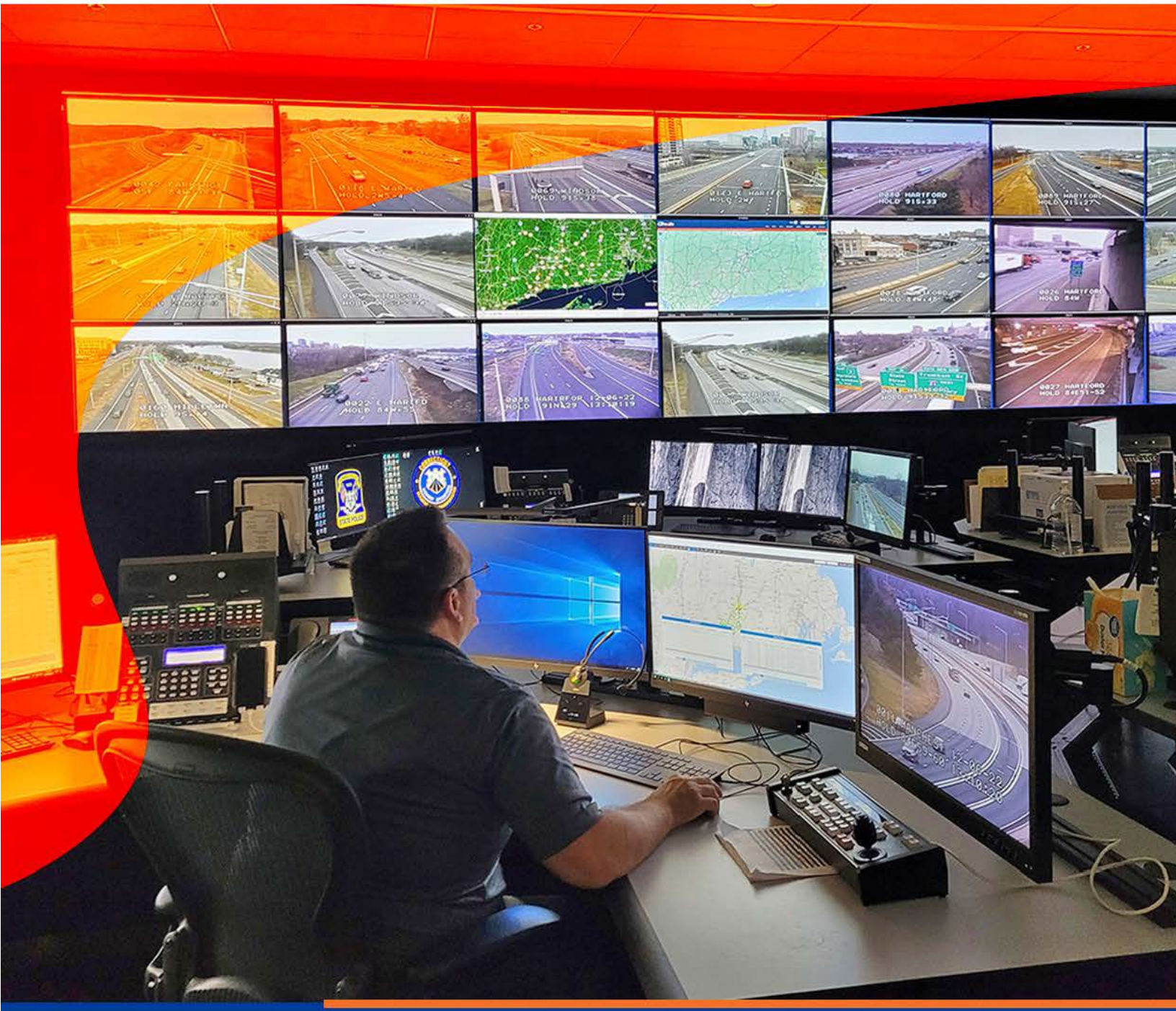
CTDOT
CONNECTICUT TRANSPORTATION

Strategic Technology Roadmap

IMPROVING LIVES THROUGH TRANSPORTATION



Summer 2025

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Introduction

To keep pace with the rapidly evolving technology landscape, the Connecticut Department of Transportation (CTDOT) is advancing a unified enterprise vision for data and technology supported by modern infrastructure and strategic investments.

Purpose

CTDOT recognizes the need to define clear processes, invest in robust software tools, and use data for more informed decision-making to improve agency efficiency, reduce costs, and strengthen collaboration to best serve the state of Connecticut.

The CTDOT Strategic Plan, published in summer 2025, sets the direction on how CTDOT will achieve three core goals and seven supporting objectives through the implementation of 12 key strategies. One of these strategies is the development of the Strategic Technology Roadmap.

The Strategic Technology Roadmap is designed to guide long-term technology investments that will support CTDOT's goals. The roadmap provides a structured plan to modernize legacy systems that do not meet current needs and transition to more flexible, secure, and scalable software tools.

Ultimately, this Strategic Technology Roadmap enables CTDOT to invest more wisely, operate more efficiently, and serve the public more effectively, laying the groundwork for a transportation system that is future-ready and resilient.

Approach and Findings

In fall 2024, CTDOT leadership established a Strategic Technology Roadmap Working Group of staff from across the agency to work with leadership to guide the development of the Strategic Technology Roadmap. The objectives were to:

- Identify and prioritize technology investments.
- Recommend workflow and organization structure improvements.
- Establish a framework to determine annual IT budget needs.

This Strategic Technology Roadmap builds on CTDOT's ongoing efforts and advances them to help the agency better manage resources—including people, processes, time, technology selection, and budgets. This plan was created in alignment with the Strategic Plan and the Capital Program Roadmap, another strategy identified in the Strategic Plan. While the Capital Program Roadmap lays a framework for strengthening CTDOT's capital program processes, both roadmaps share a unified vision for data and information that is supported by thoughtful technology infrastructure and data investments.

A multi-phase approach, presented in Figure 1, guided the process to envision and create a future state roadmap.

Figure 1: Strategic Technology Roadmap Approach

Strategic Technology Roadmap development efforts built on input received from small-group interviews and a CTDOT-wide employee survey conducted in fall 2024 as part of the Strategic Plan efforts.

