Capital Program Management System (CPMS)

Business Requirements Document (BRD)

2014

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Contractor, Maryland Department of Transportation (MDOT)

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Document Revision History

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Acronyms / Definitions

Term	Description
Consolidated Transportation Program (CTP)	Maryland's six-year capital budget for transportation projects. The CTP contains projects and programs across the Department, including the Maryland Aviation Administration, the Motor Vehicle Administration, the Maryland Transit Administration, the Washington Metropolitan Area Transit Authority, the Maryland State Highway Administration, the Maryland Port Administration, and the Maryland Transportation Authority.
Comprehensive Work Schedule (CWS)	The quarterly reporting process administered by MDOT's Office of Capital Planning and Programming to monitor and approve state transportation capital projects and programs.
CWS Worksheet	Briefing document compiled in Microsoft Excel used by the Office of Planning and Capital Programming to illustrate quarterly capital cash flow changes and reasons for those changes.
Financial Management Information System (FMIS)	MDOT's financial management system used by MVA, SHA, MPA, MAA, and MTA.
Maryland Aviation Administration (MAA)	Modal administration within MDOT that operates Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall) and Martin State Airport as well as provides grant funding to regional airports.
Maryland Department of Transportation (MDOT)	State department that has direct coordination and oversight of all modes of transportation in Maryland.
Maryland Port Administration (MPA)	Modal administration within MDOT that is responsible for the operation of various public marine terminals in Baltimore as well as promotes the Port of Baltimore as a leading hub for cargo and for cruise activity.
Maryland Transit Administration (MTA)	Modal administration within MDOT that is responsible for providing local and regional public transit services on bus and rail, as well as grant funding and technical assistance to Locally-Operated Transit Systems (LOTS) across Maryland.
Motor Vehicle Administration (MVA)	Is a modal administration within MDOT that provides services for drivers and vehicles in Maryland, including registration and licensing.
Maryland Transportation Authority (MDTA)	Independent agency responsible for operating and maintaining the State's eight toll facilities. The MDOT Secretary serves as Chairman of the MDTA.
Solomon	Maryland Transportation Authority (MDTA)'s financial management system. This system is used solely by MDTA.
State Highway Administration (SHA)	Modal administration within MDOT that is responsible for managing the State's highway system.
Washington Metropolitan Area Transit Authority (WMATA)	Independent transportation agency responsible for operating Metrorail and Metrobus in the Washington Metropolitan Area. MDOT supports WMATA through annual operating grants in accordance with the interstate compact.

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1.0 MANAGEMENT SUMMARY

The Maryland Department of Transportation (MDOT HQ) is responsible for the management of the state transportation capital program funding across various modal administrations. MDOT HQ and the various modal administrations currently use the Capital Program Management System (CPMS) to manage and report their capital program.

CPMS is a series of Microsoft Access databases consisting of SQL statements and macros that control calculations, queries, reports, and other functionality. MDOT HQ is responsible for the management of CPMS through a maintenance contract with Computer Sciences Corporation (CSC). MDOT HQ inputs data and extracts data from CPMS to compile quarterly reports. Each quarter a Comprehensive Work Schedule (CWS) document is prepared. The 1st quarter a draft Consolidated Transportation Program (CTP) report is created and the 3rd quarter a final Consolidated Transportation Program (CTP) report is created from data provided from each transportation mode.

The following modal administrations are represented in the CWS, draft CTP, and final CTP:

Maryland Port Administration (MPA)
Maryland Aviation Administration (MAA)
Maryland Transportation Authority (MDTA)
Maryland State Highway Administration (SHA)
Maryland Transit Administration (MTA)
Maryland Motor Vehicle Administration (MVA)
Washington Metropolitan Area Transit Authority (WMATA)
Transportation Secretary's Office (TSO)

The modes provide MDOT HQ with data that is used in the creation of the CWS, draft CTP, and the final CTP. Additionally, many modes use CPMS for the day-to-day management of their capital program to monitor and track project cash flow, status, and schedules.

CPMS was created by contract developers associated with Computer Sciences Corporation (CSC). The original intent of CPMS was to:

- Manage project data and schedules
- Develop the draft CTP and final CTP
- Create the quarterly CWS
- Perform quarterly Federal Aid assumption analysis
- Forecast project cash flows
- Move data to and from other non-CPMS systems

Each mode is assigned a Microsoft Access Database and related utilities. The mode is responsible to input project data and cash flow information into the database each quarter. The mode saves the data and provides MDOT HQ with a copy of the saved database file. MDOT HQ manually uploads the database file into the MDOT HQ CPMS Application (access database). MDOT HQ reviews the mode information and creates a CWS, a draft CTP, and / or a final CTP.

