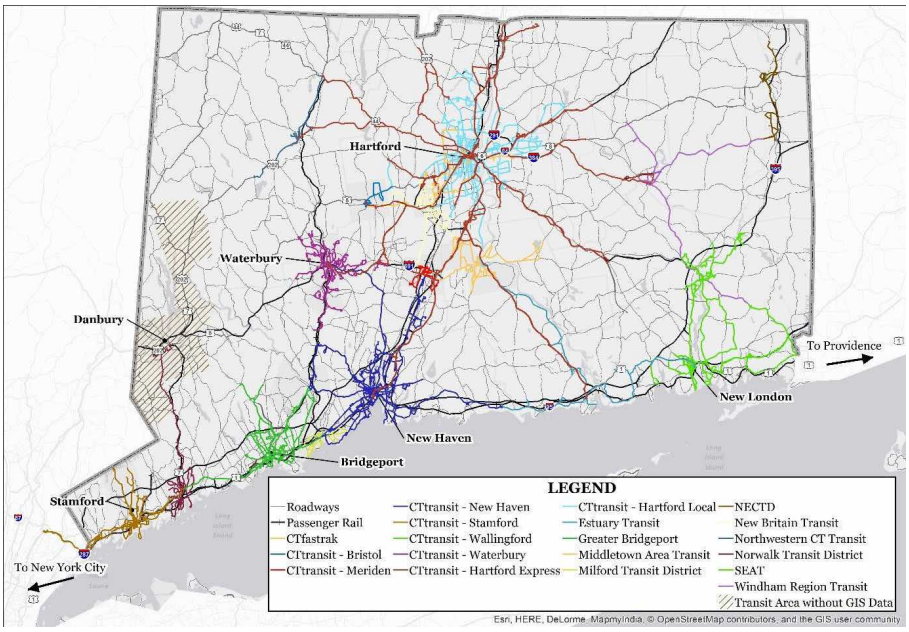


Figure 3-3. Bus Service in Connecticut

As described in chapter One, CTDOT owns and provides bus service, branded CTtransit, throughout Connecticut, but contracts out operation to private companies.

CTDOT also owns the bus rapid transit system CTfastrak, which operates on fixed guideway between Hartford and New Britain under CTtransit Hartford. According to FTA, bus rapid transit differs from bus transit in that the majority of each line operates in a separated right-of-way (ROW) dedicated for public transportation use during peak periods. Bus rapid transit also can include defined stations; traffic signal priority for transit vehicles; short headway bidirectional services; and pre-board ticketing, platform level boarding, and separate branding.

The CTfastrak system between New Britain and Hartford opened in March 2015 and reached a milestone in 2016 carrying its four millionth customer since opening day and routinely transporting more than 20,000 customers daily.

The primary assets of the bus service system in Connecticut are rolling stock, equipment and facilities. The majority of the primary bus assets in Connecticut are owned and supported with State and Federal funds. Connecticut owns all the rolling stock and equipment of CT Transit and maintenance facilities of six of the divisions of CT Transit in Hartford, New Haven, Stamford, Waterbury, Meriden and Wallingford.

Passenger Rail

Passenger rail service is shown below in Figure 3-4 below.

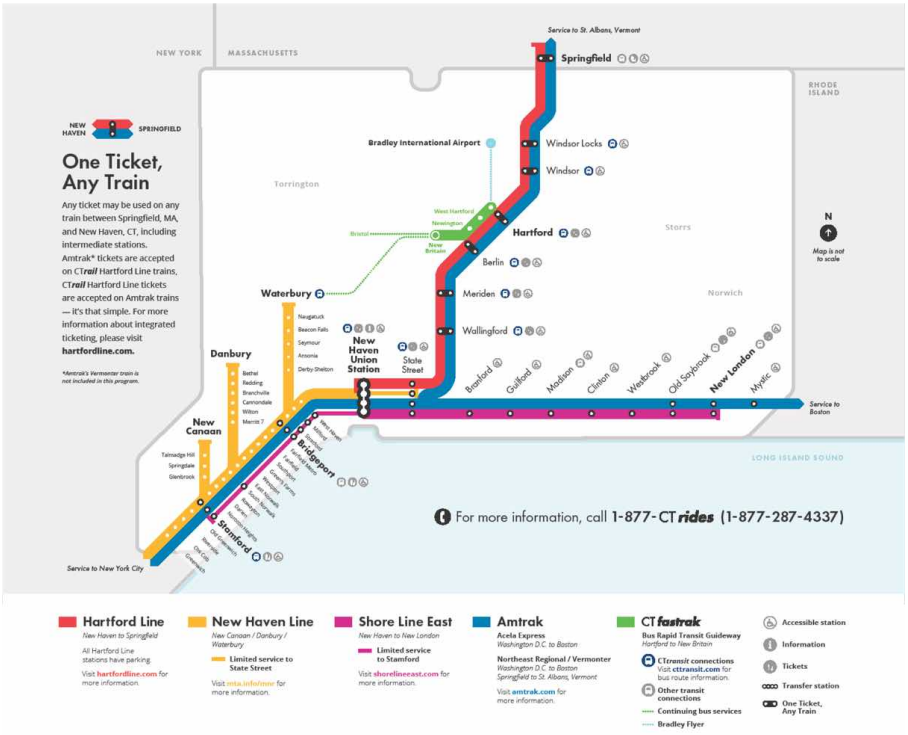


Figure 3-4. Passenger Rail Service in Connecticut

The CT-Rail network is mostly composed of the Northeast Corridor (NEC), a larger regional network of rail that connects Boston to Washington D.C. through Amtrak and other Commuter Rail services. The passenger rail network in Connecticut over which CTDOT services operate or has capital responsibility comprises the New Haven Line and branch lines, Shore Line East, and the Hartford Line.

The New Haven Line and Branch Lines represents the 48 mile segment of the NEC from the CT-NY State Line to New Haven, and the three separate branch lines supplementing the main New Haven Line service that terminates at Grand Central Terminal. The Main Line is generally a four track corridor electrified through an overhead contact system (OCS) to support a fleet that is mostly comprised of Electric Multiple Units (EMU). The branch lines are three additional single track routes considered as supplemental services that connect to the main line with less frequent service. The branch line services provided are the New Canaan, Danbury, and Waterbury, with segment mileages of 8, 24, and 27 miles respectively. The New Canaan branch is also electrified with overhead contact power that supports EMU Fleet while Danbury and Waterbury operate diesel only rolling stock. All lines except Waterbury use Centralized Traffic Control (CTC) signal systems, which uses manual block to

date. The system also comprises 38 passenger stations and 5 administrative/maintenance facilities (four rail yards and one standalone facility).

As stated in the ARSA mentioned in chapter one, CTDOT holds 100% capital responsibility for all fixed infrastructure along these routes. The New Haven Line continues west into New York State for about another 14 miles; however, this portion of the line is owned by MTA/MNR meaning CTDOT has no capital responsibility for this segment. CTDOT holds at least partial capital responsibility for all passenger facilities and 100% capital responsibility for the administrative/maintenance facilities on the Connecticut side of the New Haven Line. Rolling stock used along the line has a split ownership between CTDOT and MTA/MNR, and is denoted by vehicle number in each agency's inventory.

Shore Line East operates along the segment of the NEC from New Haven to New London, which is owned and maintained by Amtrak. This corridor spans approximately 50 miles, and is generally two tracks with passing sidings installed in various locations with OCS and CTC. Although the line is electrified through OCS, Shore Line East service currently uses diesel rolling stock which is owned by CTDOT. The service has 7 total passenger stations (not including New Haven Stations which are part of New Haven Line) and no SLE exclusive administrative/ maintenance facilities (New Haven Rail Yard is part of New Haven Line). Since Amtrak owns this portion of the Northeast Corridor, CTDOT only has capital responsibility for 5 of the 7 stations and diesel rolling stock but may help fund rail infrastructure projects along this route to provide financial assistance for Amtrak. The NEC within Connecticut continues past New London to the CT-RI state line, but only serves regional intercity Amtrak trains.

The Hartford Line represents a spur of the NEC, but is also the supporting rail network for the new Hartford Line intercity rail service that is provided through CTDOT. This line spans 62 miles from New Haven to Springfield, and is generally two tracks with no OCS and new Positive Train Control (PTC) installed, with a few segments that are single track north of Hartford. The service is operating existing Amtrak diesel locomotives and push-pull coaches, as well as recently leased diesel locomotives and push-pulls coaches operated by Trans America Services and Alternate Concepts Incorporated (TASCI). Occasionally, the Hartford Line will utilize Shore Line East diesel locomotive and passenger coaches. The service currently has 7 stations (includes Springfield, MA; but excludes the two New Haven stations) and no exclusive administrative / maintenance facilities (uses New Haven Rail Yard which is part of New Haven Line) along the route. Similar to SLE, Amtrak owns this corridor meaning CTDOT holds no capital responsibility even though the majority of the recent upgrades to the line used Connecticut state funds. Although CTDOT has leased a portion of the rolling stock used for this new service, any assets used

in the operation of the Hartford line are exempt from FTA TAM requirements as mentioned in chapter one and therefore are not reflected in the current inventory.

Asset Data and Inventory Development

Monitoring and measuring transit asset conditions enables CTDOT to assess the performance of the transit system, analyze deficiencies and predict future needs, allocate funding, and prioritize investments to maintain SGR. Asset condition is also an important public-facing measure. Users of the transit network notice and experience asset condition every day and recognize changes in asset condition. Further, public trust and confidence is bolstered when objective measurable results can be demonstrated from increased public investment. For depicting asset conditions, this PT-TAMP uses definitions of asset condition and SGR developed by CTDOT and consistent with FTA's mandated performance measures.

In CTDOT's Transit Gap Analysis, conducted prior to the development of the PT-TAMP, one gap was that CTDOT lacked a sophisticated asset inventory system that contained sufficient data to support capital decision-making. CTDOT's existing system for inventory tracking is a statewide financial management system called CORE-CT that is stewarded by the Bureau of Finance and Administration. While CORE-CT provides useful information such as asset ID's, asset age, and asset costs, the system provides limited asset management capabilities. As part of the development of the PT-TAMP, CTDOT defined and populated an asset inventory, the SGR Transit Database.

The first task was to establish the definition of a capital asset and to define an asset hierarchy. Inventory data on transit assets in Connecticut historically has been maintained at a unit level as opposed to an enterprise level, which provided varying definitions of assets and their conditions. While FTA set the four major asset categories required for the PT-TAMP, the PT TAM Unit had to coordinate with providers and staff to determine what should be considered a capital asset, what information should be collected, and where it should be stored.

The second task was the collection of inventory data from the transit service providers and CTDOT Capital Services unit. Transit asset inventory and condition data was collected from the individual transit service providers and authenticated by the PT TAM Unit. Data was input into the SGR Transit Database after final validation of the transit asset inventory by the PT TAM Unit. The data resources contributing to the SGR Transit Database are depicted in Figure 3-5.

Communication

The PT-TAMP is a valuable tool to communicate needs and to advocate for resources.

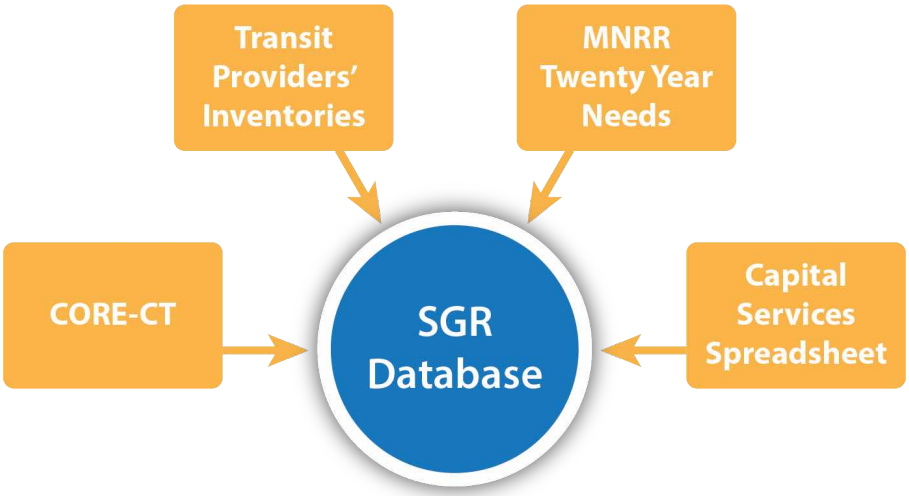


Figure 3-5. Data Resources for SGR Inventory

Rolling Stock and Equipment

Bus

The PT TAM Unit held several meetings with working groups composed of the transit service providers and CTDOT staff. The process of developing an asset inventory is one of the key elements of the TAMP Plan. Transit asset inventory was collected from the individual transit service providers and authenticated against CTDOT Capital Services database and the CORE-CT financial register. This step was integral in the process as many of Connecticut transit assets are owned, maintained and operated by the transit service providers thus do not register in the CORE-CT financial record but are subsidized 100% by CTDOT with state and federal funds. Verified bus data was imported into the SGR Transit Database.

Rail

Inventory data including model year (used to determine age) are stored by vehicle in the Office of Rail's Rolling Stock Inventory Database. For the purpose of developing its PT-TAMP, CTDOT extracted revenue vehicle data from this database, aggregated it by fleet, and imported the data into the SGR Transit Database.

Infrastructure

Bus Rapid Transit

CTDOT has begun the initial steps of data collection on CTfastrak guideway for inventory and condition assessment. Details of the condition assessment process are outlined in chapter seven. Future CTfastrak data will be imported into the SGR Transit Database.

Rail Guideway

The system of record for data on the rail guideway inventory is the set of track charts maintained for the NEC and branch lines. The charts show locations of major assets, and detail when assets were most recently rehabilitated.

As a supplement to the track charts, MNR maintains a less detailed, summary inventory of rail guideway assets for use in preparation of the MTA Twenty Year Needs Assessment (TYNA). The MNR data were imported into the SGR Transit Database and used to populate data on Track and Power in the CTDOT PT-TAMP.

CTDOT's existing structures data were used to populate the data for the structure asset class. Inventory and condition data for bridges are gathered through the bridge inspection process. The data are stored in CTDOT's Bridge Management System (BMS) using customized InspectTech software and updated based on inspections, which happen most commonly on an annual basis per FRA regulations. Existing structures data were imported into the SGR Transit Database.

Facilities

Administrative/Maintenance

Inventory data on Connecticut facilities are stored in CTDOT's Financial Management System (CORE-CT) and the transit providers' asset registries, but the level of detail stored on each facility varies. Thus, for the purpose of developing its PT-TAMP, CTDOT extracted data on administrative/maintenance facilities from CORE-CT and imported the data to the SGR Transit Database.

Component-level condition data are not available for all administrative / maintenance facilities. However, the overall condition of CTDOT-owned facilities has been previously established through engineering judgements when data was unavailable. Thus, component-level conditions were manually determined for each facility using the available component-level data, overall facility condition, and facility age.

Passenger

Inventory data on CTDOT facilities and the level of detail stored on each facility is limited. Thus, for the purpose of developing its PT-TAMP, CTDOT extracted data on passenger facilities from various sources.

Existing condition data available for passenger facilities varied by specific type of facility. For these facilities, component-level conditions were manually determined for each facility using the overall facility condition and facility age.

For rail stations, more detailed assessments were recently performed. The Design Unit of the Office of Rail conducted an evaluation, visual inspection and limited physical testing of the platforms/canopies, station buildings, and

pedestrian bridges (cross-track bridges and the bridges connecting the platforms to adjacent parking structures) at 43 of Connecticut's commuter rail stations in early 2017. The information collected from this assessment was used to establish current conditions of the platforms/canopies, station buildings, and pedestrian bridges.

Rolling Stock

In 49 CFR §625.5, FTA defines rolling stock as a revenue vehicle used in providing public transportation, including vehicles used for carrying passengers on fare-free services. CTDOT's PT-TAMP includes rolling stock operating in three modes of travel: bus, commuter rail, and ferry.

Bus Rolling Stock

Bus transit is an integral piece of Connecticut's public transportation system. Buses provide affordable, equitable, and reliable mobility to Connecticut travelers. FTA defines the bus transit mode as comprised of rubber-tired passenger vehicles operating on fixed routes and schedules over roadways. Vehicles can be powered by diesel, gasoline, battery, or alternative fuel engines contained within the vehicle.

As stated in chapter one, CTDOT owns the local bus systems in Hartford, New Haven, Stamford, Waterbury, New Britain, Bristol, Meriden, and Wallingford, and operates them under the CT transit brand name. CTDOT owns all the rolling stock that provides CTtransit services. CTtransit services carry roughly 80% of annual bus ridership in Connecticut.

CTtransit Hartford, the largest of the eight divisions operates CTfastrak and provides service using a fleet of rolling stock which includes articulated buses, transit buses and over the road Motor Coach Industries (MCI's). CTtransit New Haven operates a fleet which includes both articulated and transit buses. CTtransit Stamford, the smallest of the Hartford, New Haven, Stamford (HNS) operations include articulated buses, transit buses and over the road Motor Coach Industries (MCI) in their fleet.

CTtransit divisions of Waterbury, Meriden and Wallingford provide service through North-East Transportation Company Inc. The fleet includes transit buses and cutaways for both fixed route and paratransit service.

New Britain and Bristol divisions of CTtransit are provided through the private companies of New Britain Transportation and Dattco whose fleets include both transit buses and over the road MCIs.

Nason/Kelley, a private operator contracted with CTDOT provides express bus service utilizing a fleet which includes over the road MCIs.

Rolling Stock

Revenue vehicle used in providing public transportation

CTtransit

CTtransit is the brand name for CTDOT-owned bus service across Connecticut. Several companies, including Datto, North-East Transportation Company Inc., New Britain Transportation Co, and Nason/Kelley are under contract to CTDOT to operate the bus service.

CTDOT's rolling stock inventory is used to provide both fixed route and demand response service, and includes a number of asset types. FTA defines these vehicle types in the 2017 NTD Glossary[3].

Bus Types	
	**Transit Bus**: A transit mode comprised of rubber-tired passenger vehicles operating on fixed routes and schedules over roadways. Vehicles are powered by: • Diesel • Gasoline • Battery • Alternative fuel engines contained within the vehicle.
	**Articulated Bus**: Extra-long (54 ft. to 60 ft.) bus with two connected passenger compartments. The rear body section is connected to the main body by a joint mechanism that allows the vehicles to bend when in operation for sharp turns and curves and yet have a continuous interior.
	**Over-the-road Bus:** A bus characterized by an elevated passenger deck located over a baggage compartment.

3 FTA. *National Transit Database Glossary*. FTA, 2017.

Cutaway: A vehicle that consists of a bus body that is mounted on the chassis of a van or light-duty truck. The original van or light-duty truck chassis may be reinforced or extended. Cutaways typically seat 15 or more passengers and may accommodate some standing passengers.

Bus Condition Assessment and Performance Measures

The purpose of the rolling stock condition assessment is to provide an overall snapshot of the current state of repair of a fleet to aid in decisions concerning when it is most cost effective to replace it.

FTA's mandated performance measure for rolling stock is the percentage of assets within a class that have met or exceed their ULB. An asset is deemed to be in SGR if its age is less than the ULB specified for the corresponding asset type. Likewise, an asset is deemed to no longer be in SGR if its age equals or exceeds the corresponding ULB. The ULB value may be specified in terms of asset age, mileage and/or other factors. FTA provides a set of default ULB values by asset type, all of which are specified in terms of asset age. An agency can use these or set its own values.

CTDOT has worked with transit service providers in Connecticut to define custom ULB values. The custom ULBs align more with the Connecticut operating environment. The miles incurred by our vehicles annually can far exceed the useful life of that vehicle class, particularly for cutaway bus, vans and mini vans utilized for paratransit service.

The climate of New England further adds to the deterioration of vehicles caused by salt and chemical treatments of the roads in Connecticut.

Connecticut's custom ULB values for bus rolling stock are listed in Table 3-1.

Table 3-1. ULB Values for Bus Rolling Stock

Asset Type	FTA Default ULB (years)	Connecticut ULB (years)
Transit Bus	14	12
Articulated Bus	14	12
Over-the-road Bus	14	12
Cutaway	10	5

Bus Inventory and Conditions

CTDOT owns 649 revenue vehicles, the majority of which are transit buses. Table 3-2 summarizes CTDOT's bus inventory and condition.

Table 3-2. CTDOT Bus Inventory and Condition

Asset Type	Inventory	Vehicles below ULB	Vehicles met or exceeded ULB	
Transit Bus	496 vehicles	81%	19%	
Articulated Bus	51 vehicles	100%	0%	
Over-the-Road Bus	60 vehicles	97%	3%	
Cutaway Bus	42 vehicles	100%	0%	

Rail Rolling Stock

CTDOT's rail rolling stock consists of three vehicle types, as defined in the NTD Glossary.

Rail Vehicle Types	
	**Commuter Rail Locomotive:** Commuter rail vehicles used to pull or push passenger coaches. Locomotives do not carry passengers themselves.
	**Commuter Rail Passenger Coach:** Commuter rail passenger vehicles not independently propelled and requiring one or more locomotives for propulsion.

Commuter Rail Self-Propelled Passenger Car: Commuter rail passenger vehicles not requiring a separate locomotive for propulsion.

Rail Rolling Stock Condition Assessment and Performance Measures

The condition assessment approach and performance measures are the same for rail rolling stock as for bus rolling stock.

Connecticut's ULB values for rail rolling stock are listed in Table 3-3. Locomotives and passenger coaches have different custom ULBs depending on the rail service due to differing use patterns and maintenance schedules.

Table 3-3. ULB Values for Rail Rolling Stock

Asset Type	FTA Default ULB (years)	Connecticut ULB (years)
Commuter Rail Locomotive (MNR)	39	35
Commuter Rail Locomotive (SLE/HL)	39	25
Commuter Rail Passenger Coach (MNR)	39	35
Commuter Rail Passenger Coach (SLE/HL)	39	25
Commuter Rail Self-Propelled Passenger Car	39	35

Rail Rolling Stock Inventory and Condition

CTDOT owns 428 rail vehicles, the majority of which are EMUs. Of the EMUs, there are 274 Kawasaki M8s and 36 General Electric M2s. CTDOT's rail inventory also includes 34 locomotives and 84 passenger coaches. Of the 84 Passenger Coaches, 51 are Bombardier's used primarily on the Danbury and Waterbury Branch Lines while 33 are Mafersa's used for SLE and HL. Table 3-4 summarizes CTDOT's rail rolling stock inventory and condition.

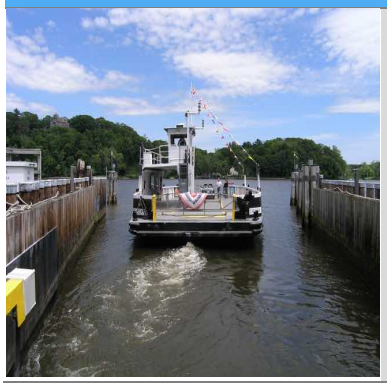
Table 3-4. CTDOT Rail Rolling Stock Inventory and Condition

Asset Type	Inventory	Vehicles below ULB	Vehicles met or exceeded ULB	
Commuter Rail Locomotive (MNR)	22 vehicles	46%	54%	
Commuter Rail Locomotive (SLE/HL)	12 vehicles	0%	100%	
Commuter Rail passenger coach (MNR)	50 vehicles	100%	0%	
Commuter Rail passenger coach (SLE/HL)	33 vehicles	0%	100%	
Commuter Rail Self-Propelled Passenger Car	310 vehicles	88%	12%	

Ferryboat

CTDOT owns and operates two historic Connecticut River ferries as referenced in chapter one – one that connects Rocky Hill to Glastonbury, and another that connects Chester to Hadlyme. FTA defines ferryboat in the 2017 NTD Glossary as a transit mode comprised of vessels that carry passengers and/or vehicles over a body of water and are generally steam or diesel powered.

Ferry Vehicle Types



Ferryboat: Vessels for carrying passengers and / or vehicles over a body of water. The vessels are generally steam or diesel powered conventional ferry vessels. They may also be hovercraft, hydrofoil and other high-speed vessels.

Ferryboat Rolling Stock Condition Assessment and Performance Measures

The condition assessment approach and performance measures are the same for ferryboats as for all other rolling stock. Connecticut's ULB values for ferryboat rolling stock are listed in Table 3-5.

Table 3-5. ULB Values for Ferryboat Rolling Stock

Asset Type	FTA Default ULB (years)	Connecticut ULB (years)
Ferryboat	42	42

Ferryboat Rolling Stock Inventory and Condition

CTDOT owns 3 ferryboats: a double-ended, self-propelled ferry; a barge; and a towboat. Table 3-6 summarizes CTDOT's ferryboat inventory and condition.

Table 3-6. CTDOT Rail Rolling Stock Inventory and Condition

Asset Type	Inventory	Vehicles below ULB	Vehicles met or exceeded ULB	
Ferryboat	3 vehicles	0%	100%	

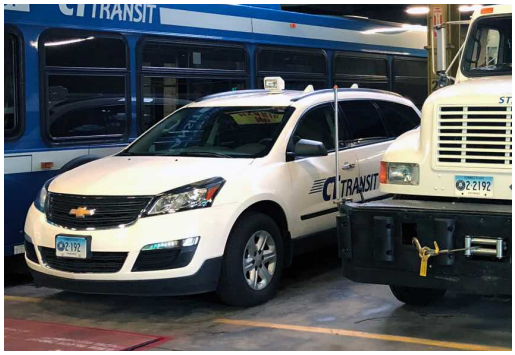
Inventory data including model year (used to determine age) are stored by vehicle in the SGR Transit Database.

Equipment

In 49 CFR §625.5, FTA defines equipment as an article of nonexpendable, tangible property having a useful life of at least one year. In Connecticut's case, most equipment assets are service vehicles, defined by FTA as equipment used primarily to support maintenance and repair work for public transportation. Examples of service vehicles provided in the 2017 NTD Glossary include tow trucks, supervisor vans, transit, staff cars, and maintenance vehicles for maintaining passenger facilities and (ROW). CTDOT's PT-TAMP includes service vehicles supporting two modes of travel: bus and commuter rail.

Note that CTDOT's inventory includes a small number of additional pieces of equipment valued at $50,000 or more, but these are not detailed here. Please refer to Appendix H for a detailed list.

CTDOT's service vehicles are organized into five types. Trucks, automobiles, Sport Utility Vehicles, and vans can be used as staff vehicles. Steel wheel vehicles are used for inspection and maintenance of facilities and (ROW). The definitions for these vehicles are shown on the next page.

Service Vehicle Types	
	**Automobiles:** Passenger cars, up to and including station wagons in size. Excludes minivans and anything larger.
	**Rubber Tire Vehicles (Truck):** Any motor vehicle designed to transport Cargo
	**Sport Utility Vehicle:** A high-performance four-wheel drive car built on a truck chassis. It is a passenger vehicle which combines the towing capacity of a pickup truck with the passenger-carrying space of a minivan or station wagon.
	**Van:** An enclosed vehicle having a typical seating capacity of 8 to 18 passengers and a driver. A van is typically taller and with a higher floor than a passenger car, such as a hatchback or station wagon.

Steel Wheel Vehicle: Any support vehicle that is solely used on a running rail.

Equipment Condition Assessment and Performance Measures

CTDOT uses the same basic approach for assessing condition of equipment as it does for rolling stock. Specifically, a custom ULB value is established for equipment type. A piece of equipment is assessed as being in SGR if its age is less than the corresponding ULB, and not in SGR if it meets or exceeds the ULB. This approach supports reporting of FTA's mandated SGR performance measure for equipment: the percentage of service vehicles that have met or exceed their ULB. Connecticut's custom ULBs for equipment are listed in Table 3-7.

Table 3-7. ULB Custom Values for Equipment

Asset Type	FTA Default ULB (years)	Connecticut ULB (years)
Rubber Tire Vehicle (Truck)	14	14
Automobile	8	5
Sport Utility Vehicle	8	5
Van	8	5
Steel Wheel Vehicle	25	25

Equipment Inventory and Condition

CTDOT owns 119 service vehicles, 76 for bus and 43 for rail. Table 3-8 summarizes CTDOT's equipment inventory and its condition.

Table 3-8. CTDOT Equipment Inventory and Condition

Asset Type	Inventory	Vehicles below ULB	Vehicles met or exceeded ULB	
Rubber Tire Vehicle (Truck)	27 vehicles	74%	26%	
Automobile	11 vehicles	54%	46%	
Sport Utility Vehicle	27 vehicles	70%	30%	
Van	11 vehicles	46%	54%	
Steel Wheel Vehicle	43 vehicles	2%	98%	

Inventory data including model year (used to determine age) are stored by vehicle in the SGR Transit Database.

Infrastructure

In 49 CFR §625.5, FTA defines infrastructure as the underlying framework or structures that support a public transportation system. For the purposes of the TAMP, this refers to track, power, signals/communications, and structures. CTDOT owns both rail (New Haven Line and three branch lines) and bus (CTfastrak) fixed guideway, along with any fixed infrastructure located along these lines.

Rail Infrastructure

As noted earlier, the only rail segment that CTDOT owns is the NEC between New Haven and the New York/Connecticut border, as well the New Canaan, Danbury and Waterbury Branch Lines. Therefore the values below only include these segments, and exclude infrastructure along Shore Line East and the Hartford Line.

Rail Infrastructure is not just the track, but the various infrastructure along the ROW that supports the movement of trains along the track. The infrastructure can span from simple assemblies like Rail and Ties, to intricated systems such as substations, grade crossings, and catenary, to multi-million structures such as moveable bridges. MNR and CTDOT both have a Maintenance-of-Way (MOW) unit, which refers to personnel in charge of maintaining fixed railroad

property. The assets are summarized into four main types below based on how MNR has structured divisions within its MOW unit:

Rail Infrastructure Types	
	**Track Elements:** Track-related infrastructure; includes running rail, ties, turnouts, and ballast.
	**Power:** Infrastructure related to the transmission of power for signals and traction via the overhead contact system. Includes AC substations, catenary plant, catenary portals, and transmission equipment.
	**Communication and Signals:** Systems related to the monitoring and safety of train movements. Includes switches and signals, grade crossings, vehicle detection equipment, Intelligent Transportation System technology, and Positive Train Control equipment.
	**Structures:** Major Infrastructure to supplement safe movement of trains above or below grade. Includes Moveable Bridges, Fixed Bridges, Culverts, Station Pedestrian Bridges/Tunnels, and Retaining Walls.

Rail Infrastructure Condition Assessment and Performance Measures

For all rail guideway assets other than bridges and culverts, CTDOT assesses condition based on asset age, using an approach patterned on current MNR practices. For each asset type a ULB value is specified in years. Asset condition is then approximated by comparing the age of the asset (years since it was either constructed or last rehabilitated) to the ULB. A condition rating is assigned on the five-point TERM scale based on Table 3-9.

Table 3-9. Conversion Scale: Rail Infrastructure Asset Age to FTA TERM Condition Rating

Asset Age as % of ULB	TERM Rating	Condition
New	5	Excellent
≤ 50%	4	Good
>50% and ≤100%	3	Adequate
>100% and ≤125%	2	Marginal
≥125%	1	Poor

Note the ULB values used here for rail infrastructure are generally consistent with those for MNR described in the MTA Twenty Year Needs Assessment (TYNA).

Connecticut's ULBs for track elements are listed in Table 3-10.

Table 3-10. ULB Values for Track elements

Asset Class	Asset Type	ULB (years)
Rail	Tangent	40
	Curves <2 degrees	30
	Curves 2-4 degrees	20
	Curves >4 degrees	10
Ties	Concrete	40
	Wood	30
Turnouts	High Speed	25
	Mainline	20
	Yard	30
	Siding	30

Connecticut's ULBs for power are listed in Table 3-11.

Table 3-11. ULB Values for Power

Asset Class	Asset Type	ULB (years)
Overhead Catenary	Overhead Catenary	50
Power Cable	AC Feeder Cable	40
	Signal Power 12kV	50
Catenary Poles	Catenary Poles	100
Substations / Power Distribution	Substation Wayside Switchyard	30
	Anchor Bridge Substation	30
	Snow Melter Transformers/Unit Substation	30
	Supply Stations	40
	Substations	20
	Yard Power Distribution System	30

For structures, a detailed assessment approach has already been defined and implemented. The FRA established Railroad Bridge Safety Standards, 49 CFR Parts 213 and 237 that require track owners to adopt and implement a Railroad Bridge Management Program (RBMP). CTDOT is the railroad track owner as defined in §237.5 for the commuter operations and freight on the NHL and numerous lines or segments of lines supporting freight and tourist operations throughout the state. The Federal Regulations stipulate that each railroad track owner perform inspections, prepare reports, and determine the safe load capacity for railroad bridges in accordance with their adopted RBMP. This RBMP is intended to be specific to structures supporting railroad track and is complemented by the CTDOT Railroad Bridge Inspection Manual (RBIM). The purpose of this Manual is to define the procedures and practices of the CTDOT Office of Rail for determining the physical condition, load capacity and maintenance needs of railroad bridges in the State of Connecticut.

CTDOT performs visual inspections of structures in the subcategories Fixed, Moveable, Culvert, and Pedestrian. These are patterned on the approach used for highway bridges. Through the inspection CTDOT assesses condition of the bridge deck, superstructure and substructure condition using the 10-point National Bridge Inventory (NBI) condition scale (with values ranging from 0 to 9) rather than the 5-point TERM scale described here. For culverts a single

overall culvert rating is specified. A bridge is deemed to be in SGR if all of its ratings are 5 or greater and not in SGR if any rating is 4 or less.

Rail Infrastructure Inventory and Condition

CTDOT owns 243 track miles of passenger rail infrastructure. Tables 3-12 through 3-15 summarize CTDOT's track, power, structures, and signals inventory and condition.

Table 3-12. CTDOT Track Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Rail	243 track miles	50%	50%	
Tie	243 track miles	69%	31%	
Turnout	375 assets	72%	28%	

Note that the asset class Power Cable includes asset types AC Feeder Cable and Signal Power 12kV cable. The asset class Substations / Power Distribution includes six asset types. The condition data shown in Table 3-13 is a average of the asset types within each asset class, weighted by unit cost.

Table 3-13. CTDOT Power Inventory and Condition

Asset Class	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Overhead Catenary	288 miles	100%	0%	
Power Cable	291 miles	1%	99%	
Catenary Poles	870 assets	0%	100%	
Substations / Power Distribution	44 assets	64%	36%	

Table 3-14. CTDOT Structures Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Fixed	148 assets	68%	32%	
Moveable	5 assets	60%	40%	
Culvert	36 assets	86%	14%	
Pedestrian	17 assets	82%	18%	

For the asset category Signals, work remains to be performed to develop a full inventory. Thus, for this category the CTDOT inventory has entries for the New Haven Main Line, New Canaan Branch, Danbury Branch, and Waterbury Branch.

Table 3-15. CTDOT Signals Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Main Line	185 miles	100%	0%	
New Canaan	8 miles	100%	0%	
Danbury	24 miles	100%	0%	
Waterbury	27 miles	0%	100%	

Bus Infrastructure

CTDOT owns the CTfastrak bus fixed guideway between New Britain and Hartford. The guideway consists of 9.4 miles of pavement and multiple structures.

Bus Infrastructure Condition Assessment and Performance Measures

CTDOT's approach for inventorying and assessing condition of bus fixed guideway assets has not been implemented to date, though it will incorporate the approach used for highway assets, for which existing systems and approaches are well defined.

For pavement, CTDOT uses a Pavement Condition Index (PCI) to measure the condition of CTDOT-maintained pavements. PCI is calculated for each 0.1-mile segment based on five metrics. The overall PCI is a weighted average of the following metrics shown in Table 3-16 below.

Table 3-16. Pavement Condition Index Metrics

Metric	Weight	Description
Roughness	**10%**	An indicator of pavement roughness experienced by road users traveling over the pavements. The International Roughness Index (IRI) is computed from a single longitudinal profile
Rutting	**15%**	Rutting is quantified for asphalt pavements by measuring the depth of ruts along the wheel path. Rutting is commonly caused by a combination of high traffic volumes, heavy vehicles and the instability of the pavement mix.
Cracking	**25%**	Cracks in the pavement surface can be caused or accelerated by aging, loading, poor drainage, frost heaves or temperature changes, or construction flaws. Cracking is measured in terms of the percentage of cracked pavement surface.
Disintegration	**30%**	Disintegration is the wearing away of the pavement surface caused by the dislodging of aggregate particles and loss of asphalt binder. CTDOT calculates the disintegration metric using pavement age.
Drainage	**20%**	Drainage refers to the ability of the surface of the roadway to drain. CTDOT uses the collected cross slope and grade of the roadway to compute the drainage metric

The PCI is scaled from 1.0 to 9.0, with 9.0 describing a pavement without defects. Within this scale, roadways with a PCI less than 4.0 are classified in "Poor" condition, those between 4.0 and less than 6.0 are in "Fair" condition, 6.0 to less than 8.0 PCI indicates "Good" condition, and 8.0 to 9.0 indicates "Excellent" condition. A pavement section for which the PCI is 6 or greater is classified as being in a state of good repair. Implementation strategies are referred to in chapter seven.

For structures, CTDOT uses a similar approach for rail and highway bridges. As described previously, bridges are inspected visually. Conditions of bridge decks, superstructures and substructures are assessed using the 10-point NBI scale.

Bus Infrastructure Inventory and Condition

CTDOT owns 9.4 centerline miles of bus fixed guideway and 15 bridges. As described previously, CTDOT does not yet collect inventory and condition data for bus guideway pavement, but will in the future. CTDOT has already inventoried and inspected the bridges on the CTfastrak guideway and is managing these together with other highway bridges. Table 3-17 summarizes CTDOT's bus guideway inventory and condition for bridges only.

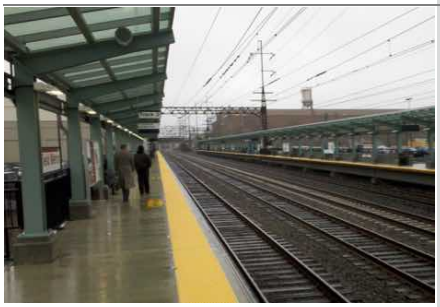
Table 3-17. CTDOT Bus Guideway Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Structure	15 bridges	100%	0%	

Facilities

CTDOT categorized transit facilities into FTA's two main classes: administrative/ maintenance facilities, and passenger facilities. CTDOT owns a majority of these facilities and has capital responsibility for these properties that are operated and maintained by transit providers and other property managers. The condition assessment approach is similar for both facility types, and relies on visual inspection of primary facility components. However, the specific facility components and available data differ between the two types of facilities.

Facilities in this TAM plan are categorized by a Parent/Child Relationship of Site and Building. There are numerous occurrences where a facility may be a single site but have multiple buildings/structures, or have a site but no enclosed structure, particularly for passenger rail stations. Therefore for consistency, inventory counts for facilities are by site, but any condition assessment should be done separately for each building/structure.

Facility Types	
	**Administrative/Maintenance:** Administrative facilities are typically offices that house management and supporting activities for overall transit operations such as accounting, finance, engineering, legal, safety, security, customer services, scheduling, and planning. They also include facilities for customer information or ticket sales, but that are not part of any passenger station. Maintenance facilities are those where routine maintenance and repairs or heavy maintenance or unit rebuilds are conducted.
	**Passenger/Parking:** Passenger facilities are significant structures on a separate ROW. For rail modes, passenger facilities typically mean a platform area and any associated access structures or accessory spaces accessible to passengers or by staff who are in support of passenger service.

Administrative / Maintenance Facilities

CTDOT owns 12 administrative/maintenance facilities for rail, bus, and ferry services. These include CTtransit facilities in Hartford, Stamford, New Haven, and Waterbury; CTferry facilities in Rocky Hill and Chester/Hadlyme, and rail facilities in Bridgeport, Danbury, New Haven, Stamford, and Springdale.

Administrative/Maintenance Facility Condition Assessment and Performance Measures

CTDOT has started to inspect facilities using an approach based on FTA's guidance detailed in *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*. FTA's guidance is intended to support calculation of FTA's mandated SGR performance measure for facilities, which is the percentage of facilities within an asset class rated less than 3 on the five-point scale used in TERM. However, a facility with an overall condition rating of 3 or greater may still have outstanding SGR needs for certain components. CTDOT's approach is detailed in a Condition Assessment Guidance document.

Major facility components are inspected and rated on a 1 to 5 condition scale. The condition rating values and their descriptions are listed in Table 3-18. The components are listed in Table 3-19.

Table 3-18. FTA TERM Condition Assessment Scale

Rating	Condition	Description
5	**Excellent**	No visible defects, new or near new condition, may still be under warranty if applicable
4	**Good**	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	**Adequate**	Moderately deteriorated or defective; but has not exceeded useful life
2	**Marginal**	Defective or deteriorated in need of replacement; exceeded useful life
1	**Poor**	Critically damaged or in need of immediate repair; well past useful life

The specific components of administrative/maintenance facilities are listed below. Note that the first nine components listed in the table are assessed for each building in the facility, and the final component, Site, is assessed for the site as a whole.

Table 3-19. Administrative/Maintenance Facility Components

Inventory Unit	Component	Notes	Typical Useful Life* (years)	Component Condition Weight**
Building	Substructure		30	1.0
Building	Shell		30	1.0
Building	Interior		30	1.0
Building	Plumbing	May need to assess based on age	20	1.0
Building	HVAC	May need to assess based on age	20	1.0
Building	Electrical	May need to assess based on age	30	1.0
Building	Fire Protection	See Table 5 in Appendix B	20	1.0
Building	Conveyance	See Table 5 in Appendix B	20	1.0
Building	Equipment	Includes fixed specialty equipment	30	1.0
Building	Site		50	1.0

*Useful life can be utilized for components that cannot be visually inspected.
**Component Condition Weight represents the relative importance of the component compared to other components. By default, these numbers are 1.0. However, based on the agency's experiences and practices, the inspector can use a different number to lower or raise the importance of a component and thus change how component conditions impact the overall facility condition.

For some components, a visual inspection may be insufficient for establishing conditions. In these cases, an age-based approach is used to estimate condition using useful life for the component listed in Table 3-19 with the conversion scale shown in Table 3-20. Useful life is the average amount of time in years that an item, component, or system is economically efficient to keep in operation.

Table 3-20. Conversion Scale: Asset Age to FTA TERM Condition Rating

Asset Age as % of ULB	TERM Rating	Condition
New	5	Excellent
≤ 50%	4	Good
>50% and ≤100%	3	Adequate
>100% and ≤125%	2	Marginal
≥125%	1	Poor

*Useful life can be utilized for components that cannot be visually inspected.

For Fire Protection and Conveyance, separate inspections are typically performed to assess code compliance. CTDOT uses the results from those inspections in performing their condition assessment, applying the condition assessment scale shown in Table 3-21 for these components.

Table 3-21. Fire Protection and Conveyance Condition Assessment Scale

Rating	Condition	Description
5	Excellent	System is new and there are no identified code issues
4	Good	System is not new, but there are no identified code issues
3	Adequate	Isolated code issues exist that can be addressed through maintenance
2	Marginal	Code issues exist that do not necessitate facility closure
1	Poor	Extensive code issues have been identified that may necessitate facility closure

Given the individual component conditions, the overall condition of the facility is calculated as:

$$Condition = \frac{\sum_{i=1}^{n} c_i f_i r_i}{\sum_{i=1}^{n} f_i r_i}$$

where c_i is the condition of component i, f_i is the weight factor listed in Table 3-19, and r_i is the replacement cost of the component.

Administrative/Maintenance Facility Inventory and Condition

Of the 12 admin/maintenance facilities owned by CTDOT, only 9 require condition assessments, as the 3 ferry facilities are excluded from FTA TAMP reporting requirements. Of these 9 facilities, only the CTtransit Hartford facility has had a recent detailed inspection and condition assessment. The remaining administrative/maintenance facilities were determined to be above a three on the TERM scale based on Engineering Judgements. Table 3-22 summarizes CTDOT's administrative/maintenance facility inventory and condition.

Table 3-22. CTDOT Administrative/Maintenance Facility Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Administrative /Maintenance Facility	9 facilities	100%	0%	

Passenger Facilities

CTDOT owns 53 passenger facilities for bus rapid transit and commuter rail services, including 10 CTfastrak passenger facilities and 43 rail passenger facilities.

Passenger Facility Condition Assessment and Performance Measures

The condition assessment approach for passenger facilities is similar to that for administrative/maintenance facilities. The approach described here is based on FTA's guidance detailed in *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*. FTA's guidance is intended to support calculation of FTA's mandated SGR performance measure for facilities, which is the percentage of facilities within an asset class rated less than 3 on the five-point TERM scale. However, a facility with an overall condition rating of 3 or greater may still have outstanding SGR needs for certain components.

Major facility components are inspected and rated on a 1 to 5 condition scale. The condition rating values and their descriptions are listed in Table 3-18. The components are listed in Table 3-23.

Regarding the specific components of passenger facilities, note that first nine listed in the table below are assessed for each building in the facility. Three components are assessed for each platform, and Site is assessed for the site as a whole.

Table 3-23. Passenger Facility Components

Inventory Unit	Component	Notes	Typical Useful Life* (years)	Component Condition Weight**
Building	Substructure		30	1.0
Building	Shell		30	1.0
Building	Interior		30	1.0
Building	Plumbing	May need to assess based on age	20	1.0
Building	HVAC	May need to assess based on age	20	1.0
Building	Electrical	May need to assess based on age	30	1.0
Building	Fire Protection	See Table 6 in Appendix B	20	1.0
Building	Conveyance	See Table 6 in Appendix B	20	1.0
Building	Fare Collection		20	1.0
Platform	Structure		30	1.0
Platform	Canopy		30	1.0
Platform	Electrical		30	1.0
Site	Site		50	1.0

*Useful life can be utilized for components that cannot be visually inspected.
**Component Condition Weight represents the relative importance of the component compared to other components. By default, these numbers are 1.0. However, based on the agency's experiences and practices, the inspector can use a different number to lower or raise the importance of a component and thus change how component conditions impact the overall facility condition.

The other details of the assessment process are identical to that described previously for administrative/maintenance facilities. Table 3-20 lists rating values to use if CTDOT uses age as a proxy for condition. Table 3-21 lists specific condition assessment language to use for fire protection and conveyance. Given the individual component conditions, the overall condition of the facility is calculated as:

$$Condition = \frac{\sum_{i=1}^{n} c_i f_i r_i}{\sum_{i=1}^{n} f_i r_i}$$

where c_i is the condition of component i, f_i is the weight factor listed in Table 3-23, and r_i is the replacement cost of the component.

Recent rail passenger facility inspections conducted by CTDOT contained sufficient information to meet FTA requirements for conducting facility condition assessment, as well as defining condition states that were converted

to FTA's TERM 1-5 Scale for NTD reporting. The inspections were performed for different facility components using a 10-point scale similar to the NBI condition scale (with values ranging from 0 to 9). NBI conditions were converted to the TERM scale by dividing the rating by 2 and then rounding to the nearest integer value. Thus, a component was deemed to have a TERM rating of 2 if its NBI rating was 5 (fair) or less. The conversion scale is show in Table 3-24.

Table 3-24. Conversion Scale: NBI to TERM

NBI Scale	TERM Rating	Condition
9	5	Excellent
8	4	Good
7		
6	3	Adequate
5	2	Marginal
4		
3		
2	1	Poor
1		
0		

The rail facility inspections were mapped to component conditions as follows:

- The condition for Substructure was established based on the value for Foundations.
- The condition for Shell was established based on the minimum of Roof and Exterior Walls.
- The condition for Interior was established based on the minimum of Interior Walls, Floors, Windows/Skylights/Doors, Stairs/Ramps and Walking Surfaces.
- The condition for Plumbing was established based on the minimum of the two ratings for Drainage and the rating for Restrooms.
- The condition for HVAC was established based on the minimum of HVAC, Duct Work, Compressors, and Blowers.
- The condition for Conveyance was established based on the minimum of Elevator Pit, Elevator Machine Room, Elevator Cab, and Escalator.
- The condition for Site was established based on the value for Site-Electrical.

For rail platforms, the condition was determined for the components Structure, Canopy and Electrical. For each of these the condition was determined by taking the minimum of the subcomponent ratings.

The station data included information on station bridges, but this was considered to be part of the data set of Fixed Guideway – Structures.

Passenger Facility Inventory and Condition

CTDOT owns 53 passenger facilities. Passenger facility assessments and score conversions were only available for rail stations. CTfastrak stations were determined to be above a three on the TERM scale based on Engineering Judgements. Table 3-25 summarizes CTDOT's passenger facility inventory and condition.

Table 3-25. CTDOT Passenger Facility Inventory and Condition

Asset Type	Inventory	Rated 3 or above on TERM scale	Rated below 3 on TERM scale	
Passenger Facility (Commuter Rail)	43 facilities	42%	58%	
Passenger Facility (Bus Rapid Transit)	10 facilities	100%	0%	

FTA Performance Measures

As mentioned throughout this chapter, FTA has established SGR performance measures for the four capital asset categories required for the PT-TAMP. Transit providers must set one-year performance targets for each applicable performance measure. These targets must be updated and submitted on the A90 form of the Asset Inventory Module (AIM) module to the NTD annually. The NTD AIM is designed to collect basic information on assets and infrastructure used by U.S. transit agencies to deliver service. Beginning in Report Year (RY) 2018, agencies that receive or benefit from Chapter 53 funds from FTA are required to report asset inventory, condition and performance information to the NTD. For rolling stock and equipment, CTDOT uses FTA performance measures to track asset condition. Targets in Connecticut are set using the following business practice process adopted by CTDOT:

Target (%) = # of years to procure asset / (ULB + years of procurement)

For example, a bus asset with a procurement time of two years and a ULB of 12 years would have a 14% target.

For infrastructure, the FTA performance measure required for NTD reporting is different from CTDOT's measure to track asset condition. The FTA has prescribed that operators submit to NTD a performance measure that measures a percentage of track that is under a speed restriction, a terminology that is tied to the issuance of slow zones. Slow zones are orders put out by a rail provider to inform train operators that a segment of track should be traversed at a slower speed than normal or avoided altogether due to weather, maintenance, or defect. In this case, FTA has requested the collection of all slow zone data with the exception of blanket slow zones (usually weather-related).

CTDOT collected this data from MNR, which submits daily slow zone bulletins to the department to inform of track outages. The FTA requires transit providers to only collect data for the first Wednesday of every month at 9:00 AM, as a method of keeping data collection simple and representative of day to day. Each month when data is received, CTDOT would track the total track miles under performance restriction. Once 12 months of data are collected, these numbers should be averaged to determine number of track miles on average that are under a restriction, and then divide by the total number of track miles on the system to get a % for the year. See Appendix E for Slow Zone calculations for Report Year 2018.

This percentage would be reported to the NTD calculated as shown below:

$$V = (\sum_{i=1}^{12} T_i)/12$$

T = Total Track Miles under restriction for month i
I = Month
V = Guideway Performance Metric (Average Track Miles Under Restriction per Month)

$$G = \left(\frac{V}{S}\right) * 100$$

S = Total Track Miles on System
G = Guideway Performance Measure (%)

For facilities, CTDOT uses the FTA performance measure required for NTD reporting. CTDOT's condition assessment approach was developed to meet the FTA requirements and deliver condition data for calculating the performance measure. FTA requires facilities to be inspected at least every 4 years, but initially only requires 25% of all facilities to be inspected and reported each year. Please refer to Appendix D to show which facilities have been formally inspected and those facilities still outstanding. A summary of the FTA performance measures and CTDOT's targets is provided in Tables 3-26 through 3-29.

Table 3-26. FTA Performance Measures and Targets for Rolling Stock

Performance Measure	Asset Class	Performance SFY 18	Target SFY 19
Percentage of vehicles that have met or exceed their ULB	Transit Bus	19%	14%
	Articulated Bus	0%	14%
	Cutaway Bus	0%	17%
	Over-the-Road Bus	3%	14%
	Commuter Rail Locomotive (MNR)	55%	13%
	Commuter Rail Locomotive (SLE/HL)	100%	17%
	Commuter Rail Passenger Coach (MNR)	0%	13%
	Commuter Rail Passenger Coach (SLE/HL)	100%	17%
	Commuter Rail Self-Propelled Passenger Car	12%	13%
	Ferry Boat	100%	0%

Table 3-27. FTA Performance Measures and Targets for Equipment

Performance Measure	Asset Class	Performance SFY 18	Target SFY 19
Percentage of equipment that have met or exceed their ULB	Truck	26%	7%
	Automobile	46%	17%
	Sport Utility Vehicle	30%	17%
	Van	55%	17%
	Steel Wheel Vehicle	98%	0%

Table 3-28. FTA Performance Measures and Targets for Infrastructure

Performance Measure	Asset Class	Performance SFY 18	Target SFY 19
Percentage of track segments with performance restrictions	Rail Guideway	5%	2%

The passenger facilities reported below consist of 43 rail passenger facilities. The 10 CTfastrak facilities owned by CTDOT are not required to be reported to NTD and thus are not included in the performance measure calculation.

Table 3-29. FTA Performance Measures and Targets for Facilities

Performance Measure	Asset Class	Performance SFY 18	Target SFY 19
Percentage of facilities within an asset class, rated below condition 3 on the TERM scale	Administrative/Maintenance	0%	0%
	Passenger	58%	0%

CHAPTER 4

Analytical Approach

Asset management involves operating, maintaining, and improving assets using analysis to identify a sequence of actions that will achieve a State of Good Repair over the life cycle of the assets. Thus, asset management concepts apply over the full life of an asset, spanning from installation or construction of an asset to its replacement or retirement. As part of asset management practice, CTDOT makes investment decisions that consider not only the current condition, but also the full life cycle and associated costs of assets. Analytical processes and decision support tools help support CTDOT's investment decisions and develop a prioritized list of needs.

Overview

This chapter describes CTDOT's analytical approach for its transit assets. CTDOT's approach for analyzing transit investment needs relies on two systems. First, the asset data described in chapter three are stored in a single, integrated database, the SGR Transit Database. Also, to perform the analysis and prioritization of SGR needs, CTDOT is using a customized version of the Transit Asset Prioritization Tool (TAPT) developed through the Transit Cooperative Research Program (TCRP) and included with TCRP Report 172.

Deterioration models and costs used with the tool are based on Connecticut data (where available), or alternatively on the TAPT defaults from the FTA Transit Economic Requirements Model (TERM). TERM is a decision tool that helps transit agencies with assessing and prioritizing SGR needs given funding constraints. The TERM scale is a rating system to define levels of condition for use in deterioration curves to determine the remaining life of assets.

Federal Legislative Context

In 49 CFR 625.25, FTA requires that a TAM plan include a "description of analytical processes or decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization."