Focused workshops including subject matter experts across CTDOT and the Strategic Technology Roadmap Working Group started in late 2024. Among its first tasks was a review of the following areas:

- Current state workflows
- Data collection
- System architecture
- Performance measures
- Information-sharing throughout CTDOT
- Core business functions and objectives
- Pain points experienced by CTDOT staff
- Technology applications currently being used and those being implemented
- Strengths and areas for improvement

Current State Findings and Improvement Opportunities

The team categorized findings from discussions with the Working Group into four categories: people/organization, processes, data, and technology. A summary of the findings is as follows:

People/Organization

CTDOT staff are engaged and passionate about improvements to workflows and technology related to their projects. There is a high willingness to change and a drive to find solutions and tools to improve CTDOT's consistency to better serve the traveling public. CTDOT staff have been resourceful; however, the current IT team and adjacent teams (Architectural, Engineering and Construction [AEC], GIS and others) have a large backlog of software enhancement requests from stakeholders, and the requests are hard to fulfill quickly with available staff. It is estimated that each IT staff member has a backlog with a year's worth of effort pending—and the priorities from stakeholders are not always clear or consistent, which makes overall task prioritization difficult. Historically, this has resulted in many business units undertaking multiple and overlapping initiatives to fulfill individual needs, which has led to disparate, standalone, and, in many cases, separate solutions that solve recurring or redundant problems. This leads to higher maintenance costs and disconnected software and data sources, which makes comprehensive reporting a cumbersome, time-consuming activity.

Having clear technology roles and responsibilities across CTDOT that are consistently communicated, understood, and followed would avoid building any more isolated solutions and allow CTDOT to consistently prioritize the most pressing technology needs.

Processes

Historically, as different Bureaus have implemented singular business-specific tools, they have been operating in a highly decentralized and disconnected data environment. While CTDOT has undertaken some efforts in recent years to standardize data sources and definitions, CTDOT is far from achieving a unified data repository. CTDOT currently lacks a formalized and enforceable IT governance, which would include a consistent evaluation of priorities and needs. While CTDOT has created IT standard operating procedures, these are not effectively communicated, understood, or enforced. This has relegated the role of IT function to that of fulfiller of requests instead of a strategic business partner.

Similarly, CTDOT lacks a robust data governance process resulting in inconsistent data management and use.

With the advent of low-code and no-code solutions, including Power Apps and Esri ArcGIS platform updates, it is easier for staff to create solutions for single-business-unit use, which can lead to more siloed data and software. Establishing and enforcing a unified process for assessing CTDOT technology and data needs, including protocols to request new functionality or software, would lead to consistent software use, enhance communication, and support enterprise-wide coordination.

Data

CTDOT staff are committed to collecting and maintaining data and using it in support of their work. Although there is awareness and willingness to move away from standalone data sources, there are ongoing duplicate efforts across CTDOT to identify data and to define authoritative systems. Many of these efforts have been Bureau-specific, leading to data islands that hamper holistic decision-making.

Data governance efforts at CTDOT are still in their infancy. The efforts are currently focused on the first step—data education. These efforts can be expanded, formalized, and enforced across CTDOT on the different roles for data management, internal and external data sources, and how to identify data sensitivity (e.g., external, internal, private, confidential), data retention practices, and other elements that are important to manage data across CTDOT.

Formal data governance will enable informed decisions and foster greater integration and coordination across Bureaus and units, as well as with external partners. In addition, the changes will allow CTDOT to create a strong data foundation and move toward a centralized/unified data platform that can leverage advances in analytics and artificial intelligence.

Technology

CTDOT has been responsive in meeting business needs through a variety of technology solutions for years. Current initiatives demonstrate a strong commitment to innovation and intra-agency collaboration, including the enterprise rollout of Compass, pilots of emerging technologies, and the use of Linear Referencing System (LRS) and Geographic Information System (GIS) technologies in a centralized Transportation Enterprise Database (TED).

That said, historically, different efforts have mostly been business-specific, which has led to multiple "problem-specific" solutions, custom software, Excel files, and Access databases. These tools serve business-critical functions but are not accessible to all relevant stakeholders. Also, given the tools were custom designed with a specific purpose, and built on platforms without a lot of flexibility, many of the tools do not meet current business needs. This has created significant technical debt—a landscape of obsolete "problem-specific" solutions instead of flexible, robust enterprise-wide software tools. Stakeholders have used the analogy of "using multiple shovels when we really need an excavator" to describe the current mismatch between tools and needs.

Based on a review of the software application list and discussions with working group members, it is estimated that CTDOT has over 60 custom software applications , which are typically harder to maintain and update, and over 6,000 Excel and Access files, which are not widely accessible and may contain critical information.

To ensure long-term operational efficiency and interoperability of software tools, CTDOT will need larger and sustained capital investments for modernizing software systems, and then maintaining them, at an enterprise level. This includes addressing the backlog of needs for both software and hardware.

Improvement Initiatives

The Strategic Technology Roadmap Working Group and CTDOT subject matter experts discussed and validated the findings including the improvement opportunities. Building on these discussions, the team prioritized the needs and categorized them into three groups of improvement initiatives:

- Software
- Information
- Processes

These initiatives, presented in Table 1, will help address the key improvement opportunities identified earlier through this effort.

Table 1: Strategic Technology Roadmap Improvement Initiatives

ID	Improvement Initiative Name
SOFTWARE	
A	**Procure and Implement a New Asset Management/Maintenance Management Software:** Procure a robust off-the-shelf Enterprise Asset Management/Maintenance Management Software that integrates with Atlas, Core, Compass, and other systems, and provides the necessary data and software capabilities for holistic asset management.
B	**Enhance Program and Portfolio Management Software Tools:** Add features through new tools to help centrally organize and manage CTDOT's portfolio of projects to better manage budgets, grants, and schedules.
C	**Implement an Integrated Transit Mobile Ticketing Software:** Implement an integrated bus and rail ticketing software to improve the rider experience and allow for improved analytics.
D	**Replace Parking Management Software:** Digitize the current paper ticketing system that is currently supported by multiple parking management software to improve the user parking experience. This would also allow CTDOT to move towards a dynamic pricing structure and improve how CTDOT charges for parking across multiple locations.
E	**Procure and Implement Permitting Software:** Provide automated processes for the entire encroachment permitting workflow, from application to submission to approval, and centralize management and tracking.
F	**Procure and Implement Customer Service Application:** Invest in a centralized customer service application that automates processes, improves efficiency, enhances communication, and provides the ability to collect, analyze, and report data.

INFORMATION	
G	**Establish Central Data Source for Public Transit Analytics:** Establish a central data repository to consolidate data from various sources of transit data, to obtain comprehensive transit asset life cycle data and improve public transit trip visibility.
H	**Improve Data Sharing and Integration with Core:** Improve data sharing between the state's financial system (Core) and CTDOT's key software (e.g., Enterprise Asset Management, Program and Portfolio Management Software) to reduce data duplication and re-entry, and to simplify data entry, reconciliation, and analytics.
I	**Establish and Maintain Central Location for CTDOT Data:** Create a central data location, building on past efforts, to store key information, allowing users easier access to information, and improve enterprise-wide reporting and analytics.
PROCESSES	
J	**Strengthen IT Governance:** Strengthen current IT SOPs to establish and formalize a clear framework to consistently identify, prioritize, track, and evaluate IT initiatives on a recurring basis and implement them across CTDOT.
K	**Formalize Data Governance:** Formalize and guide the process to define, collect, produce, maintain, and protect CTDOT data to strengthen the foundation for data-driven decision making.
L	**Prepare and Execute a Plan for Ongoing System Modernization Needs:** Prepare and execute a plan to conduct ongoing system modernization (similar to maintaining physical infrastructure/assets). This will help CTDOT avoid future backlog of needs/technical debt.
M	**Conduct Ongoing Change Management Activities:** Effective implementation of the Technology Roadmap's improvement initiatives will require managing change throughout the process. Prepare a structured change management plan and execute it to ensure that all the improvements are widely accepted so CTDOT realizes maximum benefits from these efforts.
N	**Ongoing Training Activities:** Provide users with training for the new software, data integrations/platforms and processes (including data literacy). This will ensure that the staff have the knowledge and the ability to best use the advances and allow CTDOT to realize maximum benefits.

The details for the Improvement Initiatives A through L are provided in the next section of this document. The details for change management and training activities are included in the success factors section of this document.

Improvement Initiative Plan Definitions

The Improvement Initiative Plans in this section further describe each of the planned initiatives/projects. Each improvement initiative includes the following elements:

- **Project Description:** A short description of the project.
- **Timeframe to Begin:** How long will it take us to begin each initiative. The "short-term" label includes those strategies with actions that are already underway.
    - Short-term – Up to 24 months (includes strategies with actions that are already underway)
    - Mid-term – Two to three years
    - Long-term – Four years or more
- **Full Implementation Duration:** Estimated time to complete each initiative's implementation actions. Some actions are related to core CTDOT activities and will continue on an ongoing basis.
- **Key Benefits:** The primary benefits anticipated through successful completion of this initiative.
- **Dependencies and Adjacent Initiatives:** Other initiatives that are related to this initiative.
- **Resources Needed:** The roles that will need to be a part of each effort/initiative.
- **Implementation Actions:** The work activities that will lead to successful execution of each initiative. These actions are designed to provide an overall path to implementation without being prescriptive.

Resources Needed

The resources that would be required to make each initiative a success and a summary of their responsibilities are presented below. In addition, CTDOT should consider a lead/champion role that would oversee implementation of the full roadmap/all the initiatives at a programmatic level.

Technology Resources

Project Manager

Each initiative will require a project manager that may be involved on the project either full-time (for major initiatives) or part-time (for smaller initiatives). The project manager would ideally have a combination of project management expertise and technology knowledge to both manage the project and to effectively coordinate with all stakeholders.

The key responsibilities of the project manager would include:

- Manage scope, schedule, and budget for each initiative
- Manage vendor contract
- Closely coordinate with business sponsor and functional lead to ensure functional needs are being met on the project

IT Lead

Each initiative would require a part-time IT lead with CTDOT technology background and experience. The staff members may either have a traditional IT background or a non-traditional background (e.g., current GIS or Compass team members). The key responsibilities of the IT lead would include:

- Lead/facilitate IT action items (e.g., integrations, data migration, IT infrastructure)
- Sign off and ensure compliance with project technical requirements
- Oversee system architecture and security compliance

Data Architect

Each initiative would require a part-time data architect with CTDOT technology background and experience. The key responsibilities of the data architect would include:

- Design and govern data structures for interoperability and scalability
- Ensure data is usable across platforms (e.g., mobile ticketing, permitting systems)
- Lead efforts in centralizing and securing relevant analytics and performance management metrics
- Work closely with IT lead for data architecture and environments management

BITS IT Lead

Each initiative would require a part-time BITS IT lead with BITS technology background and experience. The key responsibilities of the BITS IT lead would include:

- Coordinate between CTDOT IT and BITS IT for key decisions, integrations, and data sharing
- Manage Core integrations and requests for additional data needs
- Participate in CTDOT IT governance discussions and coordinate with BITS IT for support and key decisions

Overall Resources

Business Analyst

Each initiative would require a part-time business analyst, ideally with business analyst training (e.g., Certified Business Analysis Professional) and experience. The key responsibilities of the business analyst would include:

- Gather needs from business leads and subject matter experts (SMEs) and translate them into functional requirements and workflows
- Assess impacts of legacy system replacement and process changes
- Support communicating business processes/requirements to functional lead and IT lead and act as a bridge to business SMEs

Change Management/Training Lead

CTDOT would require a part-time organizational change management/training lead on each initiative. This person would have a keen understanding of CTDOT and its culture, and experience related to change management, communication planning, and training coordination. The key responsibilities of the change management/training lead would include:

- Conduct change readiness assessment and action items
- Prepare and execute change management plan, including stakeholder communication plan
- Prepare training plans for different groups and coordinate with implementation vendor and internal staff to develop tailored training materials
- Conduct ongoing change readiness and risk management

Procurement Lead

CTDOT would require a part-time procurement lead for each software initiative with CTDOT procurement process knowledge and experience, including CT Department of Administrative Services (DAS) contracting process. The key responsibilities of the procurement lead would include:

- Lead the RFP preparation process (boilerplate language, contract terms, etc.) supported by SMEs/leads for scope and other details
- Support negotiating contracts, pricing, and terms with vendors and contractors
- Maintain relationships with vendors and contractors
- Oversee vendor performance and milestone tracking with project management and quality assurance team

Business Resources

Business Sponsor

CTDOT would require a business sponsor for each initiative, ideally a senior executive from the most affected group/Bureau for each initiative. The key responsibilities of the business sponsor would include:

- Secure executive sponsorship and budget approval
- Champion initiatives to ensure long-term adoption
- Serve as point of contact for escalating issues or scope changes

Functional Lead

The functional lead with CTDOT business and technology background and experience. The key responsibilities of the functional lead would include:

- Serve as day-to-day project lead coordinating closely with IT project manager
- Coordinate daily operational tasks related to needs development, RFP issuance, selection, and implementation
- Coordinate with PM, IT lead and SMEs
- Coordinate with technical and business teams throughout the selection and implementation process for needs definition, workflow definition, and software configuration feedback/validation

Functional Subject Matter Experts (SMEs)

CTDOT would require part-time functional SMEs for each of the impacted bureaus and/or business units for each initiative. The SMEs would collectively cover all business functions and sub-functions. Key responsibilities of the functional SMEs would include:

- Provide functional expertise related to business processes (both current and future)
- Participate in software configuration workshops for key decisions (e.g., workflow definition, configuration parameters)
- Participate in user acceptance testing activities for final software sign-off

Success Factors

This section presents key success factors for implementing improvement initiatives and sustaining the changes to achieve the expected benefits. These factors are based on the team's experience and industry research.