SGR Transit Database

The SGR Transit Database is a relational database that integrates the asset condition inventory and condition data used to develop this plan. The database is a MySQL database deployed on the Amazon Relational Database Service. Pending development of customized forms, CTDOT and contractor staff access the database using commercial off the shelf (COTS) database clients, such as MySQLWorkbench. Figure 4-1 shows the database schema.

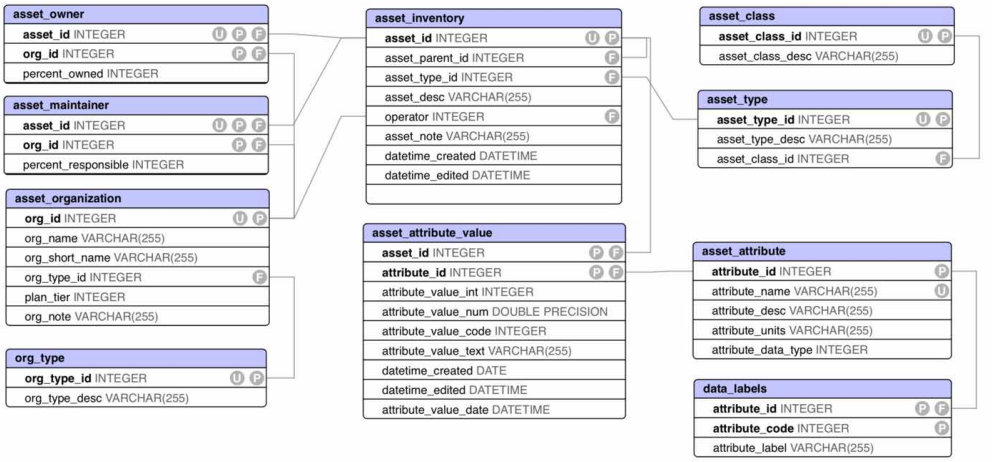


Figure 4-1. SGR Transit Database Schema

The database is structured to store data on any asset, with the ability to add asset types and attributes without changing the underlying database structure. Also, the database supports specification of parent-child relationships, so that complex asset hierarchies can be specified if needed. For instance, for facilities a record is stored for each individual facility, as well as for each building on the facility site.

In the database the list of assets is stored in the table asset_type lists the specific types of assets stored in the database. The table asset_attribute specifies the specific attributes that may be defined for an asset. These attributes vary by asset type. The list of assets is stored in the table asset_inventory. This table provides a description of each asset, identifies the asset type, and specify the organization responsible for operating the asset. The attribute values for each asset are stored in the table asset_attribute_value. This table has one record for each attribute of each asset. Additional tables specify organizations that may own, operate or maintain assets, as well as which organizations own and operate the various assets.

Asset types currently stored in the database correspond to those identified in chapter three. Note that in the case of revenue vehicles the database stores data by vehicle fleet, though the database structure supports specification of individual vehicles as well. The attributes stored for each asset necessarily vary by asset type, and include those required to identify the asset and support use of TAPT for modeling investment needs as described in the following section. For instance, for buildings the database stores data on the construction date of the facility, the construction cost, floor area, and the condition of the building components listed in chapter three. However, CTDOT and individual transit operators have significant additional information on buildings used for day-to-day management stored in other systems.

Data are exported for use in TAPT using a set of custom views defined by asset type. These views are accessed through MySQLWorkbench or other database clients. Also, project team members exported the views to spreadsheet form to facilitate review and verification of the data.

Analytical Tool

As noted above, CTDOT used TAPT to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs. The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Figure 4-2 is a diagram illustrating the structure of TAPT. As shown in the figure, the tool has a single start screen that supports navigation, generation of new models, and performing an analysis. The tool has templates for vehicle models, age-based-models, and condition-based models. TAPT also includes a single worksheet for entry of major parameters and budgets, as well as worksheets for viewing summary and detailed outputs of an analysis. The tool creates new worksheets with summary outputs and detailed outputs (the program list) for each analysis a user performs.

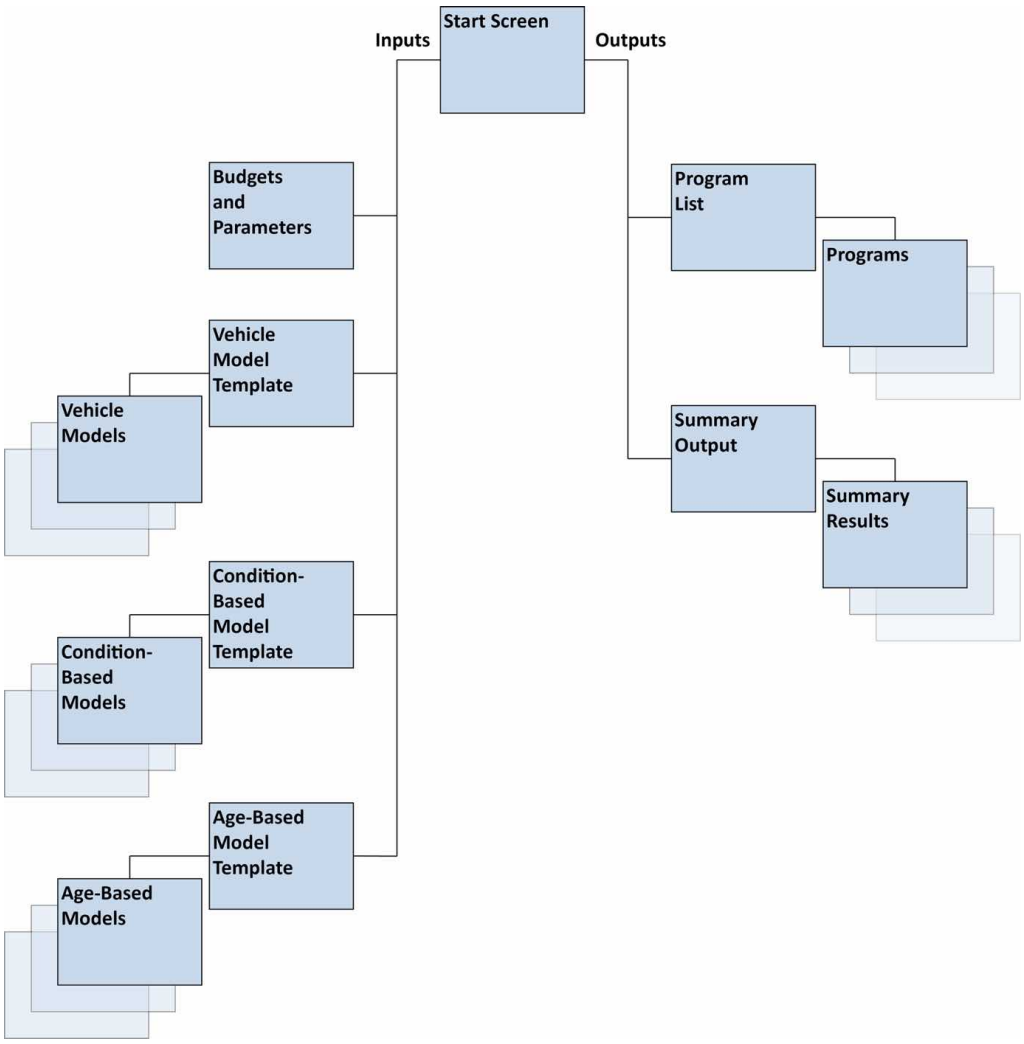


Figure 4-2. TAPT User Interface Organization

Figure 4-3 illustrates the start screen of the tool, which provides the tool user the ability to create a new asset model, edit an existing model, run the prioritization model (which uses the asset models), and/or view results. Figure 4-4 illustrates the specification of an asset model. In this case, a condition-based model is shown. The user specifies the quantity and condition of each asset of a specified type, a transition probability matrix that describes how the asset will deteriorate (or improve in the event an action is performed) and additional cost data (not shown in this screenshot).

The outputs generated using TAPT include lifecycle models for each asset type, a recommended policy specifying the point at which the asset should be rehabilitated or replaced, and predictions of future conditions as an asset continues to age. The prioritization model uses the asset-specific

results to predict future conditions and recommend work given a particular budget. Alternatively, one can enter a specific set of asset rehabilitation/replacement actions ("pipelined" projects) and view the predicted conditions and performance over time without using the prioritization model to determine when these actions will be implemented.

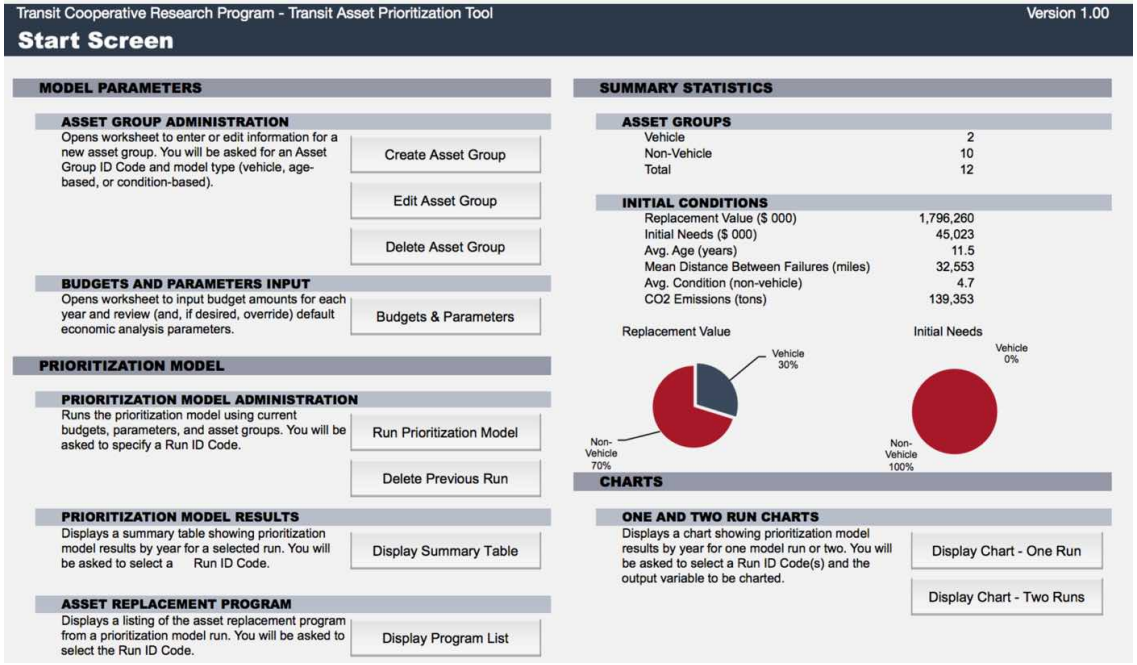
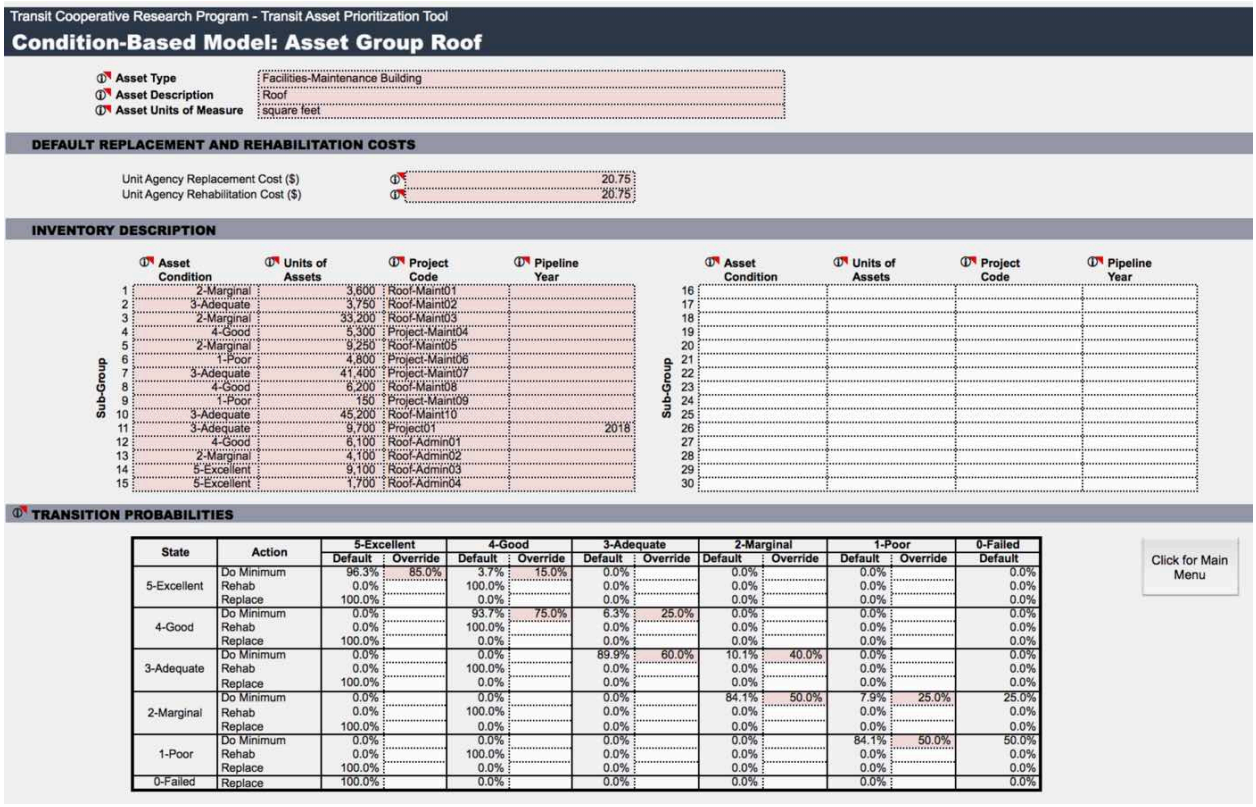


Figure 4-3. TAPT Start Screen



Transit Cooperative Research Program - Transit Asset Prioritization Tool

Condition-Based Model: Asset Group Roof

Asset Type	Facilities-Maintenance Building
Asset Description	Roof
Asset Units of Measure	square feet

DEFAULT REPLACEMENT AND REHABILITATION COSTS

Unit Agency Replacement Cost ($)	20.75
Unit Agency Rehabilitation Cost ($)	20.75

INVENTORY DESCRIPTION

Sub-Group	Asset Condition	Units of Assets	Project Code	Pipeline Year
1	2-Marginal	3,600	Roof-Maint01	
2	3-Adequate	3,750	Roof-Maint02	
3	2-Marginal	33,200	Roof-Maint03	
4	4-Good	5,300	Project-Maint04	
5	2-Marginal	9,250	Roof-Maint05	
6	1-Poor	4,800	Project-Maint06	
7	3-Adequate	41,400	Project-Maint07	
8	4-Good	6,200	Roof-Maint08	
9	1-Poor	150	Project-Maint09	
10	3-Adequate	45,200	Roof-Maint10	
11	3-Adequate	9,700	Project01	2018
12	4-Good	6,100	Roof-Admin01	
13	2-Marginal	4,100	Roof-Admin02	
14	5-Excellent	9,100	Roof-Admin03	
15	5-Excellent	1,700	Roof-Admin04	

Sub-Group	Asset Condition	Units of Assets	Project Code	Pipeline Year
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

TRANSITION PROBABILITIES

State	Action	5-Excellent		4-Good		3-Adequate		2-Marginal		1-Poor		0-Failed
		Default	Override	Default	Override	Default	Override	Default	Override	Default	Override	Default
5-Excellent	Do Minimum	96.3%	85.0%	3.7%	15.0%	0.0%		0.0%		0.0%		0.0%
	Rehab	0.0%		100.0%		0.0%		0.0%		0.0%		0.0%
	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%
4-Good	Do Minimum	0.0%		93.7%	75.0%	6.3%	25.0%	0.0%		0.0%		0.0%
	Rehab	0.0%		100.0%		0.0%		0.0%		0.0%		0.0%
	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%
3-Adequate	Do Minimum	0.0%		0.0%		89.9%	60.0%	10.1%	40.0%	0.0%		0.0%
	Rehab	0.0%		100.0%		0.0%		0.0%		0.0%		0.0%
	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%
2-Marginal	Do Minimum	0.0%		0.0%		0.0%		84.1%	50.0%	7.9%	25.0%	25.0%
	Rehab	0.0%		100.0%		0.0%		0.0%		0.0%		0.0%
	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%
1-Poor	Do Minimum	0.0%		0.0%		0.0%		0.0%		84.1%	50.0%	50.0%
	Rehab	0.0%		100.0%		0.0%		0.0%		0.0%		0.0%
	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%
0-Failed	Replace	100.0%		0.0%		0.0%		0.0%		0.0%		0.0%

Click for Main Menu

Figure 4-4. TAPT Model Example

The TAPT modeling approach incorporates the three different asset-level models noted above, as well as a prioritization model that integrates the asset-level models and simulates the allocation of resources to address SGR needs over time and across asset types. Below is a brief description of each of these:

- **Vehicle Model:** the revenue vehicle model takes as input data items reported by urban transit agencies to the NTD specified for a given fleet of vehicles, such as vehicle mileage, revenue passenger miles, maintenance costs, energy consumption and mechanical failures. The model then predicts agency, user and external costs, and mean distance between failures (MDBF) as a function of vehicle mileage. Further, it calculates the mileage at which a given vehicle should be replaced to minimize lifecycle costs, and the increased lifecycle costs that will result each year a needed replacement is deferred. The model includes default assumptions for growth in maintenance costs, rehabilitation costs and failures that are calibrated based on model inputs. Alternatively, one may override the default assumptions.

- **Condition-Based Model:** this model, which is technically a Markovian Decision Model, may be used to model any asset. It predicts the lifecycle agency, user and external costs associated with an asset, as well as the optimal point to perform rehabilitation or replacement, and the increase in lifecycle costs of deferring action. An asset is modeled as existing in one of a number of different condition states (in this case, using the five-point condition scale from TERM), and a set of transition probabilities describes the likelihood of transition from a given state to another given either the asset deteriorates or some action is taken. The model determines the optimal policy, or set of actions to take as a function of condition, to minimize agency, user and external costs. Further, the model explicitly calculates the cost of deferring a recommended action in terms of the increased lifecycle cost resulting from action deferral. Model defaults are provided for each asset type defined in TERM using TERM data.
- **Age-Based Model:** like the condition-based model, this is a generic model that can be used to model any asset. However, the condition-based model is recommended over this model where condition data are available. In the age-based model, asset rehabilitation or replacement is motivated by the gradually increasing cost of asset maintenance, as well as increasing likelihood of asset failure. This likelihood is modeled using a Weibull distribution. Using the model requires data on asset age, and the model outputs are essentially the same as those produced using the condition-based model.
- **Prioritization Model:** in TAPT asset rehabilitation/replacement is prioritized with an objective of minimizing lifecycle agency, user and external costs subject to a budget constraint. To accomplish this objective, the model establishes candidate rehabilitation/replacement actions, and calculates the costs and impacts of these using the asset-level models. The model then prioritizes potential investments in decreasing order of Prioritization Index (PI), where the PI is defined as the change in lifecycle cost resulting from delaying an action one year relative performing it in the specified year divided by the action cost. In concept the PI is a benefit cost ratio. However, one may tailor the prioritization function to change the weight of different types of benefits and/or specify an additional benefit realized from replacing an asset over and above that modeled by the asset-level models.

See TCRP Report 172 for a detailed description of TAPT, guidance on how to use the spreadsheet tool, and two tutorials using example data.

Implementing the Tool at CTDOT

This section provides additional details on the revisions made to support CTDOT's use of TAPT. The revisions include creating new screens for refining inventory data and changing underlying code in TAPT to relax some of the tool's constraints.

Screens for Editing Inventory Data

A major change to TAPT is the addition of two new screens to the system, including screens for importing vehicle data and facility data from the SGR Transit Database and/or other systems. With this functionality the tool user can quickly enter data on a set of vehicle fleets and facilities.

Figure 4-5 illustrates the start screen for the CTDOT version of TAPT providing access to the new screens. Relative to the default, this version of the tool includes a new section labeled "Asset Inventory" for two new buttons providing access to the new screens. Figure 4-6 shows a section of the vehicle inventory screen. This screen has one row for each fleet exported from the SGR Transit Database. A fleet is a subgroup of vehicles that are operated by the same transit provider and have the same manufacturer, model, and model year. The user can edit the following fields for each fleet, either using imported data or overriding it as appropriate:

- **Fleet ID.** This is formed by concatenating the agency name and a sequence number, both of which can be edited.
- **Vehicle description.** This is formed from SGR Transit Database data by concatenating the model year, manufacturer and model.
- **Vehicle Useful Life (miles).** The ULB for the fleet in miles, if defined (by default this is not used).
- **Vehicle Useful Life (years).** The ULB for the fleet in year. This is defined by CTDOT by vehicle type.
- **Vehicle type.** This field specifies which specific vehicle model to use of the types defined in CTDOT's asset hierarchy.
- **Model year.** This is formed from SGR Transit Database data and used to calculate vehicle age.
- **Total current miles/hours.** This is an optional field and is not populated by default. If populated it is used to calculate an effective age for the fleet.
- **Number of vehicles.** This is the number of vehicles in a fleet and is formed from SGR Transit Database data.
- **Condition.** The condition of the fleet, measured using the 1-5 TERM scale. This is an optional field and is not populated by

default. If populated it is used to calculate an effective age for the fleet.

- **Vehicle age.** This is calculated based on model year or date vehicle is placed into service. Vehicle condition is provided to assist in evaluating effective age.
- **Project code.** This is an optional field that can be used to identify a known project.
- **Pipeline year.** This is an optional field that can be used to identify a specific year when the vehicle will be replaced.
- **Indicator of whether or not to include the vehicle in the modeling.** Vehicles may be excluded if data are incomplete, or if the vehicle is modeled through a separately-defined asset group model.

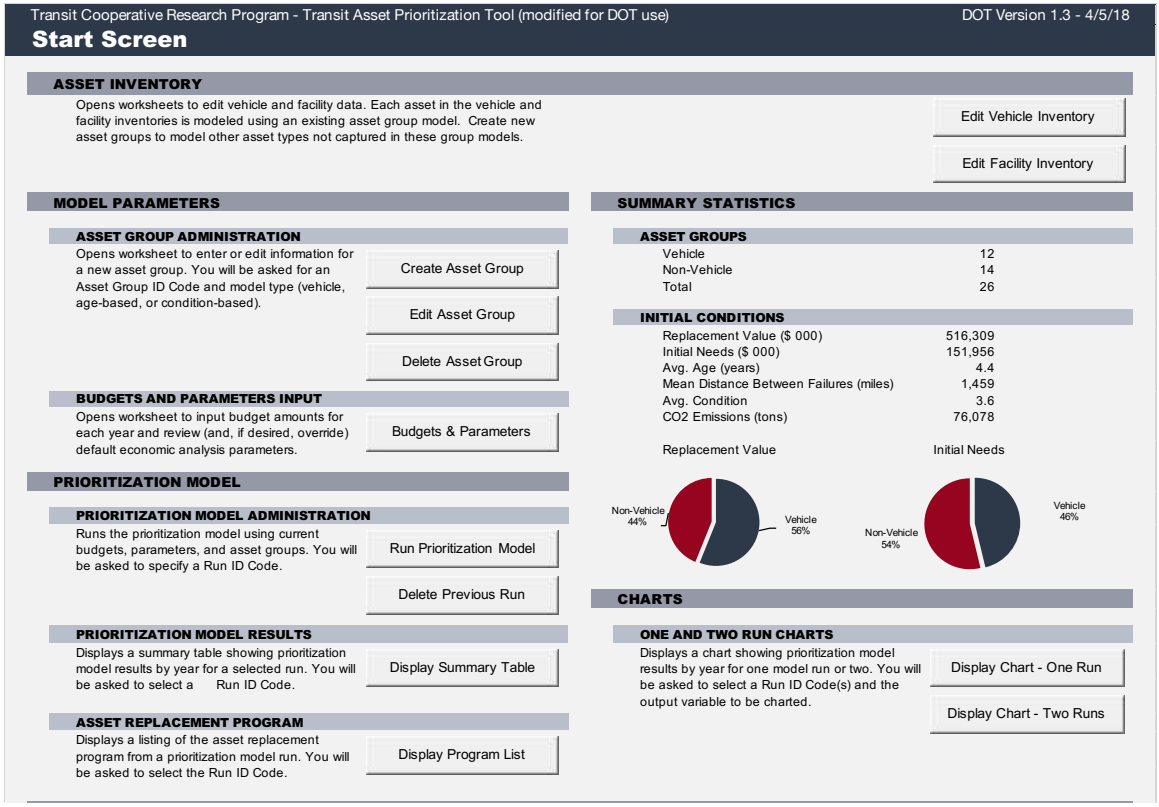


Figure 4-5. CTDOT TAPT Start Screen

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Vehicle Inventory

Agency	ID Default	Override	Description	Vehicle Useful Life (miles)	Vehicle Useful Life (years)	Vehicle Type	Model Year	Total Current Miles/Hours	Num. Vehicles	Condition	Age Model Year
Collins	1		2010 MCI			Over-the-Road Bus	2010		5		8
Collins	2		2015 MCI			Over-the-Road Bus	2015		2		3
CTTransit Hartford	1		2011 Nova			Articulated Bus	2011		10		7
CTTransit Hartford	2		2014 Nova/Fastrak			Articulated Bus	2014		12		4
CTTransit Hartford	3		2005 New Flyer			Transit Bus	2005		48		13
CTTransit Hartford	4		2007 New Flyer			Transit Bus	2007		64		11
CTTransit Hartford	5		2008 New Flyer			Transit Bus	2008		2		10
CTTransit Hartford	6		2012 New Flyer			Transit Bus	2012		3		6
CTTransit Hartford	7		2014 Gillig			Transit Bus	2014		9		4
CTTransit Hartford	8		2014 New Flyer			Transit Bus	2014		18		4
CTTransit Hartford	9		2015 Gillig			Transit Bus	2015		3		3
CTTransit Hartford	10		2017 New Flyer			Transit Bus	2017		26		1
CTTransit Hartford	11		2017 New Flyer			Transit Bus	2017		78		1
CTTransit Hartford	12		2017 New Flyer			Transit Bus	2017		5		1
CTTransit Hartford	13		2010 MCI			Over-the-Road Bus	2010		2		8
CTTransit Hartford	14		2017 MCI D4500			Over-the-Road Bus	2017		19		1

Figure 4-6. CTDOT TAPT Vehicle Inventory

The facility inventory is similar in concept to the vehicle inventory. For each facility defined, the screen allows specification of the following items:

- **Facility ID.** This is formed by concatenating the agency name, facility description and a sequence number, all of which can be edited.
- **Condition.** This is specified for ten facility systems – substructure, shell, interior, conveyance, plumbing, HVAC, fire protection, electrical, equipment, and site.
- **Construction year.** This field is used to calculate facility age.
- **Quantity.** This must be specified separately by system, and is typically either the roof area, floor area, or site area.
- **Project code.** This is an optional field that can be used to identify a known project.
- **Pipeline year.** This is an optional field that can be used to identify a specific year when the facility will be replaced/rehabilitated.
- **Indicator of whether or not to include the facility in the modeling.** Facilities may be excluded if data are incomplete, or if the vehicle is modeled through a separately-defined asset group model.

Note that each facility is modeled as a set of ten assets in TAPT, with one asset defined for each of the ten facility systems listed above.

Other TAPT Revisions

Several further revisions were made in TAPT to relax certain constraints in the tool. Specific changes made in this regard include the following:

- The tool was revised to allow modeling of assets listed on the new inventory pages without providing the same level of detail required for developing asset group models. For these assets it is necessary to specify certain basic data outlined above, including specification of what asset group model should be used. Preexisting TAPT functionality is used to develop the asset group models. By default,

TAPT is constrained to model only those assets listed in the group model pages.

- The handling of assets excluded from prioritization runs was revised. The preexisting version of the tool allowed for specifying that assets used for building an asset group model should be excluded from prioritization. However, if this option was used both the asset and the model were excluded; in other words, selecting this option was equivalent to deleting the model entirely. For CTDOT, it is desirable to define asset group models, and then use the models without including the specific assets included in developing the model (as they may already be included in the data imported from the SGR Transit Database). The tool was revised to support this approach.
- The tool was revised to model up to 5,000 assets, including 3,000 assets listed on the vehicle inventory pages, 1,000 assets listed on the facility inventory page (10 systems for each of 100 facilities), and 1,000 other assets that may be defined as part of the asset group models. The preexisting version of the tool was constrained to model only 1,000 assets. Likewise, the page size was increased for display of model results considering the increase in number of assets.

Modeling Assumptions for Connecticut Transit Assets

This section describes key modeling assumptions and parameters by asset type.

Buses. For buses prototype models were developed for the bus types identified in chapter three using the TAPT vehicle model. These models were then calibrated such that replacement is recommended at the ULB value specified for CTDOT. Vehicle replacement costs were established through review of CTDOT data on recent bus purchases, adjusting historic costs to 2017 costs using the Consumer Price Index (CPI).

Rail Vehicles. As in the case prototype models were developed for the bus types identified in chapter three using the TAPT vehicle model. These models were then calibrated such that replacement is recommended at the ULB value specified for CTDOT. The default values for vehicle replacement were based on those in TAPT (which are in turn based on those in TERM), adjusted for inflation using the CPI.

Facilities. The TAPT condition-based model was used to define models for each of the major facility components defined in chapter three. In the tool assets were created for each facility component of each building. Platforms were treated as an additional facility component. TAPT defaults (which are in turn derived from those in TERM) were used to predict deterioration rates for each facility component.

Regarding facility costs, the average cost per square foot was determined for passenger buildings and administrative/maintenance facilities by averaging inflation-adjusted historic construction costs. CTDOT staff estimated the percentage of the overall facility cost attributed to each facility component.

For platforms a single cost per platform was calculated by averaging the inflation-adjusted historic costs. Overall facility conditions were predicted by calculating a weighted average condition, with each component weighted based on its replacement value.

Bridges. The TAPT condition-based model was used to develop a model for bridges. TAPT defaults were used for deterioration. CTDOT staff calculated an average cost per bridge for culverts and pedestrian structures, moveable bridges, and fixed bridges.

Track. TAPT condition-based models were developed for tangent track, curved track, wood ties, concrete ties, turnouts, and guideway surfacing. Deterioration models for each of these asset types were developed to match MNR definitions of each condition and MNR estimates of useful life. For instance, for tangent track MNR estimates a useful life of 40 years. The deterioration probabilities for tangent track were specified such that the median years to reach a value of 2 on the TERM scale (100% of the useful life) is 40 years, and the median years to reach a value of 1 on the TERM scale (125% of the useful life) is 50 years. Costs for the track models were based on the 2017 Railroad Engineering and Construction Cost Benchmarks published by Compass International Inc.

Power. TAPT condition-based models were developed for the power assets described in chapter three, grouping these were the same units of measure were used for multiple subtypes. This resulted in models for Catenary Wire, Catenary Insulators and Pulleys, Cable, Catenary Poles, Substations, and Other Power Components. Deterioration models for each of these asset types were developed to match MNR definitions of each condition and MNR estimates of useful life. TAPT defaults (based on those in TERM) were used for estimating costs.

Signals. A TAPT age-based model was established for signals using TAPT defaults for deterioration. A single asset was defined for the overall signal system for each rail line (the NEC mainline and the three branch lines). The cost per track mile was determined based on the estimated cost for replacing the signal system on the Waterbury Branch.

Service Vehicles. TAPT age-based models were developed for the different types of service vehicles defined in chapter three. TAPT defaults were used, calibrating these to CTDOT's established ULB values. Vehicle replacement

costs were established through review of CTDOT data on recent service vehicle purchase, adjusting historic costs to 2017 costs using the CPI.

Business Processes to Support the Tool

Although the use of TAPT is an important element of the development of the PT-TAMP, in reality its use is just one of a number of steps in the decision-making process for capital planning. The business process for performing the analysis of SGR needs and using this to develop the capital plan is as follows:

- First, TAPT is populated with available data on the asset inventory, its condition, treatments costs, and other data.
- Next, projects that are in progress or planned in the near term are entered in TAPT as "pipelined" projects. This forces the system to rehabilitate or replace these assets in the specified year.
- Next, separate runs are performed in TAPT for buses and rail assets. This generates a set of predicted conditions at different budget levels, as well as a prioritized list of SGR investments recommended in each year.
- The initial model results are reviewed to identify issues in the data, such as incorrectly coded ages, cases where there are additional known investments that need to be pipelined, and/or other issues.
- TAPT is then rerun, generating a new set of results and priorities.
- CTDOT next revises its capital plan using data from TAPT to help inform its decision-making. However, the work that is actually planned may differ significantly from that recommended by TAPT for a variety of reasons. These include:
    - Bundling of related needs differently than that modeled by the system. For instance, if work on a facility is performed, then all work needed would generally be performed given the costs associated with initiating a project. TAPT might recommend work on one facility system one year, to be followed by work on another system in a subsequent project.
    - Differences in costs. TAPT is populated with average unit costs, but the costs for a given project may be greater or less than the average.
    - Need for geographical equity. TAPT does not consider the need to balance investments between different areas or

regions, but this is an important factor in “real world” decisions.

    - Limitations in uses of funding. TAPT models a budget as a single fund that can be used without limitation for any project. In reality CTDOT derives funding from multiple sources and there are various stipulations on the use of those funds that must be considered in developing the capital plan. For instance, some funds may be available only for certain asset types, or certain types of work.
    - CTDOT staff incorporate many additional factors and perspectives in prioritizing needs beyond those captured in any model.

- Once the capital plan is revised, the prioritized list of needs generated by TAPT is revised based on actual project plans.

The end result of the above process is a capital plan that reflects available funding and incorporates TAPT priorities to the extent feasible. The process also yields a prioritized list of SGR needs that helps inform decisions concerning where additional and/or future investment should be directed. The final list of prioritized needs included in this PT-TAMP is a product of the staff judgement, TAPT analysis, and institutional experience.

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CHAPTER 5

Investment Scenarios

Developing investment scenarios at various funding levels enables CTDOT to evaluate funding priorities. The investment scenarios show projected needs and work across the four asset categories in the plan. While CTDOT is making progress towards performance targets at current funding levels, the investment scenarios demonstrate a need for additional funding to achieve SGR.

Overview

This chapter describes the estimated funding available for transit at CTDOT, the estimated uses for that funding, projected asset investment needs, and projected capital projects based on funding scenarios. Funding for transit in Connecticut comes from a mix of federal and state sources. As described in chapter four, CTDOT uses TAPT to model asset conditions and predict investments needed to achieve and maintain SGR.

Federal Legislative Context

In 49 CFR 625.25, FTA requires than a TAM plan include a "provider's project-based prioritization of investments." The investment prioritization must "take into consideration its estimation of funding levels from all available sources that it reasonably expects will be available in each fiscal year during the TAM plan horizon period."

Funding for Transit at CTDOT

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Connecticut public transportation bond funds are used to match federal funds and provide funding for 100% state projects. Within the State Public Transportation Bonds, the bond funds are divided into state match for federal and projects with 100% State Funding.

Recently, the State of Connecticut implemented Let's Go CT, a program which in part provides an influx of transit funds and accounts for a large percentage of transit funding in the short term. Transit funding sources at CTDOT and the bonding process are discussed in detail in CTDOT's Annual Capital Plan Report. Estimated funding sources for transit over the four-year period of the PT-TAMP, organized by source, are shown in Table 5-1.

Table 5-1. Summary of Estimated Funding for Transit

	Value by Fiscal Year ($M) in 2018 dollars			
Description	**2018**	**2019**	**2020**	**2021**
Federal Funds	$193	$192	$195	$195
FTA Funds	$188	$192	$195	$195
FTA Special Funds/Earmarks/New Starts	$5	$0	$0	$0
State Funds (Bonds Authorized)*	$236	$246	$236	$236
Let's GO CT	$15	$438	$527	$330
Let's Go CT Ramp-Up (Bonds Authorized)**	$15	$438	$527	$0
Additional State Funds Required to Sustain Program	$0	$0	$0	$330
Total Funding	$445	$876	$958	$761

*Combination of State Federal Match and 100% State Bonded Projects. Authorized only through 2019 in Accordance with the approved biennial Budget

****Authorized but not appropriated through 2020**

Federal funds for transit come from a number of FTA grant programs, including:

- Section 5305 – Planning Programs
  - 5305(d) Metropolitan Planning
  - 5305(e) State Planning and Research
- Section 5307 – Urbanized Area Formula Funding
- Section 5310 - Enhanced Mobility of Seniors & People with Disabilities
- Section 5311 – Formula Grants for Rural Areas
  - SEC 5311(b)(3) Rural Transportation Assistance Program
- Section 5337 – State of Good Repair Grants Program
- Section 5339 - Bus & Bus Facilities Infrastructure Investment Program

The program section titles correspond to the sections of the US Code in which each program is defined. A breakdown of estimated federal funding by FTA program is shown in Table 5-2.

Table 5-2. Summary of Estimated Connecticut Share of FTA Programs

	Value by Fiscal Year ($) in 2018 dollars			
Description	2018	2019	2020	2021
SEC 5305(d)	$1,164,020	$1,186,835	$1,207,011	$1,207,011
SEC 5305(e)	$303,924	$309,881	$315,149	$315,149
SEC 5307	$104,585,517	$106,635,393	$108,448,195	$108,448,195
Enhancement	$0	$0	$0	$0
Small Intensive Cities	$2,424,030	$2,471,541	$2,513,557	$2,513,557
Capital	$102,161,487	$104,163,852	$105,934,638	$105,934,638
SEC 5310	$4,240,338	$4,323,449	$4,396,947	$4,396,947
SEC 5311	$3,119,678	$3,180,824	$3,234,898	$3,234,898
SEC 5311(b)(3)	$111,390	$113,573	$115,504	$115,504
SEC 5337 (High Intensity Fixed Guideway)	$69,134,272	$70,489,304	$71,687,622	$71,687,622
Hartford	$365,136	$372,293	$378,622	$378,622
Southwestern	$68,769,136	$70,117,011	$71,309,000	$71,309,000
SEC 5337 (High Intensity Motorbus)	$1,262,945	$1,287,699	$1,309,590	$1,309,590
Hartford	$1,262,945	$1,287,699	$1,309,590	$1,309,590
SEC 5339	$4,514,968	$4,603,461	$4,681,720	$4,681,720
Earmarks	$5,050,000	$0	$0	$0
LOW-NO - GBTA	$1,450,000	$0	$0	$0
SEC 5339 Discretionary - Norwalk TD	$3,600,000	$0	$0	$0
Total	$193,487,052	$192,130,418	$195,396,635	$195,396,635

In order to generate investment scenarios for transit assets, the funding must be organized by mode (use) rather than by program (source). A summary of estimated funding uses for transit over the four-year period of the PT-TAMP, organized by mode, is shown in Table 5-3 below. This table includes all federal funding; however, funding for non-SGR activities was excluded from the TAPT Model.

Federal fund use is split between bus and rail assets. Statewide bus funding included in the investment scenarios comes from Sections 5307, 5311, 5337, 5339; and earmarks. The Section 5337 funding for Hartford is fixed guideway funding and can be used on CTfastrak and approximately 65% of Section 5307 funding is programmed for bus projects, based on historical trends. Rail funding comes from Sections 5307 and 5337. Section 5337 funding for Southwestern is fixed guideway funding and used for rail projects and approximately 35% of Section 5307 funding is programmed for rail projects, based on historical trends. The estimates of federal funding by mode shown in Table 5-3 are averages which can fluctuate depending on the projects being undertaken by mode each year. Table 5-3 also includes FTA planning funds.

For state public transportation bond funding, CTDOT traditionally assumes 20% will be dedicated to the bus program and 80% to the rail program. Again, within the State Public Transportation Bonds, the Bond funds are divided into State Match for Federal and projects with 100% State Funding. These estimates are an average which can fluctuate depending on actual projects underway in any given year.

Let's Go CT funding is authorized but not appropriated through 2020 only. The breakdown of Let's Go CT funding is required by legislation, not estimated. For the year 2021, the estimated additional state funds required to sustain Let's Go CT are included.

Table 5-3. Summary of Estimated Funding Uses for Transit

	Value by Fiscal Year ($M) in 2018 dollars			
Description	**2018**	**2019**	**2020**	**2021**
Bus	$130	$156	$127	$127
Federal	$82	$79	$80	$80
State Match	$21	$20	$20	$20
PT State Bonds	$27	$29	$27	$27
Let's Go CT	$0	$28	$0	$0
Rail	$309	$714	$825	$628
Federal	$105	$107	$109	$109
State Match	$26	$27	$27	$27
PT State Bonds	$163	$170	$162	$162
Let's Go CT	$15	$410	$527	$330
Other (FTA planning funds)	$1	$1	$2	$2
5310 Program	$5	$5	$5	$5
Total	$445	$876	$958	$761

Current Estimated Investment Needs

Current capital investment needs for bus for 2018 are approximately $74 million. Figure 5-1 shows these investment needs for 2018 for the bus mode, broken down by asset category. Rolling stock constitutes 92% of CTDOT's bus mode need, equipment constitutes 5%, and facility constitutes 3%. There are no modeled needs for bus infrastructure because the TAPT model results do not include CTfastrak busway assets.

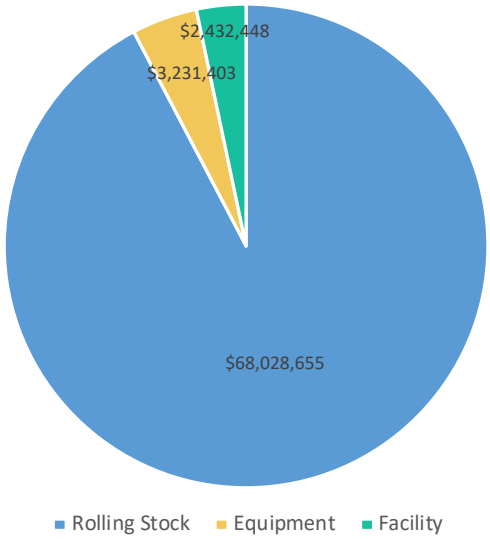

Figure 5-1. Estimated Investment Needs by Asset Category in 2018 (Bus Mode)

Current capital investment needs for rail for 2018 are approximately $3 billion. Figure 5-2 shows investment needs in 2018 for the rail mode, broken down by asset category. Infrastructure constitutes 87% of CTDOT's rail mode need, rolling stock constitutes 8%, facility constitutes 5% and equipment constitutes 1%.

Modeling SGR Needs

TAPT only models certain SGR needs. There are additional needs beyond SGR needs addressed in the capital program, and additional SGR needs short of capital replacement that are addressed in capital and operating budgets.

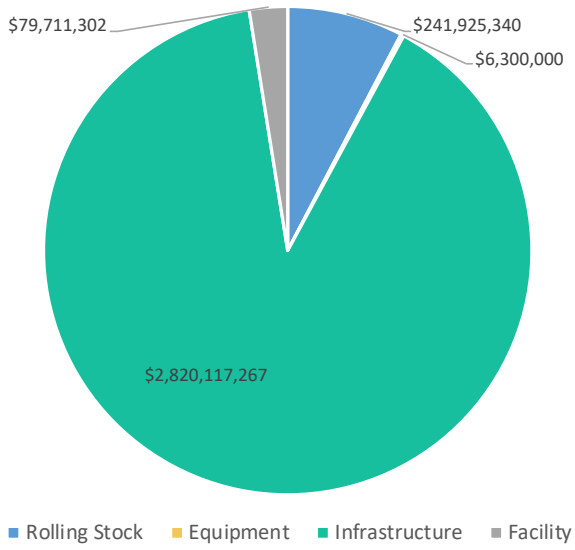

Figure 5-2. Estimated Investment Needs by Asset Category in 2018 (Rail Mode)

Investment Scenarios

This section builds on the estimated available funding to generate investment scenarios to help identify and prioritize state of good repair investments in capital assets. As described in chapter four, CTDOT uses TAPT to predict transit asset conditions and SGR investment needs. The PT-TAMP includes multiple investment scenarios:

- Scenario 1 - Federal Program with State Match Only
- Scenario 2 - Federal Program with State Match plus Remaining PT Annual Bond Program Funds
- Scenario 3 - Federal Program with State Match plus Remaining PT Annual Bond Program Funds plus Let's Go CT Program Funds

Note that because CTDOT programs bus and rail assets differently in the capital planning and programming process, bus and rail assets are modeled separately in the PT-TAMP. Also, the investment scenarios are not divided into Tier I and Tier II for the bus mode assets. This approach reflects CTDOT's capital planning practices and allows CTDOT to analyze the needs of the entire transit system. TAPT is only modeling capital needs for the transit assets included in this plan.

Projected Funding Level by Scenario

Each investment scenario is generated by modeling transit needs using a certain funding level, or budget. The budget is the variable input. TAPT models

only certain SGR activities, so the corresponding budget should only include funding directed to those activities. For that reason, each SGR funding level used as a budget in the investment scenarios is derived from Table 5-3.

A budget for each of the three investment scenarios was defined in a multi-step process. The first step was to review the 2018 STIP and 2017 capital plan to categorize transit funding as either SGR or non-SGR activities for the four-year period of the PT-TAMP, organized by rail or bus mode. Based on that review, the following percentages were calculated. Table 5-4 shows the percent of total funds used for modeled SGR activities, by source.

Table 5-4. Percent of Total Funds Used for Modeled SGR Activities, by Source

Description	Federal	State Match	PT State Bonds	Let's Go CT
Bus	49.0%	49.0%	0.0%	0.0%
Rail	96.8%	96.8%	97.5%	100.0%

Next, the total estimated SGR funding for bus, calculated by multiplying the percentages in Table 5-4 by the values in Table 5-3, was divided by the total overall funding for bus to calculate an estimated percent of total funds used for modeled SGR activities. The same process was repeated for rail. As shown in Table 5-5, 36.5% of funds for bus are estimated to be used for SGR activities and 98.6% of funds for rail are estimated to be used for SGR activities.

Table 5-5. Percent of Total Funds Used for Modeled SGR Activities

Description	Federal
Bus	36.5%
Rail	98.6%

These percentages were applied to the total funding for transit in each investment scenario, shown in Table 5-6, in order to generate an estimated annual funding level for SGR activities, by year and mode.

Table 5-6. Total Funds by Scenario

	Funds ($M) in current dollars			
Description	**2018**	**2019**	**2020**	**2021**
Bus				
Scenario 1	$102.5	$98.8	$100.0	$100.0
Scenario 2	$129.5	$127.8	$127.0	$127.0
Scenario 3	$129.5	$155.8	$127.0	$127.0
Rail				
Scenario 1	$131.3	$133.8	$136.3	$136.3
Scenario 2	$294.3	$303.8	$298.3	$298.3
Scenario 3	$309.3	$713.8	$825.3	$628.3

The estimated SGR funding by year was adjusted for inflation assuming a 3% inflation rate and averaged to yield an average annual SGR funding level for each scenario for bus and rail. The values presented in Table 5-7 are the budgets used for modeling SGR investments in TAPT for the PT-TAMP.

Table 5-7. SGR Funds by Scenario

	Funds ($M) in constant dollars				
Description	**2018**	**2019**	**2020**	**2021**	**Annual Average (2018-2021)**
Bus					
Scenario 1	$37.4	$35.0	$34.4	$33.4	$35.0
Scenario 2	$47.2	$45.2	$43.6	$42.4	$44.6
Scenario 3	$47.2	$55.1	$43.6	$42.4	$47.1
Rail					
Scenario 1	$129.5	$128.1	$126.7	$123.0	$126.8
Scenario 2	$290.3	$290.9	$277.3	$269.2	$281.9
Scenario 3	$305.1	$683.6	$767.3	$567.1	$580.8

The following sections present the investment scenario results for the bus and rail modes.

Bus Mode

Scenario 1

Estimated investment needs and projected work in Scenario 1 are shown in Figure 5-3. Given federal funding and state match, projected work will trim needs from $74 million in 2018 to around $56 million in 2021.

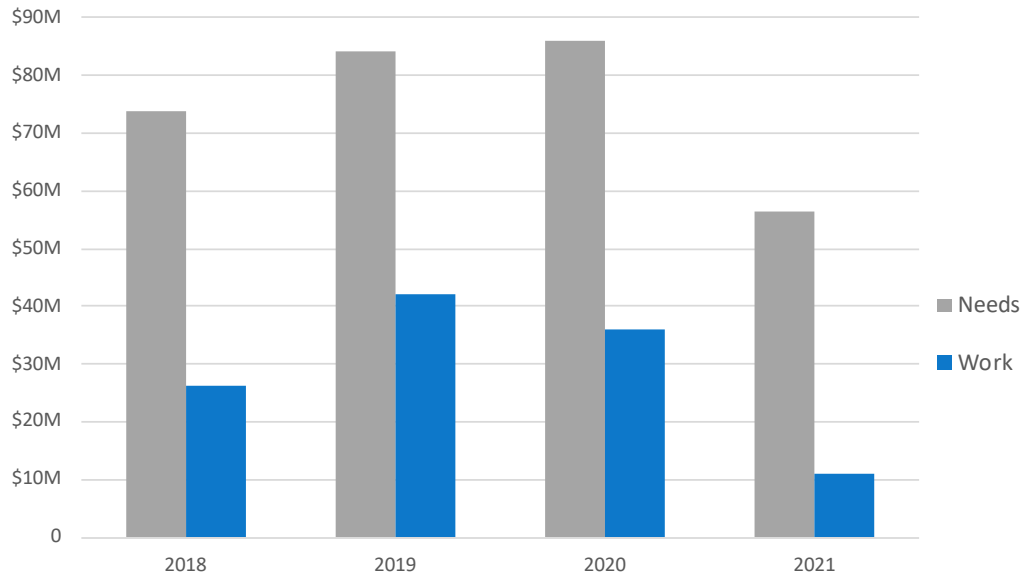

Figure 5-3. Estimated Investment Needs and Work, Scenario 1 (Bus Mode)

Scenario 2

Estimated investment needs and projected work in Scenario 2 are shown in Figure 5-7. Total need in 2021, $55 million, will be met.

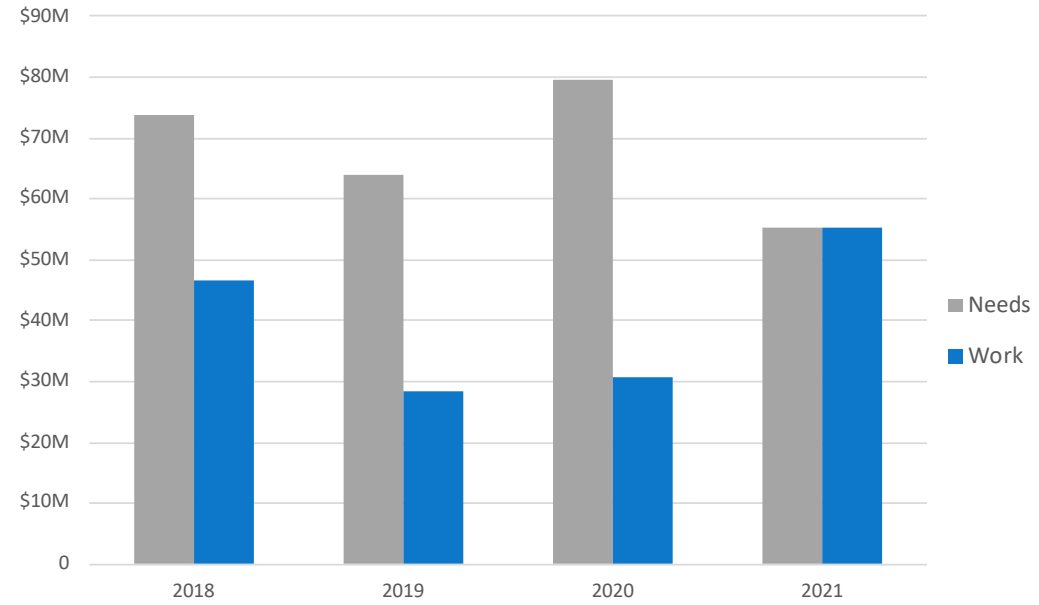

Figure 5-4. Estimated Investment Needs and Work, Scenario 2 (Bus Mode)

Scenario 3

Estimated investment needs and projected work in Scenario 3 are shown in Figure 5-5. Total need in 2020 ($79 million) and 2021 ($20 million) will be met.

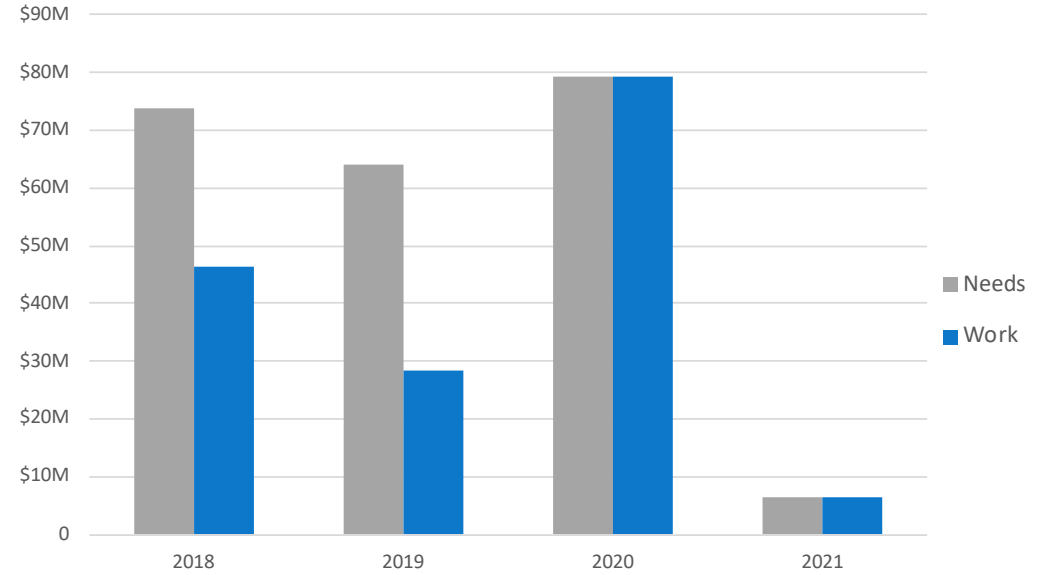

Figure 5-5. Estimated Investment Needs and Work, Scenario 3 (Bus Mode)

Rail Mode

Scenario 1

Estimated rail mode investment needs and projected work in Scenario 1 are shown in Figure 5-6. Projected work will reduce needs from nearly $3 billion in 2018 to roughly $2.75 billion in 2021.