- **Executive sponsorship:** Executive sponsors reinforce the need and value for the changes, championing the vision and building an overall desire for change. They also help secure necessary funding and resources for the initiatives. Executive sponsors also help resolve major silos and critical issues. Initiatives risk losing momentum or agency buy-in in the absence of an executive sponsor or a coalition of sponsors.
- **Resource commitment:** Lack of adequate staff resources is often cited as a top reason for project failures. This includes assigning staff beyond their regular full-time responsibilities. It is imperative to properly define all the required resources, and ensure CTDOT is committed to protecting the time of the resources for the improvement initiatives (preventing burnout).
- **Realistic expectations:** A major reason for loss of momentum and buy-in is unrealistic expectations—either around the scope, timeline, or budget (or all of them). It is important to define clear milestones, be clear about expectations and needs (including discussing a loss of productivity right after new software implementation as users learn and become more efficient), and not overpromising software capabilities. Successful initiatives also include contingencies for unforeseen complexities and needed corrections.
- **Robust organizational change management:** Successful change requires managing both technical aspects and human/people aspects, emphasizing the reason for change. Even the best designed solutions fail if people do not adopt them. Prosci research[1] indicates that effective change management can increase the probability of success on an initiative by up to seven times. Organizational change management includes building a desire for change, communicating "what's in it for me" to the stakeholders, providing them with the right tools and training to make the change, and then support them during and after the change. These efforts typically require specialized staff who are experienced and trained in change management and associated communication efforts.
- **Robust onboarding and refresher training:** Connected to the change management factor, it is important to customize training based on system or process roles for each initiative. Onboarding and ongoing refresher training help to build and maintain needed skills for effectively using the tools. Types of training (e.g., manual, video tutorials, in-person) may

[1] Digital Transformation Change Management

vary across initiatives. Initial software training should ideally be incorporated in the staff onboarding process, and refresher training should be available in short modules on-demand to staff (either through a stand-alone learning management system or embedded/linked through the specific software tools).

- **Business-led, IT-facilitated initiatives:** This model emphasizes that the agency business units/groups should drive the vision and requirements, while IT provides technical expertise and infrastructure to enable success for long-term use across the agency. This ensures strong business value and usability for all solutions. To succeed, IT and the business units must work hand in hand to choose technically sound and operationally relevant solutions.

Improvement Initiative A. | Software

Procure and Implement a New Enterprise Asset Management/ Maintenance Management Software

INITIATIVE DESCRIPTION

Procure and implement a robust off-the-shelf Enterprise Asset Management/ Maintenance Management Software that integrates with GIS, Core, Compass, and other legacy systems with operation and maintenance data for a holistic asset management view.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 24-36 Months

Key Benefits

- Tracks all maintenance work performed.
- Supports better decision-making through a review of historical trends, risk-based forecasting, and eventually moving to proactive work orders.
- Offers holistic investment planning and cross-asset trade-off analysis, which can help make the most of the available budget to improve assets' condition and may demonstrate the need for additional funding.
- Provides improved analytics to help make a case for increased funding.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Improve Data Sharing and Integration with Core
- Establish and Maintain Central Location for CTDOT Data

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Identify Needs and Requirements for New Software

The project manager, business sponsor, and functional lead will meet with key business stakeholders to define functional needs and requirements for the new software. Current functionality, needs, and CTDOT's vision for asset management practices will be considered, to confirm the new software can support CTDOT for a decade or more. Needs identification will include input from various business subject matter experts to capture holistic functional needs and requirements. CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm that the software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements. Also include the need for any additional hardware (e.g., mobile devices, field laptops, shop laptops) for end users.

Conduct Options Analysis and Develop Procurement Strategy

Based on the defined needs and requirements, identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation will typically involve configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. A phased implementation approach, supported by change management, can facilitate stakeholder adoption of the new software and related process changes. The initial phase may concentrate on a minimum viable product (MVP) approach, which focuses on replicating existing functionality, with subsequent phases introducing additional features such as advanced analytics and prioritization tools.

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, such as Core and Compass, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements. Procure the required hardware and include it in the final testing of the software.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current to the new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff. The training should include how users can use both mobile versions and desktop versions of the software.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from legacy systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative B. | Software

Enhance Program and Portfolio Management Software Tools

INITIATIVE DESCRIPTION

Define and add functionality to CTDOT's current suite of tools, providing many Program and Portfolio Management System (PPMS) capabilities to achieve a full, centrally organized, efficient system.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 24-36 Months

Key Benefits

- Provides holistic view of all CTDOT projects, from needs identification and prioritization to project completion.
- Simplifies tracking and reporting of needs and projects throughout the process.
- Offers better tracking and management of budgets, grants and schedules.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Improve Data Sharing and Integration with Core
- Establish and Maintain Central Location for CTDOT Data
- Capital Program Roadmap

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Identify Needs and Requirements for New Software

The project manager, business sponsor, and functional lead will meet with key business stakeholders to define functional needs and requirements for new software. Current functionality, needs, and CTDOT's vision for robust program and portfolio management practices will be considered, to confirm the new software can support CTDOT for a decade or more. Needs identification will include various business subject matter experts to capture holistic functional needs and requirements. CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements.

Conduct Options Analysis and Develop Procurement Strategy

Based on the defined needs and requirements, identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation typically involves configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. A phased implementation approach, supported by change management, can facilitate stakeholder adoption of the new software and related process changes. The initial phase may concentrate on a minimum viable product (MVP) approach which focuses on biggest needs/gaps (e.g., Preparing CIP and STIP electronically), with subsequent phases introducing additional features such as grants management and portfolio-level risk management.

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, including, but not limited to, Core and Compass, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current processes to the processes incorporating new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from legacy systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative C. | Software

Implement an Integrated Transit Mobile Ticketing Software

INITIATIVE DESCRIPTION

Implement an integrated bus and rail ticketing software to improve the rider experience by only requiring one ticket for multimodal trips. An integrated system would also lead to improved analytics. This initiative would build on the current unified fare and mobile application solution in progress by the Public Transportation (PT) bus and rideshare unit as defined in the Customer Service Experience Action Plan.

TIMEFRAME TO BEGIN	**Short-Term**
FULL IMPLEMENTATION DURATION	**12-16 Months (Phase 1)**

Key Benefits

- Meets customer service goals for ease of use, real-time data, and convenience.
- Provides holistic view of transit data and information.
- Automates data collection and sharing for efficiency and accuracy.
- Provides ability to offer different fare benefits (e.g., monthly maximum/fare cap) in the future.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Establish Central Data Source for Public Transit Analytics
- Replace Parking Management Software

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from impacted Bureaus and SMEs

Implementation Actions

Review Current Customer Service Experience Plan and Discuss Lessons Learned.

Identify key successes and failures from CTDOT's Customer Service Experience Plan, aligned to CTDOT's strategic plan and the vision for transit mobile ticketing across modes. Consider industry good practice and trends around mobile ticketing software and what other agencies have learned. Review processes related to one transit mobile ticketing software (e.g., customer service, ticketing, and backend processing and analytics) and identify lessons learned and opportunities for process improvement. Additionally, CTDOT should consider what functionality and/or tools (if any) should be offered as a trip planner that allows customers to plan for trips across different modes. In addition, CTDOT could share more data with other companies (e.g., Google maps, Apple, Waze) to help travelers plan across regional boundaries.

Identify Needs and Requirements for Integrated Transit Mobile Ticketing Solution

The project manager, business sponsor, and functional lead will meet with key business stakeholders to define functional needs and requirements for new software. Current needs and CTDOT's vision for an integrated transit mobile ticketing solution will be considered, to confirm the new software can support CTDOT for a decade or more. Needs identification will include various business subject matter experts to capture holistic public transportation functional requirements across modes (e.g., bus and rail). CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements.

Conduct Options Analysis and Develop Procurement Strategy

Based on the defined needs and requirements, identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation typically involves configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. A phased implementation approach, supported by change management, can facilitate stakeholder adoption of the new software and related process changes. The initial phase may concentrate on a minimum viable product (MVP) approach which focuses on integrated mobile ticketing for CT*transit* and CT*rail*. The subsequent phases might integrate other bus transit agencies in Connecticut with the integrated mobile solution, followed by either the New Haven Line or integrated parking (allowing passengers to pay for parking through the mobile ticketing solution).

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, such as Core, Compass, and other analytics applications, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current processes to the processes incorporating new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff. In addition, develop and deploy support materials for the traveling public to allow them to better use the new mobile ticketing software.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from existing systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative D. | Software

Replace Parking Management Software

INITIATIVE DESCRIPTION

Digitize the current paper ticketing system with a user-friendly application that is currently supported by multiple parking management software to improve the user parking experience. This would also allow CTDOT to move toward a dynamic pricing structure and improve how CTDOT charges for parking across multiple locations.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 12-18 Months

Key Benefits

- Improves traveler user experience.
- Provides a full view of parking information and automates data collection and sharing for efficiency and accuracy.
- Provides option/ability to offer dynamic pricing structure that meets state requirements and is cost-efficient.
- Adds system functionality that supports better parking policy decision-making.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Improve Data Sharing and Integration with Core
- Establish Central Data Source for Public Transit Analytics
- Implement an Integrated Transit Mobile Ticketing Software

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Identify Business Efforts Needed and Review the Current Customer Service Experience Action Plan for Lessons Learned.

This initiative is underway. Current state business-related activities need to happen before choosing software, including determining which parking lots are managed by CTDOT. A working group should identify the activities needed to identify a list of assets related to parking and ownership. Identify key successes and failures from current findings and CTDOT's Customer Service Experience Plan, in alignment with CTDOT's Strategic Plan and the vision for mobile ticketing across modes. Discuss the lessons learned and opportunities for process improvement.

Identify Needs and Requirements for New Software and Determine Fit for Combining with Integrated Transit Mobile Ticketing Solution.

The project manager, business sponsor, and functional lead will meet with key business stakeholders to define functional needs and requirements for the new software and review the Public Transportation (PT) bus and rail ticketing requirements from Initiative C. "Implement an Integrated Transit Mobile Ticketing Software," and the recent CTDOT Parking Reform—IPMS Procurement Options study to determine fit for using the same software. Current needs and CTDOT's vision for parking will be considered to confirm the new software can support CTDOT for a decade or more. Needs identification will include various business subject matter experts to capture holistic public transportation functional requirements across modes (e.g., bus and rail). CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements.

Conduct Options Analysis and Develop Procurement Strategy

Based on the defined needs and requirements, identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. This may include options like mobile parking options (with less up-front investments from CTDOT). Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation typically involves configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. A phased implementation approach, supported by change management, can facilitate stakeholder adoption of the new software and related process changes. The initial phase may concentrate on a minimum viable product (MVP) approach which focuses on replicating existing functionality (parking hardware and software for legacy locations), with subsequent phases introducing additional features such as mobile parking and additional locations (e.g., park and ride lots).

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, such as Core, Compass, and other analytics applications, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current processes to the processes incorporating new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff. In addition, develop and deploy support materials for the traveling public to allow them to better use the new parking payment software.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from legacy systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative E. | Software

Procure and Implement Permitting Software

INITIATIVE DESCRIPTION

Procure and implement a robust off-the-shelf encroachment permitting software that better meets CTDOT's needs with automated processes.

TIMEFRAME TO BEGIN	Short-Term
FULL IMPLEMENTATION DURATION	18-24 Months

Key Benefits

- Promotes better collaboration and stakeholder engagement, and as a result, better customer satisfaction.
- Provides automated process for the entire permitting workflow from application submission to approval.
- Improves tracking of status and metadata for regulatory and compliance reporting and requirements.
- Centralizes management and optimal utilization of resources for inspections, etc.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Identify Needs and Requirements for New Software

This initiative is underway; the business sponsor has identified requirements for new encroachment permitting software. Current functionality, needs, and CTDOT's vision for centralized and robust permitting practices should also be considered. Needs identification will include various business subject matter experts to capture holistic requirements. CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements.

Conduct Options Analysis and Develop Procurement Strategy

A preliminary market scan has been completed, and both off-the-shelf and custom GIS focused options have been explored. Based on the market scan and defined needs and requirements, continue to identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation typically involves configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. The implementation approach should be fully supported by change management efforts for both internal users and external stakeholders.

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, such as Core, Compass, and other analytics applications, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current processes to the processes incorporating new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff. In addition, develop and deploy support materials for the external stakeholders (developers, etc.) to allow them to better use the new software.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from legacy systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative F. | Software

Procure and Implement Customer Service Application

INITIATIVE DESCRIPTION

Procure a centralized robust off-the-shelf Customer Service Application/Customer Relationship Management (CRM) software that better meets CTDOT's customer service needs. CTDOT should consider the functionality required across different Bureaus and their specific workflows.

TIMEFRAME TO BEGIN	**Short-Term**
FULL IMPLEMENTATION DURATION	**18-24 Months**

Key Benefits

- Improves customer service experience through a single portal for interaction.
- Improves customer service team's experience and ability to address customer requests and needs in a timely manner through better duplication identification, customer communication and others.
- Simplifies reporting of issues and triaging capabilities and needs.
- Integrates with other tools, including work orders/maintenance requests for simpler work tracking and reporting.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Improve Data Sharing and Integration with Core
- Procure and Implement a New Enterprise Asset Management/Maintenance Management Software

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Change management/training lead
- A working group, with leads from interested Bureaus

Implementation Actions

Identify Needs and Requirements for New Software

The project manager, business sponsor, and functional lead will meet with key business stakeholders to define functional needs and requirements for new software. The requirements will build on the work completed by the Customer Service working group, which was formalized about a year ago but is currently on hold. Current functionality, needs, and CTDOT's vision for centralized and robust customer service practices will be considered, to confirm the new software can support CTDOT for a decade or more. Needs identification will include various business subject matter experts to capture holistic functional needs and requirements beyond the current Customer Service team. CTDOT's IT lead and data architect will provide technical requirements including interface capabilities, security standards, uptime, and other technical software elements to confirm software aligns with CTDOT and Bureau of Information Technology Solutions (BITS) requirements.