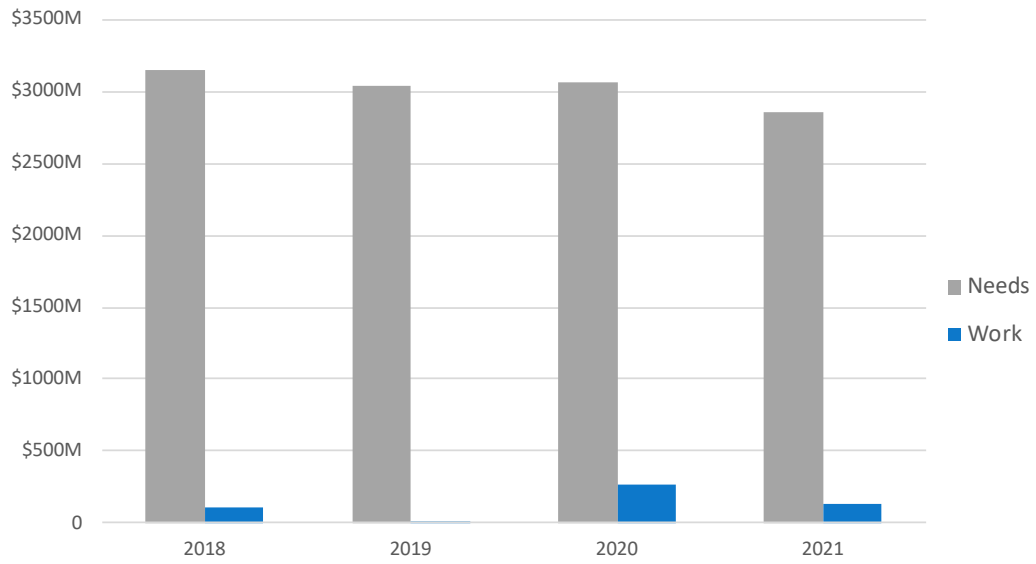

Figure 5-6. Estimated Investment Needs and Work, Scenario 1 (Rail Mode)

Scenario 2

Estimated rail mode investment needs and projected work in Scenario 2 are shown in Figure 5-7. Projected work will reduce needs from nearly $3 billion in 2018 to roughly $2.3 billion in 2021.

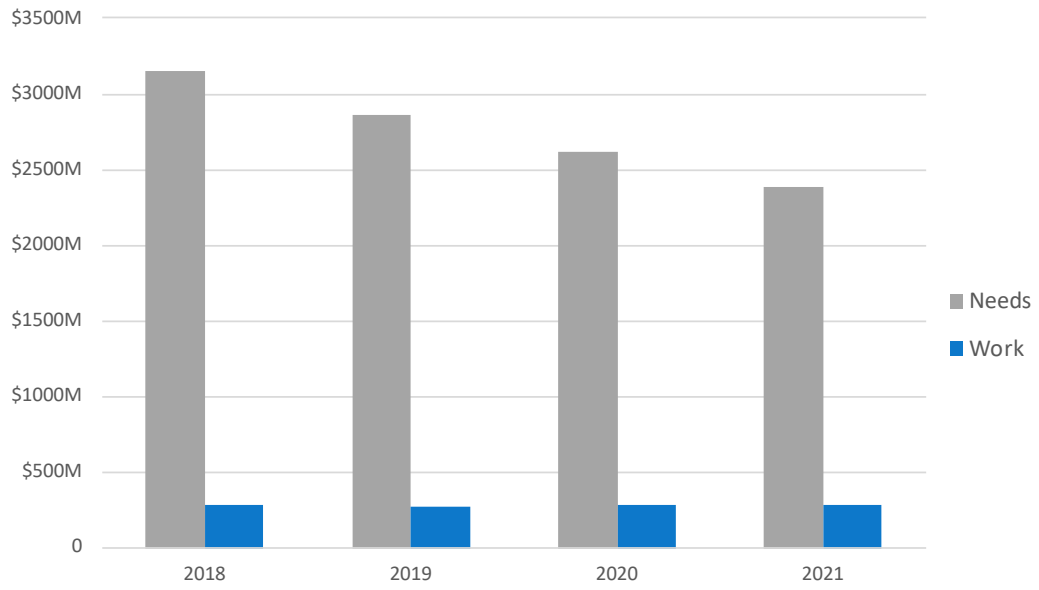

Figure 5-7. Estimated Investment Needs and Work, Scenario 2 (Rail Mode)

Scenario 3

Estimated rail mode investment needs and projected work in Scenario 3 are shown in Figure 5-8. Projected work will reduce needs from nearly $3 billion in 2018 to roughly $2.1 billion in 2021.

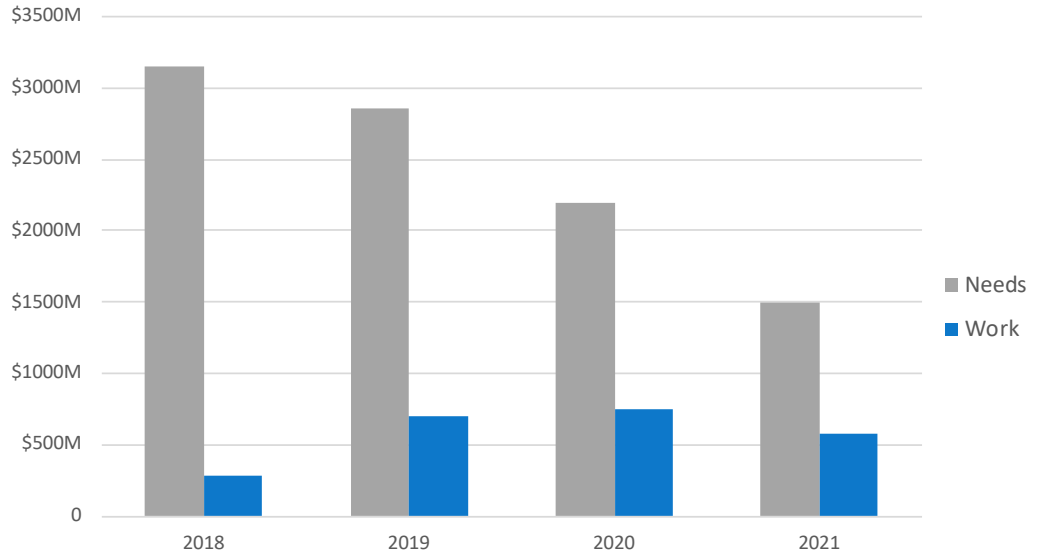

Figure 5-8. Estimated Investment Needs and Work, Scenario 3 (Rail Mode)

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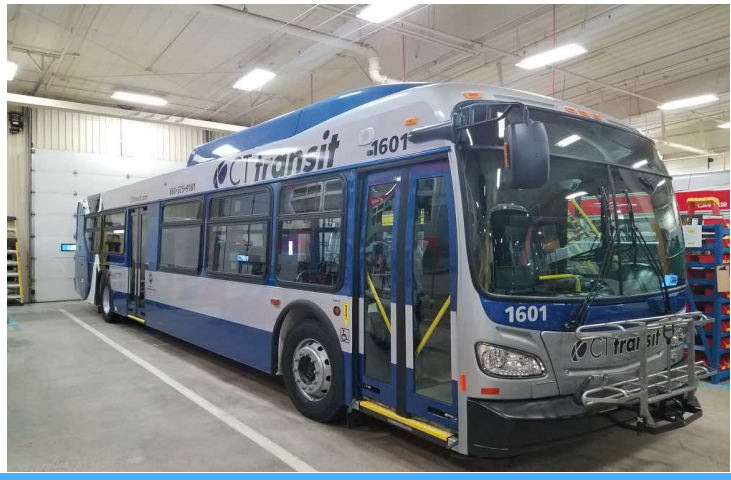
CHAPTER 6

Investment Plan

The investment plan is a key piece of CTDOT's commitment to achieve and maintain SGR for transit assets. The investments in this chapter reflect CTDOT's TAM goals and objectives and are prioritized based on projected SGR needs and available TAM funding.



Connecticut Department of Transportation

PUBLIC TRANSPORTATION TRANSIT ASSET MANAGEMENT PLAN

Overview

This chapter describes the current capital planning process at CTDOT and presents a prioritized list of SGR investments. Incorporating the inventory and condition data summarized in chapter three into the analytical approach described in chapter four, CTDOT has modeled asset performance and investment needs. The list of prioritized investments is an output of TAPT and is aligned with the goals and objectives represented in the CTDOT capital plan.

Federal Legislative Context

In 49 CFR 625.25, FTA requires that a TAM plan include a "provider's project-based prioritization of investments." FTA defines investment prioritization as "a transit provider's ranking of capital projects or programs to achieve or maintain a state of good repair. An investment prioritization is based on financial resources from all sources that a transit provider reasonably anticipates will be available over the TAM plan horizon period."

In 49 CFR 625.33, FTA requires that a transit provider must consider the following when developing the investment prioritization:

- Projects to improve an identified unacceptable safety risk
- Estimated available funding for TAM projects
- Requirements under 49 CFR 37.161 and 37.163 concerning maintenance of accessible features and the requirements under 49 CFR 37.43 concerning alteration of transportation facilities

Projects must be ranked in order of priority and anticipated project year, and project rankings must be consistent with agency TAM policy and strategies.

Capital Planning Process

This section presents a summary of CTDOT's current capital planning process.

CTDOT 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 and rural areas of the state. As the designated recipient, CTDOT 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. CTDOT does not utilize a formula to reallocate Section 5307

formula funds to the bus operators, rather the funding pool allows for a cooperative, nondiscriminatory allocation of funds to different regions based on annual needs. The disbursement of these funds is approved by the Metropolitan Planning Organizations in the Statewide Transportation Improvement Program (STIP). Sub-area split agreements that reflect the annual disbursement of funds by region are created by CTDOT 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.

CTDOT prioritizes public transportation investments that ensure public safety, restore the infrastructure to a state of good repair, improve the customer experience, and promote economic development.

The Bus Capital Program supports transit services around the state including state-owned CT transit operations in eight urban areas, transit district-owned services in seven other urban areas, rural services in five areas around the state, and para-transit operations in 13 transit districts.

The Rail Capital Program includes capital projects necessary to support the existing commuter railroads: New Haven Line, Shore Line East, and the Hartford Line. The overall program is intended to bolster service reliability and operational efficiency, replace outdated and undersized facilities and provide the capacity for growth in rail service.

CTDOT has a five-point action plan which identifies the major areas for prioritizing and emphasizing investments for all modes of transportation. The points were determined after careful consideration of available resources, and federal and State mandates and initiatives.

The following are the components of this five-point action plan:

- **Preservation - Maintain the Existing System in a State-of-Good-Repair.** CTDOT has identified preservation and maintenance of the existing system as its highest priority for targeting the limited available resources. CTDOT will invest in maintaining and repairing the transportation system before expanding it or adding new system components.
- **System Modification - Safety & Modernization.** Safety is a major concern for CTDOT. Modification needs identified for improving safety are a high priority when considering the allocation of staff, funding and equipment. In addition to preserving and maintaining the system to ensure the general safety of the traveling public, CTDOT will continue to consider areas where system modification could significantly improve safety beyond the constraints of the existing infrastructure's limitations.

- **System Productivity – Efficiency.** System productivity refers to maximizing use of the existing system by facilitating travel in and between modes. This is done by applying improved technologies, coordinating the scheduling of maintenance efforts and providing real-time travel information to the public. The development and application of new technology and improved construction practices, the continued advancement and expansion of Intelligent Transportation Systems (ITS), and the provision of real time information to users of Connecticut's highway system and public transportation services are critical components of CTDOT's plan to address the current and future mobility needs of the State's residents, businesses, and visitors. CTDOT will continue to identify and invest in ways to maximize the use of the existing transportation system. As part of enhancing system productivity, CTDOT is committed to encouraging commuters to use transit and ridesharing options.
- **Economic & Environmental Impact - Quality of Life.** It is critical to the health of the State and its residents that the transportation system has a positive impact on the state's economy, physical environment and, ultimately, quality of life. The availability of multiple options for meeting mobility needs of people and for freight contributes to the development of economically vibrant, sustainable communities that provide residents with the ability to make lifestyle choices that have positive impacts on themselves, others and their environments. It is essential that CTDOT assists in improving and expanding mobility options throughout the state by considering and addressing the needs of stakeholders such as pedestrians, bicyclists and users of other non-motorized means of transportation when undertaking projects. CTDOT takes a context-sensitive solutions (CSS) approach when undertaking projects to ensure active public participation and implementation of designs that are appropriately scaled to both the community and the need. CTDOT must also facilitate the efficient and cost-effective movement of people and freight within and through the state. Additionally, CTDOT must ensure the security of the transportation system, as this is directly correlated to community health and economic vitality. Ultimately, it is a responsibility of all State agencies to support efforts of their sister agencies in stimulating the economy and protecting the quality of life of the state's residents; CTDOT is committed to its part in this effort.
- **Strategic Capacity Improvements.** When necessary, CTDOT will pursue strategic capacity improvements to improve the efficiency of the transportation system. When CTDOT evaluates projects

designed to enhance, expand or modify limits on system capacity, an important factor in the decision-making process will be the extent to which a project contributes to providing greater mobility, accessibility and integration of the various transportation modes. Any improvements to capacity will only be undertaken after seriously considering the availability of funding and resource allocations. Priority will be given to "Fix- it-First" initiatives.

DOT's process to develop the capital plan predates the TAM plan requirement and the use of TAPT to prioritize investments. The capital plan is CTDOT's definitive list of planned investments. The prioritized list of investments presented in the following section is a list of SGR investments recommended by TAPT and is complementary to the capital planning process.

Recommended Work by Category

This section presents more detailed results of the investment scenarios introduced in chapter five. The following figures show the projected work recommended by the TAPT model over the four year period of the PT-TAMP, organized by asset category. The TAPT model scenario results are included in Appendix F.

Bus Mode

Scenario 1

A breakdown of the expected work by asset category in Scenario 1 is shown in Figure 6-1. Rolling stock work makes up the majority of projected spending in the first two years, followed by increased investment in facilities. Rolling stock work constitutes 65% of estimated transit asset management spending on the bus mode over the four-year period of the plan, while facilities and equipment constitute 32% and 3%, respectively.

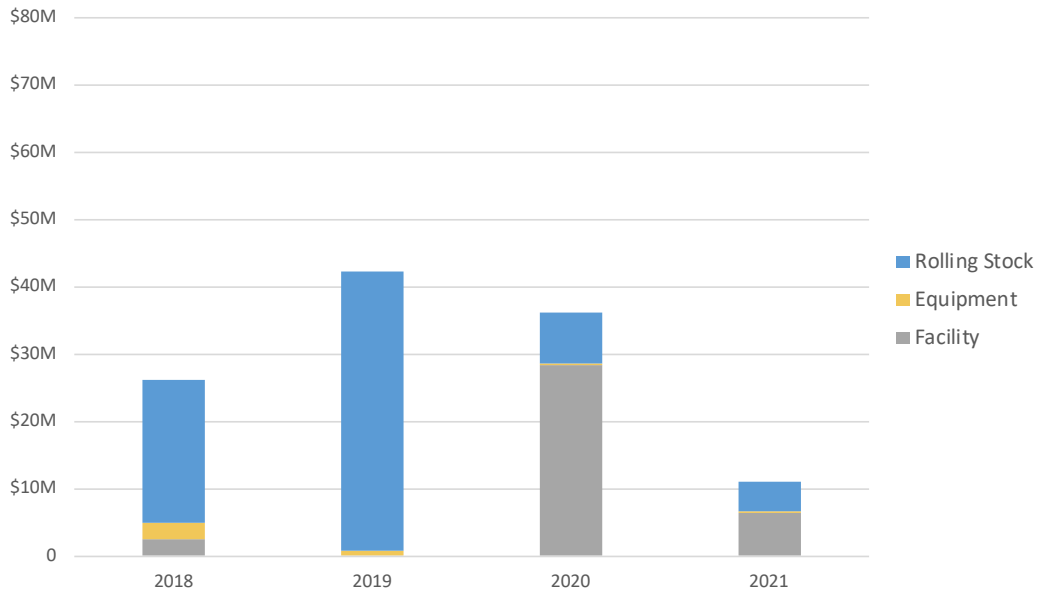


Figure 6-1. Recommended Work by Asset Category, Scenario 1 (Bus Mode)

Scenario 2

In Scenario 2, rolling stock work makes up the majority of projected spending. Rolling stock work constitutes 74% of estimated transit asset management spending on the bus mode over the four-year period of the plan, while facilities and equipment constitute 23% and 3%, respectively. A breakdown of the expected work by asset category in Scenario 2 is shown in Figure 6-2.

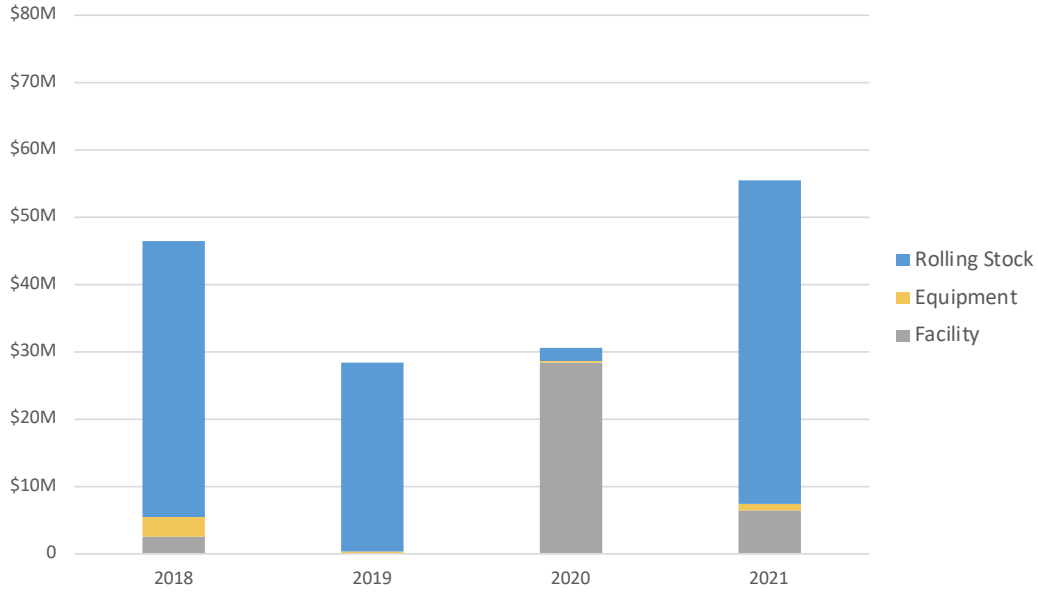


Figure 6-2. Recommended Work by Asset Category, Scenario 2 (Bus Mode)

Scenario 3

In Scenario 3, rolling stock work makes up the majority of projected spending. Rolling stock work constitutes 74% of estimated transit asset management spending on the bus mode over the four-year period of the plan, while facilities and equipment constitute 23% and 3%, respectively. The only difference between Scenario 2 and 3 is that rolling stock work is moved forward from 2021 to 2020 in Scenario 3. A breakdown of the expected work by asset category in Scenario 3 is shown in Figure 6-3.

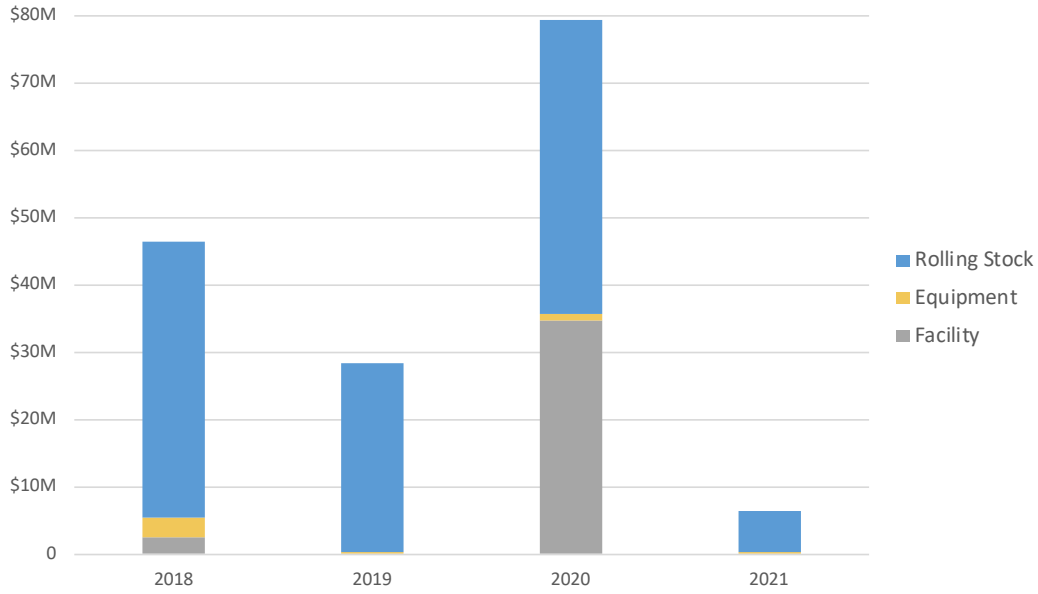


Figure 6-3. Recommended Work by Asset Category, Scenario 3 (Bus Mode)

Rail Mode

Scenario 1

In Scenario 1, infrastructure work makes up nearly all of projected spending. Infrastructure work constitutes 86% of estimated transit asset management spending on the rail mode over the four-year period of the plan, while facilities and rail rolling stock constitute 8% and 6%, respectively. Spending on equipment is less than 0.1% of the total. A breakdown of the expected work by asset category is shown in Figure 6-4.

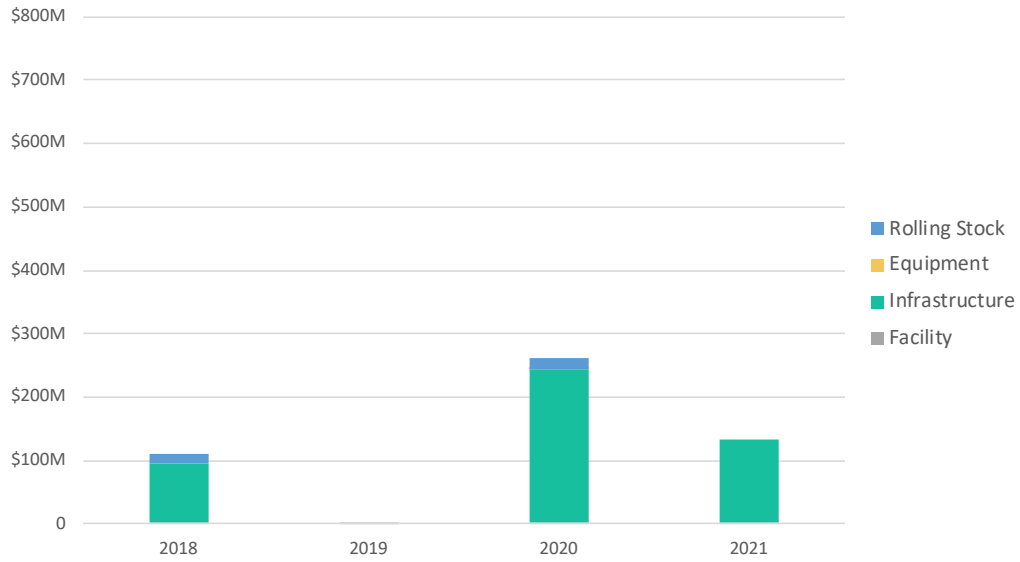


Figure 6-4. Recommended Work by Asset Category, Scenario 1 (Rail Mode)

Scenario 2

In Scenario 2, infrastructure work makes up nearly all of projected spending. Infrastructure work constitutes 88% of estimated transit asset management spending on the rail mode over the four-year period of the plan, while facilities and rail rolling stock constitute 9% and 3%, respectively. Spending on equipment is less than 0.1% of the total. A breakdown of the expected work by asset category is shown in Figure 6-5.

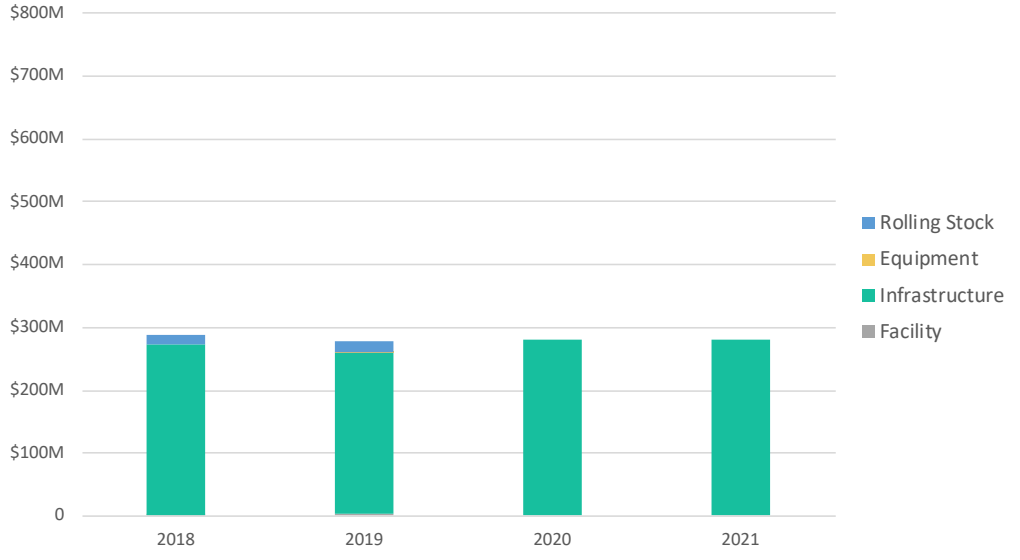


Figure 6-5. Recommended Work by Asset Category, Scenario 2 (Rail Mode)

Scenario 3

In Scenario 3, infrastructure work makes up nearly all of projected spending. Infrastructure work constitutes 83% of estimated transit asset management spending on the rail mode over the four-year period of the plan, while rail rolling stock and facilities constitute 10% and 7%, respectively. Spending on equipment is 0.3% of the total. The large increase in infrastructure work shown in 2021 is the recommended to replace a movable bridge at the cost of roughly $750 million. A breakdown of the expected work by asset category is shown in Figure 6-6.

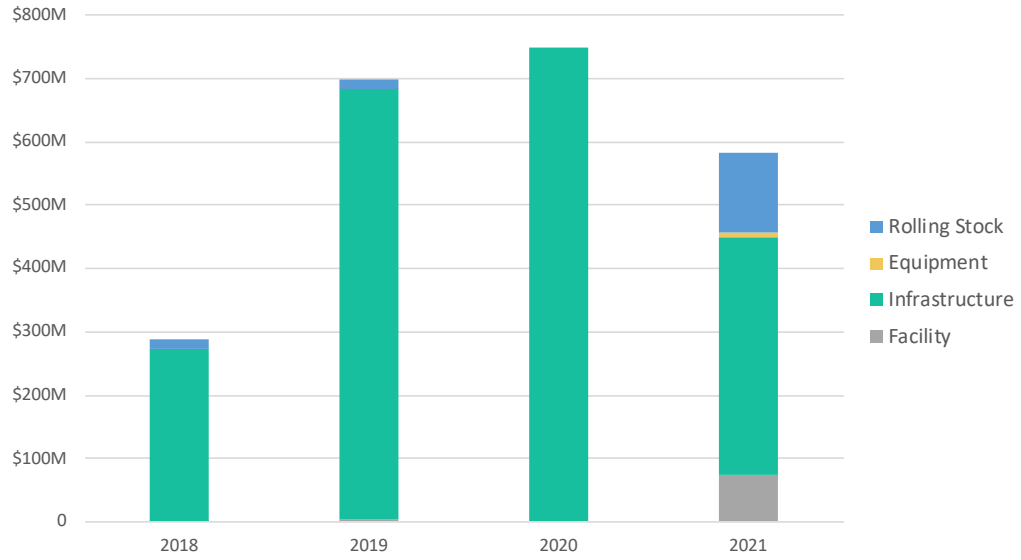


Figure 6-6. Recommended Work by Asset Category, Scenario 3 (Rail Mode)

Predicted Asset Performance

The estimated impact of the recommended work on asset condition is summarized by asset category in Figures 6-7 thru 6-10. Each figure shows the current performance of each asset class, and predicted performance by Fiscal Year from 2018-2021 for each funding scenario. Note that slow zone performance is not modeled in this plan and thus rail infrastructure predictions are not included.

Figure 6-7 shows predicted performance for bus rolling stock. The performance measure on the y-axis is the percent of vehicles at or exceeding the ULB.

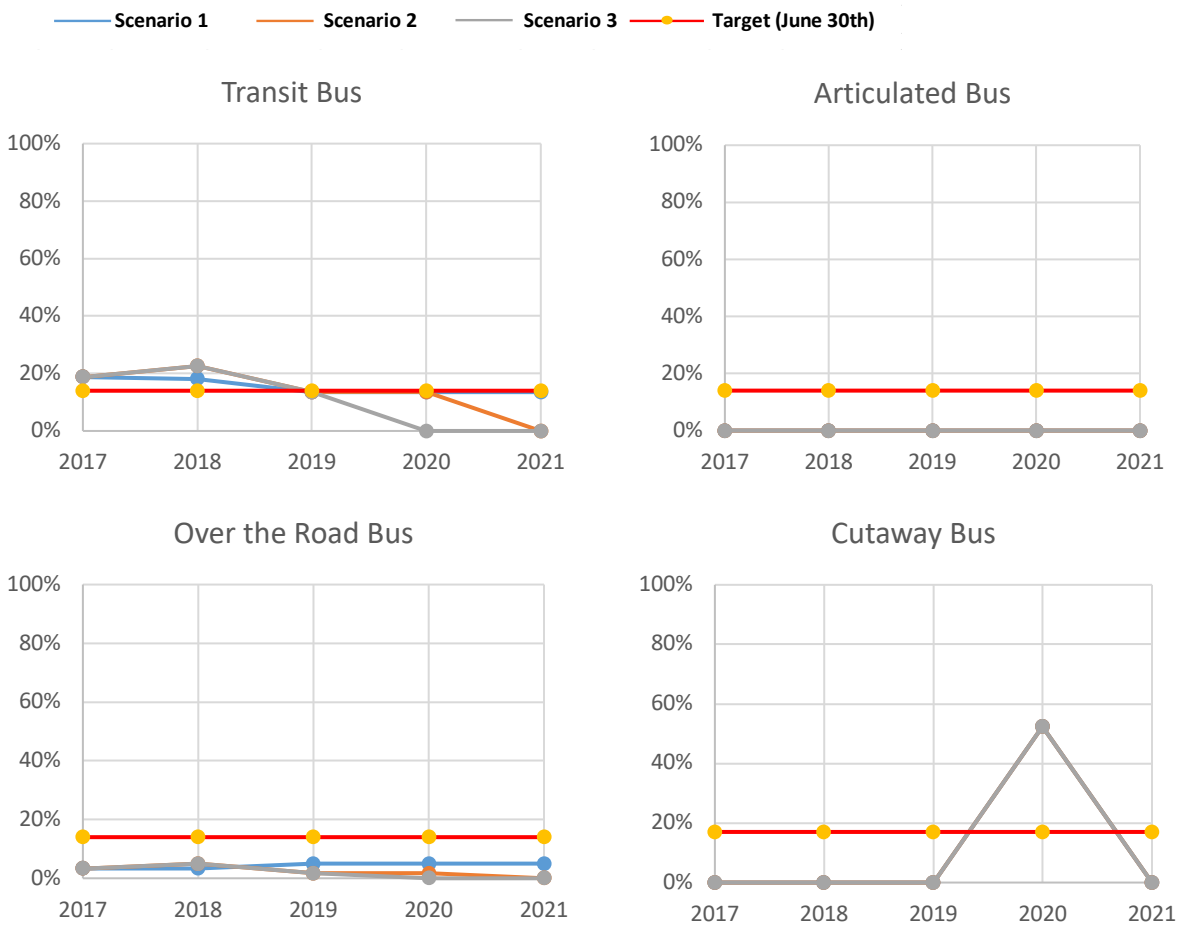


Figure 6-7. Predicted Performance for Bus Rolling Stock

Figure 6-8 shows predicted performance for rail rolling stock. The performance measure on the y-axis is the percent of vehicles at or exceeding the ULB.

Figure 6-8. Predicted Performance for Rail Rolling Stock

Figure 6-9 shows predicted performance for equipment. The performance measure on the y-axis is the percent of vehicles at or exceeding the ULB.

Figure 6-9. Predicted Performance for Equipment

Figure 6-10 shows predicted performance for facilities. The performance measure on the y-axis is the percent of facilities rated below condition 3 on the TERM scale.

Figure 6-10. Predicted Performance for Facilities

Prioritized List of Investments

Tier I Bus Investment Prioritization

The prioritized list of Tier I Bus investments is included in Appendix F. The modeling results are generally consistent with CTDOT's capital plan, but have not been specifically reconciled with the plan. Projects identified in the prioritization list are taken directly from CTDOT's 2017-2021 Capital Plan in Appendix G. A number of assets have been left out of modeling due to lack of data, insufficient data, or newly constructed assets. This includes ferries, CTfastrak guideway, and other assets.

Service vehicles are replaced differently than revenue vehicles in Connecticut. Age, mileage, condition and service hours in addition to the transit providers' overall assessment of the vehicle all factor into the replacement of a service vehicle. So in reality those service vehicles rising to the top of this prioritized list of Tier I investments might not be replaced for years beyond their ULB.

For Capital Plan programming purposes service vehicles are grouped under the SCV Vehicle and Administrative Capital/Miscellaneous Support Equipment line in the Capital Plan. Funding is available for replacement but ultimately CTDOT depends on the transit providers to assess the service vehicles for safe operation and request replacement when necessary.

The top priorities are replacements of CTtransit service vehicles. More expensive investment priorities include work on the CTtransit Hartford Admin/Maintenance facility, as well as replacement of 41 CTtransit New Haven transit buses and 48 CTtransit Hartford transit buses.

Rail Investment Prioritization

The prioritized list of rail investments is included in Appendix F. The top priorities are replacement of MNR locomotives from 1960 and replacements of ties and track in TERM condition rating 1 and 2. Some guideway assets, including ties and track, are grouped by condition rating because there is condition data but no location data for the assets. Other top priorities include work on rail platforms.

CHAPTER 7

Implementation and Monitoring

TAM is a series of processes intended to help preserve asset condition over the life of the asset at minimal cost. Practicing TAM means continuous improvement and TAM practices and processes need to be documented and reevaluated on an ongoing basis. As CTDOT continues implementing TAM and maturing its TAM practices and processes, the agency is always looking for opportunities for improvement. CTDOT has developed a set of implementation tasks to help improve TAM and update the PT-TAMP.

Overview

This chapter supplements the plan's discussion of current asset management practices in Connecticut with the identification of key implementation activities that will help to continue to improve our TAM practices. The PT-TAMP is a living document that will evolve to reflect changing TAM practices and processes at CTDOT. This plan addresses needs for both Tier I and Tier II implementation, which CTDOT approaches in an integrated manner.

Federal Legislative Context

In 49 CFR 625.25, FTA requires that a Tier I provider must include the following items in a TAM plan:

- A provider's TAM plan implementation strategy
- A description of key TAM activities that a provider intends to engage in over the TAM plan horizon period
- A summary or list of the resources, including personnel, that a provider needs to develop and carry out the TAM plan
- An outline of how a provider will monitor, update, and evaluate, as needed, its TAM plan and related business practices, to ensure the continuous improvement of its TAM practices

In 49 CFR 625.5, implementation strategy is defined as "a transit provider's approach to carrying out TAM practices, including establishing a schedule, accountabilities, tasks, dependencies, and roles and responsibilities."

Key asset management activities are defined as "a list of activities that a transit provider determines are critical to achieving its TAM goals."

TAM Plan Implementation Strategy

CTDOT implementation of TAM began before the FTA rule on TAM was finalized. CTDOT established a PT TAM Unit to coordinate TAM implementation and lead development of the PT-TAMP.

In anticipation of the final rule, CTDOT conducted a gap assessment of transit asset management practices in Connecticut. This initial effort had four objectives:

- Assess the current state of transit asset management practices at CTDOT
- Perform a transit asset management gap assessment

- Assess readiness to comply with FTA transit asset management requirements
- Develop implementation plan for addressing gaps

The effort was organized into a series of tasks designed to achieve the objectives.

CTDOT reviewed transit asset management materials to gain understanding of the current state of practice at the agency. As part of the review of current practices, the PT TAM Unit interviewed CTDOT staff from a variety of offices and staff from transit providers that operate in Connecticut. These in-person interviews helped the project team form an understanding of current transit asset management practices in Connecticut and also illustrated potential gaps in current practices. The interviews, along with the review of existing materials and the gap analysis survey, informed the writing of the gap assessment.

CTDOT also performed a literature review of best practices in asset management, including transportation asset management self-assessment tools and maturity models. The review included documents from federal agencies, state agencies, local agencies, and other organizations.

Based on the review of best practices, the PT TAM Unit developed a CTDOT transit asset management self-assessment which included 27 multiple choice questions. The survey was sent to 80 individuals representing five different groups: CTDOT, transit districts, CTtransit, Amtrak, and Metro-North. The self-assessment served as a gap analysis survey. Following the completion of the survey, the PT TAM Unit compiled survey results and prepared a summary of the results.

The PT TAM Unit organized and facilitated a transit asset management workshop at CTDOT to present the results of the gap analysis. Group sessions were used to brainstorm implementation tasks to address the gaps.

Using the workshop results, the PT TAM Unit drafted a gap assessment document comparing existing transit asset management practices to best practices and needs for supporting development of an FTA-compliant asset management plan. The gaps represent the deficiencies in current practices relative to best practices and/or practices needed to fulfill FTA's asset management requirements. The gaps were organized into four types:

- Inventory and Condition Gaps
- Business Process Gaps
- Information Systems Gaps
- Staffing Gaps

This assessment provided the foundation for the development of an initial TAM implementation plan, which included tasks to improve transit asset management practices.

As CTDOT has made progress on implementing TAM and developing the PT-TAMP, the initial implementation tasks have been updated based on completed work. This chapter includes implementation tasks which represent CTDOT's next steps in its implementation of TAM.

Key TAM Activities

This section presents a series of key TAM activities that CTDOT either needs or currently is doing to achieve asset management goals, improve TAM practices, and integrate TAM throughout the agency.

Development of Asset Hierarchy and Inventory

CTDOT built the SGR Transit Database during the development of the PT-TAMP, as referenced in chapter three. Many of Connecticut transit service providers own, operate and maintain their transit assets therefore they are not registered in CORE-CT, the financial register. An integral step in accurate data collection and reporting is validating the SGR Transit Database with all transit service providers. CTDOT will continue to develop the SGR Transit Database into a more robust system and to coordinate data collection with transit providers.

Define and Implement Condition Assessment

As part of the development of the PT-TAMP, CTDOT defined a condition assessment approach for rolling stock, equipment, infrastructure, and facilities, included in the Condition Assessment Guidance in Appendix B. CTDOT will continue to implement the condition assessment approach and assess the condition of transit assets. In particular, both admin/maintenance and passenger facilities need condition assessments and will develop a cyclical inspection program in order to meet FTA reporting requirements on facilities. CTDOT will collect, maintain, and update asset condition data. Part of this effort will include coordinating with Amtrak and Metro-North for rail assets.

For CTfastrak, CTDOT will collect inventory and condition data using a similar approach to CTDOT highway. CTDOT collects pavement inventory and condition data using specially equipped Fugro Roadware Automatic Road Analyzer (ARAN) vans. The entire CTDOT-maintained mainline is measured each year. CTDOT performed an initial data collection run of CTfastrak guideway in March 2015, prior to the system opening. CTDOT is

establishing a process for regular data collection, data processing, and integration with the Pavement Management System.

Performance Measure Data Collection and Reporting

FTA requires that a provider must set performance targets annually for the following program year. These targets must be reported to the NTD in the provider's annual data report. CTDOT will collect data to calculate federally required performance measures for rolling stock, equipment, infrastructure, and facilities. CTDOT will set performance targets for each performance measure and report both targets and asset condition to the NTD annually.

CTDOT currently maintains an online performance measure dashboard that features proprietary measures linked to CTDOT's mission. Some of the existing performance measures on the dashboard are tied to transit assets. CTDOT will add the FTA TAM performance measures to the dashboard and continue to update the maintain the dashboard and the data for the measures.

Implement a Statewide Facilities Asset Management System

Using an asset or facilities management system to track day-to-day inspection and maintenance activities is consistent with best practices in asset management. CTDOT and other CT transit providers typically have systems for managing maintenance of their vehicles but tend to need systems for facility management.

CTDOT has begun the process of procuring a multimodal Facilities Management Solution (FMS) to manage CTDOT's entire asset class of buildings within a single system. A comprehensive FMS can help CTDOT record inventory, track assets, and manage the necessary asset management activities to keep all CTDOT's buildings operating in SGR. CTDOT can also use the system to assist in predicting capital programming expenditures in a transparent manner.

CTDOT went through an RFI process to gather information on FMS in 2017, and is now considering an RFP moving forward. The software should manage all asset management aspects of the building from maintaining the current inventory, tracking asset condition, performing detailed inspections, rating and ranking building assets by SGR, work order tracking that links back and updated asset condition, building deterioration modeling, and project prioritization and financial modeling multiple funding scenarios.

Once implemented, the vision for the system will be to manage and inspect CTDOT owned facility assets for both bus and rail, including other transit

providers as well. This activity is also being considered to address management of other CTDOT asset classes in addition to transit facilities, and was a requested requirement for FMS in the RFI process.

Improve Oversight of Maintenance Plans and Activities

CTDOT develops maintenance plans for new facilities, but appeared to need mechanisms for confirming these plans are followed. Further, many older facilities may not have maintenance plans altogether, or have outdated information on who is responsible for certain maintenance tasks. CTDOT also needed better oversight for other guideway assets along rail lines.

The Bureau of Public Transportation has taken initial steps to improve upon these gaps through various actions and activities. The PT TAM Unit recently worked with Office of Rail and MNR to update a rail passenger station matrix that outlines which entities are supposed to perform specific maintenance activities for New Haven Line Stations (snow removal, electrical maintenance, cleaning, etc.) See Appendix C for a copy of this matrix.

In addition, the Bureau of Public Transportation has developed a new Rail Regulatory Unit within the Office of Rail to address oversight of rail maintenance facilities and other rail guideway assets. Aside from primary responsibilities of improving general oversight of MOW activities by MNR, additional activities to date include developing pilot inspection programs for rail yard facilities and grade crossings. This group will continue to work closely with the PT TAM unit to ensure activities are coordinated and meet FTA compliance.

The PT TAM Unit has also coordinated with Metro North who is in the process of developing an enterprise asset management system for work order management along the rail lines it operates including New Haven Line. Coordination efforts have focused on ensuring CTDOT staff has access to this system to further improve its oversight responsibilities for the New Haven Line.

All of CT Transit divisions, including CTfastrak and all bus service providers in Connecticut, have extensive vehicle and facility maintenance plans in place, as required by the FTA. Procedures and specific maintenance inspections on vehicles and facilities are detailed in these plans. The PT TAM Unit will continue to coordinate with all bus transit service providers in Connecticut as they explore and pilot different systems to ensure the oversight of these maintenance plans.

Improve Predictive Capability for Fixed Assets

As part of PT-TAMP development, CTDOT reviewed tools for predicting transit capital needs, including TAPT and FTA's TERM Lite. CTDOT selected

TAPT as the predictive approach, loaded inventory and condition data, and generated predictions of SGR needs and work.

CTDOT will continue to refine the modeling approach for transit assets, particularly for fixed assets. Future modeling will require updated costs and more detailed and comprehensive data, as available. CTDOT will seek technical support for the training of TAPT as it works to integrate a defined prioritization process for the capital plan. Part of this effort may include coordinating with Amtrak and Metro-North for rail asset data.

The PT TAM Unit will also need to work with its transit operators to ensure that the lifecycle needs/costs of the assets are being optimized and captured through a data driven process, to better understand when investments should be made. This will be an iterative process that involves constant communication and development of data for analytical purposes as well as the procurement or development of mature asset management systems/software. Lifecycle strategies will differ by each transit operator and by asset class:

Bus

- Rolling Stock: CTtransit Hartford has a software called Asset Works which tracks data on vehicles down to the part. This system provides needed transparency and detail to accurately track lifecycle costs for all vehicles.
- Guideway: CTfastrak is a 9.4-mile bus-only guideway whose main component is a paved surface similar to a highway asset. It was determined that in order to track condition and predictive capabilities, the CTfastrak system is best housed in CTDOT's pavement management system and roadway inventory network. Improvement activities include geocoding the CTfastrak route into CTDOT's GIS system, and then using CTDOT's adapted Photolog technology to ID features and track pavement condition. The PT TAM Unit has coordinated with Policy and Planning and Engineering to place the CTfastrak into these systems by December 2018.
- Facilities: As mentioned earlier, the FMS system by CTDOT is a multimodal approach that includes CTtransit. CTtransit's HNS operator has decided to accelerate this process by obtaining a pilot version of a FMS called FAMIS. They have begun data collection for this pilot and will include all buildings at the Hartford, Hamden, and Stamford facilities.

Rail

- Rolling Stock: MNR adopted a 35-year ULB for its rolling stock, based on the commercial life of many car types while incorporating a Reliability Centered Maintenance (RCM) approach. This approach focuses on the

ability to study failure rates and types in order to become more proactive in addressing maintenance issues and preserving the life of its rolling stock. Implementing a successful RCM approach can reduce dependency on costly capital repairs while also extending the life of an asset, saving CTDOT substantial financial obligations in the long term.

- Guideway: MNR performs day-to-day maintenance of CTDOT's portion of the New Haven Line. As part of MNR's new EAM system INFOR, they are currently implementing Bentley's Optram software package in order to better utilize data that is collected from the geometry cars that test for defects along the rail infrastructure. The ability to better use this data can be an invaluable tool to create more capital projects that are proactive in rail replacement and reduce reliance on emergency maintenance for rail defects.
- Facilities: As mentioned earlier, CTDOT will be procuring a FMS that will be able to collect better data on its rail facilities. Having more of this data readily available can provide better insight into operating costs and capital needs, to ensure facilities are constantly in SGR and operating efficiently and safely.

Maintain and Update Transit Asset Management Plan

FTA requires that a transit provider must update its TAM plan every four years. Additionally, a provider should amend its TAM plan when there is a significant change to inventory, condition, or investment prioritization. CTDOT will work to update the PT-TAMP on a four-year cycle and to revise the plan to be consistent with any significant changes. Updating the PT-TAMP will involve updating the inventory data, performing new condition assessments, modeling new investment scenarios, and generating a new list of prioritized SGR investments. CTDOT will also be responsible for updating the Tier II plan in Connecticut.

Information Sharing

CTDOT will lead a set of activities to facilitate exchange of information on asset management practices between transit providers in Connecticut. Participants should include CTDOT staff, as well as transit providers under contract to CTDOT, and the transit districts.

The SGR Transit Database created by the PT TAM Unit was crucial not only for developing inventory, but creating a system where data could be authenticated, maintained, and shared amongst various stakeholders who depend on the data collected within this system. The PT TAM unit will be responsible for establishing a set of guidelines on how to update and share data that is stored within this database, particularly for personnel who are not part of CTDOT staff.

In addition, a long-term vision will be focused on how to integrate the SGR Transit database into CTDOT's existing and future data sharing structure. CTDOT is currently in the process of developing a Transportation Enterprise Database (TED) as a means of establishing a universal source of data by linking numerous other databases into a universal system, and developing a set of data governance principles to ensure data used is maintained and authenticated.

PT TAM Unit will develop a program of periodic peer exchanges and/or facilitated workshops to communicate current status of CTDOT transit asset management activities and facilitate exchange of information on asset management approaches/lessons learned. PT TAM Unit will organize, conduct, and summarize these activities for the participants.

TAM Resources

This section describes the TAM resources needed to develop and carry out the PT-TAMP. While CTDOT is integrating TAM throughout the agency, there is a PT TAM Unit which currently includes three staff members dedicated to TAM. This group is responsible for developing, maintaining, and updating the PT-TAMP, and for coordinating, setting, and submitting performance measures and targets to the NTD. A TAM Implementation Committee will be created consisting of representatives from transit providers and key CTDOT staff to support future TAM implementation activities. CTDOT also convened working groups consisting of stakeholders to help develop the PT-TAMP.

CTDOT will need to address its short and long term needs for an asset inventory system. CTDOT is also using ongoing consultant support for TAM implementation.

Monitoring and Evaluations

CTDOT will monitor, update, and evaluate the PT-TAMP as an ongoing activity.

The PT TAM unit will lead the implementation activities, update the plan, and periodically convene workshops to interface with other transit providers. This work includes two of the TAM implementation activities above: "Maintain and Update TAM Plan" and "Information Sharing".

In addition, the PT TAM unit will lead a series of further monitoring and evaluation activities in the following key areas:

- Implementing use of asset management targets;

- Improving STIP and capital plan development;
- Informing Long-Range-Plan development;
- Improving data collection;
- Updating the asset management needs analysis; and
- Support Tier II asset management implementation.

The following paragraphs discuss specific activities in each of these areas.

Implementing Use of Asset Management Targets. Moving forward the measures and targets established for asset management should inform investment decisions, and in particular the identification of and selection of capital projects. The PT TAM Unit will work with CTDOT capital planning and programming staff to establish targets, and ensure that the capital program is structured to achieve these targets once set. To evaluate progress in this area CTDOT will assess the degree to which the targets established in the annual target-setting process are met.

Improving STIP and Capital Plan Development. An important product of asset management plan development is the prioritized list of SGR needs identified in chapter five. Ideally CTDOT and its partners will refer to this list of needs in developing future STIPs and capital plans. To help accomplish this, the PT TAM Unit will work with the CTDOT's Council of Government Coordination Unit to improve the connection between the STIP and the Capital Program for Transit Assets. To evaluate progress in this area CTDOT will assess whether the needs identified in this plan are incorporated in future STIP updates to the extent needed funds are available.

Informing Long-Range-Plan Development. Moving forward it is important for CTDOT and its planning partners to incorporate consideration of transit asset management performance targets and the set of identified SGR needs in the planning process. To help accomplish this, CTDOT is working on a reporting mechanism to link prioritized projects and targets to the MPOs' long range planning and programming process. To evaluate progress in this area CTDOT will determine whether such a reporting mechanism has been established, and if so whether it has been used in the planning process.

Improving Data Collection. The PT TAM Unit will be responsible for managing the annual update of asset inventory and condition data. Inventory will be updated in the SGR Transit Database.

As condition assessments are performed for various fixed assets, the condition of the assets can be updated in the SGR Transit Database. For rolling stock, equipment, and facilities, the condition data can be used directly to calculate the FTA TAM performance measures. For guideway, the slow zone performance measure will need to be updated separately.

The PT-TAM Unit will coordinate with MPO's and transit providers to set targets annually through a set of information sharing activities. These targets will be incorporated into an annual data report and narrative report submitted to the NTD. The data report will include current condition and the FTA TAM performance targets for the following year. The narrative report will include a description of any changes in transit system condition and describe progress made towards performance targets. The PT TAM Unit will be responsible for drafting the narrative report.

To improve data collection the PT-TAM unit will implement a set of data quality assurance/quality control (QA/QC) processes to verify the accuracy and completeness of inventory and condition data. These processes will specify the process for updating the data, and responsibility for maintenance and upkeep of asset management data (data governance), as well as specific steps to verify data quality and completeness. To evaluate progress in this area CTDOT will assess whether CTDOT is successful in timely completion of required reporting. Also, CTDOT will assess whether the QA/QC processes have been established and are being followed.

Updating the Asset Management Needs Analysis. Although FTA does not require annual updates of this plan, annual updates to the data and assessment of SGR needs to support performance reporting requirements and the related business processes described above. The PT-TAM unit will update the SGR needs analysis on an annual basis to support these requirements, incorporating the improvements to asset data and the analysis of SGR needs described above. To evaluate progress in this area CTDOT will assess whether the needs analysis is, indeed, updated on an annual basis incorporating updates to asset data and supporting systems.

Support Tier II Asset Management Efforts. Comprehensive implementation of an asset management approach addresses how an asset is managed over its entire lifecycle, from construction or purchase through to its retirement or replacement. Consequently, putting best practices in asset management into place in an agency can impact a number of business functions. Connecticut's transit providers are committed to using an asset management approach to help improve the State of Good Repair of Connecticut's physical transit assets, and make the best use of scarce resources. Over time application of asset management concepts may impact areas such as how maintenance decisions are made, what staff transit agencies need to meet their mission, and the data and systems they use.

The PT-TAM unit will help support Tier II transit agency efforts to implement asset management concepts more broadly in their agencies through the communication and outreach activities described previously in this section. To evaluate progress in this area CTDOT will assess whether

the outreach activities are conducted as described in this document, and the level of participation of the agencies in the various outreach activities. This evaluation will help inform the set of asset management-related activities that are needed in future updates of this plan.

Appendix A. Asset Fact Sheets

Connecticut Tier I Transit Asset Management Plan

Bus Rolling Stock

Description

- CTDOT owns the local bus systems in Hartford, New Haven, Stamford, Waterbury, New Britain, Bristol, Meriden, and Wallingford, and operates them under the CTtransit brand name. CTDOT owns all the rolling stock that provides CTtransit services.
- CTtransit services carry roughly 80% of annual bus ridership in Connecticut.
- CTDOT also owns the bus rapid transit system CTfastrak, which includes fixed guideway between Hartford and New Britain.
- CTDOT's bus rolling stock inventory includes four vehicle types: transit bus, articulated bus, over-the-road bus, and cutaway.

Performance Measures

The percentage of revenue vehicles within a particular asset class that have either met or exceeded their useful life benchmark

- Useful life benchmark (ULB) defines an asset's economic useful life, specified in terms of age, mileage and/or other factors. An agency can use FTA's default ULB values or set its own values. CTDOT has worked with its transit service provider partners to define custom values.
- A revenue vehicle that has not reached or exceeded its ULB is considered to have met the performance metric.

Inventory and Condition

Transit Bus

A bus with front and center doors, normally with a rear-mounted engine, low-back seating, and without luggage compartments or restroom facilities for use in frequent- stop service. This is what is used most typically on fixed route systems. A 40-foot coach is the common type bus used in larger systems. This vehicle can usually hold about 42 ambulatory passengers when two wheelchair tiedowns are provided.