Conduct Options Analysis and Develop Procurement Strategy

Based on the defined needs and requirements, identify potential software solutions: either a single platform that meets all needs or a combination of specialized tools that integrate. Also consider procurement options, such as purchasing through an existing Department of Administrative Services (DAS) contract or issuing a market Request for Proposals (RFP). Based on the options, identify the procurement strategy and next steps.

Procure Software, Implementation Services, and Ongoing System Support

Execute the procurement strategy to acquire the software and related services, including implementation, hosting, and ongoing support. Implementation typically involves configuring the software (workflow, data schema, roles), data migration, integration of systems, and end user training. A phased implementation approach, supported by change management, can facilitate stakeholder adoption of the new software and related process changes. The initial phase may concentrate on a minimum viable product (MVP) approach which focuses on connecting to other existing software, with subsequent phases introducing additional features such as advanced request triaging and prioritization.

Configure and Test Software for CTDOT Needs

Provide adequate staff to define workflows and business rules for the selected vendor to properly configure the software and to review the data to be migrated to the new software. Provide IT resources to set up integrations with existing software, such as Core and Compass, and ensure compliance with organizational policies and workflows. Collaborate with the selected vendor to test the configured software to validate that it works per the defined system requirements.

Conduct Initial and Ongoing Training

Develop training materials—typically provided by the implementation vendor—tailored to CTDOT, emphasizing changes from the current processes to the processes incorporating new software, with input from CTDOT staff. Deliver initial user training and establish a program for ongoing refresher sessions and onboarding new staff. In addition, develop and deploy support materials for the traveling public to allow them to better use the new customer service application/software.

Migrate Data and Deploy System and Initiate Ongoing Support

Collaborate with the implementation vendor to identify the data that will be migrated to the new system and prepare a data migration plan. Work with the implementation vendor to develop detailed data mapping between old and new systems and to extract the data as required from legacy systems. Conduct multiple mock conversions and perform any necessary data clean-up. Perform final data conversion as part of deployment of the new system. Initiate production operations and ongoing support.

Improvement Initiative G. | Information

Establish Central Data Source for Public Transit Analytics

INITIATIVE DESCRIPTION

Establish a central data repository to consolidate data from various sources of transit data to obtain comprehensive transit asset life cycle data and improve public transit trip visibility.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 6-12 Months

Key Benefits

- Supports CTDOT's knowledge management goals
- Provides more informed decision-making opportunities. This includes the ability to:
- Create end-to-end trip data and operational information that can be analyzed for better route and fare policy decisions.
- Enhance the efficiency and reliability of public transit systems through robust data analytics.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Establish and Maintain Central Location for CTDOT Data
- All transit-related software initiatives

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Review Current Software In Use and Data Sharing Agreements In Place with Software Providers.

Review and prepare a list of all the current software in use for public transit. Include software provided/used by contracted vendors (e.g., for operations, maintenance, fare collection). Include any data sharing agreements in place, and how CTDOT currently ingests, stores, and uses data from software that is used by contracted vendors.

Prepare Detailed List of Information Elements and Attributes, and the Relevant Sources of Information.

Define key information in each software and the attributes to be collected for all transit applications and available means of data transfer. This should include identifying where the data is created, read, updated, and archived.

Review Data Warehouse or Other CTDOT Platforms with IT to Ingest, Manage and Retrieve the Data.

Select the most suitable central data repository to store all CTDOT transit-related data aligned with IT governance and data governance processes, considering flexibility for future changes. Consider factors such as scalability, security, and ease of integration with existing systems. Prepare a conceptual architecture showing the connections and transfers between different software to the central data location/warehouse.

Prepare and Execute Data Analytics Platform Implementation Plan.

Building on the conceptual architecture, software list, and information elements, prepare and execute the plan for the data analytics platform.

Make Continuous Improvement Efforts to Centralize Data and Improve Analytics Across CTDOT.

Create an action plan for continuous improvements, both for broader data platform efforts and for transit data analytics. Continue monitoring and adjusting the goals and processes as required and continue ongoing data quality initiatives.

Improvement Initiative H. | Information

Improve Data Sharing and Integration with Core

INITIATIVE DESCRIPTION

Improve data sharing between the state's financial system (Core) and CTDOT's key software (e.g., Enterprise Asset Management/Maintenance Management and various Program and Portfolio Management tools) to reduce data duplication and re-entry, and to simplify data entry, reconciliation, and analytics.

TIMEFRAME TO BEGIN — Mid-Term

FULL IMPLEMENTATION DURATION — 24-36 months

Key Benefits

- Streamlines data entry processes and reconciliation, reducing redundancy and errors.
- Relieves administrative burdens caused by manual and duplicative entry, lag in information updates, reporting discrepancies, and other factors.
- Enhances efficiency and authoritative sources (enhances access to information to support management decision-making).
- Integrates workflows and improves decision-making and alignment across CTDOT's digital infrastructure.

Dependencies and Adjacent Initiatives

- Procure and Implement a New Asset /Maintenance Management Software
- Enhance Program and Portfolio Management Software tools
- Establish Central Data Source for Public Transit Analytics
- Establish and Maintain Central Location for CTDOT Data
- Strengthen IT Governance
- Formalize Data Governance

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- IT database resource(s)
- Data architect
- BITS resource(s)
- Change management/training lead
- A working group, with leads from impacted Bureaus

Implementation Actions

Identify Required Interface Data to and from Core

Identify required data integration points between current and planned CTDOT management systems and the State of Connecticut's statewide enterprise resource planning (ERP) application known as Core, which is based on the Oracle PeopleSoft platform (and the official accounting record system for the State). Potential integration and specific data to be exchanged should be identified and prioritized based on business value to CTDOT. Special consideration should be given to potential future integration points to be implemented as part of the new Enterprise Asset Management/Maintenance Management Software or Program and Portfolio Management software tools initiatives. Use cases should be considered both where Core is the source system, and where Core is the target system for data from other authoritative sources.

Discuss Data Exchange Methods with BITS

Discuss data exchanging methods with the Department of Administrative Services (DAS), and the Bureau of Information Technology Solutions (BITS). These discussions should include leadership or designees (including accounting team leaders) to ensure operational changes are proposed with a comprehensive view of financial stewardship and consensus of users. Discuss data exchange methods with BITS, data reconciliation, and other elements necessary for data sharing. CTDOT can leverage a combination of integration methods based on system capabilities, data sensitivity, and frequency of updates.

Common approaches include application program interfaces (APIs) for real-time, secure data transfer; batch data processing using Extract, Transform, Load (ETL) tools for scheduled synchronization; and web services or middleware platforms such as an Enterprise Service Bus (ESB) to standardize communication between disparate systems.

Data governance policies, metadata standards, and integration layer logging should be implemented to ensure data integrity, traceability, and compliance with security requirements. These methods will enable Core (PeopleSoft) to function as both a source and recipient of authoritative data, supporting cohesive operations across CTDOT's digital ecosystem.

Discuss State Financial and Accounting Data Exchange Roles and Rules

Effective data exchange requires clearly defined roles, responsibilities, and data governance to ensure compliance with statewide fiscal policies and auditing standards, metadata standards, traceability, and security requirements. CTDOT would coordinate with the Office of the State Comptroller and other relevant agencies to align on financial data structures, reporting formats, and transaction processing protocols. Data exchange would adhere to state-mandated rules regarding fund accounting, object coding, and fiscal year cutoffs, with audit trails maintained for all data transfers. These roles and rules help maintain fiscal transparency, data integrity, and accountability across the broader state financial ecosystem. Building on the data exchange protocols and technical elements, develop a memorandum of understanding regarding data sharing and technical protocols, including an agreed upon project timeline and resource requirements.

Develop Integration Specifications and Workflows

Develop comprehensive technical and functional specifications, as well as clearly defined workflows. The specifications would detail data formats, exchange protocols (e.g., APIs, web services, ETL processes), data dictionaries, and mapping logic between systems, ensuring consistency and interoperability.
These specifications need to adhere to state-mandated rules regarding fund accounting, object coding, and fiscal year cutoffs, with audit trails maintained for all data transfers. As integration needs evolve, CTDOT must also analyze and document existing business processes to identify gaps and opportunities to align workflows across systems. This involves stakeholder collaboration to define new process flows, decision points, exception handling, and data validation rules that support integrations. Establishing reusable integration patterns, interface specifications, and governance frameworks will help ensure current system integrations are robust, while also enabling scalable, adaptable connections to future enterprise solutions.

Develop Interfaces and Perform Unit Testing and System Integration Testing

Using the defined interface specifications (and data mappings) develop and unit test interfaces between Core and other systems. Plan and conduct system integration testing (SIT) prior to implementation of new integration points. Development, unit testing and SIT may take place as part of Enterprise Asset Management/Maintenance Management software and Program and Portfolio Management support tools initiatives.

Implement New Enterprise-Level Core Integration Workflows

Implement new integrated process using tools, data and information effectively. Update the enterprise level workflows as needed and educate staff on new standards for interfacing with Core, including the importance of data integrity and Core's role as the State's official accounting records system.

Improvement Initiative I. | Information

Establish and Maintain Central Location for CTDOT Data

INITIATIVE DESCRIPTION

Building on past efforts, create a central data location to store key information, allowing users easier access to information, and improve enterprise-wide reporting and analytics.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — TBD

Key Benefits

- Removes data silos and define data sources allowing for a central point of access (and a "single version of truth") across CTDOT.
- Provides holistic reporting and better decision-making capabilities.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Formalize Data Governance
- Improve Data Sharing and Integration with Core
- Establish Central Data Source for Public Transit Analytics
- All software initiatives

Resources Needed

- Project manager
- Business sponsor
- Functional lead
- IT lead
- Data architect
- Change management/training lead
- A working group, with leads from all Bureaus

Implementation Actions

Planning: Define Objectives and Requirements for the Central Data Location Related to Data Governance.

Review and update comprehensive list of CTDOT active applications and data stores. Building on the data governance and public transit analytics efforts, continue to define attributes and information to be collected. In addition, conducting an enterprise data warehouse maturity assessment (using any of the freely available tools, including the SlimGIM EDW maturity assessment tool that is expected to be released by the end of 2025 as a part of NCHRP 23-29 report) will help CTDOT to identify the next steps towards a central2 data repository. Consider the different data management methods (such as traditional centralized data warehouse, data lake, lakehouse, data mesh and data fabric) to identify the best approach (or combination) for CTDOT's data and needs.

Planning: Select the Right Platform(s) for Data Ingestion, Storage, Processing, and Analytics.

Based on the preferred data management method(s) and associated data architecture decisions, identify the preferred data management platform(s). Consider such factors as scalability, security, and ease of integration with existing systems. Design a standard schema and establish processes for data transfer, update and ongoing management. Prepare a conceptual architecture showing the connections and transfers between different software to the central data location/warehouse. Ensure flexibility for future updates.

Planning: Design a Data Architecture, Building on Data Governance Efforts to Identify Key Data Sources.

Building on the conceptual architecture, software list and information elements, prepare and execute the plan for the data analytics platform.

[2] "Central" refers to having a unified data repository, and may include a combination of traditional centralized data warehouses and newer decentralized lakehouse or data mesh.

Execute: Ingest, Transform, and Transport Data.

Prepare and execute the data flow plan, integrating the different software tools and data stores. This may include a combination of traditional batch Extract, Transform, Load (ETL) processes, Application programming interfaces (APIs) and prebuilt connectors for integrations.

Execute: Implement Data Analytics.

Build on reporting and analytics requirements to implement the right analytics tools. Start using the tools to present and visualize information stored in the unified data repository to support more informed decision-making.

Execute: Monitor and Optimize.

Create an action plan for continuous improvements, both for unified data management, and data reporting and analytics.

Execute: Maintain Central/Unified Data Repository (Based on Architecture and Plan for Scalability).

Continue monitoring and adjusting the data management plan, data architecture, required analytics, and associated platforms and tools based on new/updated business needs and new technologies.

Improvement Initiative J. | Processes

Strengthen IT Governance

INITIATIVE DESCRIPTION

Establish and formalize a clearly defined method to consistently identify, prioritize, and track IT initiatives agency wide. This ensures CTDOT investments in IT projects and initiatives align with agency strategic priorities and business needs. The IT Governance project scope will leverage the work done to date by CTDOT including current SOPs and IT Strategic Plan.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 8-12 Months

Key Benefits

- Improves prioritization for all technology-related projects.
- Enhances alignment of technology spend with CTDOT strategic priorities.
- Creates greater awareness and transparency among stakeholders regarding CTDOT goals, focus, and delivery expectations for IT-related projects.
- Reduces technical debt and inconsistent technology across the enterprise (including avoiding future technical debt).

Dependencies and Adjacent Initiatives

- Formalize Data Governance

Resources Needed

- Project manager
- Business/IT sponsor
- IT lead
- Chief data officer
- Data lead
- Change management/training lead
- A working group, with leads from all Bureaus

Implementation Actions

Identify People, Processes, and Priorities for IT Governance

To effectively implement IT Governance, actions will focus on aligning people, processes, and priorities. Key personnel/levels for IT governance include the following:

- An accountable executive as a primary sponsor of the roadmap, to ensure oversight, and to discuss strategic priorities with BITS.
- A steering committee for strategic guidance, establishing the priority and timing for the initiatives. This team would include both business and technology team stakeholders and may include BITS members as non-voting members.
- A portfolio review team to assess project value and alignment. This team would regularly confirm/validate the needs and priorities with a business view and help articulate needs for the steering committee.
- A dedicated IT governance coordinator to serve as the point of contact for IT governance activities, communications, managing the IT request intake process, and for implementing the standard operating procedures (SOPs).