496 Vehicles

12 Years ULB

81% Below ULB

Articulated Bus

Extra-long (54 ft. to 60 ft.) bus with two connected passenger compartments. The rear body section is connected to the main body by a joint mechanism that allows the vehicles to bend when in operation for sharp turns and curves and yet have a continuous interior.

51 Vehicles

12 Years ULB

100% Below ULB

Over-the-road Bus

A bus characterized by an elevated passenger deck located over a baggage compartment.

60 Vehicles

12 Years ULB

97% Below ULB

Cutaway Bus

A vehicle that consists of a bus body that is mounted on the chassis of a van or light-duty truck. The original van or light-duty truck chassis may be reinforced or extended. Cutaways typically seat 15 or more passengers and may accommodate some standing passengers.

42 Vehicles

5 Years ULB

100% Below ULB

Based on CTDOT data as of March, 2018

**The Performance measures herein are for FTA reporting purposes only. Due to the variability of mechanical reliability and operating environment, the Age based metric prescribed by FTA does not accurately reflect SGR needs.*

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually.

Performance and Targets for Tier I Bus Rolling Stock

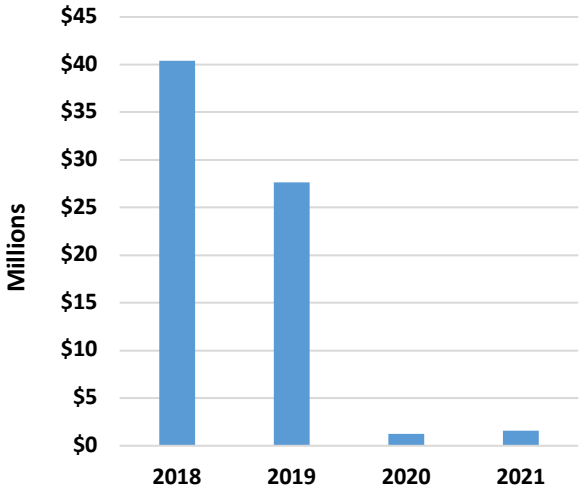
	% Vehicles Below ULB	% Vehicles Met or Exceeded ULB	
Asset Class	Current Performance	Current Performance	Performance Target
Transit Bus	81%	19%	14%
Articulated Bus	100%	0%	14%
Over-the-Road Bus	97%	3%	14%
Cutaway	100%	0%	17%

Connecticut Tier I Transit Asset Management Plan

Bus Rolling Stock

2018-2021 Investment Needs

Estimated Investment Needs by Year
(TAPT Modeling Results)



CTDOT anticipates over $70 million of SGR needs from 2018-2021 for its Tier I Bus Rolling Stock. This includes an initial backlog in 2018 of $40.4 million in SGR needs, and an additional $30.4 million of SGR needs from 2019-2021.

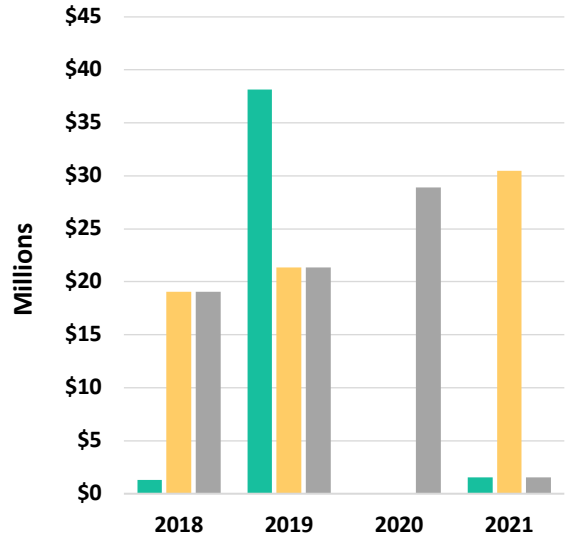
The main 2018 initial needs include replacing New Flyer transit buses from the early 2000's and a couple of MCI over the road buses for the CTTransit Stamford Division.

Additional items that will enter the SGR backlog from 2019-2021 include New Flyer transit buses from the late 2000's, a 2007 MCI over the road bus, and 22 cutaways from CTTransit Waterbury in 2021.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Tier I Bus Rolling Stock
(TAPT Modeling Results)



Based on CTDOT data as of March, 2018

- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In Scenario 1, the TAPT model recommends CTDOT invest nearly $41million in Tier I bus rolling stock over the 4 year horizon from 2018-2021. Scenarios 2 and 3 recommends CTDOT invest nearly $70.9 million in Tier I bus rolling stock over the 4 year horizon.

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Funding for Tier I bus assets comes from a variety of federal funding programs, including Sections 5307, 5337, 5339.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Connecticut Tier I Transit Asset Management Plan

Rail Rolling Stock

Description

- The New Haven Line, which serves stations along the Connecticut shore from New Haven to Greenwich and on to Grand Central Terminal in New York City, is operated by Metro-North (MNR) under contract to CTDOT. CTDOT has a capital interest in the rail vehicles that operate on the line.
- Shore Line East (SLE), operated by Amtrak under contract to CTDOT, serves stations from New London to New Haven. SLE service operates CTDOT-owned rolling stock, which are also used on Hartford Line (HL).
- CTDOT's rail rolling stock inventory includes three vehicle types: locomotive, passenger coach, and self-propelled passenger car.

Performance Measures

The percentage of revenue vehicles within a particular asset class that have either met or exceeded their useful life benchmark

- Useful life benchmark (ULB) defines an asset's economic useful life, specified in terms of age, mileage and/or other factors. An agency can use FTA's default ULB values or set its own values. CTDOT has worked with its transit service provider partners to define custom values.
- A revenue vehicle that has not reached or exceeded its ULB is considered to have met the performance metric.

Inventory and Condition

Locomotive

Commuter rail vehicles used to pull or push passenger coaches. Locomotives do not carry passengers themselves.

MNR	22 Vehicles	35 Years ULB	46% Below ULB
SLE/ HL	12 Vehicles	25 Years ULB	0% Below ULB

Passenger Coach

Commuter rail passenger vehicles not independently propelled and requiring one or more locomotives for propulsion.

MNR	50 Vehicles	35 Years ULB	100% Below ULB
SLE/ HL	33 Vehicles	25 Years ULB	0% Below ULB

Self-Propelled Passenger Car

Commuter rail passenger vehicles not requiring a separate locomotive for propulsion.

	310 Vehicles	25 Years ULB	88% Below ULB

Based on CTDOT data as of March, 2018

**The Performance measures herein are for FTA reporting purposes only. Due to the variability of mechanical reliability and operating environment, the age based metric prescribed by FTA does not fully reflect SGR needs.*

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually. CTDOT set separate ULB's for locomotives and passenger coaches depending on the service line due to different maintenance strategies.

Performance and Targets for Rail Rolling Stock

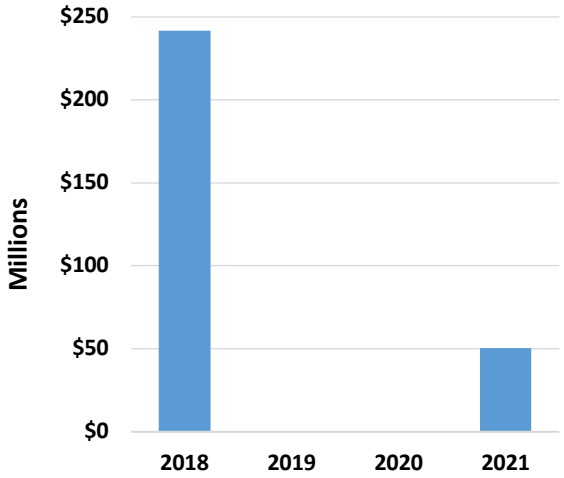
	% Vehicles Below ULB	% Vehicles Met or Exceeded ULB	
Asset Class	Current Performance	Current Performance	Performance Target
Locomotive (MNR)	46%	54%	13%
Locomotive (SLE/HL)	0%	100%	17%
Passenger Coach (MNR)	100%	0%	13%
Passenger Coach (SLE/HL)	0%	100%	17%
Self-Propelled Passenger Car	88%	12%	13%

Connecticut Tier I Transit Asset Management Plan

Rail Rolling Stock

2018-2021 Investment Needs

Estimated Investment Needs for Rail Rolling Stock (TAPT Modeling Results)



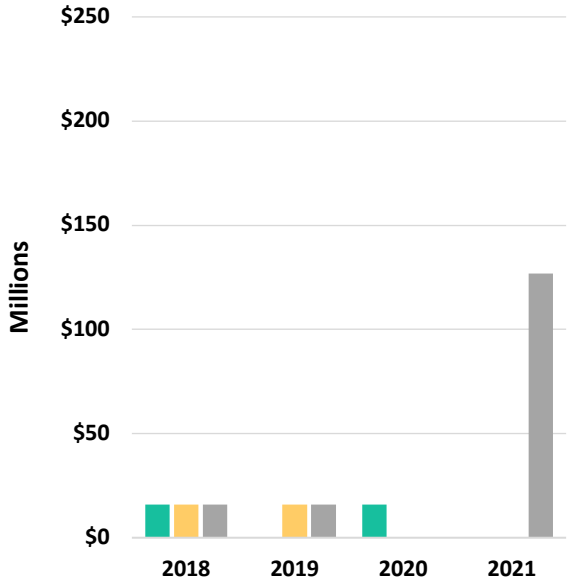
CTDOT anticipates over $292 million of SGR needs from 2018-2021 for its rail rolling stock. This includes an initial backlog in 2018 of nearly $242 million in SGR needs, and an additional $50.4 million of SGR needs in 2021.

The 2018 initial needs include replacing 24 rail locomotives, the 36 1972 self propelled vehicles, and all 33 Shore Line East passenger coaches. The 2021 needs include replacing 20 New Haven Line passenger coaches.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Rail Rolling Stock (TAPT Modeling Results)



- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In Scenarios 1 and 2, the TAPT model recommends CTDOT invest nearly $31.7 million in rail rolling stock over the 4 year horizon from 2018-2021. Scenario 3 recommends CTDOT invest almost $159 million in rail rolling stock over the 4 year horizon.

Based on CTDOT data as of March, 2018

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Federal funding for rail assets comes from a variety of FTA programs, including Sections 5307 and 5337.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Connecticut Tier I Transit Asset Management Plan

Service Vehicles

Description

- Service vehicles are defined by FTA as equipment used primarily to support maintenance and repair work for public transportation.
- CTDOT's service vehicles support two modes of travel: bus and commuter rail.
- CTDOT's 119 service vehicles are organized into five types. Trucks, automobiles, SUVs, and vans can be used as staff vehicles. Steel wheel vehicles are used for inspection and maintenance of facilities and rights-of-way.

Performance Measures

The percentage of service vehicles within a particular asset class that have either met or exceeded their useful life benchmark

- Useful life benchmark (ULB) defines an asset's economic useful life, specified in terms of age, mileage and/or other factors. An agency can use FTA's default ULB values or set its own values. CTDOT has worked with its transit service provider partners to define custom values.
- A service vehicle that has not reached or exceeded its ULB is considered to have met the performance metric.

Inventory and Condition

Rubber Tire Vehicle (Truck)

Any motor vehicle designed to transport cargo.

27 Vehicles

14 Years ULB

74% Below ULB

Automobile

Passenger cars, up to and including station wagons in size. Excludes minivans and anything larger.

11 Vehicles

5 Years ULB

55% Below ULB

Sport Utility Vehicle

A high-performance four-wheel drive car built on a truck chassis. It is a passenger vehicle which combines the towing capacity of a pickup truck with the passenger-carrying space of a minivan or station wagon.

27 Vehicles

5 Years ULB

70% Below ULB

Van

An enclosed vehicle having a typical seating capacity of 8 to 18 passengers and a driver. A van is typically taller and with a higher floor than a passenger car, such as a hatchback or station wagon.

11 Vehicles

5 Years ULB

46% Below ULB

Steel Wheel Vehicle

Any support vehicle that is solely used on a running rail.

43 Vehicles

25 Years ULB

2% Below ULB

Based on CTDOT data as of March, 2018

**The Performance measures herein are for FTA reporting purposes only. Due to the variability of mechanical reliability and operating environment, the age based metric prescribed by FTA does not fully reflect SGR needs.*

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually.

Performance and Targets for Tier I Service Vehicles

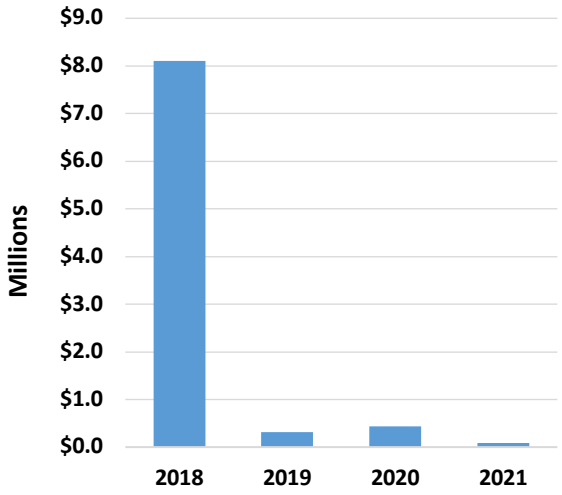
	% Vehicles Below ULB	% Vehicles Met or Exceeded ULB	
Asset Class	Current Performance	Current Performance	Performance Target
Rubber Tire Vehicle (Truck)	74%	26%	7%
Automobile	55%	45%	17%
Sport Utility Vehicle	70%	30%	17%
Van	46%	54%	17%
Steel Wheel Vehicle	2%	98%	0%

Connecticut Tier I Transit Asset Management Plan

Service Vehicles

2018-2021 Investment Needs

Estimated Investment Needs for Tier I Service Vehicles (TAPT Modeling Results)



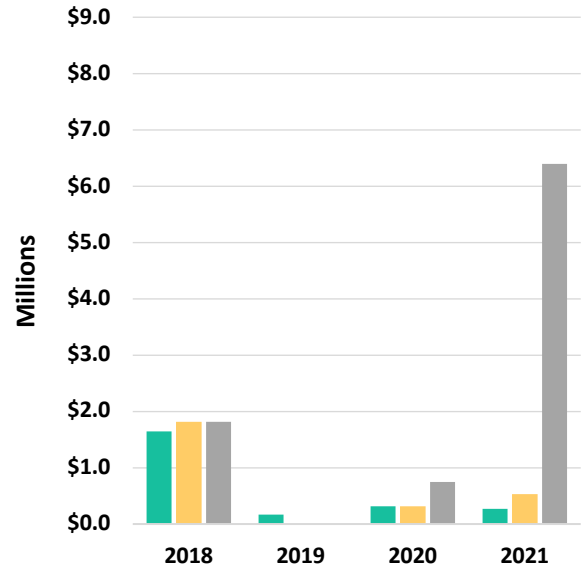
CTDOT anticipates about $9 million of SGR needs from 2018-2021 for its Tier I Service Vehicles. Most of the service vehicles are part of the initial backlog in 2018, totaling around $8.1 million. The majority of the backlog is the 43 steel wheel vehicles for rail at $6.3 Million.

For Capital Plan programming purposes, service vehicles are grouped under the SCV Vehicle and Administrative Capital/Miscellaneous Support Equipment line in the Capital Plan. Funding is available for replacement but ultimately depends on the transit providers to assess the service vehicles for safe operation and request replacement when necessary.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Tier I Service Vehicles (TAPT Modeling Results)



Based on CTDOT data as of March, 2018

- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In Scenario 1, the TAPT model recommends funding about $2.4 million for service vehicle replacement for the 4 year horizon from 2018-2021.In Scenario 2, the model recommends funding about $2.7 million. In Scenario 3, the TAPT model recommends eliminating the entire $9 million backlog.

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Funding for service vehicles comes from a variety of federal funding programs.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Connecticut Tier I Transit Asset Management Plan

Rail Infrastructure

Description

- CTDOT owns rail infrastructure on the Northeast Corridor between New Haven and the New York/Connecticut border, as well the New Canaan, Danbury and Waterbury Branch Lines.

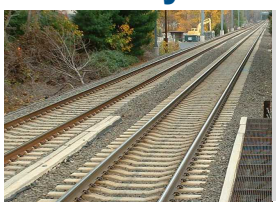
Performance Measures

The FTA performance measure for infrastructure is the percentage of guideway that is under speed restriction.

CTDOT also assesses rail infrastructure condition using other performance measures.

- For all rail infrastructure assets other than structures, CTDOT assesses condition based on asset age. For each asset type a ULB value is specified in years. Asset condition is then approximated by comparing the age of the asset to the ULB. A condition rating is assigned on the five-point TERM scale based on a conversion scale.
- CTDOT performs visual inspections of structures to assess conditions of the bridge deck, superstructure and substructure using the 10-point National Bridge Inventory (NBI) condition scale (with values ranging from 0 to 9). For culverts a single overall culvert rating is specified. A bridge is deemed to be in SGR if all of its ratings are 5 or greater, and not in SGR if any rating is 4 or less.

Inventory and Condition



Track

Track-related infrastructure; includes running rail, ties, turnouts, and ballast.

243 Track Miles | **375** Turnouts | **60%** Below ULB

Power

Infrastructure related to the transmission of power for signals and traction via the overhead contact system. Includes AC substations, catenary plant, catenary portals, and transmission equipment.

288 Miles of Catenary | **291** Miles of Power Cable | **75%** Below ULB

44 Substation assets | **870** Catenary Poles

Communication and Signals

Systems related to the monitoring and safety of train movements. Includes switches and signals, grade crossings, vehicle detection equipment, Intelligent Transportation System technology, and Positive Train Control equipment.

243 Track Miles | **89%** Below ULB

Structures

Major Infrastructure to supplement safe movement of trains above or below grade. Includes Moveable Bridges, Fixed Bridges, Culverts, Station Pedestrian Bridges/Tunnels, and Retaining Walls.

148 Fixed Structures | **36** Culvert Structures | **63%** Rated below 5

5 Moveable Structures | **17** Pedestrian Structures

Based on CTDOT data as of March, 2018

Slow Zone Restriction Performance Measure herein is required for FTA reporting purposes and does not fully reflect SGR needs. Asset Condition is monitored through a combination of age, visual and hands on inspections, and performance measures.

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually.

Performance and Targets for Rail Infrastructure

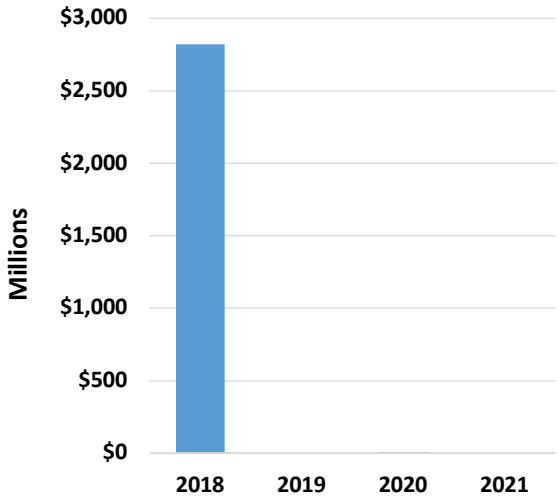
	% Guideway Slow Zone Restriction	
Asset Class	**Current Performance**	**Performance Target**
Rail Guideway	**5%**	**2%**

Connecticut Tier I Transit Asset Management Plan

Rail Infrastructure

2018-2021 Investment Needs

Estimated Investment Needs for Rail Infrastructure (TAPT Modeling Results)



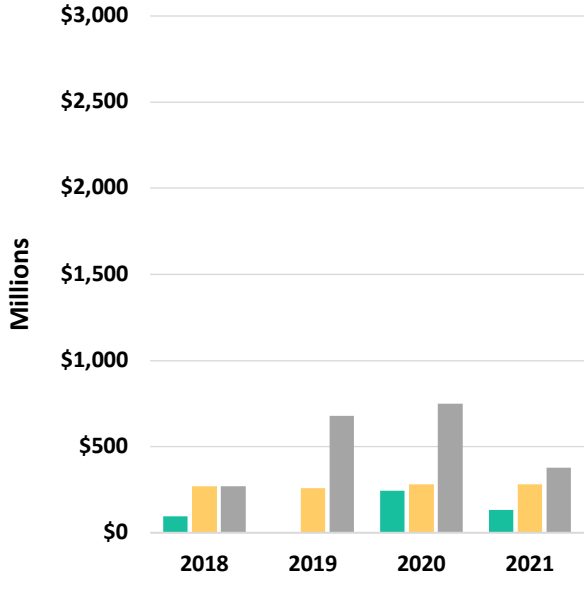
CTDOT anticipates about $2.8 **billion** of SGR needs from 2018-2021 for its New Haven Line/Branch Line rail infrastructure. The modeled SGR needs are anticipated to enter the SGR backlog in State Fiscal Year 2020. While other SGR needs may arise in this horizon period, the TAPT model was not able to capture other potential needs due to lack of more granular data.

The TAPT model SGR needs include replacing two moveable bridges estimated at $750 million each, and other various bridge replacements, track maintenance, and power and signal upgrades.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Rail Infrastructure (TAPT Modeling Results)



- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In Scenario 1, the TAPT recommends allocating about $469 million towards infrastructure investments. In Scenario 2, the TAPT recommends around $1.1 billion towards infrastructure investments. With Lets Go CT money allocated, the TAPT recommends in Scenario 3 to invest around $2.1 billion, to address nearly 2/3 of the rail infrastructure backlog over the 4 year horizon from 2018-2021.

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Federal funding for rail assets comes from a variety of FTA programs, including Sections 5307 and 5337.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Connecticut Tier I Transit Asset Management Plan

Bus Facilities

Description

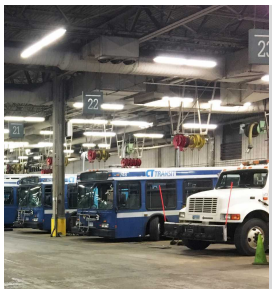
- CTDOT owns four administrative or maintenance bus facilities. These are CTtransit facilities in Hartford, Stamford, New Haven, and Waterbury.
- CTDOT owns 10 bus passenger facilities, all of which are on the CTfastrak bus rapid transit service.
- Only CTtransit Hartford facility has had a recent detailed inspection and condition assessment. Condition data for the other facilities is based on engineering judgement.

Performance Measures

The percentage of facilities within a particular asset class rated below condition 3 on the FTA Transit Economic Requirements Model (TERM) scale.

- Major facility components are inspected and rated on a 1 to 5 condition scale. The component condition ratings are averaged using weight factors and replacement cost to calculate the overall condition of a facility.
- For some components, a visual inspection may be insufficient for establishing conditions. In these cases, an age-based approach is used to estimate condition using useful life.
- A facility that has a condition rating of 3 or greater has met the performance metric.

Inventory and Condition

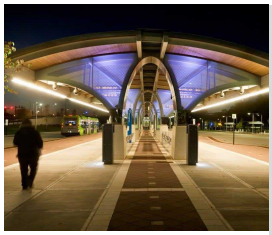


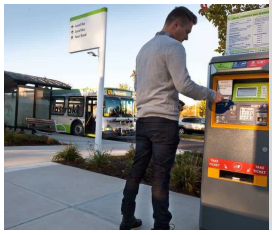
Administrative/Maintenance

Administrative facilities are typically offices that house management and supporting activities for overall transit operations such as accounting, finance, engineering, legal, safety, security, customer services, scheduling, and planning. They also include facilities for customer information or ticket sales, but that are not part of any passenger station. Maintenance facilities are those where routine maintenance and repairs or heavy maintenance or unit rebuilds are conducted.

4 Facilities

100% % rated condition 3 or above





Passenger/Parking

Passenger facilities are significant structures on a separate ROW.

- All motorbus, rapid bus, commuter bus, and trolley bus passenger facilities in a separate ROW that have an enclosed structure (building) for passengers for items such as ticketing, information, restrooms, and concessions
- All transportation, transit or transfer centers, and transit malls if they have an enclosed structure (building) for passengers for items such as ticketing, information, restrooms, concessions, and telephones

10 Facilities

100% % rated condition 3 or above

Based on CTDOT data as of March, 2018

**Performance measure herein is required for FTA reporting purposes only. Condition Ratings are used to determine overall SGR status either through engineering judgement or formal condition assessments, which may not reflect SGR needs in its entirety.*

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually.

Performance and Targets for Tier I Bus Facilities

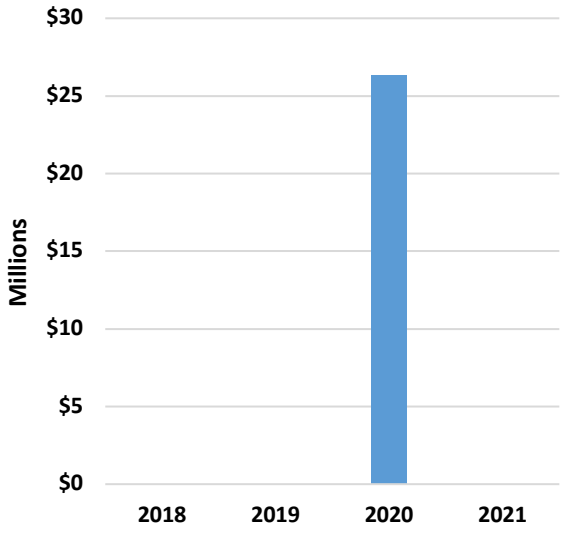
	% Facilities Rated Condition 3 or Above	% Facilities Rated Below Condition 3	
Asset Class	**Current Performance**	**Current Performance**	**Performance Target**
Administrative/ Maintenance	100%	0%	0%
Passenger	100%	0%	0%

Connecticut Tier I Transit Asset Management Plan

Bus Facilities

2018-2021 Investment Needs

Estimated Investment Needs for Tier I Bus Facilities (TAPT Modeling Results)



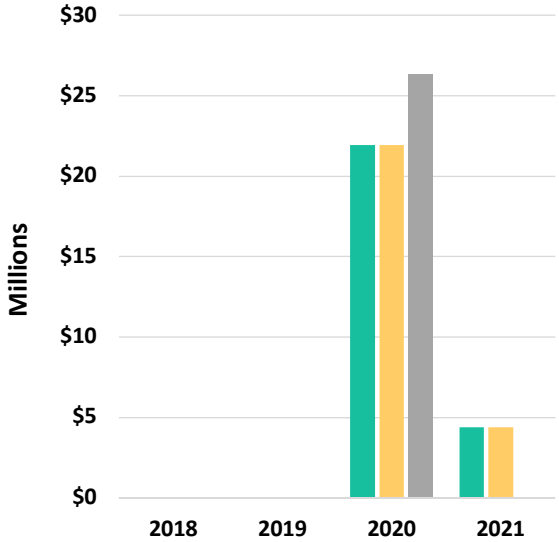
CTDOT anticipates about $26.3 million of SGR needs from 2018-2021 for its Tier I Bus Facilities. The modeled SGR needs are anticipated to enter the SGR backlog in State Fiscal Year 2020. While other SGR needs may arise in this horizon period, the TAPT model was not able to capture other potential needs due to lack of formal condition assessments at some facilities.

The TAPT model SGR needs include various component level work at the CTTransit Hartford and Stamford facilities.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Tier I Bus Facilities (TAPT Modeling Results)



- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In all Scenarios, the TAPT model recommends CTDOT invest nearly $26.3 million in Tier I bus facilities over the 4 year horizon from 2018-2021 to address all modeled SGR needs.

Based on CTDOT data as of March, 2018

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Funding for Tier I bus assets comes from a variety of federal funding programs, including Sections 5307, 5337, 5339.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Connecticut Tier I Transit Asset Management Plan

Rail Facilities

Description

- CTDOT owns five administrative or maintenance rail facilities. These are facilities in Bridgeport, Danbury, New Haven, Stamford, and Springdale. However condition data is not available for all Facilities.
- CTDOT owns 43 rail passenger facilities, serving Metro North and Shore Line East. Formal condition assessments were performed for all passenger facilities in 2017.

Performance Measures

The percentage of facilities within a particular asset class rated below condition 3 on the FTA Transit Economic Requirements Model (TERM) scale.

- Major facility components are inspected and rated on a 1 to 5 condition scale. The component condition ratings are averaged using weight factors and replacement cost to calculate the overall condition of a facility.
- For some components, a visual inspection may be insufficient for establishing conditions. In these cases, an age-based approach is used to estimate condition using useful life.
- A facility that has a condition rating of 3 or greater has met the performance metric.

Inventory and Condition

Administrative/Maintenance

Administrative facilities are typically offices that house management and supporting activities for overall transit operations such as accounting, finance, engineering, legal, safety, security, customer services, scheduling, and planning. They also include facilities for customer information or ticket sales, but that are not part of any passenger station. Maintenance facilities are those where routine maintenance and repairs or heavy maintenance or unit rebuilds are conducted.

5 Facilities

100% % rated 3 or above

Passenger/Parking

Passenger facilities are significant structures on a separate ROW. For rail modes, passenger facilities typically mean a platform area and any associated access structures or accessory spaces accessible to passengers or by staff who are in support of passenger service. Examples include

- All rail passenger facilities (except for light rail, cable car, and streetcar modes)
- All light rail, cable car, and streetcar passenger facilities that have platforms and serve track that is in a separate ROW (not in mixed-street traffic)
- All transportation, transit or transfer centers, and transit malls if they have an enclosed structure (building) for passengers for items such as ticketing, information, restrooms, concessions, and telephones

43 Facilities

42% % rated 3 or above

Based on CTDOT data as of March, 2018

**Performance measure herein is required for FTA reporting purposes only. Condition Ratings are used to determine overall SGR status either through engineering judgement or formal condition asssessments, which may not reflect SGR needs in its entirety.*

Current Performance and Targets

Transit providers must set one-year performance targets using the performance measures established by FTA for the four capital asset categories required for a TAM plan, as applicable. These targets must be updated and submitted to the NTD annually.

Performance and Targets for Rail Facilities

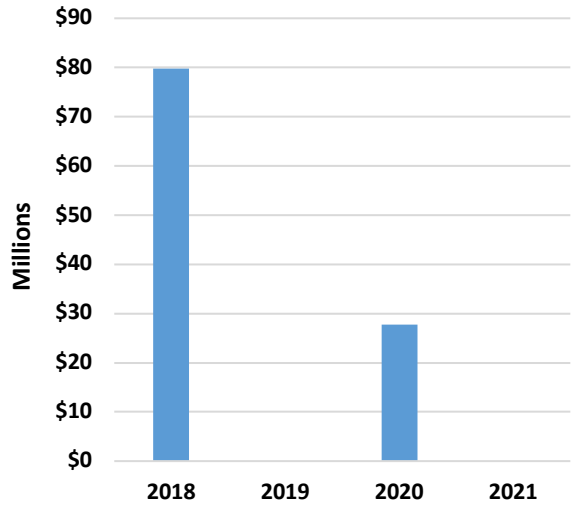
	% Facilities Rated 3 or Above	% Facilities Rated Below Condition 3	
Asset Class	**Current Performance**	**Current Performance**	**Performance Target**
Administrative/Maintenance	**100%**	**0%**	**0%**
Passenger	**42%**	**58%**	**0%**

Connecticut Tier I Transit Asset Management Plan

Rail Facilities

2018-2021 Investment Needs

Estimated Investment Needs for Tier I Rail Facilities (TAPT Modeling Results)



CTDOT anticipates over $107 million of SGR needs from 2018-2021 for its Rail Passenger Facilities. This includes an initial backlog in 2018 of $79.7 million in SGR needs, and an additional $27.7 million of SGR needs in 2020. While other SGR needs may arise in this horizon period, the TAPT model was not able to capture other potential needs due to lack of formal condition assessments at some facilities.

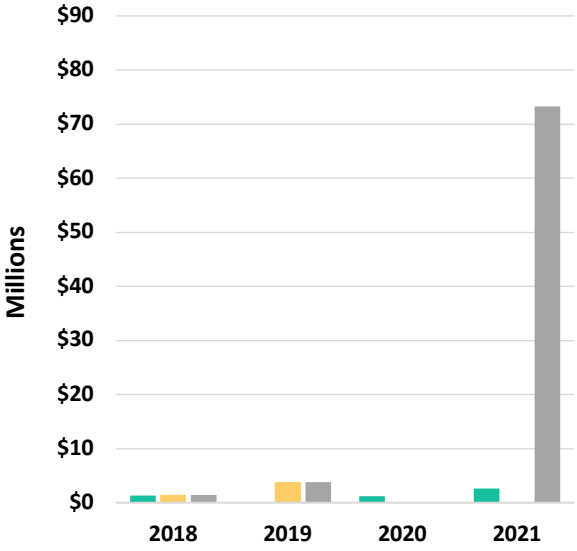
The main 2018 initial needs include station platform electrical and structural component level work at various stations throughout the New Haven Line and Shore Line East system.

The 2020 SGR backlog items include some anticipated component level work needed at various Administrative /Maintenance facilities.

*Years referenced in these charts are by State of Connecticut Fiscal Year which runs from July 1st to June 30th.

2018-2021 Investment Scenarios

Recommended Investments for Tier I Rail Facilities (TAPT Modeling Results)



Based on CTDOT data as of March, 2018

- **Scenario 1:** Federal with State Match Only
- **Scenario 2:** Federal with State Match + Public Transportation State Bonds
- **Scenario 3:** Federal with State Match + Public Transportation State Bonds + Lets Go CT

Funding Scenarios were developed by CTDOT's Capital Services Unit to reflect how different available funding sources impact what is programmed in CTDOT's 5 year capital plan. Connecticut's 2017-2021 Capital Plan is a document that lists all projects expected to be federally-funded over a five-year period.

In Scenario 1 and 2, the TAPT model recommends CTDOT invest nearly $5.3 million in Tier I rail facilities over the 4 year horizon from 2018-2021. Scenario 3 recommends CTDOT invest nearly $78.5 million in Tier I rail facilities over the 4 year horizon.

Transit Funding

Funding for transit in Connecticut historically comes primarily from FTA funds, with the remainder coming from state public transportation bonds. Bond funds are used to match federal funds and provide funding for 100% of state projects. Recently, the Let's Go CT program provided an influx of transit funds and currently accounts for a large percentage of transit funding in the short term.

Federal funding for rail assets comes from a variety of FTA programs, including Sections 5307 and 5337.

Analytical Approach

CTDOT uses the Transit Asset Prioritization Tool (TAPT) to support its analytical approach. TAPT is a spreadsheet tool for predicting transit asset conditions and SGR needs.

The tool has a series of models for different asset types that recommend when to rehabilitate or replace an asset, and the conditions and performance predicted for the asset over time. Also, the tool supports prediction of the overall performance resulting for a specified funding scenario, and recommends a prioritized list of projects to fund given a budget constraint.

Appendix B. Condition Assessment Guidance Document

Condition Assessment Guidance

Connecticut Department of Transportation

May 15, 2018

Spy Pond Partners, LLC
with CDM Smith Inc.

Table of Contents

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1.0 Introduction

1.1 Background and Purpose

The mission of the Bureau of Public Transportation at Connecticut Department of Transportation (CTDOT) is "to develop, maintain, and operate a system that provides for the safe, efficient and sustainable movement of people and goods." In pursuit of that mission, CTDOT has three transit objectives:

- Maintain existing systems at a state of good repair and enhance system safety and security
- Improve efficiency and effectiveness of transit service delivery
- Expand services to capture a greater share of existing markets and address specific new markets.

CTDOT faces an unusual challenge because of the transit service delivery model in Connecticut. Unlike many other state DOTs, CTDOT owns transit systems including bus operations throughout the state as well as the Shore Line East and New Haven Line commuter rail service.

Fifty percent of CTDOT's annual operating budget is dedicated to Public Transportation statewide operations. CTDOT has direct financial responsibility for millions of dollars of transit assets in Connecticut, but contracts out the operation of transit service to private companies. To meet the requirements for developing a transit asset management plan, established in the final rule on Transit Asset Management by the Federal Transit Administration (FTA), CTDOT is obligated to collect data, manage, and report on transit assets throughout the state.

As part of the rule on transit asset management, providers must develop and implement transit asset management (TAM) plans. Transit providers may be required to either develop their own TAM plan or participate in a group TAM plan depending on whether they are Tier I or Tier II. The FTA rule on Transit Asset Management defines Tier I and Tier II providers:

> *Tier I provider* means a recipient that owns, operates, or manages either (1) one hundred and one (101) or more vehicles in revenue service during peak regular service across all fixed route modes or in any one non-fixed route mode, or (2) rail transit.
>
> *Tier II provider* means a recipient that owns, operates, or manages (1) one hundred (100) or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (2) a subrecipient under the 5311 Rural Area Formula Program, (3) or any American Indian tribe.

States must develop a group TAM plan for Tier II transit providers, while Tier I providers must develop their own TAM plans. Tier II providers may also choose to forgo the group plan and develop individual plans.

A TAM plan needs to include TAM and SGR policy, TAM plan implementation strategy, an asset inventory, condition assessments, a description of systems used to predict capital needs, a project-based prioritization of investments, a description of key TAM activities, a list of TAM resources, and an outline for updating the plan and TAM practices.

The condition assessment must be performed at a level of detail sufficient to support capital planning. Also, ideally, the condition assessment should support calculation of the SGR performance measures FTA has defined for four capital assets categories: equipment (non-revenue vehicles), rolling stock (revenue vehicles), infrastructure (rail fixed-guideway, track, signals, and systems), and facilities. This document establishes an approach for calculating asset condition for each of the four asset categories.

1.2 Document Organization

This guidebook is organized into five main sections:

- **Section 1** describes the background of the project and the organization of this document.
- **Section 2** describes the inventory data and condition assessment approach for revenue vehicles.
- **Section 3** describes the inventory data and condition assessment approach for facilities.
- **Section 4** describes the inventory data and condition assessment approach for fixed guideway.
- **Section 5** describes the inventory data and condition assessment approach for equipment.
- **Appendix A** includes a detailed list of assessment items for Administrative and Maintenance Facilities
- **Appendix B** includes recommended inspection procedures for Administrative and Maintenance Facilities
- **Appendix C** includes a detailed list of assessment items for Passenger Facilities
- **Appendix D** includes a detailed asset hierarchy for rail guideway

2.0 Revenue Vehicles

2.1 Inventory Data

Revenue vehicles are inventoried by vehicle fleet. All vehicles in a given fleet share the same vehicle type, make/model, model year, and operator. Other inventory data collected for a fleet may include, but is not limited to, vehicle length and fuel type. Figures 1 to 4 illustrate the asset hierarchy for revenue vehicles. Figure 1 shows three subclasses of vehicles: bus, rail, and ferryboat. Figure 2 shows the five vehicle types defined for buses, Figure 3 shows the six defined for rail, and Figure 4 shows the three for ferry.

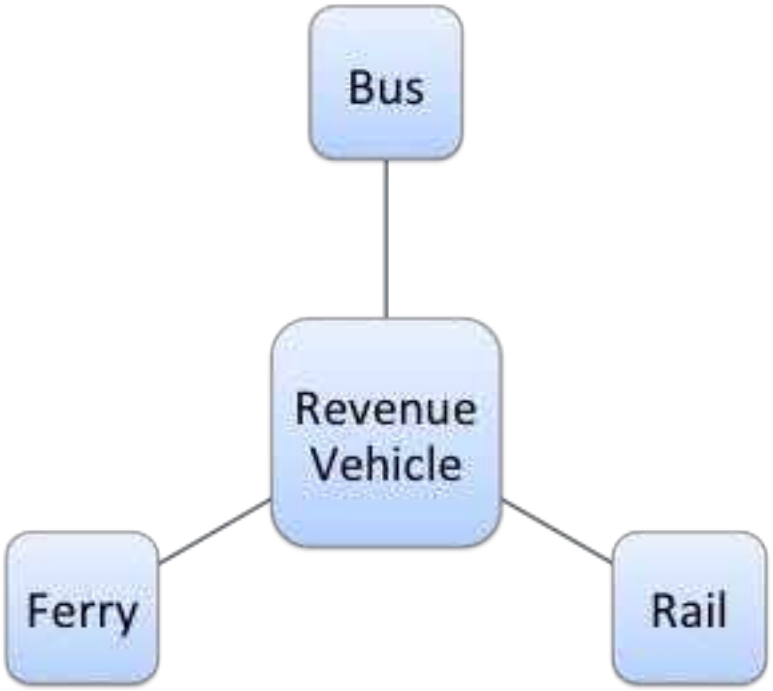

Figure 1. Asset Hierarchy – Revenue Vehicles

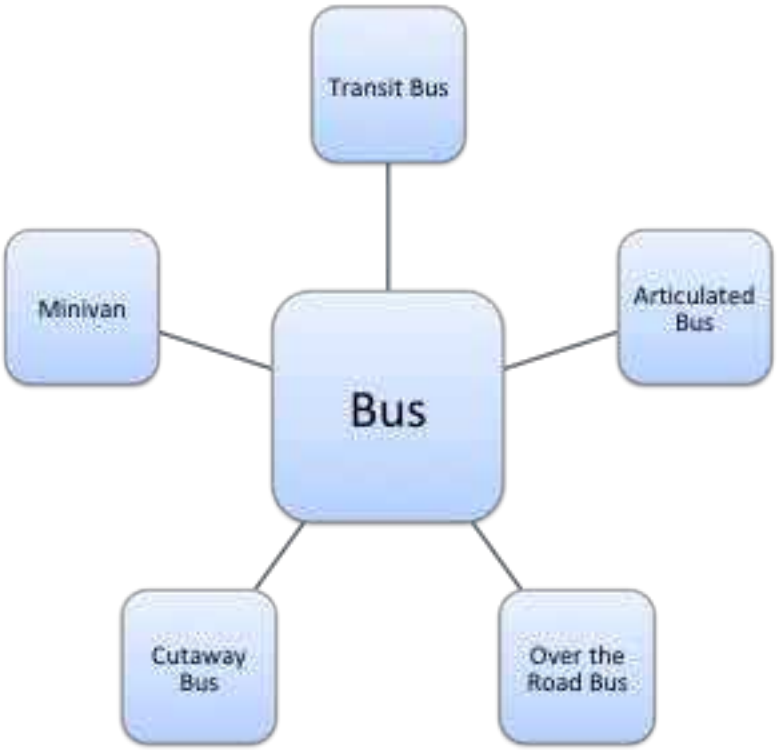

Figure 2. Asset Hierarchy – Revenue Vehicles – Bus

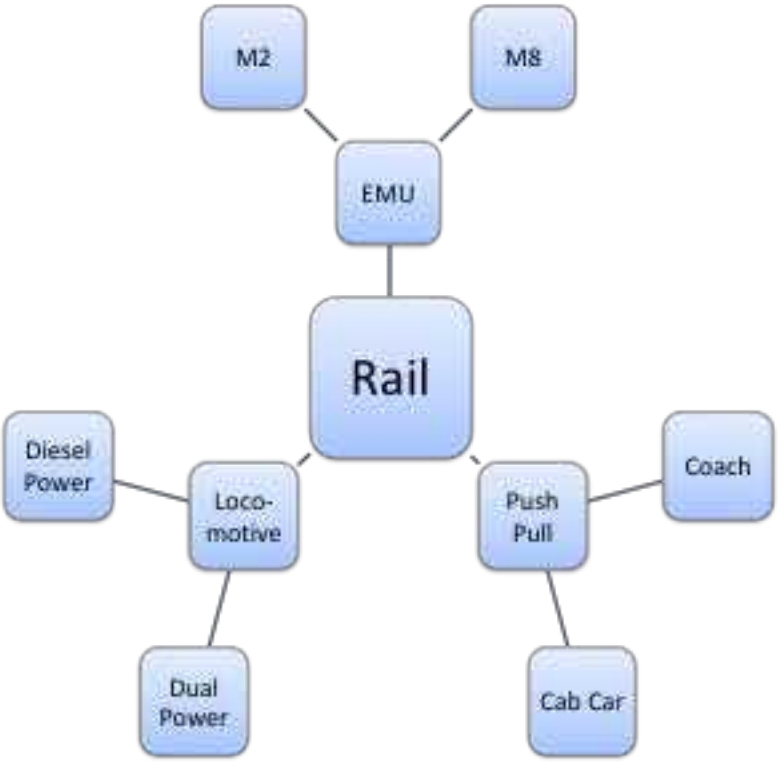

Figure 3. Asset Hierarchy – Revenue Vehicles – Rail

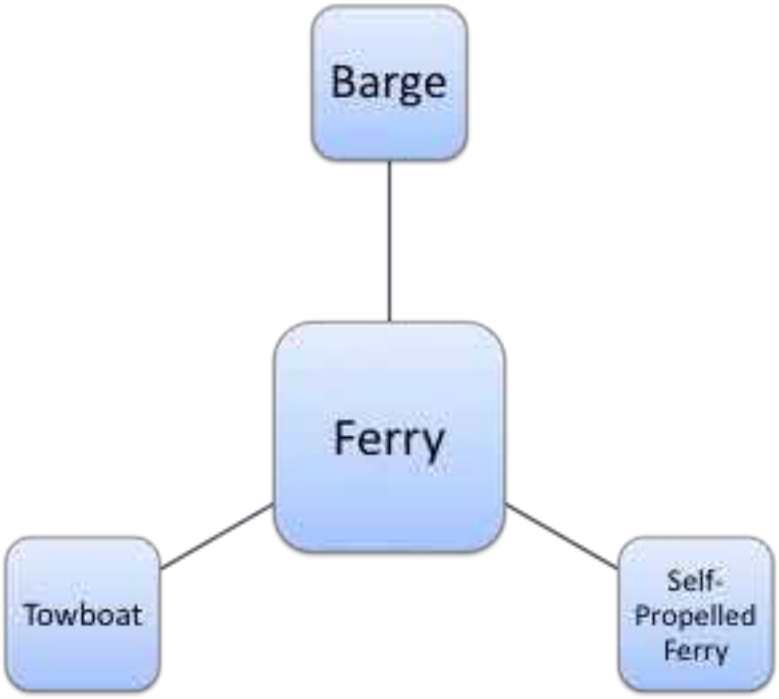

Figure 4. Asset Hierarchy – Revenue Vehicles – Ferry

2.2 Condition Assessment Approach

The purpose of the vehicle condition assessment is to provide an overall snapshot of the current state of repair of a vehicle fleet to aid in decisions concerning when it is most cost effective to replace it.

FTA's mandated SGR performance measure for revenue vehicles is the percentage of vehicles that have met or exceed their Useful Life Benchmark (ULBs). The ULB is age at which a vehicle has reached the end of its economic useful life. This value may be specified in terms of vehicle age, mileage and/or other factors. FTA provides a set of default ULB values by vehicle type, all of which are specified in terms of vehicle age.

Following FTA's model, CTDOT uses fleet age as its indicator of vehicle condition. A vehicle is deemed to be in good repair if its age is less than the ULB specified for the corresponding vehicle type. Likewise, a vehicle is deemed to no longer be in good repair if its age equals or exceeds the corresponding ULB.

CTDOT has worked with their Tier I and Tier II service providers in Connecticut to define custom ULB values. Connecticut's ULB values for revenue vehicles are listed in Table 1.

Table 1. ULB Values for Revenue Vehicles

Tier I	Tier II	Asset Class	ULB (years)
●	●	Transit Bus	12
●		Articulated Bus	12
●	●	Cutaway Bus	5
●		Over the Road Bus	12
	●	Minivan	5
●		Rail Locomotive (Dual Power or Diesel)	25
●		Rail Push Pull (Coach or Cab Car)	25
●		Rail Electric Multiple Unit (M2 or M8 RMU)	25
●		Ferryboat	42

2.3 Assessment of Existing Data

Inventory data including model year (used to determine age) are stored by vehicle in CORE-CT and in inventory registries of Connecticut transit providers including the 12 transit districts participating in the Connecticut Group TAM Plan. For the purpose of developing its TAM Plan, CTDOT extracted revenue vehicle data from CORE-CT and transit providers, aggregated it by fleet, and imported the data into a separate transit asset inventory database, SGRtransdata.

3.0 Facilities

Two types of transit facilities are defined in the Connecticut SGR database: administrative/ maintenance facilities, and passenger facilities. The condition assessment approach is similar for both facility types, and relies on visual inspection of primary facility components. However, the specific facility components and available data differ between the two types of facilities. Section 3.1 discusses the recommended condition assessment approach for administrative/ maintenance facilities and Section 3.2 discusses the recommended approach for passenger facilities.

3.1 Administrative/Maintenance Facilities

3.1.1 Inventory Data

For administrative/maintenance facilities both the overall facility site and each individual building on the site are included in the inventory. In some cases, there may be only one building on a given site, but larger facilities may include multiple buildings.

Inventory data for the facility site may include, but is not limited to, the site address, operator and land area. Inventory data for buildings may include, but is not limited to, the operator, floor area, construction cost and date.

3.1.2 Condition Assessment Approach

The purpose of the facility condition assessment is to provide an overall snapshot of the current state of repair of a facility to aid in decisions concerning capital investments to improve the facility's condition. This section describes how to assess the condition of an administrative/ maintenance facility.

The approach described here is based on FTA's guidance detailed in *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*. FTA's guidance is intended to support calculation of FTA's mandated SGR performance measure for facilities, which is the percentage of facilities within an asset class rated less than three on the five-point scale used in the FTA Transit Economic Requirements Model (TERM). As described in FTA's guidance document, the components were established based upon American Society of Testing and Materials (ASTM) documents that provide standards for classification of buildings and related features, but these have been customized in certain respects to address common features of transit facilities.

To assess facility conditions an inspector should assign a value of 1 to 5 to each of the major components of the facility. The condition rating values and their descriptions are listed in Table 2. The components are listed in Table 3. Specific subcomponents the inspector should examine for each component are listed in Appendix A. The inspector may wish to assess the condition of these individual sub-components or simply use the list as a reference when performing the inspection. Further, when performing inspections at a sub-component level for certain sub-components, the inspector may wish to specify the percentage of the sub-component quantity in each condition rather than a single, overall condition. If sub-component conditions are assessed they should be aggregated to obtain an overall score for the component using the approach

described here for aggregating component scores. Suggested inspection procedures are included in Appendix B.

Table 2. FTA TERM Condition Assessment Scale

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable
4	Good	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	Adequate	Moderately deteriorated or defective; but has not exceeded useful life
2	Marginal	Defective or deteriorated in need of replacement; exceeded useful life
1	Poor	Critically damaged or in need of immediate repair; well past useful life

The specific components of administrative/maintenance facilities are listed below. Note that the first nine components listed in the table should be assessed for each building in the facility, and the final component, Site, should be assessed for the site as a whole.

Table 3. Administrative/Maintenance Facility Condition Assessment Components

Inventory Unit	Component	Notes	Typical Useful Life* (years)	Component Condition Weight**
Building	Substructure		30	1.0
Building	Shell		30	1.0
Building	Interior		30	1.0
Building	Plumbing	May need to assess based on age	20	1.0
Building	HVAC	May need to assess based on age	20	1.0
Building	Electrical	May need to assess based on age	30	1.0
Building	Fire Protection	See Table 5	20	1.0
Building	Conveyance	See Table 5	20	1.0
Building	Equipment	Includes fixed specialty equipment	30	1.0
Site	Site		50	1.0

*Useful life can be utilized for components that cannot be visually inspected.
**Component Condition Weight represents the relative importance of the component compared to other components. By default, these numbers are 1.0. However, based on the agency's experiences and practices, the inspector can use a different number to lower or raise the importance of a component and thus change how component conditions impact the overall facility condition.

For some components, a visual inspection may be insufficient for establishing conditions. In cases where the inspector finds that he or she cannot assess conditions of a component visually, the inspector should estimate the age of the component (the time since it was constructed or last rehabilitated), and estimate the condition based on the age using useful life for the component listed in Table 3 with the scale shown in Table 4. Useful life is the average amount of time in years that an item, component, or system is economically efficient to keep in operation. This approach will typically be required for Plumbing, HVAC and Electrical, but may also be required for other components. Refer to the discussion of rail guideway assets and Table 7 for further details on this conversion scale.

Table 4. Conversion Scale: Component Age to FTA TERM Condition Rating

Component Age as % of Useful Life	Rating	Condition
New	5	Excellent
≤ 50%	4	Good
>50% ≤100%	3	Adequate
>100% ≤125%	2	Marginal
>125%	1	Poor

For Fire Protection and Conveyance, separate inspections are typically performed to assess code compliance. The inspector should utilize the results from those inspections in performing their condition assessment. Specifically, the inspector should use the condition assessment scale shown in Table 5 for these components.

Table 5. Fire Protection and Conveyance Condition Assessment Scale

Rating	Condition	Description
5	Excellent	System is new and there are no identified code issues
4	Good	System is not new, but there are no identified code issues
3	Adequate	Isolated code issues exist that can be addressed through maintenance
2	Marginal	Code issues exist that do not necessitate facility closure
1	Poor	Extensive code issues have been identified that may necessitate facility closure

Given the individual component conditions, the overall condition of the facility is calculated as:

$$Condition = \frac{\sum_{i=1}^{n} c_i f_i r_i}{\sum_{i=1}^{n} f_i r_i}$$

where c_i is the condition of component i, f_i is the replacement cost factor listed in Table 3, and r_i is the replacement cost of the component.

3.1.3 Assessment of Existing Data

Inventory data on Connecticut facilities are stored in CORE-CT and the transit providers' asset registries, but the level of detail stored on each facility varies. Thus, for the purpose of developing its TAM Plan, CTDOT extracted data on administrative/maintenance facilities from CORE-CT and the transit providers' asset registries, then manually reviewed data for each facility. Except in the case of a selected Tier II facilities that have been recently inspected, component-level condition data are not available for administrative/maintenance facilities. However, the overall condition of CTDOT-owned facilities has been previously established. Thus, component-level conditions were manually determined for each facility using the available component-level data, overall facility condition, and facility age. Data for each facility and building were imported into the transit asset inventory database, SGRtransdata.

3.2 Passenger Facilities

3.2.1 Inventory Data

For passengers facilities the overall facility site, each individual building on the site, and each rail platform (if applicable) are included in the inventory. In some cases, there may be only one building and/or platform on a given site, but larger facilities may include multiple buildings and/or platforms.

Inventory data for the facility site may include, but is not limited to, the site address, operator and land area. Inventory data for buildings may include, but is not limited to, the operator, floor area, parking spaces (for parking lots), construction cost and date.

3.2.2 Condition Assessment Approach

The condition assessment approach for passenger facilities is similar to that for administrative/maintenance facilities. The approach described here is based on FTA's guidance detailed in *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*. FTA's guidance is intended to support calculation of FTA's mandated SGR performance measure for facilities, which is the percentage of facilities within an asset class rated less than three on the five-point TERM scale.