Governance processes will be updated and communicated to intake and scope IT project requests, with structured evaluation and scoring criteria to approve or deny requests based on strategic fit, risk, and value. Prioritization efforts will culminate in the development of a comprehensive two- to five-year IT implementation roadmap, as a supplement to strategic technology roadmap, to guide long-term planning and investment decisions.

Formalize and Communicate Roles and Responsibilities

To ensure clarity and accountability within IT governance, it is essential to formally define and communicate the roles and responsibilities of all involved stakeholders. This includes establishing clear mandates for the accountable executive, the steering committee, the portfolio review team, and the IT governance coordinator. This multi-level structure enables informed decision-making, promotes consistency in project evaluation, and ensures that governance activities are integrated across strategic, tactical, and operational teams.

Each role should be documented in governance charters and SOPs, outlining decision-making authority, oversight duties, and coordination responsibilities. The charters and SOPs should include a list of all members (for each governance level), with their names, titles and contact information.

Regular communication through training sessions, documentation dissemination, and stakeholder briefings will reinforce understanding and alignment. This structured approach promotes transparency, enhances cross-functional collaboration, and ensures consistent execution of governance processes across the organization.

Design and Implement Project Review Framework and Process

To formalize the IT governance framework and a structured project prioritization/review process, a structured lifecycle process will be implemented, guiding initiatives from project intake through implementation and ongoing maintenance. This will include the development of a project scoring process to evaluate and compare projects in terms of their strategic value to the agency.

The framework begins with a standardized intake process where project requests are submitted and initially reviewed for completeness and alignment with strategic objectives. Approved requests undergo a detailed evaluation and scoring process based on predefined criteria such as business value, risk, resource requirements, and impact. Projects that meet threshold scores are prioritized and incorporated into a managed portfolio.

Projects may be slotted to begin in the next fiscal year or a future fiscal year within the overall technology program. Once prioritized, projects proceed through structured planning, execution, and monitoring phases, with oversight provided by governance bodies to ensure adherence to standards, timelines, and budgets.

Post-implementation, projects transition into maintenance with continuous performance reviews and alignment checks, ensuring long-term value and sustainability within the IT ecosystem.

Communicate, Monitor, and Adjust the Process

Effective communication of the IT governance structure, processes, and prioritization criteria is critical to ensuring organization-wide understanding, alignment, and engagement. A comprehensive communication plan will be developed to disseminate governance roles, decision-making workflows, and evaluation criteria to all stakeholders through various channels, including formal documentation, intranet portals, training sessions, and periodic briefings.

This transparency promotes accountability and encourages informed participation across Bureaus. In parallel, a feedback and monitoring mechanism will be established to assess the effectiveness of the governance processes over time. Metrics, stakeholder input, and performance reviews will be regularly analyzed to identify areas for improvement, enabling continuous refinement of the governance framework to adapt to evolving business needs and technological changes.

Improvement Opportunity K. | Processes

Formalize Data Governance

PROJECT DESCRIPTION

Elevate the importance of data as a valuable CTDOT asset. This effort will help formalize and guide the process to define, collect, manage, maintain, and protect CTDOT data. These efforts would build on the Data Officer's current data education efforts.

TIMEFRAME TO BEGIN — Short-Term

FULL IMPLEMENTATION DURATION — 6-36 Months

Key Benefits

- Improves access to data and information across the agency.
- Improves data quality, currency, and consistency.
- Removes data silos.
- Provides holistic reporting and better decision-making capabilities.
- Supports managing data as an asset.

Dependencies and Adjacent Initiatives

- Strengthen IT Governance
- Establish Central Data Source for Public Transit Analytics
- Improve Data Sharing and Integration with Core

Resources Needed

- Project manager
- Data architect
- Data analysts
- Business/functional leads
- Change management/training lead
- A working group, with leads from all Bureaus

Implementation Actions

Refine Data Governance and Information Management Strategies.

Review and update data governance and information management definitions and strategies, including alignment with existing data governance standards and practices (e.g., for Core data). Identify staffing required to support data governance structure (including additional full time employee support required and outlining a plan for obtaining these resources). Consider executive sponsors, data governance committee members, and data stewards as a part of the data governance framework. This would include continuing activities to educate staff on the definition and value of data governance. Consider additional resource(s) responsible for change management that work with the data governance committee to ensure effective communication and accelerating the desire throughout CTDOT for effective data governance.

Create Data Governance Roadmap.

Create an action plan and communication plan as determined by CTDOT for data governance implementation and transparency. Consider opportunities for incremental improvements to improve access to data while implementing longer-term recommendations such as the shared data repository.

Establish Data Sources and Definitions.

Define definitive data sources for specific types of information aligned with Statewide data governance, including identifying where the data is created, read, updated and archived. In parallel, create a data dictionary that would include standard attributes and their definitions that will be used across multiple data systems and reports. Establish a data catalog that includes architecture standards, metadata related to business and technical requirements and standards tools to use across the enterprise.

Design standards for data schemas and establish Extract, Transform and Load (ETL) processes that accommodate all the necessary fields and formats for the data and ensure flexibility for future updates. Perform these activities for each type/class of data in a priority order based on business criticality of data. CTDOT would start with an initial focus on asset management, project delivery and public transit data—which would align with the key software that need to be replaced and with the public transit analytics improvement initiative.

Establish Data Management Processes and Communicate Across Enterprise.

Update data governance policies and distribute across CTDOT. Consider such factors as scalability, security, and ease of integration with existing systems. Communicate the efforts across the enterprise with ongoing training and education initiatives. Ensure there is a focus on change management, communication, and internal training for unique processes. Document the new internal, administrative, and technical processes and then distribute and educate across the agency for knowledge transfer.

Assess Data Quality.

Conduct data quality assessment on datasets produced and/or managed. Identify gaps and develop recommendations for addressing gaps in data quality.

Connect Data Sources.

Connect systems as determined by CTDOT aligned with the data analytics initiative (central data repository), the data sharing and integration with Core initiative and business needs. Data should be consistent, reliable, secure, and accessible by roles as required.

Transition Data from Legacy to Enterprise Standards.

Execute the implementation plan for established data governance, transitioning data sets to be fully compliant with CTDOT's data governance program.

Implement, Monitor, and Adjust (Continuous Improvement)

Create an action plan for continuous improvement including a lessons learned discussion after the first year of implementation. Continue monitoring and adjusting the data governance goals and processes as required and continue ongoing data quality initiatives.