To assess facility conditions an inspector should assign a value of 1 to 5 to each of the major components of the facility. The condition rating values and their descriptions are listed in Table 2. The components are listed in Table 6. Specific subcomponents the inspector should examine for each component are listed in Appendix C. The inspector may wish to assess the condition of these individual sub-components or simply use the list as a reference when performing the inspection. Further, when performing inspections at a sub-component level, for certain sub-components the inspector may wish to specify the percentage of the sub-component quantity in each condition rather than a single, overall condition. If sub-component conditions are assessed they should be aggregated to obtain an overall score for the component using the approach described here for aggregating component scores. Suggested inspection procedures are included in Appendix B.

Regarding the specific components of passenger facilities, note that first nine listed in the table

below should be assessed for each building in the facility. Three components should be assessed for each platform, and Site should be assessed for the site as a whole.

Table 6. Passenger Facility Condition Assessment Components

Inventory Unit	Component	Notes	Typical Useful Life (years)*	Component Condition Weight**
Building	Substructure		30	1.0
Building	Shell		30	1.0
Building	Interior		30	1.0
Building	Plumbing	May need to assess based on age	20	1.0
Building	HVAC	May need to assess based on age	20	1.0
Building	Electrical	May need to assess based on age	30	1.0
Building	Fire Protection	See Table 5	20	1.0
Building	Conveyance	See Table 5	20	1.0
Building	Fare Collection		20	1.0
Platform	Structure		30	1.0
Platform	Canopy		30	1.0
Platform	Electrical		30	1.0
Site	Site		50	1.0

*Useful life can be utilized for components that cannot be visually inspected.
**Component Condition Weight represents the relative importance of the component compared to other components. By default, these numbers are 1.0. However, based on the agency's experiences and practices, the inspector can use a different number to lower or raise the importance of a component and thus change how component conditions impact the overall facility condition.

The other details of the assessment process are identical to that described previously for administrative/maintenance facilities. Table 4 lists rating values to use if the inspector uses age as a proxy for condition. Table 5 lists specific condition assessment language to use for fire protection and conveyance. Given the individual component conditions, the overall condition of the facility is calculated as:

$$Condition = \frac{\sum_{i=1}^{n} c_i f_i r_i}{\sum_{i=1}^{n} f_i r_i}$$

where c_i is the condition of component i, f_i is the replacement cost factor listed in Table 6, and r_i is the replacement cost of the component.

3.2.3 Assessment of Existing Data

Inventory data on Connecticut facilities are stored in CORE-CT and the transit providers' asset registries, but the level of detail stored on each facility varies. Thus, for the purpose of developing its TAM Plan, CTDOT extracted data on passenger facilities from CORE-CT and the transit providers' asset registries, and then manually reviewed data for each facility to establish the inventory. Data for each facility, platform and building were imported into the transit asset inventory database, SGRtransdata.

Existing condition data available for passenger facilities varied by specific type of facility. For Tier II facilities and for CTfastrak stations, an overall condition rating was assigned. For these facilities, component-level conditions were manually determined for each facility using the overall facility condition and facility age.

For rail stations, more detailed assessments were recently performed. These inspections were performed for different facility components using the 10-point National Bridge Inventory (NBI) condition scale (with values ranging from 0 to 4) rather than the 5-point TERM scale described here. NBI conditions were converted to the TERM scale by dividing the rating by 2 and then rounding to the nearest integer value. Thus, a component was deemed to have a TERM rating of 2 if its NBI rating was 5 (fair) or less.

The rail facility inspections were mapped to component conditions as follows:

- The condition for Substructure was established based on the value for Foundations.
- The condition for Shell was established based on the minimum of Roof and Exterior Walls.
- The condition for Interior was established based on the minimum of Interior Walls, Floors, Windows/Skylights/Doors, Stairs/Ramps and Walking Surfaces.
- The condition for Plumbing was established based on the minimum of the two ratings for Drainage and the rating for Restrooms.
- The condition for HVAC was established based on the minimum of HVAC, Duct Work, Compressors, and Blowers.
- The condition for Conveyance was established based on the minimum of Elevator Pit, Elevator Machine Room, Elevator Cab, and Escalator.
- The condition for Site was established based on the value for Site-Electrical.

For rail platforms, the condition was determined for the components Structure, Canopy and Electrical. For each of these the condition was determined by taking the minimum of the subcomponent ratings.

The station data included information on station bridges, but this was considered to be part of the data set of Fixed Guideway – Structures.

4.0 Fixed Guideway

Two types of fixed guideway are defined in the Connecticut SGR database: rail, and bus. Rail guideway includes the Connecticut-owned portion of the Northeast Corridor, as well as three branch lines: New Canaan, Danbury and Waterbury. The inventory is structured such that additional freight rail guideway and related assets may be added if desired. Bus guideway includes the pavement, bridges and ancillary assets associated with the CTfastrak guideway running from New Britain to Hartford. Section 4.1 discusses the recommended condition assessment approach for rail guideway and Section 4.2 discusses the recommended approach for bus guideway.

4.1 Rail

4.1.1 Inventory Data

Rail fixed guideway inventory data is organized into four primary categories: track, power, structure, and signals/communications, as depicted in Figure 5. Each of these four categories is further divided into a two-level hierarchy. Note the hierarchy is based on that recommended by Metro North Railroad (MNR) based on that agency's work to implement a new enterprise asset management system. The rail guideway asset hierarchy is presented in detail in Appendix D.

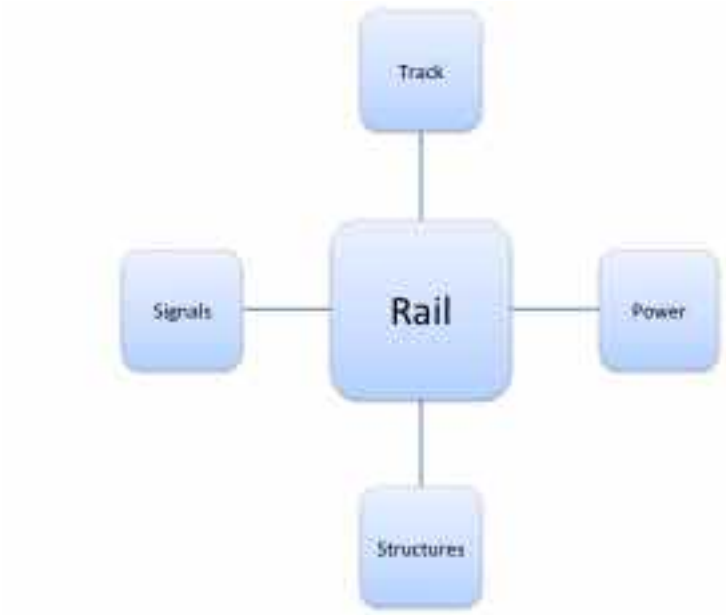

Figure 5. Asset Hierarchy – Fixed Guideway – Rail

Figure 6 shows the hierarchy for Track. Track is classified Main or Special. Main track is further divided into five subcategories, and special track is further divided into two subcategories. Track is inventoried by segment.

Figure 7 shows the hierarchy for Power. Power is divided into four subcategories: Supply System Traction Power; Supply System Transmission Power; Traction Power Distribution; and Signal Power System. Each of these is further divided into four subcategories. Assets in the subcategories Supply System Traction Power, Supply System Transmission Power, and Signal

Power System are inventoried by site (e.g., by substation). Traction Power Distribution is inventoried by track segment.

Figure 8 shows the hierarchy for Structures. Three basic categories of structures are defined: Undergrade Structure; Retaining Wall and Overhead Structure. Each of these is further subdivided into two or three subcategories. Each individual structure is included in the inventory.

Figure 9 shows the inventory for Signals/Communications. This subcategory is further divided into the following: Signaling; Train Detection Control; Communication/Monitoring; Security System; and Positive Train Control. Assets in this subcategory are inventoried by piece of equipment.

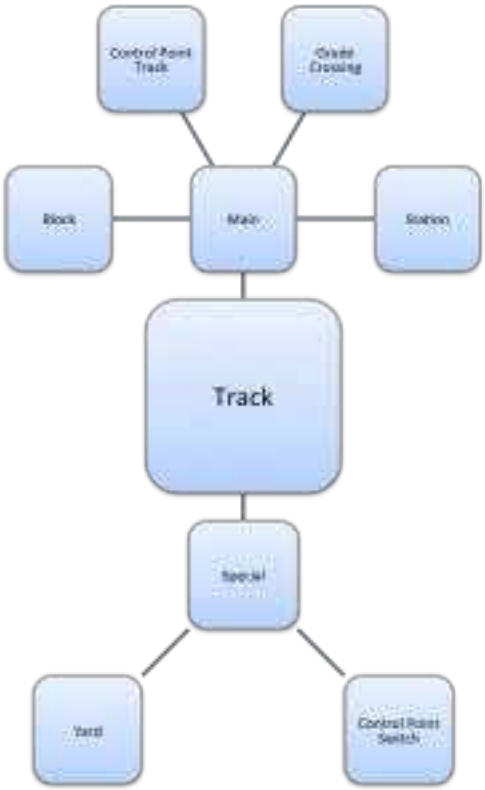

Figure 6. Asset Hierarchy – Fixed Guideway – Rail – Track

Figure 7. Asset Hierarchy – Fixed Guideway – Rail – Power

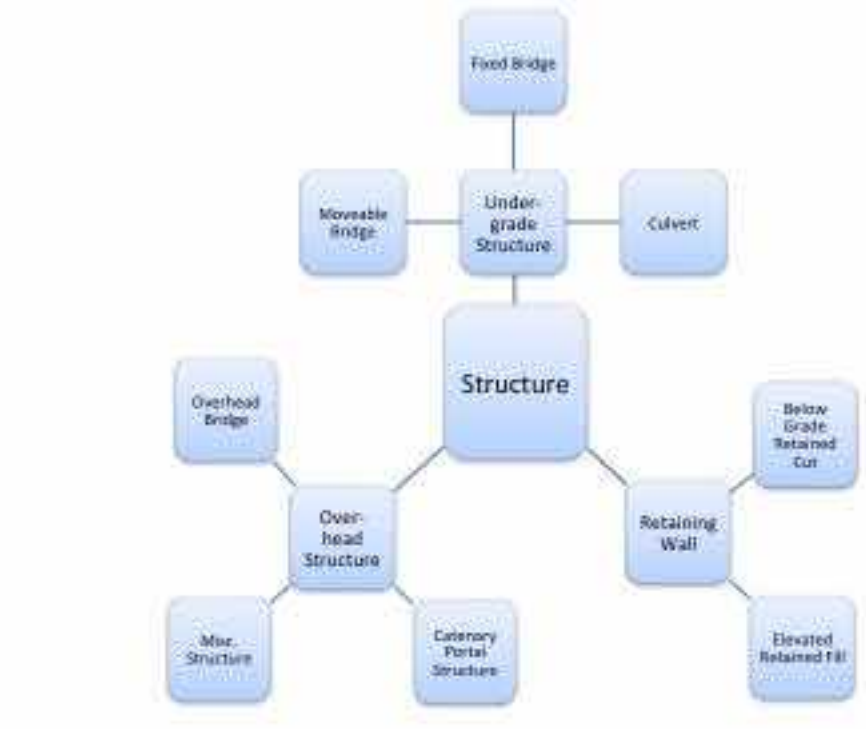

Figure 8. Asset Hierarchy – Fixed Guideway – Rail – Structure

Figure 9. Asset Hierarchy – Fixed Guideway – Rail – Signal/Communications

4.1.2 Condition Assessment Approach

MNR and Amtrak have each identified a need for a comprehensive condition assessment approach for assessing rail guideway on the Northeast Corridor. Such an approach would ideally consider results of visual inspections, including track walks and other forms of inspection already performed on a routine basis, results obtained from inspection by rail geometry car, and other inputs. However, no such comprehensive approach has yet been defined. Thus, both MNR and Amtrak use asset age as a proxy for condition for most assets, with the notable exception of structures.

For all rail guideway assets other than structures, CTDOT assesses condition based on asset age, using an approach patterned on current MNR and Amtrak practices. For each asset type a ULB value is specified in years. Asset condition is then approximated by comparing the age of the asset (years since it was either constructed or last rehabilitated) to the ULB. A condition rating is assigned on the five-point TERM scale based on Table 7.

As described below in 4.1.3, MNR rail guideway asset data has four condition categories, each defined by age relative to useful life. CTDOT adapted this approach and added a fifth condition category (New/5/Excellent) to allow for mapping of MNR condition data to the TERM five-point scale.

Table 7. Conversion Scale: Rail Guideway Asset Age to FTA TERM Condition Rating

Asset Age as % of ULB	Rating	Condition
New	5	Excellent
≤ 50%	4	Good
>50% and ≤100%	3	Adequate
>100% and ≤125%	2	Marginal
>125%	1	Poor

ULB values for rail guideway assets are discussed in Section 4.1.3.

For structures a detailed assessment approach has already been defined and implemented. CTDOT performs visual inspections of structures in the subcategories Undergrade Structure and Overhead Structure. These are patterned on the approach used for highway bridges. Through the inspection CTDOT assess condition of the bridge deck, superstructure and substructure condition using the 10-point National Bridge Inventory (NBI) condition scale (with values ranging from 0 to 4) rather than the 5-point TERM scale described here. For culverts a single overall culvert rating is specified.

4.1.3 Assessment of Existing Data

Pending implementation by MNR of its new enterprise asset management system, the system of record for data on the rail guideway inventory is the set of track charts maintained for the Northeast Corridor and branch lines. The charts show locations of major assets, and detail when assets were most recently rehabilitated. However, the track charts do not provide the level of detail required to populate the asset inventory illustrated in Figures 6 to 9.

As a supplement to the track charts, MNR maintains a less detailed, summary inventory of rail guideway assets for use in preparation of the Metropolitan Transportation Authority (MTA) Ten Year Needs Assessment (TYNA). This summary inventory groups assets by ULB, and details the asset quantities in each of four condition categories:

- 1: 0 to 50 percent of useful life (4 or 5 on the TERM scale)
- 2: 50 to 100 percent of useful life (3 on the TERM scale)
- 3: 100 to 125 percent of useful life (2 on the TERM scale)
- 4: more than 125 percent of useful life (1 on the TERM scale)

Based on the above definitions, an asset in Category 3 or 4 (1 or 2 on the TERM scale) has exceeded its useful life and is not in good repair. However, in some cases MNR has established that an asset is still in good repair, despite exceeding its useful life, or alternatively, that it is no longer in good repair though it is still less than its useful life. To address such situations MNR tracks assets in a second set of categories that mirror the first set, but include adjustments for engineering judgment.

The MNR data were used to populate data on Track and Power in the CTDOT database. Table 8 summarizes the assets in the summary inventory for Track. Table 9 summarizes the assets for Power.

Table 8. MNR TYNA Summary Inventory - Rail

Category	Subcategory	ULB (years)
Rail	Tangent	40
	Curves <2 degrees	30
	Curves 2-4 degrees	20
	Curves >4 degrees	10
Ties	Concrete	40
	Wood	30
Turnouts	High Speed	25
	Mainline	20
	Yard	30
	Siding	30
Surfacing	Interlockings	4
	Control Point to Control Point	4

Table 9. MNR TYNA Summary Inventory - Power

Category	Subcategory	ULB (years)
Catenary Plant	Overhead Catenary	50
	Sectionalizing Insulators	3
	Synthetic Insulators	3
	Pulleys	15
Cable Plant	AC Feeder Cable	40
	Signal Power 12kV	50
	Catenary Poles	100
AC Substation Plant	Metal Clad	30
	RTU Sectionalizing	30
	Substation Wayside Switchyard	30
	Anchor Bridge Substation	30
	Snow Melter Transformers/Unit Substation	30
	Supply Stations	40
	MOD's	20
Signal Power Plant	Substations	20
	MOD's	20
	Transformers	30
Transmission Plant	Transformers, Small Pad Mount	40
	Yard Power Distribution System	30

CTDOT's existing structures data were used to populate the data for the category Structure. Condition data in the existing data set are expressed using the 10-point NBI scale. NBI conditions were converted to the TERM scale by dividing the rating by 2 and then rounding to the nearest integer value. Thus, a component was deemed to have a TERM rating of 2 if its NBI rating was 4 (poor) or less.

For the category Signals work remains to be performed to develop a full inventory. Thus, for this category the CTDOT inventory has entries for the Northeast Corridor, New Canaan Branch, Danbury Branch, and Waterbury Branch.

4.2 Bus

4.2.1 Inventory Data

Asset categories defined for Bus Fixed Guideway include Pavement and Structure. CTDOT's approach for inventorying these assets is to extend the approach used for highway assets, for which existing systems and approaches are well defined.

4.2.2 Condition Assessment Approach

For pavement CTDOT uses a Pavement Condition Index (PCI) to measure the condition of CTDOT-maintained pavements. PCI is calculated for each 0.1-mile segment based on five metrics. The overall PCI is a weighted average of the following metrics shown in Table 10 below.

Table 10. Pavement Condition Index Metrics

Metric	Weight	Description
Roughness	10%	An indicator of pavement roughness experienced by road users traveling over the pavements. The International Roughness Index (IRI) is computed from a single longitudinal profile
Rutting	15%	Rutting is quantified for asphalt pavements by measuring the depth of ruts along the wheel path. Rutting is commonly caused by a combination of high traffic volumes, heavy vehicles and the instability of the pavement mix.
Cracking	25%	Cracks in the pavement surface can be caused or accelerated by aging, loading, poor drainage, frost heaves or temperature changes, or construction flaws. Cracking is measured in terms of the percentage of cracked pavement surface.
Disintegration	30%	Disintegration is the wearing away of the pavement surface caused by the dislodging of aggregate particles and loss of asphalt binder. CTDOT calculates the disintegration metric using pavement age.
Drainage	20%	Drainage refers to the ability of the surface of the roadway to drain. CTDOT uses the collected cross slope and grade of the roadway to compute the drainage metric

The PCI is scaled from 1.0 to 9.0, with 9.0 describing a pavement without defects. Within this

scale, roadways with a PCI less than 4.0 are classified in “Poor” condition, those between 4.0 and less than 6.0 are in “Fair” condition, 6.0 to less than 8.0 PCI indicates “Good” condition, and 8.0 to 9.0 indicates “Excellent” condition. A pavement section for which the PCI is 6 or greater is classified as being in a state of good repair.

For structures CTDOT uses a similar approach for rail and highway bridges. As described previously, bridges are inspected visually. Conditions of bridge decks, superstructures and substructures are assessed using the 10-point NBI scale.

4.2.3 Assessment of Existing Data

CTDOT collects pavement inventory and condition data using specially equipped Fugro Roadware Automatic Road Analyzer (ARAN) vans. The entire CTDOT-maintained mainline is measured each year. CTDOT performed an initial data collection run of CTfastrak guideway in March 2015, prior to the system opening. CTDOT is establishing a process for regular data collection, data processing, and integration with the Pavement Management System.

CTDOT has already inventoried and inspected the bridges on the CTfastrak guideway and is managing these together with other highway bridges.

5.0 Equipment

5.1 Inventory Data

The Equipment asset class includes service vehicles and other equipment with a value of $50,000 or more. Service vehicles are inventoried by vehicle fleet. All vehicles in a given fleet share the same vehicle type, make/model, model year, and operator. Figure 10 shows the different types of service vehicles inventoried, including four types of "rubber tire" vehicles and two types of rail service vehicles.

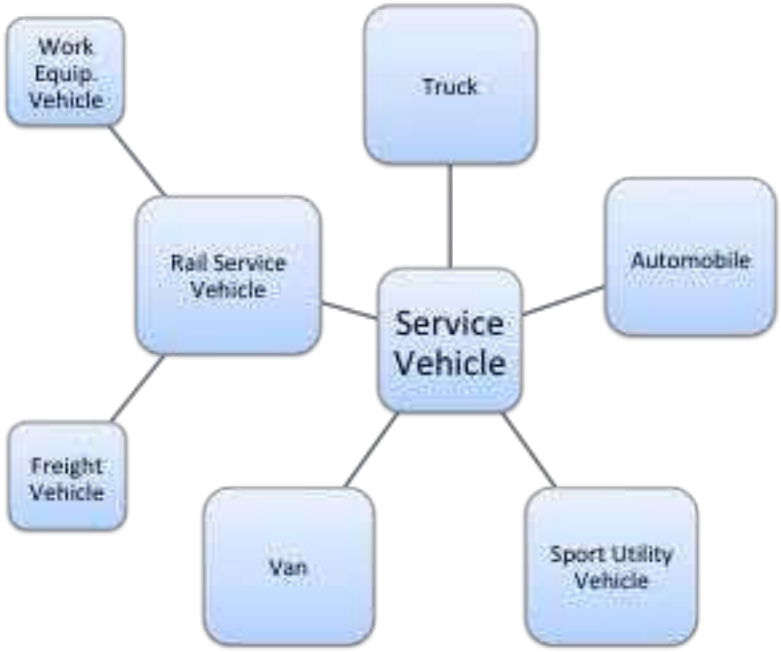

Figure 10. Asset Hierarchy – Equipment – Service Vehicles

Other equipment is inventoried by specific item. Inventory data include, but are not limited to, item descriptions, purchase cost, and purchase date.

5.2 Condition Assessment Approach

CTDOT uses the same basic approach for assessing condition of equipment as it does for revenue vehicles. This approach is discussed in Section 2. Specifically, A ULB value is established for equipment type. A piece of equipment is assessed as being in good repair if its age is less than the corresponding ULB, and not in good repair if it meets or exceeds the ULB. This approach supports reporting of FTA's mandated SGR performance measure for equipment: the percentage of service vehicles that have met or exceed their ULB. Connecticut's ULBs for equipment are listed in Table 11.

Table 11. ULBs for Equipment

Tier I	Tier II	Asset Class	ULB (years)
●	●	Trucks and Rubber Tire Vehicles	14
●	●	Automobiles	5
●	●	Sport Utility Vehicles	5
●		Steel Wheel Vehicles	25
●	●	Vans	5

5.3 Assessment of Existing Data

Inventory data including model year (used to determine age) are stored by service vehicle in CORE-CT and the transit providers' asset registries. For the purpose of developing its TAM Plan, CTDOT extracted revenue vehicle data from CORE-CT and the transit providers' asset registries, aggregated it by fleet, and imported the data into a separate transit asset inventory database, SGRtransdata.

For other equipment inventory data, such as equipment description, purchase cost, and purchase date, are stored in CORE-CT and the transit providers' asset registries as well. CTDOT extracted data on other equipment, filtering out data for items costing less than $50,000 or permanently affixed to a facility, and imported the data into SGRtransdata.

Appendix A. Detailed List of Items for Admin / Maintenance Facility Condition Assessment

Tables A-1 through A-10 present detailed lists of items for condition assessment at administration or maintenance facilities. The tables are organized by the ten components described in the approach. In addition to the items, the tables include notes for inspection (where applicable) and units of measure. This information in this appendix is also included in a separate spreadsheet.

Where these items are assessed, one would typically assign an overall value to the item. But in cases where units of measures are not “inspect as each”, an inspector may determine the percentage of total quantity in each condition.

Table A-1. Substructure

Category	Item	Notes	Unit of Measure
Foundations	Exposed Foundation Elements		inspect as each
	Other Structural Components		inspect as each
Basement	Slab		sq. ft.

Table A-2. Shell

Category	Item	Notes	Unit of Measure
Superstructure	Structural Frame	Columns, pillars, walls	inspect as each
Roof	Roof Waterproofing		inspect as each
	Roof Penetration Flashing Systems	Chimney, skylights, eaves, surroundings	inspect as each
	Roof Drainage Systems	Gutters	inspect as each
Exterior	Building Envelope - Masonry/Concrete Walls		sq. ft.
	Building Envelope - Cladding		sq. ft.
	Building Envelope - Windows and Glazing		sq. ft.
	Building Envelope - Doors, Glazing, Door Hardware		sq. ft.
	Building Envelope - Garage Doors		sq. ft.
	Bird Proofing System		inspect as each
	Exterior Finishes		inspect as each
Shell Appurtenances	Means of Egress	Stairs, fire escapes	inspect as each
	Vertical Openings		inspect as each
	Cat Walks		inspect as each
	Inspection Pits		inspect as each
Building Expansion Joints	Building Expansion Joints		linear ft.

Table A-3. Interior

Category	Item	Notes	Unit of Measure
Partitions	Interior Walls		sq. ft.
	Interior Windows and Glazing		sq. ft.
	Interior Doors, Glazing, Door Hardware		sq. ft.
Stairs	Interior Stairs and Landings		units
Finishes	Flooring System		sq. ft.
	Ceiling System		sq. ft.
	Wall Finishes		sq. ft.
Other	Interior Amenities	Signage, built-in furnishings, appliances	inspect as each
	Built-In Seating		inspect as each

Table A-4. Plumbing

Category	Item	Notes	Unit of Measure
Domestic Water Distribution	Water Heaters		inspect as each
	Water Treatment Systems		inspect as each
	Backflow Prevention		inspect as each
Pumps	Pumps	Sump, well, domestic	inspect as each
Bathroom Fixtures	Bathroom Fixtures		inspect as each
Other Plumbing Items / Fixtures	Other Plumbing Fixtures	Piping, insulation, etc.	inspect as each

Table A-5. HVAC

Category	Item	Notes	Unit of Measure
HVAC	Energy Recovery Units		units
	Heat Pumps		units
	Make-Up Units		units
	Air Handling Units		units
	Boilers		units
	Burners		units
	Furnaces		units
	Unit Heaters		units
	Radiant Heaters		units
	Finned Tube Radiation and Convertors		units
	Air Conditioning Units	Split package, commercial through-the-wall, water-cooled package	units
	Splits and Mini-Splits		units
	Cooling Towers		units
	Condensers	Air-Cooled, evaporative	units
	Chillers		units
	HVAC Air Terminals		units
	Fans	Centrifugal, axial, roof-mounted, propeller	units
	Coils		units
	Heat Exchangers		units
	Reciprocating Compressors		units
	Air Curtains		units
	Water Treatment System		inspect as each
	Other HVAC Pumps (excluding heat pumps)		inspect as each
	Other HVAC Components	Piping, ductwork, etc.	inspect as each

Table A-6. Electrical

Category	Item	Notes	Unit of Measure
Electrical Service / Distribution	Power Distribution / Switchgear	Service entrance through subpanels	inspect as each
	Generator and Transfer Switch		inspect as each
	Transformers	Non-utility owned only	inspect as each
	DC Power Substation / Traction Power Substation		inspect as each
	AC Power Substation		inspect as each
	Service Panels		inspect as each
Backup Power	Uninterruptible Power Supply (UPS)		inspect as each
Lighting	Interior Lighting		inspect as each
	Exterior Lighting		inspect as each
Other Electrical	Other Electrical Components	Conduits, etc.	inspect as each
Lightning Protection System	Lightning Protection System		inspect as each

Table A-7. Fire Protection

Category	Item	Notes	Unit of Measure
Fire Protection	Fire Detection System		inspect as each
	Fire Suppression Systems	Sprinklers, standpipes, extinguishers, hydrants	inspect as each

Table A-8. Conveyance

Category	Item	Notes	Unit of Measure
Elevators	Elevators		units
Escalators	Escalators		units
Lifts	Passenger Lifts		units

Table A-9. Equipment

Category	Item	Notes	Unit of Measure
Stationary Equipment	Hydrogen Fuel Cells		inspect as each
	Photovoltaic Panels		inspect as each
	Paint Booths		inspect as each
	Air Compressors		inspect as each
	Special Work Station Ventilation	Vehicle, welding, soldering, etc.	inspect as each
	Vehicle Washing Equipment		inspect as each
	Fall Protection Systems		inspect as each
	Rail Car Wash		inspect as each
	Sand Blasting System		inspect as each
	Radio Cell Towers		inspect as each
	In-Ground Lifts		inspect as each
	Other Stationary Equipment		inspect as each

Table A-10. Site

Category	Item	Notes	Unit of Measure
Site Equipment	Motor Fuel Island Tanks and FMU		units
	Tank Monitoring System		units
	Fuel Oil Tank		units
	Potable Water Tank		units
	Propane Tank		units
	Generator Tank	Independent from generator, i.e. not a base tank	units
	Chloride and Brine Storage Tanks		units
	Chloride System		inspect as each
	Brine System		inspect as each
Roads / Parking Lots / Sidewalk / Curbing	Access Road		sq. ft.
	Parking Lots		sq. ft.
	Sidewalks and Walkways		sq. ft.
	Pavement Markings		inspect as each
	Bollards and Handrails		inspect as each
Security	Fences		linear ft.
	Gates and Barrier Arms		inspect as each
	Camera / Surveillance System		inspect as each
	Guard Shack		inspect as each
Site Septic, Environmental, & Stormwater Management	Waste Oil Tank		units
	Waste Antifreeze Tank		units
	Wastewater Management / Drainage		inspect as each
	Oil-Water Separator Tank		units
	Sanitary/Stormwater Pumping Systems		inspect as each
	Septic System Tank		units
	Septic System Leaching Fields or Cesspools		inspect as each
	Septic System Reserve Field		inspect as each

For each of the items listed in Tables A-1 through A-10, an inspector may fill out the following "Yes/No" questions shown in Table A-11. These items were added following discussions with CTDOT and transit provider staff but are not directly applicable to the condition assessment ratings.

Using these questions could help an agency understand the importance of each asset while considering capital planning needs. The determination of safety critical, operations critical or the other fields could be initially made by the manager of the department in which the assets reside. The determination could then be reviewed and approved by Chief Operating Officer and Chief Financial Officer (who keeps the inventory).

An agency using these questions may want to establish further criteria for these items.

Table A-11. Yes/No Questions

Question	Description
Applicable?	Does the item exist at the facility / building? If it does, then answer Yes. If it does not, answer No.
Safety Critical?	A "Yes/No" question intended to highlight safety critical components.
Operations Critical?	A "Yes/No" question intended to highlight operations critical components.
Obsolete / Modernization?	A "Yes/No" question intended to highlight obsolete components.
Operating Savings Opportunity?	A "Yes/No" question intended to highlight operating savings opportunities.

Additional questions for an inspector to consider are listed below in Table A-12.

Table A-12. Additional Questions

Additional Questions
Is there adequate office space?
Is a break area provided?
Are male and female locker rooms and showers provided?
Is the facility ADA compliant?
Is the facility OSHA compliant?
Does a communications (data) system exist?
Does a phone system exist?

Appendix B. Recommended Inspection Procedures for Administrative and Maintenance Facilities

Facility condition assessment involves visual inspection of facility components to determine asset condition. This appendix includes recommended inspection procedures for administrative and maintenance facilities, organized by component and listed in Table B-1. These procedures are adapted from FTA's guidance document *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation.*

Table B-1. Recommendation Facility Inspection Procedures

Component	Procedures
Substructure	• Foundations: Inspect walls, columns, pilings, other structural elements for signs of decay or structural integrity concerns. • Basement: Inspect non-foundation and structural elements such as facing materials, insulation, slab, floor underpinnings, crawl spaces, etc.
Shell (e.g., roof, exterior structure, walls)	• Inspect roof, including roof surface (tiles, membrane, shingles, gravel etc.), gutters, eaves, skylights, flashing, chimney surrounds, and sealants, hardware and painted or coated surfaces. Note evidence of ponding, or roof leaks, significant age – and other indicators that repair may be necessary. Note age of roof(s) and whether warranty is still in effect. • Inspect building envelope, façade, curtain wall system, glazing system, exterior sealants, exterior balconies, doors, stairways, and parapets. Note signs of cracks, openings, missing elements, detached elements, deteriorated sealants, and other issues that may lead to penetration of water into the building. Also, not any concerns with structural integrity. • Inspect fire escapes, noting any loose connections, deteriorated elements, or blockage, that would impact the function or safety of fire escapes. • Inspect gutters and downspouts. Note maintenance needs, need for cleaning, loose elements, and detachment. • Inspect superstructure / structural frame, including columns, pillars, and walls. Note any signs of decay or structural integrity concerns. • Inspect windows, doors, and all finishes (paint, masonry). Note any functionality or safety issues.
Interior	• Inspect soundness and finish of drywall, partitions, interior doors, fittings, ceiling tiles, and signage. • Inspect stairs including fire and access issues. • Inspect interior finishes, including materials used on walls, floors, and ceilings, such as tile, paint, and other coatings. Look for roughness and damage.
Plumbing	• Inspect fixtures and pipes for water distribution, sanitary waste, rainwater drainage, and any damage or leaks. • If not accessible, determine or estimate the age of plumbing system.

HVAC	• Inspect systems and their elements for energy supply, heating and cooling systems, distribution systems, terminal and package units, controls and instrumentation including testing and balancing, and chimneys. Specifically, inspect coils, housing, drains, and wiring and evaluate overall performance of the system. • Note apparent or reported age of the equipment, past material element replacements/ upgrades, and the apparent level of maintenance exercised. If heating equipment is shut down or not operational at the time of the walk-through survey, provide an opinion of the condition to the extent observed. Note refrigerants and fuels used and their suitability or need for improvement / upgrade. • If elements are not accessible, determine or estimate the age of the HVAC system.
Electrical	• Inspect electrical service & distribution, noting deficiencies or needed / recommended upgrades • Inspect lighting and branch wiring (interior and exterior), communications and security, noting deficiencies or needed / recommended upgrades • Examine other electrical system-related pieces such as lightning protection, generators, emergency lighting, and elements related to electrical service and distribution such as conduit, boxes, solar panels and mountings for any damage wire chaffing or loose or corroded connections. Evaluate overall performance of the system. • If elements are not accessible, determine or estimate the age of the electrical system.
Fire Protection	• Inspect sprinklers, standpipes, hydrants, fire alarms, emergency lighting, smoke evacuation, stairwell pressurization, and any other specialized elements relating to overall protection system and code compliance.
Conveyance (e.g., elevators, escalators, wheelchair lifts)	• Inspect condition, function, and code compliance of elevators, escalators, lifts, and any other fixed apparatuses for the movement of goods or people.
Equipment (e.g., lifts, washing systems)	• Inspect equipment, noting age, condition, and functional deficiencies or safety issues.
Site (e.g., sidewalks, parking lot, grounds)	• Inspect roadways/driveways and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt. • Inspect parking lots and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt • Inspect pedestrian areas and associated signage, markings, and equipment. Inspect the curbing and ramps for cracking, settling, holes, uneven surfaces and trip hazards. Pay special attention to wheelchair ramp areas and other ADA / access considerations • Site development such as fences, walls, and miscellaneous structures. Look for corrosion, structural integrity and condition of paint.

	• Landscaping, Site Utilities: Look for signs of drainage problems such as flooded areas, eroded soil and water damage to the asphalt and clogged storm drain inlets. • Visually inspect the irrigation system, if installed. Look for signs of leaks, such as sagging areas in grass and/or pooling water. Look for dead spots in the grass which would indicate lack of water possibly caused by a mechanical failure.

Appendix C. Detailed List of Items for Passenger Facility Condition Assessment

Tables C-1 through C-10 present detailed lists of items for condition assessment at passenger facilities. The tables are organized by the eleven components described in the approach. In addition to the items, the tables include notes for inspection (where applicable) and units of measure.

This information in this appendix is also included in a separate spreadsheet.

Table C-1. Substructure

Category	Item	Notes	Unit of Measure
Foundations	Exposed Foundation Elements		inspect as each
	Other Structural Components		inspect as each
Basement	Slab		sq. ft.

Table C-2. Shell

Category	Item	Notes	Unit of Measure
Superstructure	Structural Frame	Columns, pillars, walls	inspect as each
Roof	Roof Waterproofing		inspect as each
	Roof Penetration Flashing Systems	Chimney, skylights, eaves, surroundings	inspect as each
	Roof Drainage Systems	Gutters	inspect as each
Exterior	Building Envelope - Masonry/Concrete Walls		sq. ft.
	Building Envelope - Cladding		sq. ft.
	Building Envelope - Windows and Glazing		sq. ft.
	Building Envelope - Doors, Glazing, Door Hardware		sq. ft.
	Building Envelope - Garage Doors		sq. ft.
	Bird Proofing System		inspect as each
	Exterior Finishes		inspect as each
Shell Appurtenances	Means of Egress	Stairs, fire escapes	inspect as each
	Vertical Openings		inspect as each
	Cat Walks		inspect as each
Building Expansion Joints	Building Expansion Joints		linear ft.

Table C-3. Interior

Category	Item	Notes	Unit of Measure
Partitions	Interior Walls		sq. ft.
	Interior Windows and Glazing		sq. ft.
	Interior Doors, Glazing, Door Hardware		sq. ft.
Stairs	Interior Stairs and Landings		units
Finishes	Flooring System		sq. ft.
	Ceiling System		sq. ft.
	Wall Finishes		sq. ft.
Other	Interior Amenities	Signage, built-in furnishings, appliances	inspect as each
	Built-In Seating		inspect as each

Table C-4. Plumbing

Category	Item	Notes	Unit of Measure
Domestic Water Distribution	Water Heaters		inspect as each
	Water Treatment Systems		inspect as each
	Backflow Prevention		inspect as each
Pumps	Pumps	Sump, well, domestic	inspect as each
Bathroom Fixtures	Bathroom Fixtures		inspect as each
Other Plumbing Items / Fixtures	Other Plumbing Fixtures	Piping, insulation, etc.	inspect as each

Table C-5. HVAC

Category	Item	Notes	Unit of Measure
HVAC	Energy Recovery Units		units
	Heat Pumps		units
	Make-Up Units		units
	Air Handling Units		units
	Boilers		units
	Burners		units
	Furnaces		units
	Unit Heaters		units
	Radiant Heaters		units
	Finned Tube Radiation and Convertors		units
	Air Conditioning Units	Split package, commercial through-the-wall, water-cooled package	units
	Splits and Mini-Splits		units
	Cooling Towers		units
	Condensers	Air-Cooled, evaporative	units
	Chillers		units
	HVAC Air Terminals		units
	Fans	Centrifugal, axial, roof-mounted, propeller	units
	Coils		units
	Heat Exchangers		units
	Reciprocating Compressors		units
	Air Curtains		units
	Water Treatment System		inspect as each
	Other HVAC Pumps (excluding heat pumps)		inspect as each
	Other HVAC Components	Piping, ductwork, etc.	inspect as each

Table C-6. Electrical

Category	Item	Notes	Unit of Measure
Electrical Service / Distribution	Power Distribution / Switchgear	Service entrance through subpanels	inspect as each
	Generator and Transfer Switch		inspect as each
	Transformers	Non-utility owned only	inspect as each
	DC Power Substation / Traction Power Substation		inspect as each
	AC Power Substation		inspect as each
	Service Panels		inspect as each
Backup Power	Uninterruptible Power Supply (UPS)		inspect as each
Lighting	Interior Lighting		inspect as each
	Exterior Lighting		inspect as each
Other Electrical	Other Electrical Components	Conduits, etc.	inspect as each
Lightning Protection System	Lightning Protection System		inspect as each

Table C-7. Fire Protection

Category	Item	Notes	Unit of Measure
Fire Protection	Fire Detection System		inspect as each
	Fire Suppression Systems	Sprinklers, standpipes, extinguishers, hydrants	inspect as each

Table C-8. Conveyance

Category	Item	Notes	Unit of Measure
Elevators	Elevators		units
Escalators	Escalators		units

Table C-9. Fare Collection

Category	Item	Notes	Unit of Measure
Fare Collection	Turnstiles		units
	Ticket Machines		units
	Other Fare Collection Items		inspect as each

Table C-10. Platform

Category	Item	Notes	Unit of Measure
Structure	Overlay		inspect as each
	Double Tee		inspect as each
	Joints		inspect as each
	Bearings		inspect as each
	Footing		inspect as each
	Rail Post Foundation		inspect as each
	Rail Post Connection		inspect as each
	Railing Connection		inspect as each
	Paint/Coatings		inspect as each
	Stairs/Ramps		inspect as each
	Other		inspect as each
Canopy (Deck)	Columns		inspect as each
	Structural Connections		inspect as each
	Roof Framing Elements		inspect as each
	Roof Decking		inspect as each
	Drainage System		inspect as each
	Skylights		inspect as each
	Electrical Connections		inspect as each
	Non-Electrical Connections		inspect as each
	Snow Guards		inspect as each
	Column Footings		inspect as each
Electrical	Emergency Lighting		inspect as each
	Platform Lighting		inspect as each
	Grounding		inspect as each
	PA System		inspect as each
	PIDS System		inspect as each
	VMS Signs		inspect as each

Table C-11. Site

Category	Item	Notes	Unit of Measure
Roads / Parking Lots / Sidewalk / Curbing	Access Road		sq. ft.
	Parking Lots		sq. ft.
	Sidewalks and Walkways		sq. ft.
	Pavement Markings		inspect as each
	Bollards and Handrails		inspect as each
Security	Fences		linear ft.
	Gates and Barrier Arms		inspect as each
	Camera / Surveillance System		inspect as each
	Guard Shack		inspect as each
Site Septic, Environmental, & Stormwater Management	Wastewater Management / Drainage		inspect as each
	Oil-Water Separator Tank		units
	Sanitary/Stormwater Pumping Systems		inspect as each
	Septic System Tank		units
	Septic System Leaching Fields or Cesspools		inspect as each
	Septic System Reserve Field		inspect as each

For each of the items listed in Tables C-1 through C-11, an inspector may consider the following questions shown in Table C-12.

These items were added following discussions with CTDOT and transit provider staff but are not directly applicable to the condition assessment ratings.

Using these questions could help an agency understand the importance of each asset while considering capital planning needs. The determination of safety critical, operations critical or the other fields could be initially made by the manager of the department in which the assets reside. The determination could then be reviewed and approved by Chief Operating Officer and Chief Financial Officer (who keeps the inventory).

An agency using these questions may want to establish further criteria for these items.

Table C-12. Yes/No Questions

Question	Description
Applicable?	Does the item exist at the facility / building? If it does, then answer Yes. If it does not, answer No.
Safety Critical?	A “Yes/No” question intended to highlight safety critical components.
Operations Critical?	A “Yes/No” question intended to highlight operations critical components.
Obsolete / Modernization?	A “Yes/No” question intended to highlight obsolete components.
Operating Savings Opportunity?	A “Yes/No” question intended to highlight operating savings opportunities.

Additional questions concerning the entire facility for an inspector to consider are listed below in Table C-13.

Table C-13. Additional Questions

Additional Questions
Is there adequate office space?
Is a break area provided?
Are male and female locker rooms and showers provided?
Is the facility ADA compliant?
Is the facility OSHA compliant?
Does a communications (data) system exist?
Does a phone system exist?

Appendix D. Detailed Rail Guideway Asset Hierarchy

CTDOT organizes transit assets according to an asset hierarchy. One of the four top-level categories of the hierarchy is fixed guideway, which is divided into rail and bus assets at the second level. The rail guideway hierarchy is further broken down in three additional levels, presented below in Table D-1. Note that this is an ideal hierarchy based on the approach being developed by MNR. CTDOT's working hierarchy, based on MNR's working hierarchy, is presented in Tables 8 and 9.

Table D-1. Detailed Rail Guideway Asset Hierarchy

Level 3	Level 4	Level 5
Track	Main	Block
		Control Point Track
		Grade Crossing
		Station
	Branch	Control Point Switch
		Yard
Power	Supply System Traction Power	Equipment
		Site
		Building
		Cable Plant
	Supply System Transmission Power	Equipment
		Site
		Building
		Cable Plant
	Traction Power Distribution	Test Equipment
		Negative Return System
		Catenary Equipment
		Cable Plant
	Signal Power System	Equipment
		Site
		Building
		Cable Plant
Structure	Undergrade Structure	Moveable Bridge
		Fixed Bridge

		Culvert
	Retaining Wall	Below Grade Retained Cut
		Elevated Retained Fill
	Overhead Structure	Catenary Portal Structure
		Miscellaneous Structure
		Overhead Bridge
Signals/Communications	Signaling	Block Signal System
		Interlocking
		Highway Rail Grade Crossing Network
	Train Detection Control	Train Fault Detection
		Yard Detection
	Communications/Monitoring	Communication Devices
		Fiber Optic System
		Aerial Communication Network
		Outside Cable Plant
		Passenger Communication System
	Security Systems	Integrated Electronic Security System
		Closed Circuit TV
		Fire Alarm System
		Access Control System
	Positive Train Control (Network)	Wayside Communication Network
		Back Office System
		Wayside Maintenance of Way System
		On-Board System

Appendix C. Maintenance Responsibility Matrix

NEW HAVEN LINE
STATION MAINTENANCE RESPONSIBILITY MATRIX
4/11/2018

	Lighting/Electrical						Trash	Snow			Shelters			Structural				Escalators/Elevators		Maintenance By Others		
Station	Platforms	Wait Rm.	Ticket Off.	Ovr. Pass	Misc.	Prk. Lot	Removal	Platform	Stairs	Prk. Lot	Glazing	Canopy	Over Pass	Und. Pass	Tunnel	Tkt. Off	Platform	Escalators	Elevators	Station	Stairs	Prk Lot
Greenwich	MN Power	MN Power	MN Power	MN Power	Town	Town	MN Stations(Plt. Frm, Wait Rm)	MN Structures	MN Structures	Town	MN Structures	MN Structures	MNR	–	–	–	MN Structures	–	MN Structures	Private	MN Structures	Town
Cos Cob	Town	Town	Town	–	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Greenwich	Town of Greenwich	Town of Greenwich
Riverside	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Greenwich	Town of Greenwich	Town of Greenwich
Old Greenwich	Town	Town	–	–	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Greenwich	Town of Greenwich	Town of Greenwich
Stamford	MN Power	CTDOT	MN Power	CTDOT	CTDOT	CTDOT	MN Stations (plt. Frm)	MN Structures	MN Structures	Town	MN Structures	MN Structures	–	–	CTDOT	MN Structures	MN Structures	CTDOT	CTDOT	CTDOT	MN Structures	CTDOT
Noroton Heights	Town	Town	–	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Darien	Town of Darien	Town of Darien
Darien	Town	Town	–	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	Town	–	Town	Town of Darien	Town of Darien	Town of Darien
Rowayton	MN Power	MN Power	–	–	Town	Town	MN Stations(Plt. Frm, Wait Rm)	MN Structures	MN Structures	Town	MN Structures	MN Structures	–	–	–	–	MN Structures	–	–	City of Norwalk(6th Taxing Dist.)	MN Structures	City of Norwalk(6th Taxing Dist.)
South Norwalk	MN Power	Town	–	Town	Town	Town	MN Stations(Plt. Frm)	MN Structures	MN Structures	Town	MN Structures	MN Structures	–	–	City	–	MN Structures	–	City	City of Norwalk	City of Norwalk	City of Norwalk
East Norwalk	MN Power	Town	Town	Town	Town	Town	MN Stations(Plt. Frm)	MN Structures	MN Structures	Town	MN Structures	MN Structures	–	–	–	–	MN Structures	–	–	City of Norwalk	City of Norwalk	City of Norwalk
Westport	Town	Town	–	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Westport	Town of Westport	Town of Westport
Green's Farms	Town	Town	–	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	Town	–	Town	–	Town	Town of Westport	Town of Westport	Town of Westport
Southport	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Fairfield	Town of Fairfield	Town of Fairfield
Fairfield	Town	Town	MN Power	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	MN Structures	Town	–	–	Town of Fairfield	Town of Fairfield	Town of Fairfield
Fairfield Metro	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	–	–	CTDOT	–	CTDOT	–	CTDOT	CTDOT	CTDOT	CTDOT
Bridgeport	CTDOT	CTDOT	–	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	–	CTDOT	–	CTDOT	–	CTDOT	CTDOT	CTDOT	CTDOT
Stratford	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Stratford	Town of Stratford	Town of Stratford
Milford	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	Town	Town	–	–	Milford Transit District	Milford Transit District	Milford Transit District
West Haven	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	–	–	CTDOT	MN Structures	–	CTDOT	CTDOT	CTDOT	CTDOT
New Haven	MN Power	NHPA	MN Power	–	NHPA	NHPA	MN Stations(Plt. Frm)	MN Structures	NHPA	NHPA	NHPA	MN Structures	–	–	NHPA	MN Structures	MN Structures	–	NHPA	NHPA	NHPA	NHPA
New Haven-State St.	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	CTDOT	–	–	–	CTDOT	–	CTDOT	CTDOT	CTDOT	CTDOT
New Canaan	Town	Town	–	–	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of New Canaan	Town of New Canaan	Town of New Canaan
Talmadge Hill	MN Power	–	–	–	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	–	Town	–	–	Town of New Canaan	Town of New Canaan	Town of New Canaan
Springdale	MN Power	–	–	–	Town	Town	MN Stations	Track	Track	Town	MN Structures	MN Structures	–	–	–	–	MN Structures	–	–	City of Stamford	City of Stamford	City of Stamford
Glenbrook	MN Power	–	–	–	Town	Town	MN Stations	Track	Track	Town	MN Structures	MN Structures	–	–	–	–	MN Structures	–	–	City of Stamford	City of Stamford	City of Stamford
Danbury	Town	Town	–	–	Yd. Lights	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	City of Danbury	City of Danbury	City of Danbury
Bethel	Town	Town	–	–	Town	Town	Town	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Bethel	Town of Bethel	Town of Bethel
Redding	Town	–	–	–	Town	MN Power	MN Stations	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Redding	Town of Redding	Town of Redding
Branchville E	MN Power	Town	–	–	Town	MN Power	MN Stations	Town	Town	Town	Town	Town	–	–	–	–	Town	–	–	Town of Ridgefield	Town of Ridgefield	Town of Ridgefield
Cannondale E	MN Power	CTDOT	–	–	CTDOT	CTDOT	MN Stations	Track	Track	CTDOT	CTDOT	MN Structures	–	–	–	–	MN Structures	–	–	CTDOT	CTDOT	CTDOT
Wilton E	MN Power	CTDOT	–	–	CTDOT	CTDOT	MN Stations	Track	Track	CTDOT	CTDOT	MN Structures	–	–	–	–	MN Structures	–	–	CTDOT	MN Structures	CTDOT
Merritt 7	CTDOT	–	–	–	CTDOT	CTDOT	MN Stations (Plt.): CTDOT (Wall)	CTDOT	–	CTDOT	CTDOT	CTDOT	–	–	–	–	CTDOT	–	–	–	–	CTDOT
Waterbury	MN Power	MN Power	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	State of Ct. C.D.O.T	State of Ct. C.D.O.T	State of Ct. C.D.O.T
Naugatuck	MN Power	–	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	Town of Naugatuck	Town of Naugatuck	Town of Naugatuck
Beacon Falls	MN Power	–	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	Town of Beacon Falls	Town of Beacon Falls	Town of Beacon Falls
Seymour	MN Power	Town	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	Town Of Seymour	Town Of Seymour	Town Of Seymour
Ansonia	MN Power	–	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	Derby Trans. Dist	Derby Trans. Dist	Derby Trans. Dist
Derby-Shelton	MN Power	MN Power	–	–	Town	Town	MN Stations	Track	Track	Town	Town	CDOT	–	–	–	–	CDOT	–	–	City of Derby/Valley Trans. Dist.	City of Derby/Valley Trans. Dist.	City of Derby/Valley Trans. Dist.

Note: CTDOT = CTDOT Property Manager

Richard Jankovich

Richard Jankovich
Assistant Rail Administrator
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4/13/18
Date:

Walter H Burger

Walter Burger
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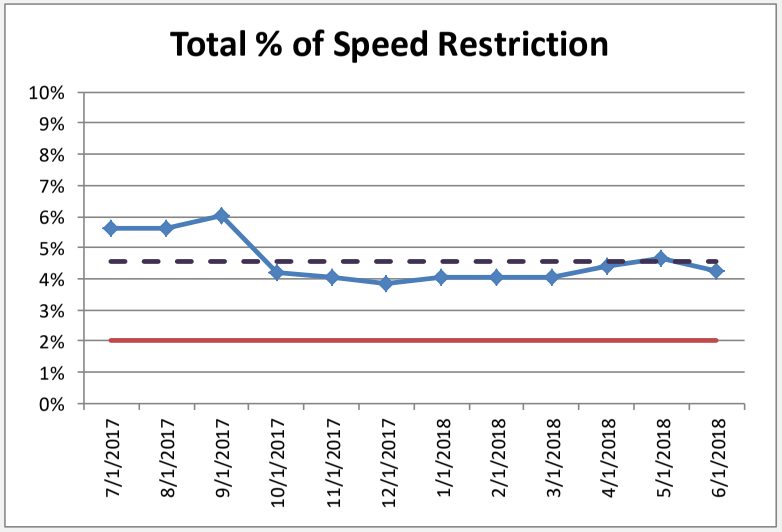
Appendix D. Target Setting Facilities Checklist

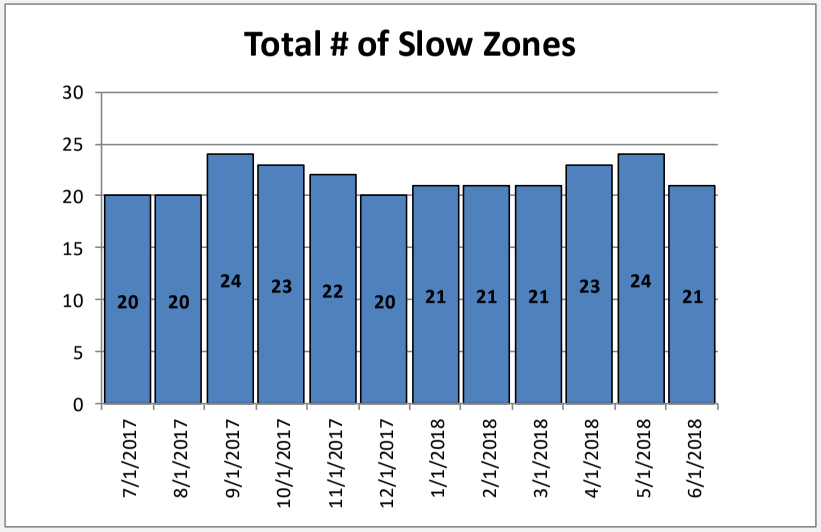
Tier I Facilities

Passenger/Parking vs Admin/Maintenance		Site	Platforms + Buildings		Month / Year	Submitted to NTD	TERM (1-5)		Month / Year	
Type	Operator	Facility Name	No. of Structures	Inspected	Inspection Date	NTD Report Year	Condition	In SGR?	Next Due Date	
P/P	MNR	Greenwich Station	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Cos Cob Station	3	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Riverside Station	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Old Greenwich Station	3	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Stamford Station	5	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Noroton Heights	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Darien	3	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Rowayton	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	South Norwalk	4	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	MNR	East Norwalk	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Westport	4	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	MNR	Greens Farms	3	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Southport	3	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Fairfield	3	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Fairfield Metro	3	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Bridgeport	4	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Stratford	4	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Milford	4	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	West Haven	3	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	MNR	New Haven	6	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	State Street	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Glenbrook	1	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Springdale	1	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Talmadge Hill	1	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	New Canaan	2	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	MNR	Merritt 7	1	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Wilton	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Cannondale	2	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	MNR	Branchville	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Redding	1	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	MNR	Bethel	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Danbury	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Derby	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Ansonia	1	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Seymour	2	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Beacon Falls	1	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	MNR	Naugatuck	1	Yes	Aug-17	18-Oct	2	No	Aug-21	
P/P	MNR	Waterbury	1	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	SLE	Branford	3	Yes	Aug-17	18-Oct	2	No	Aug-21	40%
P/P	SLE	Guilford	3	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	SLE	Madison	2	Yes	Aug-17	18-Oct	3	Yes	Aug-21	
P/P	SLE	Clinton	1	Yes	Aug-17	18-Oct	1	No	Aug-21	
P/P	SLE	Westbrook	3	Yes	Aug-17	18-Oct	4	Yes	Aug-21	
P/P	CtTransit	Sigourney Street	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Parkville	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Kane Street	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Flatbush Ave	1	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Elmwood	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Newington Junction	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	Cedar Street	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	East Street	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	East Main Street	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
P/P	CtTransit	New Britain	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	MNR	Danbury Rail Yard	0	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	MNR	East Bridgeport Rail Yard	1	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	MNR	Stamford Rail Yard	3	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	MNR	New Haven Rail Yard	17	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	MNR	Springdale	1	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	CtTransit	CtTransit Hartford	2	Yes	Aug-16	18-Oct	4	Yes	Aug-20	
A/M	CtTransit	CtTransit New Haven	1	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	CtTransit	CtTransit Stamford	2	No	Oct-18	TBD	N/A	N/A	Oct-22	
A/M	CtTransit	CtTransit Waterbury (New)	1	Yes	Oct-18	TBD	N/A	N/A	Oct-22	
Total	**62**		**156**	**45**			**2.4**	**22**		

Appendix E. Slow Zone Calculations

Slow Zone Calculations





Slow Zone	July	August	September	October	November	December	January	February	March	April	May	June
Percentage	6%	6%	6%	4%	4%	4%	4%	4%	4%	4%	5%	4%

SFY 18 - Guideway Performance Measure	5%
SFY 19 - End of Year Target	2%

Appendix F. TAPT Results

Prioritized Lists of Needs

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Needs - Tier I Bus

Year	Rank	Asset Name	Description	Count	Cost	PI	Programmed	Project
2018	1	CTTransit New Haven 2000 Chevrolet Cargo minivan	Service-Van	1	$46,182	1.6372	P	Various
2018	1	CTTransit Stamford 2000 Chevrolet 2500 cargo	Service-Van	1	$46,182	1.6372	P	Various
2018	3	CTTransit New Haven 2007 Ford Fusion 4 door sedan	Service-Auto	2	$39,358	0.9972	P	Various
2018	3	CTTransit Stamford 2007 Ford Fusion 4 door sedan	Service-Auto	1	$19,679	0.9972	P	Various
2018	5	CTTransit Hartford 2007 Chevrolet Cargo minivan	Service-Van	2	$92,364	0.9970	P	Various
2018	5	CTTransit Stamford 2007 Chevrolet CG23405 Cargo	Service-Van	1	$46,182	0.9970	P	Various
2018	5	CTTransit Waterbury 2007 Ford E150	Service-Van	1	$46,182	0.9970	P	Various
2018	8	CTTransit Hartford 2008 Toyota hybrid	Service-Auto	2	$39,358	0.8309	P	Various
2018	9	CTTransit Stamford 1990 M7-Plow/Dump and Sand Truck	Service-Truck	2	$335,550	0.5069	P	Various
2018	10	CTTransit Stamford 2011 Ford Escape	Service-SUV	3	$98,145	0.3031	P	Various
2018	11	CTTransit New Haven 2011 Ford Escape	Service-SUV	5	$163,575	0.3031	P	Various
2018	12	CTTransit Hartford 1995 International Service Truck	Service-Truck	1	$167,775	0.2897	P	Various
2018	12	CTTransit Waterbury 1995 International Service Truck	Service-Truck	1	$167,775	0.2897	P	Various
2018	14	CTTransit Stamford 1997 M8-Rack Body & Plow	Service-Truck	1	$167,775	0.2126	P	Various
2018	15	CTTransit Hartford 1999 Chevrolet Pick Up	Service-Truck	1	$167,775	0.1424	P	Various
2018	16	CTTransit Stamford 2001 New Flyer	Transit Bus	2	$848,172	0.0973	Y	DOT0403 *
2018	16	New Britain 2001 New Flyer	Transit Bus	1	$424,086	0.0973	Y	Various *
2018	18	CTTransit New Haven 2004 New Flyer	Transit Bus	41	$17,387,526	0.0402	Y	Various **
2018	18	Dattco 2004 New Flyer	Transit Bus	1	$424,086	0.0402	Y	Various *
2018	20	CTTransit Hartford 2003 Freightliner Service Patrol	Service-Truck	1	$167,775	0.0247	P	Various
2018	21	CTTransit Hartford 2005 New Flyer	Transit Bus	48	$20,356,128	0.0234	Y	Various
2018	22	CTTransit Stamford 2003 MCI	Over-the-Road Bus	2	$973,214	0.0110	Y	Various *
2019	1	CTTransit Hartford 2007 New Flyer	Transit Bus	64	$27,141,504	0.0077	Y	Various ***
2019	2	Nason/Kelley 2007 MCI	Over-the-Road Bus	1	$486,607	0.0009	Y	Various *
2019	3	CTTransit New Haven 2014 Ford Escape	Service-SUV	1	$32,715	0.0009	P	Various
2019	3	CTTransit Waterbury 2014 Chevrolet Traverse	Service-SUV	4	$130,860	0.0009	P	Various
2019	5	CTTransit Hartford 2014 Ford Fusion 4 door sedan	Service-Auto	3	$59,037	0.0006	P	Various
2019	6	CTTransit New Haven 2014 Ford E350 shuttle van	Service-Van	2	$92,364	0.0005	P	Various
2020	1	CTTransit Hartford Admin/Maintenance	Facility-Equipment	1	$17,940,583	0.0314	Y	DOT04010017CN
2020	2	CTTransit Hartford Fuel Cell Storage	Facility-Equipment	1	$468,384	0.0314	P	DOT0400
2020	2	CTTransit Stamford Maintenance	Facility-Equipment	1	$801,960	0.0314	P	DOT0400
2020	2	CTTransit Stamford Office/Storage	Facility-Equipment	1	$2,706,000	0.0314	P	DOT0400
2020	5	CTTransit Hartford Admin/Maintenance	Facility-Conveyance	1	$3,588,117	0.0143	P	DOT0400
2020	5	CTTransit Hartford Fuel Cell Storage	Facility-Conveyance	1	$93,677	0.0143	P	DOT0400
2020	5	CTTransit Stamford Office/Storage	Facility-Conveyance	1	$541,200	0.0143	P	DOT0400
2020	8	CTTransit Stamford Maintenance	Facility-Conveyance	1	$160,392	0.0143	P	DOT0400
2020	9	CTTransit Hartford 2008 New Flyer	Transit Bus	2	$848,172	0.0077	Y	DOT0400
2020	9	New Britain 2008 New Flyer	Transit Bus	1	$424,086	0.0077	Y	DOT0400 *
2020	11	CTTransit Hartford 2015 Ford Interceptor	Service-SUV	4	$130,860	0.0009	P	Various
2020	12	CTTransit Hartford 2015 GMC Savana Parts Van	Service-Van	3	$138,546	0.0005	P	Various
2020	13	CTTransit Waterbury 2006 Chevrolet Dump Truck	Service-Truck	1	$167,775	0.0002	P	Various
2021	1	CTTransit Waterbury 2016 Ford E450	Cutaway Bus	22	$1,551,374	0.1602	Y	DOT0400
2021	2	CTTransit Hartford 2016 Ford Escape	Service-SUV	1	$32,715	0.0009	P	Various
2021	3	CTTransit Hartford 2016 Ford Fusion 4 door sedan	Service-Auto	2	$39,358	0.0006	P	Various
2021	3	CTTransit New Haven 2016 Ford Fusion 4 door sedan	Service-Auto	1	$19,679	0.0006	P	Various

*	Replacement in PY18
**	27 of the fleet of 41 replaced in PY18
***	22 of the fleet of 64 replaced in PY18
Y	Programmed in Capital Plan
P	Partially programmed in Capital Plan

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Needs - Rail

Year	Rank	Asset Name	Description	Count	Unit	Cost	PI	Programmed	Project
2018	1	East Norwalk (EB) Platform	Platform Elec	1	Platform	$10,995	0.4889	N	
2018	1	East Norwalk (WB) Platform	Platform Elec	1	Platform	$10,995	0.4889	N	
2018	1	Wilton Platform	Platform Elec	1	Platform	$2,625	0.4889	N	
2018	4	Riverside (EB) Platform	Platform Elec	1	Platform	$53,900	0.4889	N	
2018	4	Riverside (WB) Platform	Platform Elec	1	Platform	$53,900	0.4889	N	
2018	4	Branchville Platform	Platform Elec	1	Platform	$38,400	0.4889	N	
2018	4	Bethel Platform	Platform Elec	1	Platform	$29,300	0.4889	N	
2018	4	Cannondale Platform	Platform Elec	1	Platform	$17,500	0.4889	N	
2018	4	Fairfield (EB) Platform	Platform Elec	1	Platform	$15,400	0.4889	N	
2018	4	Fairfield (WB) Platform	Platform Elec	1	Platform	$15,400	0.4889	N	
2018	4	Redding Platform	Platform Elec	1	Platform	$13,200	0.4889	N	
2018	4	Milford (EB) Platform	Platform Elec	1	Platform	$13,183	0.4889	N	
2018	4	Milford (WB) Platform	Platform Elec	1	Platform	$13,183	0.4889	N	
2018	4	Greenwich (EB) Platform	Platform Elec	1	Platform	$10,120	0.4889	N	
2018	4	Greenwich (WB) Platform	Platform Elec	1	Platform	$10,120	0.4889	N	
2018	4	Rowayton (WB) Platform	Platform Elec	1	Platform	$7,660	0.4889	N	
2018	4	Rowayton (EB) Platform	Platform Elec	1	Platform	$7,660	0.4889	N	
2018	4	Noroton Heights (EB) Platform	Platform Elec	1	Platform	$2,622	0.4889	Y	03010170CN
2018	4	Noroton Heights (WB) Platform	Platform Elec	1	Platform	$2,622	0.4889	Y	03010170CN
2018	4	Darien (EB) Platform	Platform Elec	1	Platform	$875	0.4889	P	03010195PE
2018	4	Darien (WB) Platform	Platform Elec	1	Platform	$875	0.4889	P	03010195PE
2018	4	Clinton Platform	Platform Elec	1	Platform	$400	0.4889	N	
2018	4	West Haven (EB) Platform	Platform Elec	1	Platform	$200	0.4889	N	
2018	4	West Haven (WB) Platform	Platform Elec	1	Platform	$200	0.4889	N	
2018	25	Southport (EB) Platform	Platform Elec	1	Platform	$94,450	0.4889	N	
2018	25	Southport (WB) Platform	Platform Elec	1	Platform	$94,450	0.4889	N	
2018	25	Stratford (EB) Platform	Platform Elec	1	Platform	$10,383	0.4889	N	
2018	25	Stratford (WB) Platform	Platform Elec	1	Platform	$10,383	0.4889	N	
2018	29	MNR 1960 MK Corp/FL9M	Locomotive - MNR	6	Vehicles	$15,865,974	0.3977	N	
2018	30	Track-Curved (TERM Rating 1)	Track-Curved	26	Track Miles	$51,694,836	0.2815	P	03000190 (C Program)
2018	31	Tumouts (TERM Rating 1)	Turnouts	58	Turnouts	$42,158,750	0.2808	P	03000190 (C Program)
2018	32	Greens Farms (EB) Platform	Platform Elec	1	Platform	$73,450	0.2738	N	
2018	32	Greens Farms (WB) Platform	Platform Elec	1	Platform	$73,450	0.2738	N	
2018	32	Cos Cob (EB) Platform	Platform Elec	1	Platform	$49,450	0.2738	N	
2018	32	Cos Cob (WB) Platform	Platform Elec	1	Platform	$49,450	0.2738	N	
2018	32	Danbury Platform	Platform Elec	1	Platform	$18,100	0.2738	N	
2018	32	Branford (EB) Platform	Platform Elec	1	Platform	$6,650	0.2738	N	
2018	32	Branford (WB) Platform	Platform Elec	1	Platform	$6,650	0.2738	N	
2018	32	Naugatuck Platform	Platform Elec	1	Platform	$1,750	0.2738	N	
2018	32	Stamford (A) Platform	Platform Elec	1	Platform	$1,100	0.2738	N	
2018	32	Ansonia Platform	Platform Elec	1	Platform	$1,050	0.2738	N	
2018	32	Beacon Falls Platform	Platform Elec	1	Platform	$525	0.2738	N	
2018	43	MNR New Haven - Wheel Mill Facility Building	Facility-Equipment	1	Building	$506,240	0.2481	P	03000138CN
2018	44	Power-Substations (TERM Rating 1)	Power-Substations	11	Substations	$170,500,000	0.2476	P	03010072CN
2018	45	MNR New Haven - Wheel Mill Facility Building	Facility-Conveyance	1	Building	$101,248	0.2372	P	03000138CN
2018	46	Guideway Surfacing (TERM Rating 1)	Guideway Surfacing	59	Track Miles	$7,398,600	0.2260	P	03000190 (C Program)
2018	47	Track-Tangent (TERM Rating 1)	Track-Tangent	48	Track Miles	$66,000,000	0.2141	P	03000190 (C Program)
2018	48	MNR 1971 GMC EMD/AMF GP40	Locomotive - MNR	6	Vehicles	$15,865,974	0.1885	N	
2018	49	Tower Wire Car - Train T-13	Service-Rail	1	Vehicle	$150,000	0.1880	N	
2018	50	MNR Greenwich Station	Facility-Electrical	1	Building	$354,265	0.1855	N	
2018	50	MNR Riverside Station	Facility-Electrical	1	Building	$354,265	0.1855	N	
2018	50	MNR Rowayton Station	Facility-Electrical	1	Building	$5,745	0.1855	N	
2018	50	MNR East Norwalk Station	Facility-Electrical	1	Building	$1,185	0.1855	N	
2018	54	MNR Milford (WB) Station	Facility-HVAC	1	Building	$323,907	0.1855	N	
2018	54	MNR Milford (EB) Station	Facility-HVAC	1	Building	$1,583	0.1855	N	
2018	54	MNR Southport Station	Facility-HVAC	1	Building	$366	0.1855	N	
2018	57	MNR Riverside Station	Facility-Interior	1	Building	$517,771	0.1762	N	
2018	58	MNR New Haven - Wheel Mill Facility Building	Facility-Fire	1	Building	$177,184	0.1709	P	03000138CN
2018	59	Ties-Wood (TERM Rating 1)	Ties-Wood	6	Track Miles	$4,620,000	0.1354	P	03000190 (C Program)
2018	60	Talmadge Hill Platform	Platform Canopy	1	Platform	$37,400	0.1271	N	
2018	60	Ansonia Platform	Platform Canopy	1	Platform	$6,963	0.1271	N	
2018	60	Derby Platform	Platform Canopy	1	Platform	$6,909	0.1271	N	
2018	60	New Canaan Platform	Platform Canopy	1	Platform	$3,200	0.1271	N	
2018	60	Seymour Platform	Platform Canopy	1	Platform	$3,040	0.1271	N	
2018	60	New Haven (C) Platform	Platform Canopy	1	Platform	$150	0.1271	N	
2018	66	Track-Curved (TERM Rating 2)	Track-Curved	21	Track Miles	$41,753,521	0.1259	P	03000190 (C Program)
2018	67	Tumouts (TERM Rating 2)	Turnouts	48	Turnouts	$34,890,000	0.1253	P	03000190 (C Program)
2018	68	Darien (EB) Platform	Platform Structure	1	Platform	$321,000	0.1252	P	03010195PE
2018	68	Darien (WB) Platform	Platform Structure	1	Platform	$321,000	0.1252	P	03010195PE
2018	68	Greenwich (EB) Platform	Platform Structure	1	Platform	$209,900	0.1252	N	
2018	68	Greenwich (WB) Platform	Platform Structure	1	Platform	$209,900	0.1252	N	
2018	68	South Norwalk (EB) Platform	Platform Structure	1	Platform	$115,800	0.1252	N	
2018	68	South Norwalk (WB) Platform	Platform Structure	1	Platform	$115,800	0.1252	N	
2018	68	Old Greenwich (EB) Platform	Platform Structure	1	Platform	$77,600	0.1252	N	
2018	68	Noroton Heights (EB) Platform	Platform Structure	1	Platform	$55,000	0.1252	Y	03010170CN
2018	68	Noroton Heights (WB) Platform	Platform Structure	1	Platform	$55,000	0.1252	Y	03010170CN
2018	68	East Norwalk (EB) Platform	Platform Structure	1	Platform	$53,400	0.1252	N	
2018	68	East Norwalk (WB) Platform	Platform Structure	1	Platform	$53,400	0.1252	N	

Year	Rank	Asset Name	Description	Count	Unit	Cost	PI	Programmed	Project
2018	68	Wilton Platform	Platform Structure	1	Platform	$50,000	0.1252	N	
2018	68	Westport (EB) Platform	Platform Structure	1	Platform	$49,050	0.1252	N	
2018	68	Westport (WB) Platform	Platform Structure	1	Platform	$49,050	0.1252	N	
2018	68	Rowayton (WB) Platform	Platform Structure	1	Platform	$47,850	0.1252	N	
2018	68	Rowayton (EB) Platform	Platform Structure	1	Platform	$47,850	0.1252	N	
2018	68	Fairfield (EB) Platform	Platform Structure	1	Platform	$35,000	0.1252	N	
2018	68	Fairfield (WB) Platform	Platform Structure	1	Platform	$35,000	0.1252	N	
2018	68	Milford (WB) Platform	Platform Structure	1	Platform	$33,000	0.1252	N	
2018	68	Glenbrook Platform	Platform Structure	1	Platform	$25,400	0.1252	N	
2018	68	Stratford (EB) Platform	Platform Structure	1	Platform	$22,500	0.1252	N	
2018	68	Stratford (WB) Platform	Platform Structure	1	Platform	$22,500	0.1252	N	
2018	68	Springdale Platform	Platform Structure	1	Platform	$18,500	0.1252	N	
2018	68	Merritt 7 Platform	Platform Structure	1	Platform	$16,500	0.1252	Y	03020014PE
2018	68	New Haven State Street Platform	Platform Structure	1	Platform	$10,000	0.1252	N	
2018	68	Ansonia Platform	Platform Structure	1	Platform	$5,250	0.1252	N	
2018	68	Derby Platform	Platform Structure	1	Platform	$2,000	0.1252	N	
2018	68	Seymour Platform	Platform Structure	1	Platform	$1,800	0.1252	N	
2018	68	Bridgeport (EB) Platform	Platform Structure	1	Platform	$450	0.1252	N	
2018	68	Bridgeport (WB) Platform	Platform Structure	1	Platform	$450	0.1252	N	
2018	98	Ties-Concrete (TERM Rating 1)	Ties-Concrete	4	Track Miles	$3,520,000	0.1206	P	03000190 (C Program)
2018	99	Power-Poles (TERM Rating 1)	Power-Poles	870	Structures	$6,472,800	0.1169	Y*	
2018	100	Guideway Surfacing (TERM Rating 2)	Guideway Surfacing	105	Track Miles	$13,167,000	0.1119	P	03000190 (C Program)
2018	101	Power-Substations (TERM Rating 2)	Power-Substations	5	Substations	$77,500,000	0.1049	P	03010072CN
2018	102	Bridge 02237R	Bridge - Fixed	1	Bridge	$28,700,000	0.1019	P	03000175
2018	102	Bridge 03680R	Bridge - Fixed	1	Bridge	$14,600,000	0.1019	P	03000175
2018	102	Bridge 08098R	Bridge - Fixed	1	Bridge	$12,000,000	0.1019	P	03000175
2018	102	Bridge 08154R	Bridge - Culvert/Pedestrian	1	Bridge	$1,500,000	0.1019	N	
2018	102	Bridge 08261R	Bridge - Culvert/Pedestrian	1	Bridge	$1,300,000	0.1019	N	
2018	102	Bridge 08269R	Bridge - Culvert/Pedestrian	1	Bridge	$1,300,000	0.1019	N	
2018	102	Bridge 08209R	Bridge - Fixed	1	Bridge	$1,300,000	0.1019	P	03000175
2018	109	Bridge 08264R	Bridge - Fixed	1	Bridge	$41,300,000	0.1019	P	03000175
2018	109	Bridge 03693R	Bridge - Fixed	1	Bridge	$33,000,000	0.1019	P	03000175
2018	109	Bridge 03686R	Bridge - Fixed	1	Bridge	$25,800,000	0.1019	P	03000175
2018	109	Bridge 08059R	Bridge - Fixed	1	Bridge	$20,400,000	0.1019	P	03000175
2018	109	Bridge 03638R	Bridge - Fixed	1	Bridge	$20,000,000	0.1019	P	03000175
2018	109	Bridge 08012R	Bridge - Fixed	1	Bridge	$19,200,000	0.1019	P	03000175
2018	109	Bridge 08075R	Bridge - Fixed	1	Bridge	$18,100,000	0.1019	P	03000175
2018	109	Bridge 08263R	Bridge - Fixed	1	Bridge	$16,800,000	0.1019	P	03000175
2018	109	Bridge 01318R	Bridge - Fixed	1	Bridge	$15,500,000	0.1019	P	03000175
2018	109	Bridge 03639R	Bridge - Fixed	1	Bridge	$14,300,000	0.1019	P	03000175
2018	109	Bridge 03948R	Bridge - Fixed	1	Bridge	$14,300,000	0.1019	P	03000175
2018	109	Bridge 08074R	Bridge - Fixed	1	Bridge	$14,300,000	0.1019	P	03000175
2018	109	Bridge 01312R	Bridge - Fixed	1	Bridge	$13,800,000	0.1019	P	03000175
2018	109	Bridge 04235R	Bridge - Fixed	1	Bridge	$13,800,000	0.1019	P	03000175
2018	109	Bridge 01403R	Bridge - Fixed	1	Bridge	$13,700,000	0.1019	P	03000175
2018	109	Bridge 03946R	Bridge - Fixed	1	Bridge	$12,900,000	0.1019	P	03000175
2018	109	Bridge 08097R	Bridge - Fixed	1	Bridge	$12,800,000	0.1019	P	03000175
2018	109	Bridge 08071R	Bridge - Fixed	1	Bridge	$12,600,000	0.1019	P	03000175
2018	109	Bridge 01348R	Bridge - Fixed	1	Bridge	$12,300,000	0.1019	P	03000175
2018	109	Bridge 08050R	Bridge - Fixed	1	Bridge	$12,200,000	0.1019	P	03000175
2018	109	Bridge 08022R	Bridge - Fixed	1	Bridge	$11,700,000	0.1019	Y	03000196CN
2018	109	Bridge 08060R	Bridge - Fixed	1	Bridge	$10,700,000	0.1019	P	03000175
2018	109	Bridge 08055R	Bridge - Fixed	1	Bridge	$10,200,000	0.1019	P	03000175
2018	109	Bridge 08287R	Bridge - Fixed	1	Bridge	$9,200,000	0.1019	P	03000175
2018	109	Bridge 04232R	Bridge - Fixed	1	Bridge	$9,000,000	0.1019	P	03000175
2018	109	Bridge 04197R	Bridge - Fixed	1	Bridge	$8,900,000	0.1019	P	03000175
2018	109	Bridge 03691R	Bridge - Fixed	1	Bridge	$8,400,000	0.1019	P	03000175
2018	109	Bridge 08035R	Bridge - Fixed	1	Bridge	$8,200,000	0.1019	P	03000175
2018	109	Bridge 08003R	Bridge - Fixed	1	Bridge	$8,000,000	0.1019	P	03000175
2018	109	Bridge 08200R	Bridge - Fixed	1	Bridge	$7,900,000	0.1019	P	03000175
2018	109	Bridge 03955R	Bridge - Fixed	1	Bridge	$7,400,000	0.1019	P	03000175
2018	109	Bridge 08006R	Bridge - Fixed	1	Bridge	$7,000,000	0.1019	P	03000175
2018	109	Bridge 08086R	Bridge - Fixed	1	Bridge	$7,000,000	0.1019	Y	03000196CN
2018	109	Bridge 08268R	Bridge - Fixed	1	Bridge	$5,300,000	0.1019	Y	03000196CN
2018	109	Bridge 08015R	Bridge - Culvert/Pedestrian	1	Bridge	$4,600,000	0.1019	N	
2018	109	Bridge 04224R	Bridge - Fixed	1	Bridge	$4,200,000	0.1019	P	03000175
2018	109	Bridge 08072R	Bridge - Culvert/Pedestrian	1	Bridge	$3,400,000	0.1019	N	
2018	109	Bridge 08279R	Bridge - Fixed	1	Bridge	$2,100,000	0.1019	P	03000175
2018	109	Bridge 08266R	Bridge - Culvert/Pedestrian	1	Bridge	$1,800,000	0.1019	N	
2018	109	Bridge 08217R	Bridge - Fixed	1	Bridge	$1,100,000	0.1019	P	03000175
2018	109	Bridge 08219R	Bridge - Fixed	1	Bridge	$1,100,000	0.1019	P	03000175
2018	109	Bridge 08218R	Bridge - Fixed	1	Bridge	$1,000,000	0.1019	P	03000175
2018	109	Bridge 08274R	Bridge - Fixed	1	Bridge	$1,000,000	0.1019	P	03000175
2018	152	Bridge 08070R	Bridge - Fixed	1	Bridge	$13,000,000	0.1019	P	03000175
2018	152	Bridge 08267R	Bridge - Fixed	1	Bridge	$10,300,000	0.1019	P	03000175
2018	152	Bridge 08210R	Bridge - Fixed	1	Bridge	$5,400,000	0.1019	P	03000175
2018	152	Bridge 08207R	Bridge - Fixed	1	Bridge	$2,700,000	0.1019	Y	03000196CN
2018	156	Bridge 08008R Cos Cob Movable	Bridge - Moveable	1	Bridge	$750,000,000	0.1019	Y	03000196CN
2018	156	Bridge 08080R Devon Movable	Bridge - Moveable	1	Bridge	$750,000,000	0.1019	N	
2018	158	Tamper	Service-Rail	1	Vehicle	$150,000	0.1007	N	
2018	159	Track-Tangent (TERM Rating 2)	Track-Tangent	26	Track Miles	$35,750,000	0.0850	P	03000190 (C Program)
2018	160	MNR Stratford (EB) Station	Facility-Plumbing	1	Building	$782,089	0.0781	N	

Year	Rank	Asset Name	Description	Count	Unit	Cost	PI	Programmed	Project
2018	160	MNR Fairfield (WB) Station	Facility-Electrical	1	Building	$631,314	0.0781	N	
2018	160	MNR Fairfield (EB) Station	Facility-Electrical	1	Building	$354,265	0.0781	N	
2018	160	MNR Riverside Station	Facility-HVAC	1	Building	$272,511	0.0781	N	
2018	160	MNR New Haven - Wheel Mill Facility Building	Facility-Electrical	1	Building	$227,808	0.0781	P	03000138CN
2018	160	MNR New Haven - Wheel Mill Facility Building	Facility-HVAC	1	Building	$227,808	0.0781	P	03000138CN
2018	160	MNR New Haven - Wheel Mill Facility Building	Facility-Plumbing	1	Building	$101,248	0.0781	P	03000138CN
2018	160	MNR Seymour Station	Facility-Plumbing	1	Building	$27,251	0.0781	N	
2018	160	MNR Cos Cob Station	Facility-Electrical	1	Building	$905	0.0781	N	
2018	160	MNR East Norwalk Station	Facility-Plumbing	1	Building	$91	0.0781	N	
2018	170	MNR Greens Farms Station	Facility-Electrical	1	Building	$1,777	0.0781	N	
2018	171	MNR New Haven Station	Facility-Interior	1	Building	$24,696,047	0.0718	N	
2018	171	MNR New Haven Station	Facility-Substructure	1	Building	$23,396,255	0.0718	N	
2018	171	MNR Stratford (EB) Station	Facility-Interior	1	Building	$14,859,686	0.0718	N	
2018	171	MNR Noroton Heights Station	Facility-Shell	1	Building	$817,534	0.0718	N	
2018	171	MNR Bridgeport (WB) Station	Facility-Shell	1	Building	$574,300	0.0718	N	
2018	171	MNR New Haven - Wheel Mill Facility Building	Facility-Shell	1	Building	$531,552	0.0718	P	03000138CN
2018	171	MNR Branchville Station	Facility-Interior	1	Building	$517,771	0.0718	N	
2018	171	MNR Cannondale Station	Facility-Interior	1	Building	$517,771	0.0718	N	
2018	171	MNR Derby Station	Facility-Interior	1	Building	$517,771	0.0718	N	
2018	171	MNR Noroton Heights Station	Facility-Interior	1	Building	$517,771	0.0718	N	
2018	171	MNR Seymour Station	Facility-Interior	1	Building	$517,771	0.0718	N	
2018	171	MNR Derby Station	Facility-Substructure	1	Building	$490,520	0.0718	N	
2018	171	MNR Danbury Station	Facility-Interior	1	Building	$406,209	0.0718	N	
2018	171	MNR Rowayton Station	Facility-Shell	1	Building	$13,259	0.0718	N	
2018	171	MNR Rowayton Station	Facility-Interior	1	Building	$8,397	0.0718	N	
2018	171	MNR Wilton Station	Facility-Shell	1	Building	$4,547	0.0718	N	
2018	171	MNR Wilton Station	Facility-Interior	1	Building	$2,880	0.0718	N	
2018	188	MNR Stamford Station	Facility-Shell	1	Building	$2,600,214	0.0718	N	
2018	188	MNR New Haven - Wheel Mill Facility Building	Facility-Interior	1	Building	$329,056	0.0718	P	03000138CN
2018	188	MNR New Haven - Wheel Mill Facility Building	Facility-Substructure	1	Building	$329,056	0.0718	P	03000138CN
2018	191	Tie Inserter w/ Crane	Service-Rail	1	Vehicle	$150,000	0.0685	N	
2018	192	Tie Shear	Service-Rail	1	Vehicle	$150,000	0.0638	N	
2018	193	Railroad Box Car	Service-Rail	5	Vehicles	$750,000	0.0591	N	
2018	194	Railroad Hopper	Service-Rail	28	Vehicles	$4,200,000	0.0591	N	
2018	194	Caboose	Service-Rail	1	Vehicle	$150,000	0.0591	N	
2018	194	Railroad CC Flat Car	Service-Rail	1	Vehicle	$150,000	0.0591	N	
2018	194	Railroad Flat Car	Service-Rail	1	Vehicle	$150,000	0.0591	N	
2018	194	Railroad Flat Well Car	Service-Rail	1	Vehicle	$150,000	0.0591	N	
2018	194	Railroad Storage Box Car	Service-Rail	1	Vehicle	$150,000	0.0591	N	
2018	200	Power-Cable (TERM Rating 2)	Power-Cable	288	Track Miles	$51,701,760	0.0585	Y*	
2018	201	MNR New Haven - Wheel Mill Facility Building	Facility-Site	1	Building	$151,872	0.0478	P	03000138CN
2018	202	Ties-Wood (TERM Rating 2)	Ties-Wood	59	Track Miles	$45,430,000	0.0421	P	03000190 (C Program)
2018	203	Ties-Concrete (TERM Rating 2)	Ties-Concrete	7	Track Miles	$6,160,000	0.0336	P	03000190 (C Program)
2018	204	Waterbury Signals	Signal System	26	Track Miles	$73,000,000	0.0118	Y	03040016CN
2018	205	MNR 1974 GE/A Car	EMU	18	Vehicles	$47,597,922	0.0102	Y	03000200RS
2018	205	MNR 1974 GE/B Car	EMU	18	Vehicles	$47,597,922	0.0102	Y	03000200RS
2018	207	SLE 1993 GE/P40 Genesis	Locomotive - SLE	12	Vehicles	$31,731,948	0.0027	N	
2018	208	SLE 1991 Mafersa Sociedade/KRC Coach	Commuter Rail Coach - SLE	23	Vehicles	$58,033,600	0.0018	N	
2018	208	SLE 1991 Mafersa Sociedade/KRC Cab	Commuter Rail Coach - SLE	10	Vehicles	$25,232,000	0.0018	N	
2019	1	Wire Reel Car Road	Service-Rail	1	Vehicle	$150,000	0.0011	N	
2020	1	MNR New Haven - Storehouse	Facility-Equipment	1	Building	$6,960,800	0.0314	P	03000138CN
2020	1	MNR Bridgeport Rail Facility Building	Facility-Equipment	1	Building	$2,892,800	0.0314	N	
2020	1	MNR New Haven - Blowing Area Shelter	Facility-Equipment	1	Building	$526,128	0.0314	P	03000138CN
2020	4	MNR New Haven - EMU Maintenance Shop	Facility-Equipment	1	Building	$5,225,120	0.0314	P	03000138CN
2020	4	MNR New Haven - Training Building	Facility-Equipment	1	Building	$4,104,160	0.0314	P	03000138CN
2020	4	MNR New Haven - Diesel-CSR Shop	Facility-Equipment	1	Building	$3,380,960	0.0314	P	03000138CN
2020	7	Guideway Surfacing (TERM Rating 3)	Guideway Surfacing	66	Track Miles	$8,276,400	0.0192	P	03000190 (C Program)
2020	8	MNR New Haven - Storehouse	Facility-Conveyance	1	Building	$1,392,160	0.0143	P	03000138CN
2020	9	MNR New Haven - EMU Maintenance Shop	Facility-Conveyance	1	Building	$1,045,024	0.0143	P	03000138CN
2020	9	MNR New Haven - Training Building	Facility-Conveyance	1	Building	$820,832	0.0143	P	03000138CN
2020	9	MNR New Haven - Diesel-CSR Shop	Facility-Conveyance	1	Building	$676,192	0.0143	P	03000138CN
2020	9	MNR Bridgeport Rail Facility Building	Facility-Conveyance	1	Building	$578,560	0.0143	N	
2020	9	MNR New Haven - Blowing Area Shelter	Facility-Conveyance	1	Building	$105,226	0.0143	P	03000138CN
2021	1	MNR 1986 Bombardier / Proj 19 Coach	Commuter Rail Coach - MNR	15	Vehicles	$37,848,000	0.0003	N	
2021	1	MNR 1986 Bombardier / Proj 19 Cab	Commuter Rail Coach - MNR	5	Vehicles	$12,616,000	0.0003	N	

*	Replacement already occurred in previous Fiscal Years
Y	Programmed in Capital Plan
P	Partially programmed in Capital Plan or Authorized but not Allocated
N	Not Programmed in Capital Plan

Scenario 1

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 1 - Bus (State Match Only)

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	1	NWLKTD 1-2004 Ford Econoline E350	Cutaway Bus	9	634,653	4.8544	Y	DOT0412 *
2018	1	NWLKTD 2-2004 Ford Econoline E450	Cutaway Bus	1	70,517	4.8544	Y	DOT0412*
2018	3	HART 1-2007 Ford E450/StarTrans	Cutaway Bus	6	423,102	2.5390	Y	DOT0416
2018	4	HART 2-2007 Ford E450/StarTrans	Cutaway Bus	2	141,034	2.5390	Y	DOT0416
2018	4	NWCTD 1-2007 Ford Startrans	Cutaway Bus	1	70,517	2.5390	P	Various
2018	6	NECTD 1-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	P	Various
2018	6	NECTD 2-2008 Ford Supreme	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NECTD 3-2008 Ford Van	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NWLKTD 3-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	Y	DOT0412
2018	6	WRTD 1-2008 Ford Supreme	Cutaway Bus	1	70,517	1.9768	Y	DOT04740091RS
2018	11	HART 1999 Ford Econoline	Service-Van	1	46,182	1.6632	P	DOT0416
2018	12	CTTransit New Haven 2000 Chevrolet Cargo minivan	Service-Van	1	46,182	1.6372	P	Various
2018	12	CTTransit Stamford 2000 Chevrolet 2500 cargo	Service-Van	1	46,182	1.6372	P	Various
2018	14	NWCTD 2-2009 Ford Supreme	Cutaway Bus	7	493,619	1.4948	P	Various
2018	14	WRTD 2-2009 Ford Startrans	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	14	WRTD 3-2009 Ford Startrans Van	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	17	SEAT 2004 Ford Explorer	Service-SUV	1	32,715	1.3911	P	DOT0414
2018	18	NWLKTD 2005 Ford Freestyle	Service-SUV	1	32,715	1.2806	P	DOT0412
2018	19	NWLKTD 2005 Ford Sedan 500 AW	Service-Auto	1	19,679	1.2797	P	Various
2018	20	HART 2005 Ford E350	Service-Van	1	46,182	1.2794	P	DOT0416
2018	21	ETD 1-2010 Ford E450	Cutaway Bus	1	70,517	1.0813	Y	DOT0478
2018	21	ETD 2-2010 Ford E450	Cutaway Bus	2	141,034	1.0813	Y	DOT0478
2018	21	NECTD 4-2010 Ford Startrans	Cutaway Bus	1	70,517	1.0813	P	Various
2018	21	NECTD 5-2010 Ford Startrans	Cutaway Bus	4	282,068	1.0813	P	Various
2018	25	NWLKTD 4-2010 Ford Phoenix E450	Cutaway Bus	10	705,170	1.0813	Y	DOT0412*
2018	26	CTTransit New Haven 2007 Ford Fusion 4 door sedan	Service-Auto	2	39,358	0.9972	P	Various
2018	26	CTTransit Stamford 2007 Ford Fusion 4 door sedan	Service-Auto	1	19,679	0.9972	P	Various
2018	28	CTTransit Hartford 2007 Chevrolet Cargo minivan	Service-Van	2	92,364	0.9970	P	Various
2018	28	CTTransit Stamford 2007 Chevrolet CG23405 Cargo	Service-Van	1	46,182	0.9970	P	Various
2018	28	CTTransit Waterbury 2007 Ford E150	Service-Van	1	46,182	0.9970	P	Various
2018	31	GBTA 1982 GMC TOW truck	Service-Truck	1	167,775	0.8932	P	DOT0410
2018	32	CTTransit Hartford 2008 Toyota hybrid	Service-Auto	2	39,358	0.8309	P	Various
2018	33	ETD 3-2011 Ford Startrans	Cutaway Bus	1	70,517	0.7266	Y	DOT0478
2018	33	NWCTD 3-2011 Ford Startrans	Cutaway Bus	4	282,068	0.7266	P	Various
2018	33	WRTD 4-2011 Ford Startrans	Cutaway Bus	3	211,551	0.7266	P	Various
2018	33	WRTD 5-2011 Ford Startrans Vans	Cutaway Bus	6	423,102	0.7266	Y	DOT04740091RS
2018	37	HART 2009 Ford Escape	Service-SUV	2	65,430	0.6555	P	DOT0416
2018	38	GBTA 2009 Toyota Camry	Service-Auto	2	39,358	0.6549	P	DOT0410
2018	39	CTTransit Stamford 1990 M7-Plow/Dump and Sand Truck	Service-Truck	2	335,550	0.5069	P	Various
2018	40	GBTA 2010 GMC Terrain SLE	Service-SUV	1	32,715	0.4768	P	DOT0410
2018	41	ETD 4-2012 Ford F550	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 5-2012 Ford Goshen E450	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 6-2012 Ford Phoenix	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 7-2012 Ford Startrans E450 28 FT	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	GBTA 1-2012 Ford Goshen	Cutaway Bus	4	282,068	0.4219	Y	DOT0410
2018	41	NWCTD 4-2012 Ford E450	Cutaway Bus	3	211,551	0.4219	P	Various
2018	41	VTD 1-2012 Ford Supreme	Cutaway Bus	14	987,238	0.4219	Y	DOT00360199RS
2018	41	WRTD 6-2012 Goshen Coach	Cutaway Bus	2	141,034	0.4219	P	Various
2018	49	CTTransit Stamford 2011 Ford Escape	Service-SUV	3	98,145	0.3031	P	Various
2018	49	ETD 2011 Ford Escape	Service-SUV	1	32,715	0.3031	P	DOT0478
2018	49	GBTA 2011 Chevrolet Tahoe	Service-SUV	2	65,430	0.3031	P	DOT0410
2018	52	CTTransit New Haven 2011 Ford Escape	Service-SUV	5	163,575	0.3031	P	Various
2018	53	CTTransit Hartford 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	53	CTTransit Waterbury 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	55	CTTransit Stamford 1997 M8-Rack Body & Plow	Service-Truck	1	167,775	0.2126	P	Various
2018	56	NWLKTD Admin/Maint 1	Facility-Fire	1	1,064,196	0.1709	P	DOT0412
2018	57	ETD 10-2013 Ford Goshen F550	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	ETD 8-2013 Ford E450	Cutaway Bus	2	141,034	0.1602	Y	DOT0478
2018	57	ETD 9-2013 Ford Goshen E450 28 FT	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	GNHTD 1-2013 Ford E350 Goshen	Cutaway Bus	13	916,721	0.1602	Y	DOT0427*
2018	57	GNHTD 2-2013 Ford E450 Goshen	Cutaway Bus	4	282,068	0.1602	Y	DOT0427
2018	57	HART 3-2013 Ford E450/Goshen Coach	Cutaway Bus	9	634,653	0.1602	Y	DOT0416
2018	57	WRTD 7-2013 Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT04740091RS
2018	64	CTTransit Hartford 1999 Chevrolet Pick Up	Service-Truck	1	167,775	0.1424	P	Various
2018	64	VTD 1999 Ford F250 Pickup	Service-Truck	1	167,775	0.1424	P	DOT00360199EQ
2018	66	CTTransit Stamford 2-2001 New Flyer	Transit Bus	2	848,172	0.0973	Y	DOT0403
2018	66	New Britain 1-2001 New Flyer	Transit Bus	1	424,086	0.0973	Y	Various
2018	68	NWLKTD 2001 Ford Utility Truck	Service-Truck	1	167,775	0.0796	P	DOT0412

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	69	NWLKTD Admin/Maint 1	Facility-Electrical	1	1,368,252	0.0781	P	DOT0412
2018	70	GBTA 4-2003 New Flyer	Transit Bus	2	848,172	0.0581	Y	DOT0410
2018	70	GBTA 5-2003 New Flyer	Transit Bus	3	1,272,258	0.0581	Y	DOT0410
2018	70	NWLKTD 6-2003 Orion VII	Transit Bus	19	8,057,634	0.0581	P	DOT0412
2018	70	SEAT 2-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2018	70	SEAT 3-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2019	1	HART 4-2014 Ford E450/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	Y	DOT0416
2019	1	HART 5-2014 Ford E450/Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT0416
2019	1	NWLKTD 5-2014 Chevrolet Pegasus	Cutaway Bus	10	705,170	0.1602	P	DOT0424
2019	4	CTTransit New Haven 3-2004 New Flyer	Transit Bus	41	17,387,526	0.0581	Y	Various
2019	4	Dattco 1-2004 New Flyer	Transit Bus	1	424,086	0.0581	Y	Various
2019	4	MlfdTD 3-2004 New Flyer	Transit Bus	1	424,086	0.0581	Y	DOT0424
2019	4	NWLKTD 7-2004 Gillig	Transit Bus	3	1,272,258	0.0581	P	DOT0424
2019	4	SEAT 4-2004 Gillig	Transit Bus	1	424,086	0.0581	P	DOT0414
2019	9	CTTransit Hartford 2003 Freightliner Service Patrol	Service-Truck	1	167,775	0.0511	P	Various
2019	9	GBTA 2003 GMC 4500Dump Truck	Service-Truck	1	167,775	0.0511	P	DOT0410
2019	11	CTTransit Hartford 3-2005 New Flyer	Transit Bus	48	20,356,128	0.0402	Y	Various
2019	12	GBTA 2004 Skid Steer	Service-Truck	1	167,775	0.0247	P	DOT0410
2019	12	HART 2004 Ford F450	Service-Truck	1	167,775	0.0247	P	DOT0416
2020	1	ETD 11-2015 Ford E450 Phoenix	Cutaway Bus	4	282,068	0.1602	Y	DOT0478
2020	1	GNHTD 3-2015 Ford E350 Goshen	Cutaway Bus	11	775,687	0.1602	Y	DOT0427
2020	1	GNHTD 4-2015 Ford E450 Goshen	Cutaway Bus	3	211,551	0.1602	Y	DOT0427
2020	1	MAT 1-2015 Goshen E350	Cutaway Bus	10	705,170	0.1602	Y	DOT0422
2020	5	CTTransit New Haven 2014 Ford Escape	Service-SUV	1	32,715	0.1423	P	Various
2020	5	CTTransit Waterbury 2014 Chevrolet Traverse	Service-SUV	4	130,860	0.1423	P	Various
2020	5	GBTA 2014 Chevrolet Tahoe	Service-SUV	1	32,715	0.1423	P	DOT0410
2020	8	CTTransit Hartford 2014 Ford Fusion 4 door sedan	Service-Auto	3	59,037	0.1419	P	Various
2020	9	CTTransit New Haven 2014 Ford E350 shuttle van	Service-Van	2	92,364	0.1418	P	Various
2020	10	NWLKTD 8-2006 Gillig	Transit Bus	3	1,272,258	0.0402	Y	DOT0412
2020	10	SEAT 5-2006 Gillig	Transit Bus	2	848,172	0.0402	Y	DOT0414
2020	10	SEAT 6-2006 New Flyer	Transit Bus	3	1,272,258	0.0402	Y	DOT0414
2020	10	SEAT 7-2006 New Flyer	Transit Bus	3	1,272,258	0.0402	Y	DOT0414
2020	10	WRTD 8-2006 Gillig	Transit Bus	2	848,172	0.0402	P	Various
2020	15	CTTransit Hartford Admin/Maintenance 1	Facility-Equipment	1	17,940,583	0.0314	Y	DOT04010017CN
2020	15	HART Passenger Facility 1	Facility-Equipment	1	15,370	0.0314	P	DOT0416
2020	15	MAT Parking 1	Facility-Equipment	1	9,865	0.0314	P	DOT0422
2020	18	CTTransit Hartford Fuel Cell Storage 1	Facility-Equipment	1	468,384	0.0314	P	DOT0400
2020	18	CTTransit Stamford Maintenance 1	Facility-Equipment	1	801,960	0.0314	P	DOT0400
2020	18	CTTransit Stamford Office/Storage 1	Facility-Equipment	1	2,706,000	0.0314	P	DOT0400
2020	18	GBTA Maint 1	Facility-Equipment	1	3,936,000	0.0314	Y	DOT0410
2020	18	GNHTD Admin/Maint 1	Facility-Equipment	1	580,560	0.0314	Y	DOT04270056CN
2020	18	SEAT Admin/Maint 1	Facility-Equipment	1	1,830,240	0.0314	P	DOT0414
2021	1	CTTransit Waterbury 4-2016 Ford E450	Cutaway Bus	22	1,551,374	0.1602	Y	DOT0400
2021	1	GNHTD 5-2016 Ford Goshen E350	Cutaway Bus	18	1,269,306	0.1602	Y	DOT0427
2021	1	HART 6-2016 Ford E450/Goshen Coach	Cutaway Bus	1	70,517	0.1602	Y	DOT0416
2021	1	HART 7-2016 Ford E350/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	P	DOT0416
2021	1	HART 8-2016 Ford E350/Goshen Coach	Cutaway Bus	5	352,585	0.1602	P	DOT0416
2021	1	MlfdTD 1-2016 Ford E450	Cutaway Bus	8	564,136	0.1602	P	DOT0424
2021	1	SEAT 1-2016 Ford Phoenix E450	Cutaway Bus	5	352,585	0.1602	P	DOT0414
2021	8	CTTransit Hartford 2015 Ford Interceptor	Service-SUV	4	130,860	0.1423	P	Various
2021	9	CTTransit Hartford 2015 GMC Savana Parts Van	Service-Van	3	138,546	0.1418	P	Various
2021	9	SEAT 2015 Dodge Caravan	Service-Van	1	46,182	0.1418	P	DOT0414
2021	11	CTTransit Hartford Admin/Maintenance 1	Facility-Conveyance	1	3,588,117	0.0945	P	DOT0400
2021	11	CTTransit Hartford Fuel Cell Storage 1	Facility-Conveyance	1	93,677	0.0945	P	DOT0400
2021	11	CTTransit Stamford Office/Storage 1	Facility-Conveyance	1	541,200	0.0945	P	DOT0400
2021	11	GBTA Maint 1	Facility-Conveyance	1	787,200	0.0945	P	DOT0410
2021	11	GNHTD Admin/Maint 1	Facility-Conveyance	1	116,112	0.0945	Y	DOT04270056CN
2021	11	HART Passenger Facility 1	Facility-Conveyance	1	61,482	0.0945	P	DOT0416
2021	11	MAT Parking 1	Facility-Conveyance	1	39,459	0.0945	P	DOT0422
2021	11	SEAT Admin/Maint 1	Facility-Conveyance	1	366,048	0.0945	P	DOT0414
2021	19	CTTransit Stamford Maintenance 1	Facility-Conveyance	1	160,392	0.0945	P	DOT0400
2021	19	NWLKTD Admin/Maint 1	Facility-Conveyance	1	608,112	0.0945	P	DOT0412

* Replacement in PY18

Y Programmed in Capital Plan

P Partially Funded or Authorized but Not Allocated

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 1 - Rail (State Match Only)

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2018	1	East Norwalk (EB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	East Norwalk (WB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	Wilton Platform	Platform - Electrical	1	Platform	$ 2,625.00	0.4889	N	
2018	4	Greenwich (EB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Greenwich (WB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Riverside (EB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Riverside (WB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Noroton Heights (EB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Noroton Heights (WB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Darien (EB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Darien (WB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Rowayton (EB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Rowayton (WB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Fairfield (EB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Fairfield (WB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Milford (EB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	Milford (WB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	West Haven (EB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	West Haven (WB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	Cannondale Platform	Platform - Electrical	1	Platform	$ 17,500.00	0.4889	N	
2018	4	Branchville Platform	Platform - Electrical	1	Platform	$ 38,400.00	0.4889	N	
2018	4	Redding Platform	Platform - Electrical	1	Platform	$ 13,200.00	0.4889	N	
2018	4	Bethel Platform	Platform - Electrical	1	Platform	$ 29,300.00	0.4889	N	
2018	4	Clinton Platform	Platform - Electrical	1	Platform	$ 400.00	0.4889	N	
2018	25	Southport (EB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Southport (WB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Stratford (EB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	25	Stratford (WB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	29	MNR 1960 MK Corp/FL9M	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.3977	N	
2018	30	Track-Curved	Track - Curved	26	Track Miles	$ 51,694,835.66	0.2815	P	03000190 (C Program)
2018	31	Track-Turnouts	Track - Turnouts	58	Track Miles	$ 42,158,750.00	0.2808	P	03000190 (C Program)
2018	32	Cos Cob (EB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Cos Cob (WB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Stamford (A) Platform	Platform - Electrical	1	Platform	$ 1,100.00	0.2738	N	
2018	32	Greens Farms (EB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Greens Farms (WB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Danbury Platform	Platform - Electrical	1	Platform	$ 18,100.00	0.2738	N	
2018	32	Ansonia Platform	Platform - Electrical	1	Platform	$ 1,050.00	0.2738	N	
2018	32	Beacon Falls Platform	Platform - Electrical	1	Platform	$ 525.00	0.2738	N	
2018	32	Naugatuck Platform	Platform - Electrical	1	Platform	$ 1,750.00	0.2738	N	
2018	32	Branford (EB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	32	Branford (WB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	43	MNR New Haven - Wheel Mill Facility Building	Facility - Equipment	1	Building	$ 506,240.00	0.2481	P	03000138CN
2019	1	MNR New Haven - Wheel Mill Facility Building	Facility - Conveyance	1	Building	$ 101,248.00	0.2939	P	03000138CN
2020	1	Power - Substations	Power - Substations	11	Substations	$ 170,500,000.00	0.2476	P	03010072CN
2020	2	Track Surfacing	Track - Surfacing	59	Track Miles	$ 7,398,600.00	0.2260	P	03000190 (C Program)
2020	3	MNR New Haven - Wheel Mill Facility Building	Facility - Fire	1	Building	$ 177,184.00	0.2247	P	03000138CN
2020	4	MNR -1971 GMC EMD/AMF GP40	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.2229	N	
2020	5	Track-Tangent	Track - Tangent	48	Track Miles	$ 66,000,000.00	0.2141	P	03000190 (C Program)
2020	6	Tower Wire Car	Service - Rail	1	Vehicles	$ 150,000.00	0.1974	N	
2020	7	MNR East Norwalk Station	Facility - Electrical	1	Building	$ 1,184.56	0.1855	N	
2020	7	MNR Greenwich Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2020	7	MNR Riverside Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2020	7	MNR Rowayton Station	Facility - Electrical	1	Building	$ 5,745.48	0.1855	N	
2020	11	MNR Milford (EB) Station	Facility - HVAC	1	Building	$ 1,583.18	0.1855	N	
2020	11	MNR Milford (WB) Station	Facility - HVAC	1	Building	$ 323,907.27	0.1855	N	
2020	11	MNR Southport Station	Facility - HVAC	1	Building	$ 365.70	0.1855	N	
2021	1	Track Surfacing	Track - Surfacing	105	Track Miles	$ 13,167,000.00	0.2014	P	03000190 (C Program)
2021	2	Track-Curved	Track - Curved	21	Track Miles	$ 41,753,521.11	0.1825	P	03000190 (C Program)
2021	3	Track Turnouts	Track - Turnouts	48	Track Miles	$ 34,890,000.00	0.1819	P	03000190 (C Program)
2021	4	New Haven (C) Platform	Platform - Canopy	1	Platform	$ 150.00	0.1795	N	
2021	4	Talmadge Hill Platform	Platform - Canopy	1	Platform	$ 37,400.00	0.1795	N	
2021	4	New Canaan Platform	Platform - Canopy	1	Platform	$ 3,200.00	0.1795	N	
2021	4	Derby Platform	Platform - Canopy	1	Platform	$ 6,909.00	0.1795	N	
2021	4	Seymour Platform	Platform - Canopy	1	Platform	$ 3,040.00	0.1795	N	
2021	9	Ansonia Platform	Platform - Canopy	1	Platform	$ 6,962.50	0.1795	N	
2021	10	Derby Platform	Platform - Structure	1	Platform	$ 2,000.00	0.1767	N	
2021	11	Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1767	N	
2021	11	Greenwich (WB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1767	N	
2021	11	Old Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 77,600.00	0.1767	N	
2021	11	Noroton Heights (EB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1767	Y	03010170CN
2021	11	Noroton Heights (WB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1767	Y	03010170CN

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2021	11	Darien (EB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1767	P	03010195PE
2021	11	Darien (WB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1767	P	03010195PE
2021	11	Rowayton (EB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1767	N	
2021	11	Rowayton (WB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1767	N	
2021	11	South Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1767	N	
2021	11	South Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1767	N	
2021	11	Westport (EB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1767	N	
2021	11	Westport (WB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1767	N	
2021	11	Fairfield (EB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1767	N	
2021	11	Fairfield (WB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1767	N	
2021	11	Bridgeport (EB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1767	N	
2021	11	Bridgeport (WB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1767	N	
2021	11	Stratford (EB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1767	N	
2021	11	Stratford (WB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1767	N	
2021	11	Milford (WB) Platform	Platform - Structure	1	Platform	$ 33,000.00	0.1767	N	
2021	11	New Haven State Street Platform	Platform - Structure	1	Platform	$ 10,000.00	0.1767	N	
2021	11	Glenbrook Platform	Platform - Structure	1	Platform	$ 25,400.00	0.1767	N	
2021	11	Springdale Platform	Platform - Structure	1	Platform	$ 18,500.00	0.1767	N	
2021	11	Merritt 7 Platform	Platform - Structure	1	Platform	$ 16,500.00	0.1767	Y	03020014PE
2021	11	Ansonia Platform	Platform - Structure	1	Platform	$ 5,250.00	0.1767	N	
2021	11	Seymour Platform	Platform - Structure	1	Platform	$ 1,800.00	0.1767	N	
2021	37	East Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1767	N	
2021	37	East Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1767	N	
2021	37	Wilton Platform	Platform - Structure	1	Platform	$ 50,000.00	0.1767	N	
2021	40	MNR Riverside Station	Facility - Interior	1	Building	$ 517,771.28	0.1762	N	
2021	42	Bridge 01312R	Bridge - Fixed	1	Bridge	$ 13,800,000.00	0.1418	P	03000175
2021	42	Bridge 01318R	Bridge - Fixed	1	Bridge	$ 15,500,000.00	0.1418	P	03000175
2021	42	Bridge 01348R	Bridge - Fixed	1	Bridge	$ 12,300,000.00	0.1418	P	03000175

Y Fully Funded
N Not Authorized
P Partially Funded or Authorized but Not Allocated

Scenario 2

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 2 - Bus (State Match and Bonding)

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	1	NWLKTD 1-2004 Ford Econoline E350	Cutaway Bus	9	634,653	4.8544	Y	DOT0412 *
2018	1	NWLKTD 2-2004 Ford Econoline E450	Cutaway Bus	1	70,517	4.8544	Y	DOT0412*
2018	3	HART 1-2007 Ford E450/StarTrans	Cutaway Bus	6	423,102	2.5390	Y	DOT0416
2018	4	HART 2-2007 Ford E450/StarTrans	Cutaway Bus	2	141,034	2.5390	Y	DOT0416
2018	4	NWCTD 1-2007 Ford Startrans	Cutaway Bus	1	70,517	2.5390	P	Various
2018	6	NECTD 1-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	P	Various
2018	6	NECTD 2-2008 Ford Supreme	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NECTD 3-2008 Ford Van	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NWLKTD 3-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	Y	DOT0412
2018	6	WRTD 1-2008 Ford Supreme	Cutaway Bus	1	70,517	1.9768	Y	DOT04740091RS
2018	11	HART 1999 Ford Econoline	Service-Van	1	46,182	1.6632	P	DOT0416
2018	12	CTTransit New Haven 2000 Chevrolet Cargo minivan	Service-Van	1	46,182	1.6372	P	Various
2018	12	CTTransit Stamford 2000 Chevrolet 2500 cargo	Service-Van	1	46,182	1.6372	P	Various
2018	14	NWCTD 2-2009 Ford Supreme	Cutaway Bus	7	493,619	1.4948	P	Various
2018	14	WRTD 2-2009 Ford Startrans	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	14	WRTD 3-2009 Ford Startrans Van	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	17	SEAT 2004 Ford Explorer	Service-SUV	1	32,715	1.3911	P	DOT0414
2018	18	NWLKTD 2005 Ford Freestyle	Service-SUV	1	32,715	1.2806	P	DOT0412
2018	19	NWLKTD 2005 Ford Sedan 500 AW	Service-Auto	1	19,679	1.2797	P	Various
2018	20	HART 2005 Ford E350	Service-Van	1	46,182	1.2794	P	DOT0416
2018	21	ETD 1-2010 Ford E450	Cutaway Bus	1	70,517	1.0813	Y	DOT0478
2018	21	ETD 2-2010 Ford E450	Cutaway Bus	2	141,034	1.0813	Y	DOT0478
2018	21	NECTD 4-2010 Ford Startrans	Cutaway Bus	1	70,517	1.0813	P	Various
2018	21	NECTD 5-2010 Ford Startrans	Cutaway Bus	4	282,068	1.0813	P	Various
2018	25	NWLKTD 4-2010 Ford Phoenix E450	Cutaway Bus	10	705,170	1.0813	Y	DOT0412*
2018	26	CTTransit New Haven 2007 Ford Fusion 4 door sedan	Service-Auto	2	39,358	0.9972	P	Various
2018	26	CTTransit Stamford 2007 Ford Fusion 4 door sedan	Service-Auto	1	19,679	0.9972	P	Various
2018	28	CTTransit Hartford 2007 Chevrolet Cargo minivan	Service-Van	2	92,364	0.9970	P	Various
2018	28	CTTransit Stamford 2007 Chevrolet CG23405 Cargo	Service-Van	1	46,182	0.9970	P	Various
2018	28	CTTransit Waterbury 2007 Ford E150	Service-Van	1	46,182	0.9970	P	Various
2018	31	GBTA 1982 GMC TOW truck	Service-Truck	1	167,775	0.8932	P	DOT0410
2018	32	CTTransit Hartford 2008 Toyota hybrid	Service-Auto	2	39,358	0.8309	P	Various
2018	33	ETD 3-2011 Ford Startrans	Cutaway Bus	1	70,517	0.7266	Y	DOT0478
2018	33	NWCTD 3-2011 Ford Startrans	Cutaway Bus	4	282,068	0.7266	P	Various
2018	33	WRTD 4-2011 Ford Startrans	Cutaway Bus	3	211,551	0.7266	P	Various
2018	33	WRTD 5-2011 Ford Startrans Vans	Cutaway Bus	6	423,102	0.7266	Y	DOT04740091RS
2018	37	HART 2009 Ford Escape	Service-SUV	2	65,430	0.6555	P	DOT0416
2018	38	GBTA 2009 Toyota Camry	Service-Auto	2	39,358	0.6549	P	DOT0410
2018	39	CTTransit Stamford 1990 M7-Plow/Dump and Sand Truck	Service-Truck	2	335,550	0.5069	P	Various
2018	40	GBTA 2010 GMC Terrain SLE	Service-SUV	1	32,715	0.4768	P	DOT0410
2018	41	ETD 4-2012 Ford F550	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 5-2012 Ford Goshen E450	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 6-2012 Ford Phoenix	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 7-2012 Ford Startrans E450 28 FT	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	GBTA 1-2012 Ford Goshen	Cutaway Bus	4	282,068	0.4219	Y	DOT0410
2018	41	NWCTD 4-2012 Ford E450	Cutaway Bus	3	211,551	0.4219	P	Various
2018	41	VTD 1-2012 Ford Supreme	Cutaway Bus	14	987,238	0.4219	Y	DOT00360199RS
2018	41	WRTD 6-2012 Goshen Coach	Cutaway Bus	2	141,034	0.4219	P	Various
2018	49	CTTransit Stamford 2011 Ford Escape	Service-SUV	3	98,145	0.3031	P	Various
2018	49	ETD 2011 Ford Escape	Service-SUV	1	32,715	0.3031	P	DOT0478
2018	49	GBTA 2011 Chevrolet Tahoe	Service-SUV	2	65,430	0.3031	P	DOT0410
2018	52	CTTransit New Haven 2011 Ford Escape	Service-SUV	5	163,575	0.3031	P	Various
2018	53	CTTransit Hartford 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	53	CTTransit Waterbury 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	55	CTTransit Stamford 1997 M8-Rack Body & Plow	Service-Truck	1	167,775	0.2126	P	Various
2018	56	NWLKTD Admin/Maint 1	Facility-Fire	1	1,064,196	0.1709	P	DOT0412
2018	57	ETD 10-2013 Ford Goshen F550	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	ETD 8-2013 Ford E450	Cutaway Bus	2	141,034	0.1602	Y	DOT0478
2018	57	ETD 9-2013 Ford Goshen E450 28 FT	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	GNHTD 1-2013 Ford E350 Goshen	Cutaway Bus	13	916,721	0.1602	Y	DOT0427*
2018	57	GNHTD 2-2013 Ford E450 Goshen	Cutaway Bus	4	282,068	0.1602	Y	DOT0427
2018	57	HART 3-2013 Ford E450/Goshen Coach	Cutaway Bus	9	634,653	0.1602	Y	DOT0416
2018	57	WRTD 7-2013 Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT04740091RS
2018	64	CTTransit Hartford 1999 Chevrolet Pick Up	Service-Truck	1	167,775	0.1424	P	Various
2018	64	VTD 1999 Ford F250 Pickup	Service-Truck	1	167,775	0.1424	P	DOT00360199EQ
2018	66	CTTransit Stamford 2-2001 New Flyer	Transit Bus	2	848,172	0.0973	Y	DOT0403
2018	66	New Britain 1-2001 New Flyer	Transit Bus	1	424,086	0.0973	Y	Various

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	68	NWLKTD 2001 Ford Utility Truck	Service-Truck	1	167,775	0.0796	P	DOT0412
2018	69	NWLKTD Admin/Maint 1	Facility-Electrical	1	1,368,252	0.0781	P	DOT0412
2018	70	GBTA 4-2003 New Flyer	Transit Bus	2	848,172	0.0581	Y	DOT0410
2018	70	GBTA 5-2003 New Flyer	Transit Bus	3	1,272,258	0.0581	Y	DOT0410
2018	70	NWLKTD 6-2003 Orion VII	Transit Bus	19	8,057,634	0.0581	P	DOT0412
2018	70	SEAT 2-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2018	70	SEAT 3-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2018	75	CTTransit New Haven 3-2004 New Flyer	Transit Bus	41	17,387,526	0.0402	Y	Various
2018	75	Dattco 1-2004 New Flyer	Transit Bus	1	424,086	0.0402	Y	Various
2018	75	MlfdTD 3-2004 New Flyer	Transit Bus	1	424,086	0.0402	P	DOT0424
2018	75	NWLKTD 7-2004 Gillig	Transit Bus	3	1,272,258	0.0402	P	DOT0412
2018	75	SEAT 4-2004 Gillig	Transit Bus	1	424,086	0.0402	P	DOT0414
2018	80	CTTransit Hartford 2003 Freightliner Service Patrol	Service-Truck	1	167,775	0.0247	P	Various
2018	80	GBTA 2003 GMC 4500Dump Truck	Service-Truck	1	167,775	0.0247	P	DOT0410
2019	1	HART 4-2014 Ford E450/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	Y	DOT0416
2019	1	HART 5-2014 Ford E450/Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT0416
2019	1	NWLKTD 5-2014 Chevrolet Pegasus	Cutaway Bus	10	705,170	0.1602	P	DOT0424
2019	4	CTTransit Hartford 3-2005 New Flyer	Transit Bus	48	20,356,128	0.0402	Y	Various
2019	5	GBTA 2004 Skid Steer	Service-Truck	1	167,775	0.0247	P	DOT0410
2019	5	HART 2004 Ford F450	Service-Truck	1	167,775	0.0247	P	DOT0416
2019	7	NWLKTD 8-2006 Gillig	Transit Bus	3	1,272,258	0.0234	Y	DOT0412
2019	7	SEAT 5-2006 Gillig	Transit Bus	2	848,172	0.0234	Y	DOT0414
2019	7	SEAT 6-2006 New Flyer	Transit Bus	3	1,272,258	0.0234	Y	DOT0414
2019	7	SEAT 7-2006 New Flyer	Transit Bus	3	1,272,258	0.0234	Y	DOT0414
2019	7	WRTD 8-2006 Gillig	Transit Bus	2	848,172	0.0234	P	Various
2019	12	CTTransit Stamford 5-2003 MCI	Over-the-Road Bus	2	973,214	0.0148	Y	Various
2020	1	ETD 11-2015 Ford E450 Phoenix	Cutaway Bus	4	282,068	0.1602	Y	DOT0478
2020	1	GNHTD 3-2015 Ford E350 Goshen	Cutaway Bus	11	775,687	0.1602	Y	DOT0427
2020	1	GNHTD 4-2015 Ford E450 Goshen	Cutaway Bus	3	211,551	0.1602	Y	DOT0427
2020	1	MAT 1-2015 Goshen E350	Cutaway Bus	10	705,170	0.1602	Y	DOT0422
2020	5	CTTransit New Haven 2014 Ford Escape	Service-SUV	1	32,715	0.1423	P	Various
2020	5	CTTransit Waterbury 2014 Chevrolet Traverse	Service-SUV	4	130,860	0.1423	P	Various
2020	5	GBTA 2014 Chevrolet Tahoe	Service-SUV	1	32,715	0.1423	P	DOT0410
2020	8	CTTransit Hartford 2014 Ford Fusion 4 door sedan	Service-Auto	3	59,037	0.1419	P	Various
2020	9	CTTransit New Haven 2014 Ford E350 shuttle van	Service-Van	2	92,364	0.1418	P	Various
2020	10	CTTransit Hartford Admin/Maintenance 1	Facility-Equipment	1	17,940,583	0.0314	Y	DOT04010017CN
2020	10	HART Passenger Facility 1	Facility-Equipment	1	15,370	0.0314	P	DOT0416
2020	10	MAT Parking 1	Facility-Equipment	1	9,865	0.0314	P	DOT0422
2020	13	CTTransit Hartford Fuel Cell Storage 1	Facility-Equipment	1	468,384	0.0314	P	DOT0400
2020	13	CTTransit Stamford Maintenance 1	Facility-Equipment	1	801,960	0.0314	P	DOT0400
2020	13	CTTransit Stamford Office/Storage 1	Facility-Equipment	1	2,706,000	0.0314	P	DOT0400
2020	13	GBTA Maint 1	Facility-Equipment	1	3,936,000	0.0314	Y	DOT0410
2020	13	GNHTD Admin/Maint 1	Facility-Equipment	1	580,560	0.0314	Y	DOT04270056CN
2020	13	SEAT Admin/Maint 1	Facility-Equipment	1	1,830,240	0.0314	P	DOT0414
2021	1	CTTransit Waterbury 4-2016 Ford E450	Cutaway Bus	22	1,551,374	0.1602	Y	DOT0400
2021	1	GNHTD 5-2016 Ford Goshen E350	Cutaway Bus	18	1,269,306	0.1602	Y	DOT0427
2021	1	HART 6-2016 Ford E450/Goshen Coach	Cutaway Bus	1	70,517	0.1602	P	DOT0416
2021	1	HART 7-2016 Ford E350/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	P	DOT0416
2021	1	HART 8-2016 Ford E350/Goshen Coach	Cutaway Bus	5	352,585	0.1602	P	DOT0416
2021	1	MlfdTD 1-2016 Ford E450	Cutaway Bus	8	564,136	0.1602	P	DOT0424
2021	1	SEAT 1-2016 Ford Phoenix E450	Cutaway Bus	5	352,585	0.1602	P	DOT0414
2021	8	CTTransit Hartford 2015 Ford Interceptor	Service-SUV	4	130,860	0.1423	P	Various
2021	9	CTTransit Hartford 2015 GMC Savana Parts Van	Service-Van	3	138,546	0.1418	P	Various
2021	9	SEAT 2015 Dodge Caravan	Service-Van	1	46,182	0.1418	P	DOT0410
2021	11	CTTransit Hartford Admin/Maintenance 1	Facility-Conveyance	1	3,588,117	0.0945	P	DOT0400
2021	11	CTTransit Hartford Fuel Cell Storage 1	Facility-Conveyance	1	93,677	0.0945	P	DOT0400
2021	11	CTTransit Stamford Office/Storage 1	Facility-Conveyance	1	541,200	0.0945	P	DOT0400
2021	11	GBTA Maint 1	Facility-Conveyance	1	787,200	0.0945	Y	DOT0410
2021	11	GNHTD Admin/Maint 1	Facility-Conveyance	1	116,112	0.0945	Y	DOT04270056CN
2021	11	HART Passenger Facility 1	Facility-Conveyance	1	61,482	0.0945	P	DOT0416
2021	11	MAT Parking 1	Facility-Conveyance	1	39,459	0.0945	P	DOT0422
2021	11	SEAT Admin/Maint 1	Facility-Conveyance	1	366,048	0.0945	P	DOT0414
2021	19	CTTransit Stamford Maintenance 1	Facility-Conveyance	1	160,392	0.0945	P	DOT0400
2021	19	NWLKTD Admin/Maint 1	Facility-Conveyance	1	608,112	0.0945	P	DOT0412
2021	21	CTTransit Hartford 4-2007 New Flyer	Transit Bus	64	27,141,504	0.0402	Y	DOT0400
2021	21	HART 10-2007 Gillig	Transit Bus	10	4,240,860	0.0402	P	DOT0416
2021	21	SEAT 8-2007 New Flyer	Transit Bus	6	2,544,516	0.0402	P	DOT0414
2021	21	SEAT 9-2007 New Flyer	Transit Bus	2	848,172	0.0402	P	DOT0414

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2021	25	GNHTD 8-2015 Dodge Caravan	Van	4	184,728	0.0280	Y	DOT0427
2021	26	CTTransit Waterbury 2006 Chevrolet Dump Truck	Service-Truck	1	167,775	0.0247	P	Various
2021	26	SEAT 2006 RAM Pickup	Service-Truck	1	167,775	0.0247	P	DOT0410
2021	28	CTTransit Hartford 5-2008 New Flyer	Transit Bus	2	848,172	0.0234	Y	DOT0400
2021	28	New Britain 2-2008 New Flyer	Transit Bus	1	424,086	0.0234	Y	DOT0400
2021	28	NWLKTD 10-2008 Gillig	Transit Bus	4	1,696,344	0.0234	P	DOT0412
2021	28	NWLKTD 9-2008 Gillig	Transit Bus	3	1,272,258	0.0234	P	DOT0412
2021	28	SEAT 10-2008 New Flyer	Transit Bus	2	848,172	0.0234	P	DOT0414
2021	28	WRTD 9-2008 Gillig	Transit Bus	3	1,272,258	0.0234	Y	DOTO4740091RS
2021	34	MlfdTD 4-2009 New Flyer	Transit Bus	4	1,696,344	0.0077	P	DOT0424
2021	35	Nason/Kelley 1-2007 MCI	Over-the-Road Bus	1	486,607	0.0074	Y	DOT0400
2021	36	GNHTD 9-2016 Dodge Caravan	Van	2	92,364	0.0063	Y	DOT0427
2021	37	CTTransit Hartford 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	Various
2021	37	HART 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	DOT0416
2021	37	HART 2016 Ford Explorer	Service-SUV	1	32,715	0.0009	P	DOT0416
2021	37	NWLKTD 2016 Ford Explorer	Service-SUV	2	65,430	0.0009	P	DOT0412
2021	37	VTD 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	DOT00360199EQ
2021	37	WRTD 2016 Jeep Patriot	Service-SUV	1	32,715	0.0009	P	Various
2021	43	CTTransit Hartford 2016 Ford Fusion 4 door sedan	Service-Auto	2	39,358	0.0006	P	Various
2021	43	CTTransit New Haven 2016 Ford Fusion 4 door sedan	Service-Auto	1	19,679	0.0006	P	Various

* Replacement in PY18

Y Programmed in Capital Plan

P Partially Funded or Authorized but Not Allocated

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 2 - Rail (State Match and Bonding)

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2018	1	East Norwalk (EB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	East Norwalk (WB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	Wilton Platform	Platform - Electrical	1	Platform	$ 2,625.00	0.4889	N	
2018	4	Greenwich (EB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Greenwich (WB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Riverside (EB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Riverside (WB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Noroton Heights (EB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Noroton Heights (WB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Darien (EB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Darien (WB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Rowayton (EB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Rowayton (WB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Fairfield (EB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Fairfield (WB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Milford (EB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	Milford (WB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	West Haven (EB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	West Haven (WB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	Cannondale Platform	Platform - Electrical	1	Platform	$ 17,500.00	0.4889	N	
2018	4	Branchville Platform	Platform - Electrical	1	Platform	$ 38,400.00	0.4889	N	
2018	4	Redding Platform	Platform - Electrical	1	Platform	$ 13,200.00	0.4889	N	
2018	4	Bethel Platform	Platform - Electrical	1	Platform	$ 29,300.00	0.4889	N	
2018	4	Clinton Platform	Platform - Electrical	1	Platform	$ 400.00	0.4889	N	
2018	25	Southport (EB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Southport (WB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Stratford (EB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	25	Stratford (WB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	29	MNR 1960 MK Corp/FL9M	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.3977	N	
2018	30	Track Curved	Track - Curved	26	Track Miles	$ 51,694,835.66	0.2815	P	03000190 (C Program)
2018	31	Track Turnouts	Track - Turnouts	58	Track Miles	$ 42,158,750.00	0.2808	P	03000190 (C Program)
2018	32	Cos Cob (EB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Cos Cob (WB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Stamford (A) Platform	Platform - Electrical	1	Platform	$ 1,100.00	0.2738	N	
2018	32	Greens Farms (EB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Greens Farms (WB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Danbury Platform	Platform - Electrical	1	Platform	$ 18,100.00	0.2738	N	
2018	32	Ansonia Platform	Platform - Electrical	1	Platform	$ 1,050.00	0.2738	N	
2018	32	Beacon Falls Platform	Platform - Electrical	1	Platform	$ 525.00	0.2738	N	
2018	32	Naugatuck Platform	Platform - Electrical	1	Platform	$ 1,750.00	0.2738	N	
2018	32	Branford (EB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	32	Branford (WB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	43	MNR New Haven - Wheel Mill Facility Building	Facility - Equipment	1	Building	$ 506,240.00	0.2481	P	03000138CN
2018	44	Power Substations	Power - Substations	11	Substations	$ 170,500,000.00	0.2476	P	03010072CN
2018	45	MNR New Haven - Wheel Mill Facility Building	Facility - Conveyance	1	Building	$ 101,248.00	0.2372	P	03000138CN
2018	46	Track-Surfacing	Track - Surfacing	59	Track Miles	$ 7,398,600.00	0.2260	P	03000190 (C Program)
2019	1	Track Tangent	Track - Tangent	48	Track Miles	$ 66,000,000.00	0.2141	P	03000190 (C Program)
2019	2	MNR 1971 GMC EMD/AMF GP40	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.2055	N	
2019	3	MNR New Haven - Wheel Mill Facility Building	Facility - Fire	1	Building	$ 177,184.00	0.2003	P	03000138CN
2019	4	Tower Wire Car	Service - Rail	1	Vehicle	$ 150,000.00	0.1927	N	
2019	5	MNR East Norwalk Station	Facility - Electrical	1	Building	$ 1,184.56	0.1855	N	
2019	5	MNR Greenwich Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2019	5	MNR Riverside Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2019	5	MNR Rowayton Station	Facility - Electrical	1	Building	$ 5,745.48	0.1855	N	
2019	9	MNR Milford (EB) Station	Facility - HVAC	1	Building	$ 1,583.18	0.1855	N	
2019	9	MNR Milford (WB) Station	Facility - HVAC	1	Building	$ 323,907.27	0.1855	N	
2019	9	MNR Southport Station	Facility - HVAC	1	Building	$ 365.70	0.1855	N	
2019	12	MNR Riverside Station	Facility - Interior	1	Building	$ 517,771.28	0.1762	N	
2019	13	Track Surfacing	Track - Surfacing	105	Track Miles	$ 13,167,000.00	0.1576	P	03000190 (C Program)
2019	14	Track Curved	Track - Curved	21	Track Miles	$ 41,753,521.11	0.1477	P	03000190 (C Program)
2019	15	New Haven (C) Platform	Platform - Canopy	1	Platform	$ 150.00	0.1471	N	
2019	15	Talmadge Hill Platform	Platform - Canopy	1	Platform	$ 37,400.00	0.1471	N	
2019	15	New Canaan Platform	Platform - Canopy	1	Platform	$ 3,200.00	0.1471	N	
2019	15	Derby Platform	Platform - Canopy	1	Platform	$ 6,909.00	0.1471	N	
2019	15	Ansonia Platform	Platform - Canopy	1	Platform	$ 6,962.50	0.1471	N	
2019	15	Seymour Platform	Platform - Canopy	1	Platform	$ 3,040.00	0.1471	N	
2019	21	Track Turnouts	Track - Turnouts	48	Track Miles	$ 34,890,000.00	0.1471	P	03000190 (C Program)
2019	22	Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1448	N	
2019	22	Greenwich (WB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1448	N	
2019	22	Old Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 77,600.00	0.1448	N	
2019	22	Noroton Heights (EB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1448	Y	03010170CN
2019	22	Noroton Heights (WB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1448	Y	03010170CN
2019	22	Darien (EB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1448	P	03010195PE

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2019	22	Darien (WB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1448	P	03010195PE
2019	22	Rowayton (EB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1448	N	
2019	22	Rowayton (WB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1448	N	
2019	22	South Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1448	N	
2019	22	South Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1448	N	
2019	22	East Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1448	N	
2019	22	East Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1448	N	
2019	22	Westport (EB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1448	N	
2019	22	Westport (WB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1448	N	
2019	22	Fairfield (EB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1448	N	
2019	22	Fairfield (WB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1448	N	
2019	22	Bridgeport (EB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1448	N	
2019	22	Bridgeport (WB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1448	N	
2019	22	Stratford (EB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1448	N	
2019	22	Stratford (WB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1448	N	
2019	22	Milford (WB) Platform	Platform - Structure	1	Platform	$ 33,000.00	0.1448	N	
2019	22	New Haven State Street Platform	Platform - Structure	1	Platform	$ 10,000.00	0.1448	N	
2019	22	Glenbrook Platform	Platform - Structure	1	Platform	$ 25,400.00	0.1448	N	
2019	22	Springdale Platform	Platform - Structure	1	Platform	$ 18,500.00	0.1448	N	
2019	22	Merritt 7 Platform	Platform - Structure	1	Platform	$ 16,500.00	0.1448	Y	03020014PE
2019	22	Wilton Platform	Platform - Structure	1	Platform	$ 50,000.00	0.1448	N	
2019	22	Derby Platform	Platform - Structure	1	Platform	$ 2,000.00	0.1448	N	
2019	22	Ansonia Platform	Platform - Structure	1	Platform	$ 5,250.00	0.1448	N	
2019	22	Seymour Platform	Platform - Structure	1	Platform	$ 1,800.00	0.1448	N	
2019	52	Ties Wood	Ties - Wood	6	Track Miles	$ 4,620,000.00	0.1354	P	03000190 (C Program)
2019	53	Power Substations	Power - Substations	5	Substations	$ 77,500,000.00	0.1220	P	03010072CN
2019	54	Ties Concrete	Ties - Concrete	4	Track Miles	$ 3,520,000.00	0.1206	P	03000190 (C Program)
2019	55	Power Poles	Power - Poles	870	Structures	$ 6,472,800.00	0.1169	Y*	
2019	56	Bridge 08287R	Bridge - Fixed	1	Bridge	$ 9,200,000.00	0.1168	P	03000175
2020	1	Bridge 08072R	Bridge - Culvert/Pedestria	1	Bridge	$ 3,400,000.00	0.1300	N	
2020	1	Bridge 08154R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,500,000.00	0.1300	N	
2020	1	Bridge 08261R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,300,000.00	0.1300	N	
2020	1	Bridge 08266R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,800,000.00	0.1300	N	
2020	1	Bridge 08269R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,300,000.00	0.1300	N	
2020	1	Bridge 01312R	Bridge - Fixed	1	Bridge	$ 13,800,000.00	0.1300	P	03000175
2020	1	Bridge 01318R	Bridge - Fixed	1	Bridge	$ 15,500,000.00	0.1300	P	03000175
2020	1	Bridge 01348R	Bridge - Fixed	1	Bridge	$ 12,300,000.00	0.1300	P	03000175
2020	1	Bridge 01403R	Bridge - Fixed	1	Bridge	$ 13,700,000.00	0.1300	P	03000175
2020	1	Bridge 02237R	Bridge - Fixed	1	Bridge	$ 28,700,000.00	0.1300	P	03000175
2020	1	Bridge 03638R	Bridge - Fixed	1	Bridge	$ 20,000,000.00	0.1300	P	03000175
2020	1	Bridge 03639R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1300	P	03000175
2020	1	Bridge 03680R	Bridge - Fixed	1	Bridge	$ 14,600,000.00	0.1300	P	03000175
2020	1	Bridge 03686R	Bridge - Fixed	1	Bridge	$ 25,800,000.00	0.1300	P	03000175
2020	1	Bridge 03691R	Bridge - Fixed	1	Bridge	$ 8,400,000.00	0.1300	P	03000175
2020	1	Bridge 03693R	Bridge - Fixed	1	Bridge	$ 33,000,000.00	0.1300	P	03000175
2020	1	Bridge 03946R	Bridge - Fixed	1	Bridge	$ 12,900,000.00	0.1300	P	03000175
2020	1	Bridge 03948R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1300	P	03000175
2020	1	Bridge 03955R	Bridge - Fixed	1	Bridge	$ 7,400,000.00	0.1300	P	03000175
2020	1	Bridge 04197R	Bridge - Fixed	1	Bridge	$ 8,900,000.00	0.1300	P	03000175
2020	1	Bridge 04224R	Bridge - Fixed	1	Bridge	$ 4,200,000.00	0.1300	P	03000175
2020	1	Bridge 04232R	Bridge - Fixed	1	Bridge	$ 9,000,000.00	0.1300	P	03000175
2020	1	Bridge 04235R	Bridge - Fixed	1	Bridge	$ 13,800,000.00	0.1300	P	03000175
2021	1	Bridge 08015R	Bridge - Culvert/Pedestria	1	Bridge	$ 4,600,000.00	0.1418	N	
2021	1	Bridge 08003R	Bridge - Fixed	1	Bridge	$ 8,000,000.00	0.1418	P	03000175
2021	1	Bridge 08006R	Bridge - Fixed	1	Bridge	$ 7,000,000.00	0.1418	P	03000175
2021	1	Bridge 08012R	Bridge - Fixed	1	Bridge	$ 19,200,000.00	0.1418	P	03000175
2021	1	Bridge 08022R	Bridge - Fixed	1	Bridge	$ 11,700,000.00	0.1418	Y	03000196CN
2021	1	Bridge 08035R	Bridge - Fixed	1	Bridge	$ 8,200,000.00	0.1418	P	03000175
2021	1	Bridge 08050R	Bridge - Fixed	1	Bridge	$ 12,200,000.00	0.1418	P	03000175
2021	1	Bridge 08055R	Bridge - Fixed	1	Bridge	$ 10,200,000.00	0.1418	P	03000175
2021	1	Bridge 08059R	Bridge - Fixed	1	Bridge	$ 20,400,000.00	0.1418	P	03000175
2021	1	Bridge 08060R	Bridge - Fixed	1	Bridge	$ 10,700,000.00	0.1418	P	03000175
2021	1	Bridge 08070R	Bridge - Fixed	1	Bridge	$ 13,000,000.00	0.1418	P	03000175
2021	1	Bridge 08071R	Bridge - Fixed	1	Bridge	$ 12,600,000.00	0.1418	P	03000175
2021	1	Bridge 08074R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1418	P	03000175
2021	1	Bridge 08075R	Bridge - Fixed	1	Bridge	$ 18,100,000.00	0.1418	P	03000175
2021	1	Bridge 08086R	Bridge - Fixed	1	Bridge	$ 7,000,000.00	0.1418	Y	03000196CN
2021	1	Bridge 08097R	Bridge - Fixed	1	Bridge	$ 12,800,000.00	0.1418	P	03000175
2021	1	Bridge 08098R	Bridge - Fixed	1	Bridge	$ 12,000,000.00	0.1418	P	03000175
2021	1	Bridge 08200R	Bridge - Fixed	1	Bridge	$ 7,900,000.00	0.1418	P	03000175
2021	1	Bridge 08207R	Bridge - Fixed	1	Bridge	$ 2,700,000.00	0.1418	Y	03000196CN
2021	1	Bridge 08209R	Bridge - Fixed	1	Bridge	$ 1,300,000.00	0.1418	P	03000175
2021	1	Bridge 08210R	Bridge - Fixed	1	Bridge	$ 5,400,000.00	0.1418	P	03000175
2021	1	Bridge 08217R	Bridge - Fixed	1	Bridge	$ 1,100,000.00	0.1418	P	03000175
2021	1	Bridge 08218R	Bridge - Fixed	1	Bridge	$ 1,000,000.00	0.1418	P	03000175
2021	1	Bridge 08219R	Bridge - Fixed	1	Bridge	$ 1,100,000.00	0.1418	P	03000175

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2021	1	Bridge 08264R	Bridge - Fixed	1	Bridge	$ 41,300,000.00	0.1418	P	03000175
2021	1	Bridge 08267R	Bridge - Fixed	1	Bridge	$ 10,300,000.00	0.1418	P	03000175
2021	1	Bridge 08268R	Bridge - Fixed	1	Bridge	$ 5,300,000.00	0.1418	Y	03000196CN
2021	1	Bridge 08279R	Bridge - Fixed	1	Bridge	$ 2,100,000.00	0.1418	P	03000175

Y	Fully Funded
N	Not Authorized
P	Partially Funded or Authorized but Not Allocated
*	Project Completed (Data Out of Date)

Scenario 3

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 3 - Bus (State Match, State Bond, and Lets Go CT)

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	1	NWLKTD 1-2004 Ford Econoline E350	Cutaway Bus	9	634,653	4.8544	Y	DOT0412 *
2018	1	NWLKTD 2-2004 Ford Econoline E450	Cutaway Bus	1	70,517	4.8544	Y	DOT0412*
2018	3	HART 1-2007 Ford E450/StarTrans	Cutaway Bus	6	423,102	2.5390	Y	DOT0416
2018	4	HART 2-2007 Ford E450/StarTrans	Cutaway Bus	2	141,034	2.5390	Y	DOT0416
2018	4	NWCTD 1-2007 Ford Startrans	Cutaway Bus	1	70,517	2.5390	P	Various
2018	6	NECTD 1-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	P	Various
2018	6	NECTD 2-2008 Ford Supreme	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NECTD 3-2008 Ford Van	Cutaway Bus	2	141,034	1.9768	P	Various
2018	6	NWLKTD 3-2008 Ford Startrans	Cutaway Bus	1	70,517	1.9768	Y	DOT0412
2018	6	WRTD 1-2008 Ford Supreme	Cutaway Bus	1	70,517	1.9768	Y	DOT04740091RS
2018	11	HART 1999 Ford Econoline	Service-Van	1	46,182	1.6632	P	DOT0416
2018	12	CTTransit New Haven 2000 Chevrolet Cargo minivan	Service-Van	1	46,182	1.6372	P	Various
2018	12	CTTransit Stamford 2000 Chevrolet 2500 cargo	Service-Van	1	46,182	1.6372	P	Various
2018	14	NWCTD 2-2009 Ford Supreme	Cutaway Bus	7	493,619	1.4948	P	Various
2018	14	WRTD 2-2009 Ford Startrans	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	14	WRTD 3-2009 Ford Startrans Van	Cutaway Bus	1	70,517	1.4948	Y	DOT04740091RS
2018	17	SEAT 2004 Ford Explorer	Service-SUV	1	32,715	1.3911	P	DOT0414
2018	18	NWLKTD 2005 Ford Freestyle	Service-SUV	1	32,715	1.2806	P	DOT0412
2018	19	NWLKTD 2005 Ford Sedan 500 AW	Service-Auto	1	19,679	1.2797	P	Various
2018	20	HART 2005 Ford E350	Service-Van	1	46,182	1.2794	P	DOT0416
2018	21	ETD 1-2010 Ford E450	Cutaway Bus	1	70,517	1.0813	Y	DOT0478
2018	21	ETD 2-2010 Ford E450	Cutaway Bus	2	141,034	1.0813	Y	DOT0478
2018	21	NECTD 4-2010 Ford Startrans	Cutaway Bus	1	70,517	1.0813	P	Various
2018	21	NECTD 5-2010 Ford Startrans	Cutaway Bus	4	282,068	1.0813	P	Various
2018	25	NWLKTD 4-2010 Ford Phoenix E450	Cutaway Bus	10	705,170	1.0813	Y	DOT0412*
2018	26	CTTransit New Haven 2007 Ford Fusion 4 door sedan	Service-Auto	2	39,358	0.9972	P	Various
2018	26	CTTransit Stamford 2007 Ford Fusion 4 door sedan	Service-Auto	1	19,679	0.9972	P	Various
2018	28	CTTransit Hartford 2007 Chevrolet Cargo minivan	Service-Van	2	92,364	0.9970	P	Various
2018	28	CTTransit Stamford 2007 Chevrolet CG23405 Cargo	Service-Van	1	46,182	0.9970	P	Various
2018	28	CTTransit Waterbury 2007 Ford E150	Service-Van	1	46,182	0.9970	P	Various
2018	31	GBTA 1982 GMC TOW truck	Service-Truck	1	167,775	0.8932	P	DOT0410
2018	32	CTTransit Hartford 2008 Toyota hybrid	Service-Auto	2	39,358	0.8309	P	Various
2018	33	ETD 3-2011 Ford Startrans	Cutaway Bus	1	70,517	0.7266	Y	DOT0478
2018	33	NWCTD 3-2011 Ford Startrans	Cutaway Bus	4	282,068	0.7266	P	Various
2018	33	WRTD 4-2011 Ford Startrans	Cutaway Bus	3	211,551	0.7266	P	Various
2018	33	WRTD 5-2011 Ford Startrans Vans	Cutaway Bus	6	423,102	0.7266	Y	DOT04740091RS
2018	37	HART 2009 Ford Escape	Service-SUV	2	65,430	0.6555	P	DOT0416
2018	38	GBTA 2009 Toyota Camry	Service-Auto	2	39,358	0.6549	P	DOT0410
2018	39	CTTransit Stamford 1990 M7-Plow/Dump and Sand Truck	Service-Truck	2	335,550	0.5069	P	Various
2018	40	GBTA 2010 GMC Terrain SLE	Service-SUV	1	32,715	0.4768	P	DOT0410
2018	41	ETD 4-2012 Ford F550	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 5-2012 Ford Goshen E450	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 6-2012 Ford Phoenix	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	ETD 7-2012 Ford Startrans E450 28 FT	Cutaway Bus	1	70,517	0.4219	Y	DOT0478
2018	41	GBTA 1-2012 Ford Goshen	Cutaway Bus	4	282,068	0.4219	Y	DOT0410
2018	41	NWCTD 4-2012 Ford E450	Cutaway Bus	3	211,551	0.4219	P	Various
2018	41	VTD 1-2012 Ford Supreme	Cutaway Bus	14	987,238	0.4219	Y	DOT00360199RS
2018	41	WRTD 6-2012 Goshen Coach	Cutaway Bus	2	141,034	0.4219	P	Various
2018	49	CTTransit Stamford 2011 Ford Escape	Service-SUV	3	98,145	0.3031	P	Various
2018	49	ETD 2011 Ford Escape	Service-SUV	1	32,715	0.3031	P	DOT0478
2018	49	GBTA 2011 Chevrolet Tahoe	Service-SUV	2	65,430	0.3031	P	DOT0410
2018	52	CTTransit New Haven 2011 Ford Escape	Service-SUV	5	163,575	0.3031	P	Various
2018	53	CTTransit Hartford 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	53	CTTransit Waterbury 1995 International Service Truck	Service-Truck	1	167,775	0.2897	P	Various
2018	55	CTTransit Stamford 1997 M8-Rack Body & Plow	Service-Truck	1	167,775	0.2126	P	Various
2018	56	NWLKTD Admin/Maint 1	Facility-Fire	1	1,064,196	0.1709	P	DOT0412
2018	57	ETD 10-2013 Ford Goshen F550	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	ETD 8-2013 Ford E450	Cutaway Bus	2	141,034	0.1602	Y	DOT0478
2018	57	ETD 9-2013 Ford Goshen E450 28 FT	Cutaway Bus	1	70,517	0.1602	Y	DOT0478
2018	57	GNHTD 1-2013 Ford E350 Goshen	Cutaway Bus	13	916,721	0.1602	Y	DOT0427*
2018	57	GNHTD 2-2013 Ford E450 Goshen	Cutaway Bus	4	282,068	0.1602	Y	DOT0427
2018	57	HART 3-2013 Ford E450/Goshen Coach	Cutaway Bus	9	634,653	0.1602	Y	DOT0416
2018	57	WRTD 7-2013 Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT04740091RS
2018	64	CTTransit Hartford 1999 Chevrolet Pick Up	Service-Truck	1	167,775	0.1424	P	Various
2018	64	VTD 1999 Ford F250 Pickup	Service-Truck	1	167,775	0.1424	P	DOT00360199EQ
2018	66	CTTransit Stamford 2-2001 New Flyer	Transit Bus	2	848,172	0.0973	Y	DOT0403
2018	66	New Britain 1-2001 New Flyer	Transit Bus	1	424,086	0.0973	Y	Various

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2018	68	NWLKTD 2001 Ford Utility Truck	Service-Truck	1	167,775	0.0796	P	DOT0412
2018	69	NWLKTD Admin/Maint 1	Facility-Electrical	1	1,368,252	0.0781	P	DOT0412
2018	70	GBTA 4-2003 New Flyer	Transit Bus	2	848,172	0.0581	Y	DOT0410
2018	70	GBTA 5-2003 New Flyer	Transit Bus	3	1,272,258	0.0581	Y	DOT0410
2018	70	NWLKTD 6-2003 Orion VII	Transit Bus	19	8,057,634	0.0581	P	DOT0412
2018	70	SEAT 2-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2018	70	SEAT 3-2003 New Flyer	Transit Bus	1	424,086	0.0581	P	DOT0414
2018	75	CTTransit New Haven 3-2004 New Flyer	Transit Bus	41	17,387,526	0.0402	Y	Various
2018	75	Dattco 1-2004 New Flyer	Transit Bus	1	424,086	0.0402	Y	Various
2018	75	MlfdTD 3-2004 New Flyer	Transit Bus	1	424,086	0.0402	P	DOT0424
2018	75	NWLKTD 7-2004 Gillig	Transit Bus	3	1,272,258	0.0402	P	DOT0412
2018	75	SEAT 4-2004 Gillig	Transit Bus	1	424,086	0.0402	P	DOT0414
2018	80	CTTransit Hartford 2003 Freightliner Service Patrol	Service-Truck	1	167,775	0.0247	P	Various
2018	80	GBTA 2003 GMC 4500Dump Truck	Service-Truck	1	167,775	0.0247	P	DOT0410
2019	1	HART 4-2014 Ford E450/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	Y	DOT0416
2019	1	HART 5-2014 Ford E450/Goshen Coach	Cutaway Bus	3	211,551	0.1602	Y	DOT0416
2019	1	NWLKTD 5-2014 Chevrolet Pegasus	Cutaway Bus	10	705,170	0.1602	P	DOT0424
2019	4	CTTransit Hartford 3-2005 New Flyer	Transit Bus	48	20,356,128	0.0402	Y	Various
2019	5	GBTA 2004 Skid Steer	Service-Truck	1	167,775	0.0247	P	DOT0410
2019	5	HART 2004 Ford F450	Service-Truck	1	167,775	0.0247	P	DOT0416
2019	7	NWLKTD 8-2006 Gillig	Transit Bus	3	1,272,258	0.0234	Y	DOT0412
2019	7	SEAT 5-2006 Gillig	Transit Bus	2	848,172	0.0234	Y	DOT0414
2019	7	SEAT 6-2006 New Flyer	Transit Bus	3	1,272,258	0.0234	Y	DOT0414
2019	7	SEAT 7-2006 New Flyer	Transit Bus	3	1,272,258	0.0234	Y	DOT0414
2019	7	WRTD 8-2006 Gillig	Transit Bus	2	848,172	0.0234	P	Various
2019	12	CTTransit Stamford 5-2003 MCI	Over-the-Road Bus	2	973,214	0.0148	Y	Various
2020	1	ETD 11-2015 Ford E450 Phoenix	Cutaway Bus	4	282,068	0.1602	Y	DOT0478
2020	1	GNHTD 3-2015 Ford E350 Goshen	Cutaway Bus	11	775,687	0.1602	Y	DOT0427
2020	1	GNHTD 4-2015 Ford E450 Goshen	Cutaway Bus	3	211,551	0.1602	Y	DOT0427
2020	1	MAT 1-2015 Goshen E350	Cutaway Bus	10	705,170	0.1602	Y	DOT0422
2020	5	CTTransit New Haven 2014 Ford Escape	Service-SUV	1	32,715	0.1423	P	Various
2020	5	CTTransit Waterbury 2014 Chevrolet Traverse	Service-SUV	4	130,860	0.1423	P	Various
2020	5	GBTA 2014 Chevrolet Tahoe	Service-SUV	1	32,715	0.1423	P	DOT0410
2020	8	CTTransit Hartford 2014 Ford Fusion 4 door sedan	Service-Auto	3	59,037	0.1419	P	Various
2020	9	CTTransit New Haven 2014 Ford E350 shuttle van	Service-Van	2	92,364	0.1418	P	Various
2020	10	CTTransit Hartford Admin/Maintenance 1	Facility-Equipment	1	17,940,583	0.0314	Y	DOT04010017CN
2020	10	HART Passenger Facility 1	Facility-Equipment	1	15,370	0.0314	P	DOT0416
2020	10	MAT Parking 1	Facility-Equipment	1	9,865	0.0314	P	DOT0422
2020	13	CTTransit Hartford Fuel Cell Storage 1	Facility-Equipment	1	468,384	0.0314	P	DOT0400
2020	13	CTTransit Stamford Maintenance 1	Facility-Equipment	1	801,960	0.0314	P	DOT0400
2020	13	CTTransit Stamford Office/Storage 1	Facility-Equipment	1	2,706,000	0.0314	P	DOT0400
2020	13	GBTA Maint 1	Facility-Equipment	1	3,936,000	0.0314	Y	DOT0410
2020	13	GNHTD Admin/Maint 1	Facility-Equipment	1	580,560	0.0314	Y	DOT04270056CN
2020	13	SEAT Admin/Maint 1	Facility-Equipment	1	1,830,240	0.0314	P	DOT0414
2020	19	CTTransit Hartford 4-2007 New Flyer	Transit Bus	64	27,141,504	0.0234	Y	DOT0400
2020	19	HART 10-2007 Gillig	Transit Bus	10	4,240,860	0.0234	Y	DOT0427
2020	19	SEAT 8-2007 New Flyer	Transit Bus	6	2,544,516	0.0234	P	DOT0416
2020	19	SEAT 9-2007 New Flyer	Transit Bus	2	848,172	0.0234	P	DOT0416
2020	23	CTTransit Hartford Admin/Maintenance 1	Facility-Conveyance	1	3,588,117	0.0143	P	DOT0400
2020	23	CTTransit Hartford Fuel Cell Storage 1	Facility-Conveyance	1	93,677	0.0143	P	DOT0400
2020	23	CTTransit Stamford Office/Storage 1	Facility-Conveyance	1	541,200	0.0143	P	DOT0400
2020	23	GBTA Maint 1	Facility-Conveyance	1	787,200	0.0143	Y	DOT0410
2020	23	GNHTD Admin/Maint 1	Facility-Conveyance	1	116,112	0.0143	Y	DOT04270056CN
2020	23	MAT Parking 1	Facility-Conveyance	1	39,459	0.0143	P	DOT0422
2020	29	CTTransit Stamford Maintenance 1	Facility-Conveyance	1	160,392	0.0143	P	DOT0400
2020	29	HART Passenger Facility 1	Facility-Conveyance	1	61,482	0.0143	P	DOT0416
2020	29	NWLKTD Admin/Maint 1	Facility-Conveyance	1	608,112	0.0143	P	DOT0412
2020	29	SEAT Admin/Maint 1	Facility-Conveyance	1	366,048	0.0143	P	DOT0414
2020	33	CTTransit Hartford 5-2008 New Flyer	Transit Bus	2	848,172	0.0077	Y	DOT0400
2020	33	New Britain 2-2008 New Flyer	Transit Bus	1	424,086	0.0077	Y	DOT0400
2020	33	NWLKTD 10-2008 Gillig	Transit Bus	4	1,696,344	0.0077	P	DOT0412
2020	33	NWLKTD 9-2008 Gillig	Transit Bus	3	1,272,258	0.0077	P	DOT0412
2020	33	SEAT 10-2008 New Flyer	Transit Bus	2	848,172	0.0077	P	DOT0414
2020	33	WRTD 9-2008 Gillig	Transit Bus	3	1,272,258	0.0077	Y	DOTO4740091RS
2020	39	GNHTD 8-2015 Dodge Caravan	Van	4	184,728	0.0063	Y	DOT0427
2020	40	Nason/Kelley 1-2007 MCI	Over-the-Road Bus	1	486,607	0.0041	Y	DOT0400
2020	41	CTTransit Hartford 2015 Ford Interceptor	Service-SUV	4	130,860	0.0009	P	Various
2020	42	CTTransit Hartford 2015 GMC Savana Parts Van	Service-Van	3	138,546	0.0005	P	Various
2020	42	SEAT 2015 Dodge Caravan	Service-Van	1	46,182	0.0005	P	DOT0410

Program Year	Project Rank	Asset Name	Description	No. of Units	Replacement Costs	PI	Programmed	Project Number
2020	44	CTTransit Waterbury 2006 Chevrolet Dump Truck	Service-Truck	1	167,775	0.0002	P	Various
2020	44	SEAT 2006 RAM Pickup	Service-Truck	1	167,775	0.0002	P	DOT0410
2021	1	CTTransit Waterbury 4-2016 Ford E450	Cutaway Bus	22	1,551,374	0.1602	Y	DOT0400
2021	1	GNHTD 5-2016 Ford Goshen E350	Cutaway Bus	18	1,269,306	0.1602	Y	DOT0427
2021	1	HART 6-2016 Ford E450/Goshen Coach	Cutaway Bus	1	70,517	0.1602	P	DOT0416
2021	1	HART 7-2016 Ford E350/ Goshen Coach	Cutaway Bus	4	282,068	0.1602	P	DOT0416
2021	1	HART 8-2016 Ford E350/Goshen Coach	Cutaway Bus	5	352,585	0.1602	P	DOT0416
2021	1	MlfdTD 1-2016 Ford E450	Cutaway Bus	8	564,136	0.1602	P	DOT0424
2021	1	SEAT 1-2016 Ford Phoenix E450	Cutaway Bus	5	352,585	0.1602	P	DOT0414
2021	8	MlfdTD 4-2009 New Flyer	Transit Bus	4	1,696,344	0.0077	P	DOT0424
2021	9	GNHTD 9-2016 Dodge Caravan	Van	2	92,364	0.0063	Y	DOT0427
2021	10	CTTransit Hartford 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	Various
2021	10	HART 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	DOT0416
2021	10	HART 2016 Ford Explorer	Service-SUV	1	32,715	0.0009	P	DOT0416
2021	10	NWLKTD 2016 Ford Explorer	Service-SUV	2	65,430	0.0009	P	DOT0412
2021	10	VTD 2016 Ford Escape	Service-SUV	1	32,715	0.0009	P	DOT00360199EQ
2021	10	WRTD 2016 Jeep Patriot	Service-SUV	1	32,715	0.0009	P	Various
2021	16	CTTransit Hartford 2016 Ford Fusion 4 door sedan	Service-Auto	2	39,358	0.0006	P	Various
2021	16	CTTransit New Haven 2016 Ford Fusion 4 door sedan	Service-Auto	1	19,679	0.0006	P	Various

* Replacement in PY18
Y Programmed in Capital Plan
P Partially Funded or Authorized but Not Allocated

Transit Cooperative Research Program - Transit Asset Prioritization Tool (modified for DOT use)

Program List: Scenario 3 - Rail (State Match, State Bond, and Lets Go CT)

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2018	1	East Norwalk (EB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	East Norwalk (WB) Platform	Platform - Electrical	1	Platform	$ 10,995.00	0.4889	N	
2018	1	Wilton Platform	Platform - Electrical	1	Platform	$ 2,625.00	0.4889	N	
2018	4	Greenwich (EB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Greenwich (WB) Platform	Platform - Electrical	1	Platform	$ 10,120.00	0.4889	N	
2018	4	Riverside (EB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Riverside (WB) Platform	Platform - Electrical	1	Platform	$ 53,900.00	0.4889	N	
2018	4	Noroton Heights (EB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Noroton Heights (WB) Platform	Platform - Electrical	1	Platform	$ 2,622.00	0.4889	Y	03010170CN
2018	4	Darien (EB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Darien (WB) Platform	Platform - Electrical	1	Platform	$ 875.00	0.4889	P	03010195PE
2018	4	Rowayton (EB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Rowayton (WB) Platform	Platform - Electrical	1	Platform	$ 7,660.00	0.4889	N	
2018	4	Fairfield (EB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Fairfield (WB) Platform	Platform - Electrical	1	Platform	$ 15,400.00	0.4889	N	
2018	4	Milford (EB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	Milford (WB) Platform	Platform - Electrical	1	Platform	$ 13,182.50	0.4889	N	
2018	4	West Haven (EB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	West Haven (WB) Platform	Platform - Electrical	1	Platform	$ 200.00	0.4889	N	
2018	4	Cannondale Platform	Platform - Electrical	1	Platform	$ 17,500.00	0.4889	N	
2018	4	Branchville Platform	Platform - Electrical	1	Platform	$ 38,400.00	0.4889	N	
2018	4	Redding Platform	Platform - Electrical	1	Platform	$ 13,200.00	0.4889	N	
2018	4	Bethel Platform	Platform - Electrical	1	Platform	$ 29,300.00	0.4889	N	
2018	4	Clinton Platform	Platform - Electrical	1	Platform	$ 400.00	0.4889	N	
2018	25	Southport (EB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Southport (WB) Platform	Platform - Electrical	1	Platform	$ 94,450.00	0.4889	N	
2018	25	Stratford (EB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	25	Stratford (WB) Platform	Platform - Electrical	1	Platform	$ 10,382.50	0.4889	N	
2018	29	MNR 1960 MK Corp/FL9M	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.3977	N	
2018	30	Track-Curved	Track - Curved	26	Track Miles	$ 51,694,835.66	0.2815	P	03000190 (C Program)
2018	31	Track-Turnouts	Track - Turnouts	58	Track Miles	$ 42,158,750.00	0.2808	P	03000190 (C Program)
2018	32	Cos Cob (EB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Cos Cob (WB) Platform	Platform - Electrical	1	Platform	$ 49,450.00	0.2738	N	
2018	32	Stamford (A) Platform	Platform - Electrical	1	Platform	$ 1,100.00	0.2738	N	
2018	32	Greens Farms (EB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Greens Farms (WB) Platform	Platform - Electrical	1	Platform	$ 73,450.00	0.2738	N	
2018	32	Danbury Platform	Platform - Electrical	1	Platform	$ 18,100.00	0.2738	N	
2018	32	Ansonia Platform	Platform - Electrical	1	Platform	$ 1,050.00	0.2738	N	
2018	32	Beacon Falls Platform	Platform - Electrical	1	Platform	$ 525.00	0.2738	N	
2018	32	Naugatuck Platform	Platform - Electrical	1	Platform	$ 1,750.00	0.2738	N	
2018	32	Branford (EB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	32	Branford (WB) Platform	Platform - Electrical	1	Platform	$ 6,650.00	0.2738	N	
2018	43	MNR New Haven - Wheel Mill Facility Building	Facility - Equipment	1	Platform	$ 506,240.00	0.2481	P	03000138CN
2018	44	Power Substations	Power - Substations	11	Substations	$ 170,500,000.00	0.2476	P	03010072CN
2018	45	MNR New Haven - Wheel Mill Facility Building	Facility - Conveyance	1	Building	$ 101,248.00	0.2372	P	03000138CN
2018	46	Track Surfacing	Track - Surfacing	59	Track Miles	$ 7,398,600.00	0.2260	P	03000190 (C Program)
2019	1	Track Tangent	Track - Tangent	48	Track Miles	$ 66,000,000.00	0.2141	P	03000190 (C Program)
2019	2	MNR 1971 GMC EMD/AMF GP40	Locomotive - MNR	6	Vehicles	$ 15,865,974.00	0.2055	N	
2019	3	MNR New Haven - Wheel Mill Facility Building	Facility - Fire	177	Buildings	$ 177,184.00	0.2003	P	03000138CN
2019	4	Tower Wire Car	Service - Rail	1	Vehicle	$ 150,000.00	0.1927	N	
2019	5	MNR East Norwalk Station	Facility - Electrical	1	Building	$ 1,184.56	0.1855	N	
2019	5	MNR Greenwich Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2019	5	MNR Riverside Station	Facility - Electrical	1	Building	$ 354,264.56	0.1855	N	
2019	5	MNR Rowayton Station	Facility - Electrical	1	Building	$ 5,745.48	0.1855	N	
2019	9	MNR Milford (EB) Station	Facility - HVAC	1	Building	$ 1,583.18	0.1855	N	
2019	9	MNR Milford (WB) Station	Facility - HVAC	1	Building	$ 323,907.27	0.1855	N	
2019	9	MNR Southport Station	Facility - HVAC	1	Building	$ 365.70	0.1855	N	
2019	12	MNR Riverside Station	Facility - Interior	1	Building	$ 517,771.28	0.1762	N	
2019	13	Track Surfacing	Track - Surfacing	105	Track Miles	$ 13,167,000.00	0.1576	P	03000190 (C Program)
2019	14	Track Curved	Track - Curved	21	Track Miles	$ 41,753,521.11	0.1477	P	03000190 (C Program)
2019	15	New Haven (C) Platform	Platform - Canopy	1	Platform	$ 150.00	0.1471	N	
2019	15	Talmadge Hill Platform	Platform - Canopy	1	Platform	$ 37,400.00	0.1471	N	
2019	15	New Canaan Platform	Platform - Canopy	1	Platform	$ 3,200.00	0.1471	N	
2019	15	Derby Platform	Platform - Canopy	1	Platform	$ 6,909.00	0.1471	N	
2019	15	Ansonia Platform	Platform - Canopy	1	Platform	$ 6,962.50	0.1471	N	
2019	15	Seymour Platform	Platform - Canopy	1	Platform	$ 3,040.00	0.1471	N	
2019	21	Turnouts	Track - Turnouts	48	Track Miles	$ 34,890,000.00	0.1471	P	03000190 (C Program)
2019	22	Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1448	N	
2019	22	Greenwich (WB) Platform	Platform - Structure	1	Platform	$ 209,900.00	0.1448	N	
2019	22	Old Greenwich (EB) Platform	Platform - Structure	1	Platform	$ 77,600.00	0.1448	N	
2019	22	Noroton Heights (EB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1448	Y	03010170CN

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2019	22	Noroton Heights (WB) Platform	Platform - Structure	1	Platform	$ 55,000.00	0.1448	Y	03010170CN
2019	22	Darien (EB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1448	P	03010195PE
2019	22	Darien (WB) Platform	Platform - Structure	1	Platform	$ 321,000.00	0.1448	P	03010195PE
2019	22	Rowayton (EB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1448	N	
2019	22	Rowayton (WB) Platform	Platform - Structure	1	Platform	$ 47,850.00	0.1448	N	
2019	22	South Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1448	N	
2019	22	South Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 115,800.00	0.1448	N	
2019	22	East Norwalk (EB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1448	N	
2019	22	East Norwalk (WB) Platform	Platform - Structure	1	Platform	$ 53,400.00	0.1448	N	
2019	22	Westport (EB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1448	N	
2019	22	Westport (WB) Platform	Platform - Structure	1	Platform	$ 49,050.00	0.1448	N	
2019	22	Fairfield (EB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1448	N	
2019	22	Fairfield (WB) Platform	Platform - Structure	1	Platform	$ 35,000.00	0.1448	N	
2019	22	Bridgeport (EB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1448	N	
2019	22	Bridgeport (WB) Platform	Platform - Structure	1	Platform	$ 450.00	0.1448	N	
2019	22	Stratford (EB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1448	N	
2019	22	Stratford (WB) Platform	Platform - Structure	1	Platform	$ 22,500.00	0.1448	N	
2019	22	Milford (WB) Platform	Platform - Structure	1	Platform	$ 33,000.00	0.1448	N	
2019	22	New Haven State Street Platform	Platform - Structure	1	Platform	$ 10,000.00	0.1448	N	
2019	22	Glenbrook Platform	Platform - Structure	1	Platform	$ 25,400.00	0.1448	N	
2019	22	Springdale Platform	Platform - Structure	1	Platform	$ 18,500.00	0.1448	N	
2019	22	Merritt 7 Platform	Platform - Structure	1	Platform	$ 16,500.00	0.1448	Y	03020014PE
2019	22	Wilton Platform	Platform - Structure	1	Platform	$ 50,000.00	0.1448	N	
2019	22	Derby Platform	Platform - Structure	1	Platform	$ 2,000.00	0.1448	N	
2019	22	Ansonia Platform	Platform - Structure	1	Platform	$ 5,250.00	0.1448	N	
2019	22	Seymour Platform	Platform - Structure	1	Platform	$ 1,800.00	0.1448	N	
2019	52	Ties-Wood	Ties - Wood	6	Track Miles	$ 4,620,000.00	0.1354	P	03000190 (C Program)
2019	53	Power-Substations	Power - Substations	5	Substations	$ 77,500,000.00	0.1220	P	03010072CN
2019	54	Ties-Concrete	Ties - Concrete	4	Track Miles	$ 3,520,000.00	0.1206	P	03000190 (C Program)
2019	55	Power-Poles	Power - Poles	870	Structures	$ 6,472,800.00	0.1169	Y*	
2019	56	Bridge 08154R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,500,000.00	0.1168	N	
2019	56	Bridge 08015R	Bridge - Culvert/Pedestria	1	Bridge	$ 4,600,000.00	0.1168	N	
2019	56	Bridge 01318R	Bridge - Fixed	1	Bridge	$ 15,500,000.00	0.1168	P	03000175
2019	56	Bridge 03638R	Bridge - Fixed	1	Bridge	$ 20,000,000.00	0.1168	P	03000175
2019	56	Bridge 04232R	Bridge - Fixed	1	Bridge	$ 9,000,000.00	0.1168	P	03000175
2019	56	Bridge 08006R	Bridge - Fixed	1	Bridge	$ 7,000,000.00	0.1168	P	03000175
2019	56	Bridge 08070R	Bridge - Fixed	1	Bridge	$ 13,000,000.00	0.1168	P	03000175
2019	56	Bridge 08086R	Bridge - Fixed	1	Bridge	$ 7,000,000.00	0.1168	Y	03000196CN
2019	56	Bridge 08098R	Bridge - Fixed	1	Bridge	$ 12,000,000.00	0.1168	P	03000175
2019	56	Bridge 08287R	Bridge - Fixed	1	Bridge	$ 9,200,000.00	0.1168	P	03000175
2019	66	Bridge 08072R	Bridge - Culvert/Pedestria	1	Bridge	$ 3,400,000.00	0.1168	N	
2019	66	Bridge 08261R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,300,000.00	0.1168	N	
2019	66	Bridge 08269R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,300,000.00	0.1168	N	
2019	66	Bridge 01312R	Bridge - Fixed	1	Bridge	$ 13,800,000.00	0.1168	P	03000175
2019	66	Bridge 01348R	Bridge - Fixed	1	Bridge	$ 12,300,000.00	0.1168	P	03000175
2019	66	Bridge 01403R	Bridge - Fixed	1	Bridge	$ 13,700,000.00	0.1168	P	03000175
2019	66	Bridge 02237R	Bridge - Fixed	1	Bridge	$ 28,700,000.00	0.1168	P	03000175
2019	66	Bridge 03639R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1168	P	03000175
2019	66	Bridge 03680R	Bridge - Fixed	1	Bridge	$ 14,600,000.00	0.1168	P	03000175
2019	66	Bridge 03686R	Bridge - Fixed	1	Bridge	$ 25,800,000.00	0.1168	P	03000175
2019	66	Bridge 03691R	Bridge - Fixed	1	Bridge	$ 8,400,000.00	0.1168	P	03000175
2019	66	Bridge 03693R	Bridge - Fixed	1	Bridge	$ 33,000,000.00	0.1168	P	03000175
2019	66	Bridge 03946R	Bridge - Fixed	1	Bridge	$ 12,900,000.00	0.1168	P	03000175
2019	66	Bridge 03948R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1168	P	03000175
2019	66	Bridge 03955R	Bridge - Fixed	1	Bridge	$ 7,400,000.00	0.1168	P	03000175
2019	66	Bridge 04197R	Bridge - Fixed	1	Bridge	$ 8,900,000.00	0.1168	P	03000175
2019	66	Bridge 04224R	Bridge - Fixed	1	Bridge	$ 4,200,000.00	0.1168	P	03000175
2019	66	Bridge 04235R	Bridge - Fixed	1	Bridge	$ 13,800,000.00	0.1168	P	03000175
2019	66	Bridge 08012R	Bridge - Fixed	1	Bridge	$ 19,200,000.00	0.1168	P	03000175
2019	66	Bridge 08035R	Bridge - Fixed	1	Bridge	$ 8,200,000.00	0.1168	P	03000175
2019	101	Bridge 08003R	Bridge - Fixed	1	Bridge	$ 8,000,000.00	0.1168	P	03000175
2019	101	Bridge 08022R	Bridge - Fixed	1	Bridge	$ 11,700,000.00	0.1168	Y	03000196CN
2019	101	Bridge 08050R	Bridge - Fixed	1	Bridge	$ 12,200,000.00	0.1168	P	03000175
2019	101	Bridge 08055R	Bridge - Fixed	1	Bridge	$ 10,200,000.00	0.1168	P	03000175
2019	101	Bridge 08059R	Bridge - Fixed	1	Bridge	$ 20,400,000.00	0.1168	P	03000175
2019	101	Bridge 08060R	Bridge - Fixed	1	Bridge	$ 10,700,000.00	0.1168	P	03000175
2020	19	Bridge 08080R Devon Movable	Bridge - Moveable	1	Bridge	$ 750,000,000.00	0.1300	N	
2021	1	Bridge 08266R	Bridge - Culvert/Pedestria	1	Bridge	$ 1,800,000.00	0.1418	N	
2021	1	Bridge 08071R	Bridge - Fixed	1	Bridge	$ 12,600,000.00	0.1418	P	03000175
2021	1	Bridge 08074R	Bridge - Fixed	1	Bridge	$ 14,300,000.00	0.1418	P	03000175
2021	1	Bridge 08075R	Bridge - Fixed	1	Bridge	$ 18,100,000.00	0.1418	P	03000175
2021	1	Bridge 08097R	Bridge - Fixed	1	Bridge	$ 12,800,000.00	0.1418	P	03000175
2021	1	Bridge 08200R	Bridge - Fixed	1	Bridge	$ 7,900,000.00	0.1418	P	03000175
2021	1	Bridge 08207R	Bridge - Fixed	1	Bridge	$ 2,700,000.00	0.1418	Y	03000196CN

Program Year	Project Rank	Asset Name	Description	No. of Units	Unit	Replacement Costs	PI	Programmed	Project Number
2021	1	Bridge 08209R	Bridge - Fixed	1	Bridge	$ 1,300,000.00	0.1418	P	03000175
2021	1	Bridge 08210R	Bridge - Fixed	1	Bridge	$ 5,400,000.00	0.1418	P	03000175
2021	1	Bridge 08217R	Bridge - Fixed	1	Bridge	$ 1,100,000.00	0.1418	P	03000175
2021	1	Bridge 08218R	Bridge - Fixed	1	Bridge	$ 1,000,000.00	0.1418	P	03000175
2021	1	Bridge 08219R	Bridge - Fixed	1	Bridge	$ 1,100,000.00	0.1418	P	03000175
2021	1	Bridge 08263R	Bridge - Fixed	1	Bridge	$ 16,800,000.00	0.1418	P	03000175
2021	1	Bridge 08264R	Bridge - Fixed	1	Bridge	$ 41,300,000.00	0.1418	P	03000175
2021	1	Bridge 08267R	Bridge - Fixed	1	Bridge	$ 10,300,000.00	0.1418	P	03000175
2021	1	Bridge 08268R	Bridge - Fixed	1	Bridge	$ 5,300,000.00	0.1418	Y	03000196CN
2021	1	Bridge 08274R	Bridge - Fixed	1	Bridge	$ 1,000,000.00	0.1418	P	03000175
2021	1	Bridge 08279R	Bridge - Fixed	1	Bridge	$ 2,100,000.00	0.1418	P	03000175
2021	20	MNR Fairfield (WB) Station	Facility - Electrical	1	Building	$ 631,314.27	0.1240	N	
2021	21	MNR New Haven - Wheel Mill Facility Building	Facility - Plumbing	1	Building	$ 101,248.00	0.1240	P	03000138CN
2021	21	MNR East Norwalk Station	Facility - Plumbing	1	Building	$ 91.12	0.1240	N	
2021	21	MNR Seymour Station	Facility - Plumbing	1	Building	$ 27,251.12	0.1240	N	
2021	21	MNR New Haven - Wheel Mill Facility Building	Facility - HVAC	1	Building	$ 227,808.00	0.1240	P	03000138CN
2021	21	MNR Riverside Station	Facility - HVAC	1	Building	$ 272,511.20	0.1240	N	
2021	21	MNR New Haven - Wheel Mill Facility Building	Facility - Electrical	1	Building	$ 227,808.00	0.1240	P	03000138CN
2021	21	MNR Fairfield (EB) Station	Facility - Electrical	1	Building	$ 354,264.56	0.1240	N	
2021	28	MNR Cos Cob Station	Facility - Electrical	1	Building	$ 904.83	0.1240	N	
2021	28	MNR Greens Farms Station	Facility - Electrical	1	Building	$ 1,776.71	0.1240	N	
2021	31	Track Tangent	Track - Tangent	26	Track Miles	$ 35,750,000.00	0.1200	P	03000190 (C Program)
2021	32	Tamper	Service - Rail	1	Vehicle	$ 150,000.00	0.1144	N	
2021	33	MNR Bridgeport Rail Facility Building	Facility - Equipment	1	Building	$ 2,892,800.00	0.1141	N	
2021	34	MNR New Haven - Diesel-CSR Shop	Facility - Equipment	1	Building	$ 3,380,960.00	0.1141	P	03000138CN
2021	34	MNR New Haven - Blowing Area Shelter	Facility - Equipment	1	Building	$ 526,128.00	0.1141	P	03000138CN
2021	38	MNR New Haven - EMU Maintenance Shop	Facility - Equipment	1	Building	$ 5,225,120.00	0.1141	P	03000138CN
2021	39	MNR New Haven Station	Facility - Substructure	1	Building	$ 23,396,255.44	0.1140	N	
2021	40	MNR New Haven - Wheel Mill Facility Building	Facility - Shell	1	Building	$ 531,552.00	0.1140	P	03000138CN
2021	40	MNR Stamford Station	Facility - Shell	1	Building	$ 2,600,214.00	0.1140	N	
2021	40	MNR Wilton Station	Facility - Shell	1	Building	$ 4,547.33	0.1140	N	
2021	40	MNR Branchville Station	Facility - Interior	1	Building	$ 517,771.28	0.1140	N	
2021	40	MNR Cannondale Station	Facility - Interior	1	Building	$ 517,771.28	0.1140	N	
2021	40	MNR Derby Station	Facility - Interior	1	Building	$ 517,771.28	0.1140	N	
2021	40	MNR New Haven Station	Facility - Interior	1	Building	$ 24,696,047.41	0.1140	N	
2021	40	MNR Noroton Heights Station	Facility - Interior	1	Building	$ 517,771.28	0.1140	N	
2021	40	MNR Rowayton Station	Facility - Interior	1	Building	$ 8,397.24	0.1140	N	
2021	40	MNR Seymour Station	Facility - Interior	1	Building	$ 517,771.28	0.1140	N	
2021	51	MNR New Haven - Wheel Mill Facility Building	Facility - Substructure	1	Building	$ 329,056.00	0.1140	P	03000138CN
2021	51	MNR Derby Station	Facility - Substructure	1	Building	$ 490,520.16	0.1140	N	
2021	51	MNR Bridgeport (WB) Station	Facility - Shell	1	Building	$ 574,299.99	0.1140	N	
2021	51	MNR Noroton Heights Station	Facility - Shell	1	Building	$ 817,533.60	0.1140	N	
2021	51	MNR Rowayton Station	Facility - Shell	1	Building	$ 13,258.80	0.1140	N	
2021	51	MNR New Haven - Wheel Mill Facility Building	Facility - Interior	1	Building	$ 329,056.00	0.1140	P	03000138CN
2021	51	MNR Danbury Station	Facility - Interior	1	Building	$ 406,209.35	0.1140	N	
2021	51	MNR Wilton Station	Facility - Interior	1	Building	$ 2,879.98	0.1140	N	
2021	59	MNR New Haven - Diesel-CSR Shop	Facility - Conveyance	1	Building	$ 676,192.00	0.0945	P	03000138CN
2021	59	MNR New Haven - EMU Maintenance Shop	Facility - Conveyance	1	Building	$ 1,045,024.00	0.0945	P	03000138CN
2021	62	MNR Bridgeport Rail Facility Building	Facility - Conveyance	1	Building	$ 578,560.00	0.0945	N	
2021	62	MNR New Haven - Blowing Area Shelter	Facility - Conveyance	1	Building	$ 105,225.60	0.0945	P	03000138CN
2021	65	Track Surfacing	Track - Surfacing	66	Track Miles	$ 8,276,400.00	0.0855	P	03000190 (C Program)
2021	66	Tie Inserter w/ Crane	Service - Rail	1	Vehicle	$ 150,000.00	0.0823	N	
2021	67	Power-Cable	Power - Cable	288	Track Miles	$ 51,701,760.00	0.0817	Y*	
2021	68	Tie Shear	Service - Rail	1	Vehicle	$ 150,000.00	0.0777	N	
2021	69	MNR New Haven - Wheel Mill Facility Building	Facility - Site	1	Building	$ 151,872.00	0.0760	P	03000138CN
2021	70	Railroad Flat Well Car	Service - Rail	1	Vehicle	$ 150,000.00	0.0731	N	
2021	70	Railroad Box Car	Service - Rail	5	Vehicles	$ 750,000.00	0.0731	N	
2021	70	Caboose	Service - Rail	1	Vehicle	$ 150,000.00	0.0731	N	
2021	70	Railroad Hopper	Service - Rail	28	Vehicles	$ 4,200,000.00	0.0731	N	
2021	70	Railroad Flat Car	Service - Rail	1	Vehicle	$ 150,000.00	0.0731	N	
2021	70	Railroad Storage Box Car	Service - Rail	1	Vehicle	$ 150,000.00	0.0731	N	
2021	70	Railroad CC Flat Car	Service - Rail	1	Vehicle	$ 150,000.00	0.0731	N	
2021	77	Ties Wood	Ties - Wood	59	Track Miles	$ 45,430,000.00	0.0718	P	03000190 (C Program)
2021	78	Ties Concrete	Ties - Concrete	7	Track Miles	$ 6,160,000.00	0.0572	P	03000190 (C Program)
2021	79	SLE 1993 GE/P40 Genesis	Locomotive - SLE	12	Vehicles	$ 31,731,948.00	0.0354	N	
2021	80	Waterbury Signals	Signal System	26	Track Miles	$ 73,000,000.06	0.0307	Y	03040016CN
2021	81	MNR 1974 GE/A Car	EMU	18	Vehicles	$ 47,597,922.00	0.0138	Y	03000200RS
2021	81	MNR 1974 GE/B Car	EMU	18	Vehicles	$ 47,597,922.00	0.0138	Y	03000200RS
2021	83	Wire Reel Car Road	Service - Rail	1	Vehicle	$ 150,000.00	0.0111	N	

Y Fully Funded
N Not Authorized
P Partially Funded or Authorized but Not Allocated
* Project Completed (Data Out of Date)

Appendix G. Five Year Capital Plan (FY 2017-2021)

2017-2021 Capital Plan - Public Transportation
Constrained

FFY 2018

	FFY18 Total Fed & State	Total Fed	Total State
Total Funding (Non Ramp Up) Programmed in Current Year	646,642,032	361,645,181	284,996,851
Total Ramp Up Funding Programmed in Current Year	224,600,000	-	224,600,000
Total Funding Programmed in Current Year	**871,242,032**	**361,645,181**	**509,596,851**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST				FUNDING SOURCE	REGION
DOT0301	NHL	VARIOUS	Bridge Replacement Program-East Ave Bridge, Norwalk	34,000,000	34,000,000	0	34,000,000	STATE	1
DOT0301	NHL	VARIOUS	Bridge Replacement Program-Osborne Ave Bridge,Norwalk	10,000,000	10,000,000	0	10,000,000	STATE	1
DOT0301	NHL	VARIOUS	Bridge Replacement Program-Fort Point St Bridge,Norwalk	15,000,000	15,000,000	0	15,000,000	STATE	1
DOT0301	NHL	Greenwich	NHL Bridge Repair-Cos Cob	30,000,000	30,000,000	0	30,000,000	Ramp Up	1
DOT0301	NHL	Stamford	Stamford Parking/Pedestrian Bridge	18,000,000	18,000,000	0	18,000,000	Ramp Up	1
DOT03010161CN	NHL	Westport	Maple Lane Bridge (moved to 2018)	15,000,000	15,000,000	12,000,000	3,000,000	5307/5337	1
DOT03010176CN	NHL	Norwalk	NHL - WALK Moveable Bridge	700,000,000	200,077,620	153,430,161	46,647,459	ER/5337	1
DOT03010176RW	NHL	Norwalk	NHL - WALK Moveable Bridge ROW	80,000,000	20,000,000	0	20,000,000	STATE	1
DOT03010181CN	NHL	Norwalk	NHL - CP 243 (WALK Bridge)	190,000,000	55,000,000	0	55,000,000	STATE	1
DOT0303	NHL-NCB	VARIOUS	New Canaan Branch Improvements	4,500,000	4,500,000	0	4,500,000	Ramp Up	1
DOT0403	CT Transit	Stamford	Route 1 BRT - Norwalk/Stamford (Buses)	5,600,000	5,600,000	0	5,600,000	Ramp Up	1
DOT0412	NTD	Norwalk	Norwalk TD Replace 2006 Buses (3 35ft)	1,750,000	1,750,000	1,400,000	350,000	5307	1
DOT0412	NTD	Norwalk	Norwalk TD - Facility Improvements	12,500,000	12,500,000	10,000,000	2,500,000	5307	1
DOT0412	NTD	Norwalk	Norwalk TD - Admin Capital/Misc Support FY 18	1,850,000	1,850,000	1,480,000	370,000	5307	1
DOT0416	HART	Danbury	HART -Paratransit Vehicles FY 18	750,000	750,000	600,000	150,000	5307	2
DOT0416	HART	Danbury	HART Admin Capital/Misc Support	200,000	200,000	160,000	40,000	5307	2
DOT0416	HART	Danbury	HART Operating Assitance	492,302	492,302	492,302	-	5307	2
DOT00360199EQ	VTD	Waterbury	NVCOG/VTD - Admin Capital/Misc Support FY 18	200,000	200,000	160,000	40,000	5307	5
DOT0410	GBTA	Bridgeport	GBTA Admin Capital/Misc Support FY 18	625,000	625,000	500,000	125,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Radio System Replacement	750,000	750,000	600,000	150,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Bridgeport Intermodal Center Improvements	150,000	150,000	120,000	30,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Rehab Bus Storage Garage	3,300,000	3,300,000	2,640,000	660,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Facility Improvements - Bus Hub	450,000	450,000	360,000	90,000	5307	7
DOT03000138CN	NHL	New Haven	NHY - West End Yard	100,000,000	23,750,000	19,000,000	4,750,000	5307/5337	8
DOT0301	NHL	New Haven	New Haven Station /Parking	17,000,000	17,000,000	0	17,000,000	Ramp Up	8
DOT03010088PE	NHL	New Haven	NHY - Continued Design and Program Management	5,000,000	5,000,000	0	5,000,000	STATE	8
DOT03010183CN	NHL	VARIOUS	NHY - Pedestrian Bridge-North	41,250,000	41,250,000	33,000,000	8,250,000	5307/5337	8
DOT0310	SLE	Madison	SLE-Madison RR Station and Garage	15,000,000	15,000,000	0	15,000,000	Ramp Up	8
DOT0424	MLFD TD	Milford	Milford TD Paratransit Vehicles FY 18	500,000	500,000	400,000	100,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Facility Improvements	50,000	50,000	40,000	10,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Admin Capital/Misc Support FY 18	375,000	375,000	300,000	75,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Paratransit Vehicles FY 18	1,875,000	1,875,000	1,500,000	375,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Admin Capital/Misc Support FY 18	500,000	500,000	400,000	100,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD New Facility	25,000,000	25,000,000	20,000,000	5,000,000	5307	8
DOT0426	GHTD	Hartford	GHTD Paratransit Vehicles FY 18	3,000,000	3,000,000	2,400,000	600,000	5307	10
DOT0426	GHTD	Hartford	GHTD Union Station	1,750,000	1,750,000	1,400,000	350,000	5307	10
DOT0426	GHTD	Hartford	GHTD Admin Capital/Misc Support	1,300,000	1,300,000	1,040,000	260,000	5307	10
DOT0414	SEAT	Norwich	SEAT Replace Buses 2006 (2 30ft/3 35ft/3 40ft)	6,875,000	6,875,000	5,500,000	1,375,000	5307	13
DOT0414	SEAT	Norwich	SEAT Admin Capital FY 18	625,000	625,000	500,000	125,000	5307	13
DOT01702384	NA	VARIOUS	Transit Capital Planning	450,000	450,000	360,000	90,000	5307	70
DOT0400	CT Transit	VARIOUS	Bus Service Expansion Fleet	22,000,000	22,000,000	0	22,000,000	Ramp Up	70
VARIOUS	VARIOUS	VARIOUS	Section 5310 Program - FFY 2018 (See Program of Projects)	3,522,895	3,522,895	3,522,895	-	5310	70
VARIOUS	VARIOUS	VARIOUS	Section 5311 Program - FFY 2018 (See Program of Projects)	3,184,637	3,184,637	3,184,637	-	5311	70
VARIOUS	Hartford Line	VARIOUS	Hartford Line	57,500,000	57,500,000	0	57,500,000	Ramp Up	70
DOT03010154	NHL	VARIOUS	NHL - Signal System Replacement Phase 3	19,375,000	19,375,000	15,500,000	3,875,000	5307/5337	77
DOT0300	NHL	VARIOUS	NHL - Station Improvement Program (3000191PE projects)	22,625,000	22,625,000	8,500,000	14,125,000	5307/5337	78
DOT0300	NHL	VARIOUS	S program/Timber Program	3,195,596	3,195,596	0	3,195,596	STATE	78
DOT0300	NHL	VARIOUS	Bridge Replacement Program	10,000,000	10,000,000	0	10,000,000	STATE	78
DOT0300	NHL	VARIOUS	New Haven Line Track Program	25,000,000	25,000,000	20,000,000	5,000,000	5307/5337	78
DOT0300	NHL	VARIOUS	Grade Crossing Renewal Program	3,000,000	3,000,000	0	3,000,000	STATE	78
DOT0300	NHL	Various	NHL Stations (Orange/Barnum/Merritt 7)	20,000,000	20,000,000	0	20,000,000	Ramp Up	78

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FFY 2018

	FFY18 Total Fed & State	Total Fed	Total State
Total Funding (Non Ramp Up) Programmed in Current Year	646,642,032	361,645,181	284,996,851
Total Ramp Up Funding Programmed in Current Year	224,600,000	-	224,600,000
Total Funding Programmed in Current Year	**871,242,032**	**361,645,181**	**509,596,851**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST				FUNDING SOURCE	REGION
DOT03000175PE	NHL	VARIOUS	Bridge Design	5,400,000	5,400,000	0	5,400,000	STATE	78
DOT03000196CN	NHL	VARIOUS	Scour Rehabilitation 4 NHL Bridges (moved to 2018 FDP 11/17)	2,500,000	2,500,000	0	2,500,000	STATE	78
DOT03000199CN	NHL	VARIOUS	NHL - Customer Service Initiative	11,000,000	11,000,000	0	11,000,000	STATE	78
DOT03000202CN	NHL	VARIOUS	Network Infrastructure Upgrade Phase 3 CN	21,250,000	21,250,000	17,000,000	4,250,000	5307/5337	78
VARIOUS	CT Transit	VARIOUS	CT Transit Bus Replacements	8,726,294	8,726,294	6,981,035	1,745,259	5307/5339	79
VARIOUS	CT Transit	VARIOUS	CT Facility Improvements/Misc Admin Capital	1,517,688	1,517,688	1,214,150	303,538	5307	79
DOT03040016CN	NHL-WTRBY	VARIOUS	Waterbury Branch Signal System	35,000,000	35,000,000	0	35,000,000	Ramp Up	81
DOT0472	NWTD	Torrington	NWTD Facility	16,500,000	16,500,000	13,200,000	3,300,000	5307	3/4
DOT00820317CN	Off-System	Middletown	Middletown Swing Bridge (Jan 18)	2,000,000	2,000,000	0	2,000,000	STATE	11/12
DOT0422	MAT	Middletown	MAT - Engine overhauls Gilligs	150,000	150,000	120,000	30,000	5307	11/12
DOT0422	MAT	Middletown	MAT Misc Support	350,000	350,000	280,000	70,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - New Facility Design/ROW	1,800,000	1,800,000	1,440,000	360,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - Bus Replacement	875,000	875,000	700,000	175,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - Admin Capital/Misc Support FY 18	275,000	275,000	220,000	55,000	5307	11/12
			TOTAL:		871,242,031	361,645,180	509,596,851		

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FFY 2019

	FFY19 Total Fed & State	Total Fed	Total State
Total Funding (Non Ramp Up) Programmed in Current Year	414,606,161	175,483,662	239,122,499
Total Ramp Up Funding Programmed in Current Year	410,000,000	0	410,000,000
Total Funding Programmed in Current Year	**824,606,161**	**175,483,662**	**649,122,499**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST				FUNDING SOURCE	REGION
DOT03010176CN	NHL	Norwalk	NHL - WALK Moveable Bridge	700,000,000	136,082,060	60,865,648	75,216,412	5307/5337	1
DOT0412	NTD	Norwalk	Norwalk TD Paratransit Vehicles FY 19	1,000,000	1,000,000	800,000	200,000	5307	1
DOT0412	NTD	Norwalk	Norwalk TD - Admin Capital/Misc Support FY 19	675,000	675,000	540,000	135,000	5307	1
VARIOUS	NHL	VARIOUS	SAGA	15,000,000	15,000,000	0	15,000,000	Ramp Up	1
DOT0416	HART	Danbury	HART -Paratransit Vehicles FY 19	687,500	687,500	550,000	137,500	5307	2
DOT0416	HART	Danbury	HART Admin Capital/Misc Support	200,000	200,000	160,000	40,000	5307	2
DOT0416	HART	Danbury	HART Operating Assitance	492,302	492,302	492,302	0	5307	2
DOT0416	HART	Danbury	HART - Replace Buses 10 35 ft	6,250,000	6,250,000	5,000,000	1,250,000	5307	2
DOT0036	VTD	Waterbury	NVCOG/VTD - Admin Capital/Misc Support FY 19	200,000	200,000	160,000	40,000	5307	5
DOT0036	VTD	Waterbury	NVCOG/VTD - Bus Shelter Replacement FY 19	250,000	250,000	200,000	50,000	5307	5
DOT00150373CN	NHL	Bridgeport	Barnum Station	146,000,000	22,000,000	0	22,000,000	STATE	7
DOT0410	GBTA	Bridgeport	GBTA Paratransit Vehicles FY 19	3,125,000	3,125,000	2,500,000	625,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA Admin Capital/Misc Support FY 19	450,000	450,000	360,000	90,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Bridgeport Intermodal Center Improvements	150,000	150,000	120,000	30,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Midlife Repower/Overhaul 15 Gilligs	915,000	915,000	732,000	183,000	5307	7
DOT03000138CN	NHL	New Haven	NHY - West End Yard	100,000,000	45,000,000	20,000,000	25,000,000	5307/5337	8
DOT0301	NHL	New Haven	NHY - Design and Program Management	30,000,000	30,000,000	0	30,000,000	STATE	8
DOT0424	MLFD TD	Milford	Milford TD Paratransit Vehicles FY 19	500,000	500,000	400,000	100,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Facility Improvements	50,000	50,000	40,000	10,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Admin Capital/Misc Support FY 19	375,000	375,000	300,000	75,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Paratransit Vehicles FY 19	2,300,000	2,300,000	1,840,000	460,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Admin Capital/Misc Support FY 19	600,000	600,000	480,000	120,000	5307	8
DOT0426	GHTD	Hartford	GHTD Paratransit Vehicles FY 19	3,250,000	3,250,000	2,600,000	650,000	5307	10
DOT0426	GHTD	Hartford	GHTD Union Station	1,000,000	1,000,000	800,000	200,000	5307	10
DOT0426	GHTD	Hartford	GHTD Admin Capital/Misc Support FY 19	500,000	500,000	400,000	100,000	5307	10
DOT0414	SEAT	Norwich	SEAT Replace Buses 2007 35 ft buses	5,000,000	5,000,000	4,000,000	1,000,000	5307	13
DOT0414	SEAT	Norwich	SEAT Admin Capital FY 19	625,000	625,000	500,000	125,000	5307	13
DOT01702384	NA	VARIOUS	Transit Capital Planning	450,000	450,000	360,000	90,000	5307	70
DOT0300	NHL/SLE	VARIOUS	Rail Fleet	98,000,000	98,000,000	0	98,000,000	Ramp Up	70
VARIOUS	VARIOUS	VARIOUS	Section 5310 Program - FFY 2019 (See Program of Projects)	3,591,944	3,591,944	3,591,944	0	5310	70
VARIOUS	VARIOUS	VARIOUS	Section 5311 Program - FFY 2019 (See Program of Projects)	3,247,056	3,247,056	3,247,056	0	5311	70
VARIOUS	Hartford Line	VARIOUS	Hartford Line	267,000,000	267,000,000	0	267,000,000	Ramp Up	70
VARIOUS	VARIOUS	VARIOUS	Transit District Bus Replacements	11,562,500	11,562,500	9,250,000	2,312,500	5307	70
DOT03010154	NHL	VARIOUS	NHL - Signal System Replacement Phase 3	34,346,063	34,346,063	27,476,850	6,869,213	5307/5337	77
DOT0300	NHL	VARIOUS	NHL - Station Improvement Program (3000191PE projects)	15,000,000	15,000,000	0	15,000,000	STATE	78
DOT0300	NHL	VARIOUS	S program/Timber Program	3,800,000	3,800,000	0	3,800,000	STATE	78
DOT0300	NHL	VARIOUS	Bridge Replacement Program	17,284,409	17,284,409	0	17,284,409	STATE	78
DOT0300	NHL	VARIOUS	Grade Crossing Renewal Program	3,500,000	3,500,000	0	3,500,000	STATE	78
DOT0300	NHL	VARIOUS	Network Infrastructure Upgrade Phase 4 PE	2,500,000	2,500,000	0	2,500,000	STATE	78
DOT0300	NHL	VARIOUS	NHL Stations (Orange/Barnum/Merritt 7)	30,000,000	30,000,000	0	30,000,000	Ramp Up	78
DOT03000175PE	NHL	VARIOUS	Bridge Design	5,000,000	5,000,000	0	5,000,000	STATE	78
DOT03000199CN	NHL	VARIOUS	NHL - Customer Service Initiative	10,000,000	10,000,000	0	10,000,000	STATE	78
VARIOUS	NHL	VARIOUS	Interlocking & Drainage	3,000,000	3,000,000	0	3,000,000	STATE	78
VARIOUS	NHL	VARIOUS	Code Compliance Upgrades of Rail Maintenance Facilities	5,000,000	5,000,000	0	5,000,000	STATE	78
VARIOUS	CT Transit	VARIOUS	CT Transit Bus Replacements	27,647,329	27,647,329	22,117,863	5,529,466	5307/5339	79
VARIOUS	CT Transit	VARIOUS	CT Facility Improvements/Misc Admin Capital	6,250,000	6,250,000	5,000,000	1,250,000	5307	79
DOT0422	MAT	Middletown	MAT Misc Support	325,000	325,000	260,000	65,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - Bus Replacement	375,000	375,000	300,000	75,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - Admin Capital/Misc Support FY 19	50,000	50,000	40,000	10,000	5307	11/12
			TOTAL:		824,606,162	175,483,663	649,122,499		

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FFY 2020

	FFY20 Total Fed & State	Total Fed	Total State
Total Funding (Non Ramp Up) Programmed in Current Year	418,121,714	178,466,884	239,654,830
Total Ramp Up Funding Programmed in Current Year	527,000,000	-	527,000,000
Total Funding Programmed in Current Year	**945,121,714**	**178,466,884**	**766,654,830**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST				FUNDING SOURCE	REGION
DOT03010176CN	NHL	Norwalk	NHL - WALK Moveable Bridge	700,000,000	173,625,455	94,900,364	78,725,091	5307/5337	1
DOT0303	NHL-NCB	VARIOUS	New Canaan Branch Improvements	15,000,000	15,000,000	0	15,000,000	Ramp Up	1
DOT0412	NTD	Norwalk	Norwalk TD Replace Buses	4,000,000	4,000,000	3,200,000	800,000	5307	1
DOT0412	NTD	Norwalk	Norwalk TD - Admin Capital/Misc Support FY 2020	375,000	375,000	300,000	75,000	5307	1
DOT0416	HART	Danbury	HART -Paratransit Vehicles FY 2020	750,000	750,000	600,000	150,000	5307	2
DOT0416	HART	Danbury	HART Admin Capital/Misc Support	200,000	200,000	160,000	40,000	5307	2
DOT0416	HART	Danbury	HART - Midlife overhaul 2014 buses	625,000	625,000	500,000	125,000	5307	2
DOT0416	HART	Danbury	HART Operating Assitance	492,302	492,302	492,302	0	5307	2
DOT00360199EQ	VTD	Waterbury	NVCOG/VTD - Admin Capital/Misc Support FY 2020	200,000	200,000	160,000	40,000	5307	5
DOT00150373CN	NHL	Bridgeport	Bamum Station	146,000,000	20,000,000	0	20,000,000	STATE	7
DOT0410	GBTA	Bridgeport	GBTA Admin Capital/Misc Support FY 20	500,000	500,000	400,000	100,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Bridgeport Intermodal Center Improvements	150,000	150,000	120,000	30,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA - Paratransit Vehicle Replacement	520,000	520,000	416,000	104,000	5307	7
DOT03000138CN	NHL	New Haven	NHY - West End Yard	100,000,000	65,000,000	0	65,000,000	STATE	8
DOT0310	SLE	Madison	SLE-Madison RR Station and Garage	17,000,000	17,000,000	0	17,000,000	Ramp Up	8
DOT0424	MLFD TD	Milford	Milford TD Paratransit Vehicles FY 2020	500,000	500,000	400,000	100,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Facility Improvements	50,000	50,000	40,000	10,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Admin Capital/Misc Support FY 2020	375,000	375,000	300,000	75,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Paratransit Vehicles FY 2020	2,500,000	2,500,000	2,000,000	500,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Admin Capital/Misc Support FY 2020	750,000	750,000	600,000	150,000	5307	8
DOT0426	GHTD	Hartford	GHTD Paratransit Vehicles FY 2020	3,250,000	3,250,000	2,600,000	650,000	5307	10
DOT0426	GHTD	Hartford	GHTD Union Station	1,000,000	1,000,000	800,000	200,000	5307	10
DOT0426	GHTD	Hartford	GHTD Admin Capital/Misc Support FY 2020	500,000	500,000	400,000	100,000	5307	10
DOT0414	SEAT	Norwich	SEAT Replace Buses 2008 40 ft buses	3,750,000	3,750,000	3,000,000	750,000	5307	13
DOT0414	SEAT	Norwich	SEAT Admin Capital FY 2020	1,000,000	1,000,000	800,000	200,000	5307	13
DOT01702384	NA	VARIOUS	Transit Capital Planning	450,000	450,000	360,000	90,000	5307	70
DOT0300	NHL/SLE	VARIOUS	Rail Fleet	435,000,000	435,000,000	0	435,000,000	Ramp Up	70
VARIOUS	VARIOUS	VARIOUS	Section 5310 Program - FFY 2020 (See Program of Projects)	3,653,007	3,653,007	3,653,007	0	5310	70
VARIOUS	VARIOUS	VARIOUS	Section 5311 Program - FFY 2020 (See Program of Projects)	3,302,256	3,302,256	3,302,256	0	5311	70
DOT03010154	NHL	VARIOUS	NHL - Signal System Replacement Phase 3	25,000,000	25,000,000	20,000,000	5,000,000	5307/5337	77
DOT0300	NHL	VARIOUS	S program/Timber Program	5,000,000	5,000,000	0	5,000,000	STATE	78
DOT0300	NHL	VARIOUS	Bridge Replacement Program	7,000,000	7,000,000	0	7,000,000	STATE	78
DOT0300	NHL	VARIOUS	New Haven Line Track Program	6,250,000	6,250,000	5,000,000	1,250,000	5307/5337	78
DOT0300	NHL	VARIOUS	Grade Crossing Renewal Program	6,900,000	6,900,000	0	6,900,000	STATE	78
DOT0300	NHL	VARIOUS	Network Infrastructure Upgrade Phase 4 CN	20,000,000	20,000,000	0	20,000,000	STATE	78
DOT0300	NHL	VARIOUS	NHL Stations (Orange/Barnum/Merritt 7)	30,000,000	30,000,000	0	30,000,000	Ramp Up	78
DOT03000175	NHL	VARIOUS	Bridge Design	5,500,000	5,500,000	0	5,500,000	STATE	78
VARIOUS	NHL	VARIOUS	Interlocking & Drainage	8,000,000	8,000,000	0	8,000,000	STATE	78
VARIOUS	NHL	VARIOUS	Code Compliance Upgrades of Rail Maintenance Facilities	4,500,000	4,500,000	0	4,500,000	STATE	78
DOT0400	CT Transit	VARIOUS	CT Transit Bus Replacements	9,048,584	9,048,584	7,238,867	1,809,717	5339	79
DOT0400	CT Transit	VARIOUS	CT Facility Improvements/Misc Admin Capital	11,655,110	11,655,110	9,324,088	2,331,022	5307	79
DOT0422	MAT	Middletown	MAT - Paratransit Vehicle Replaement	1,000,000	1,000,000	800,000	200,000	5307	11/12
DOT0422	MAT	Middletown	MAT Misc Support	350,000	350,000	280,000	70,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - Admin Capital/Misc Support FY 2020	400,000	400,000	320,000	80,000	5307	11/12
DOT0478	Esutary TD	Centerbrook	Estuary TD - New Facility	20,000,000	20,000,000	16,000,000	4,000,000	5307	11/12
VARIOUS	Hartford Line	VARIOUS	Hartford Line	30,000,000	30,000,000	0	30,000,000	Ramp Up	
			TOTAL:		945,121,714	178,466,884	766,654,830		

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FFY 2021

	FFY21 Total Fed & State	Total Fed	Total State
Total Funding (Non Ramp Up) Programmed in Current Year	747,981,714	178,466,884	569,514,830
Total Ramp Up Funding Programmed in Current Year	0	0	0
Total Funding Programmed in Current Year	**747,981,714**	**178,466,884**	**569,514,830**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST				FUNDING SOURCE	REGION
DOT00360199EQ	VTD	Waterbury	NVCOG/VTD - Admin Capital/Misc Support FY 2021	225,000	225,000	180,000	45,000	5307	1
DOT0400	CT Transit	VARIOUS	CT Facility Improvements/Misc Admin Capital	1,250,000	1,250,000	1,000,000	250,000	5307	1
DOT0412	NTD	Norwalk	Norwalk TD - Admin Capital/Misc Support FY 2021	500,000	500,000	400,000	100,000	5307	1
	NHL	VARIOUS	Bridge Replacement Program-Elm, Canal, Greenwich	100,000,000	30,000,000	0	30,000,000	STATE	1
DOT0414	SEAT	Norwich	SEAT Admin Capital FY 2021	750,000	750,000	600,000	150,000	5307	2
DOT0416	HART	Danbury	HART -Paratransit Vehicles FY 2021	750,000	750,000	600,000	150,000	5307	2
DOT0416	HART	Danbury	HART Admin Capital/Misc Support FY 2021	900,000	900,000	720,000	180,000	5307	2
DOT0416	HART	Danbury	HART Operating Assitance	492,302	492,302	492,302	0	5307	2
DOT00360199EQ	VTD	Waterbury	NVCOG/VTD - Paratransit Vehicles FY 2021	1,250,000	1,250,000	1,000,000	250,000	5307	5
DOT0410	GBTA	Bridgeport	GBTA Replace Buses	10,460,000	10,460,000	8,000,000	2,460,000	5307	7
DOT0410	GBTA	Bridgeport	GBTA Admin Capital/Misc Support FY 2021	625,000	625,000	500,000	125,000	5307	7
DOT0424	MLFD TD	Milford	Milford TD Paratransit Vehicles FY 2021	750,000	750,000	600,000	150,000	5307	7
	NHL	New Haven	NHY - Service and Inspection Shop	75,000,000	75,000,000	0	75,000,000	STATE	7
DOT0300	NHL/SLE	VARIOUS	Rail Fleet	200,000,000	200,000,000	0	200,000,000	STATE	8
DOT0412	NTD	Norwalk	Norwalk TD Paratransit Vehicles FY 2021	1,500,000	1,500,000	1,200,000	300,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Facility Improvements	50,000	50,000	40,000	10,000	5307	8
DOT0424	MLFD TD	Milford	Milford TD Admin Capital/Misc Support FY 2021	375,000	375,000	300,000	75,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Paratransit Vehicles FY 2021	2,500,000	2,500,000	2,000,000	500,000	5307	8
DOT0427	GNHTD	Hamden	GNHTD Admin Capital/Misc Support FY 2021	750,000	750,000	600,000	150,000	5307	8
DOT0426	GHTD	Hartford	GHTD Paratransit Vehicles FY 2021	3,250,000	3,250,000	2,600,000	650,000	5307	10
DOT0426	GHTD	Hartford	GHTD Union Station	1,500,000	1,500,000	1,200,000	300,000	5307	10
DOT0426	GHTD	Hartford	GHTD Admin Capital/Misc Support FY 2021	750,000	750,000	600,000	150,000	5307	10
DOT0478	Esutary TD	Centerbrook	Estuary TD - Admin Capital/Misc Support FY 2021	687,500	687,500	550,000	137,500	5307	13
DOT0300	NHL	VARIOUS	NHL Stations (Orange/Barnum/Merritt 7)	50,000,000	50,000,000	0	50,000,000	STATE	70
VARIOUS	VARIOUS	VARIOUS	Section 5310 Program - FFY 2021 (See Program of Projects)	3,653,007	3,653,007	3,653,007	0	5310	70
VARIOUS	VARIOUS	VARIOUS	Section 5311 Program - FFY 2021 (See Program of Projects)	3,302,256	3,302,256	3,302,256	0	5311	70
VARIOUS	Hartford Line	VARIOUS	Hartford Line	80,000,000	80,000,000	0	80,000,000	STATE	70
DOT03010154	NHL	VARIOUS	NHL - Signal System Replacement Phase 3	25,000,000	25,000,000	20,000,000	5,000,000	5307/5337	77
DOT01702384	NA	VARIOUS	Transit Capital Planning	450,000	450,000	360,000	90,000	5307	78
DOT0300	NHL	VARIOUS	Network Infrastructure Upgrade Phase 3/4	15,000,000	15,000,000	12,000,000	3,000,000	5307/5337	78
DOT03000175	NHL	VARIOUS	Bridge Design	4,750,000	4,750,000	0	4,750,000	STATE	78
DOT03010176CN	NHL	Norwalk	NHL - WALK Moveable Bridge	700,000,000	121,625,455	54,900,364	66,725,091	5307/5337	78
VARIOUS	NHL	VARIOUS	Interlocking & Drainage	4,500,000	4,500,000	0	4,500,000	STATE	78
VARIOUS	NHL	VARIOUS	Code Compliance Upgrades of Rail Maintenance Facilities	12,000,000	12,000,000	0	12,000,000	STATE	78
	NHL	VARIOUS	New Haven Line Track Program	25,000,000	25,000,000	20,000,000	5,000,000	5307/5337	78
	NHL	VARIOUS	NHL - Station Improvement Program (3000191PE projects)	10,350,000	10,350,000	0	10,350,000	STATE	78
	NHL	VARIOUS	S program/Timber Program	6,700,000	6,700,000	0	6,700,000	STATE	78
VARIOUS	CT Transit	VARIOUS	CT Transit Bus Replacements	20,111,194	20,111,194	16,088,955	4,022,239	5339	79
	CT Transit	VARIOUS	CT Transit Facility Improvements (Hartford/Stamford)	30,625,000	30,625,000	24,500,000	6,125,000	5307	79
DOT0422	MAT	Middletown	MAT - Engine overhauls Gilligs	250,000	250,000	200,000	50,000	5307	11/12
DOT0422	MAT	Middletown	MAT Misc Support	350,000	350,000	280,000	70,000	5307	11/12
			TOTAL:		747,981,714	178,466,884	569,514,830		

Updated 11/30/16

Appendix H. Equipment over $50,000

TIer I

March 2018

Equipment ($50,000)

Operator	ID #	Year acquired	Description of Asset	Cost	AGE	CORE ID
CT Transit New Haven	8841	5/24/13	Push Pull Tug	$ 65,254.00	5	01210362
CT Transit Hartford	8840	5/24/13	Push Pull Tug	$ 65,245.00	5	01210363
CT Transit Stamford	8940	6/30/15	Push Pull Tug	$ 87,069.00	3	01210375
CT Transit Hartford	6774	10/1/05	Sentinel Rider Sweeper	$ 132,758.41	13	02300509
CT Transit New Haven	9650	9/19/13	Sentinel Rider Sweeper	$ 181,995.00	5	02300534
CT Transit Hartford	M20-6305	9/19/13	Scrubber/Sweeper	$ 62,245.64	5	02300531
CT Transit New Haven	M20-6307	9/19/13	Scrubber/Sweeper	$ 62,245.64	5	02300532
CT Transit Stamford	M20-6306	9/19/13	Scrubber/Sweeper	$ 62,245.64	5	02300533
CT Transit New Haven	DW444HX566262	9/1/98	John Deere Tractor/Loader	$ 87,000.00	20	02800539
CT Transit Hartford	1DW524KHCFE667425	3/13/15	John Deere Loader	$ 181,534.00	3	02800573
CT Transit Hatrford	K006V01817L	4/24/13	Hyster Fork Lift Truck	$ 58,000.00	5	04510861
CT Transit New Haven	K0069V1816L	4/24/13	Hyster Fork Lift Truck	$ 58,000.00	5	04510862
CT Transit Hartford	30019829	2/20/15	Boom Lift	$ 129,320.00	3	04510990
CT Transit Waterbury	PIN12F0001	7/30/12	Bus Lift	$ 97,644.00	6	05810160
CT Transit Hartford		9/1/98	Trans-Tech 16 System W/ACC-CLA	$ 103,200.00	20	09603378
CT Transit Hartford	235463	9/10/10	Tester alternator/Generator	$ 100,200.00	8	00501035
CT Transit Hartford	AE9LZrjk644cd22z	8/30/10	Asset Works -software	$ 200,000.00	8	09719539
CT Transit Waterbury		1/23/17	Hewlett Packard Server	$ 68,722.00	1	09722256
CT Transit Hartford		8/15/17	GFI Genfare	$ 172,075.00	1	09800163
CT Transit Hartford	2UA444260RSP	1/22/15	HP Eaton Radio Control console	$ 126,907.86	3	09112073
CT Transit Hartford	2020	9/1/97	Hicklin Dynomometr w tranmission stand	$ 153,936.00	21	06803691
CT Transit Hartford		4/1/94	Electric Farebox System	$ 366,598.00	24	07407182
CT Transit Hartford		4/1/94	Electric Farebox System	$ 104,015.00	24	07407183
CT Transit Waterbury		10/11/17	S&B Farebox System	$ 1,184,528.10	1	07410107