1.1 Objectives to be Met

- Describe CPMS current state
- List future CPMS business requirements
- Propose solution(s) to replace existing system

1.2 Functional Capabilities to be Addressed

- Business Use Current State
- Future Business Requirements

1.3 Organizational Areas Affected

Maryland Department of Transportation (MDOT) Office of Planning & Capital Programming
Maryland Department of Transportation (MDOT) Finance
Maryland Department of Transportation (MDOT) Audit
Maryland Port Administration (MPA)
Maryland Aviation Administration (MAA)
Maryland Transportation Authority (MDTA)
Maryland State Highway Administration (SHA)
Maryland Transit Administration (MTA)
Maryland Motor Vehicle Administration (MVA)
Washington Metropolitan Area Transit Authority (WMATA)
Transportation Secretary's Office (TSO)
Maryland Department of Legislative Services (DLS)

1.4 Reason for Project & Project Methodology

CPMS was originally developed in the early 2000's. Recent years various modifications and upgrades have provided temporary solutions to the growing need for a more robust and modern platform to manage the transportation capital program. MDOT is experiencing various technical glitches due to Microsoft Access software upgrades. Additionally, MDOT experienced difficulty finding contract support to maintain this legacy system. These growing issues have compromised the functionality and reliability of the system.

Initially, a case study was requested. The case study was to explore in detail the current CPMS environment and based on findings suggest possible strategies to either retain the current system, modify the current system, and / or replace the current system. MDOT engaged Infojini (contractor) to provide a business analyst to create a case study.

At the start of the project, MDOT HQ leadership determined that a case study was not needed to explore the current CPMS environment. MDOT HQ leadership reasoned they already understood that retaining or modifying the current system would not be viable solutions. This reasoning was explained because Microsoft Access was already determined to be an inadequate structure for their ongoing and future needs. MDOT HQ leadership and the contractor agreed to modify the project deliverable from a case study to a Business Requirements Document (BRD).

CPMS
Business Requirements Document (BRD)

A BRD provides each stakeholder the opportunity to indicate how they currently use CPMS. The BRD captures future system requirements suggested by stakeholders. The CPMS BRD will provide future analysts, project managers, and developers with a path to follow when organizing development efforts.

The contractor used the following strategies to create the CPMS BRD and communicate project updates:

- Researched existing systems
- Researched possible vendors
- Reviewed existing CPMS documentation
- Reviewed current CPMS functionality
- Arranged meetings to document stakeholder current CPMS usage
- Arranged meetings to document stakeholder future CPMS business requirements
- Provided CPMS project owners with weekly project updates
- Facilitated formal and informal project update meetings

Before the end of the project MDOT HQ requested the contractor to add case study elements into the CPMS BRD. The final deliverable is a hybrid document that provides some case study elements and BRD elements.

The contractor suggests government organizations who consider new system development use the following steps:

1. Conduct internal formal and informal information gathering / sharing discussions regarding the current system
2. Perform business process modeling efforts for those areas / individuals who contribute to the current system and / or depend on information from the current system
3. Engage Procurement to determine appropriate vehicles for any anticipated vendor engagement if internal skill set is not available
4. Conduct a formal case study and / or formal needs analysis
5. Create a BRD written with a development audience in mind that captures the current state and captures future business requirements (the document should focus on what the business would like the new system to do not how the system should do it)
6. Send the BRD out to external vendors and to internal IT groups for request for information and / or request for quote (the deliverable should indicate what technologies the organization will use to develop the new system and general costs estimates that include when appropriate, hardware, software, server(s), customized development, project oversight, etc.)
7. If appropriate send out for request for proposal requesting awarded vendor to provide the following deliverables: functional requirements document, technical specifications document, system development, periodic system demo's, system technical QA, system User Acceptance Testing, system roll out to production plan, system documentation, user system training materials, and if appropriate system maintenance plan

2.0 STAKEHOLDERS

Stakeholder	Participants
Maryland Department of Transportation (MDOT) Office of Planning & Capital Programming	Brian Martin, Assistant Director William Appold, Manager, Consolidated Transportation Program Andrea Anderson, Capital Program Analyst Robert DiPietro, Capital Program Analyst Dan Favarulo, Capital Program Analyst
Contract Developers	Jerry Navratil Kerri Griffin
Maryland Department of Transportation (MDOT) Finance	Don Sellner, Policy Analyst Michael Mikolajczyk, Policy Analyst
Maryland Department of Transportation (MDOT) Audit	Brenda Cachuela, Director, MDOT Office of Audits
Maryland Port Administration (MPA)	Tony Moore Special Assistant , Office of Capital Planning
Maryland Aviation Administration (MAA)	Merrilyn Williams Director, Office of Capital Programs
Maryland Transportation Authority (MDTA)	Suhair Alkhatib Capital Program Manager, Division of Capital Planning
Maryland State Highway Administration (SHA)	Felicia Alexander, Office of Planning & Preliminary Engineering Paul Wenck, Office of Planning & Preliminary Engineering Perry Smith, Program Development Brian Wilbur, Program Development
Maryland Transit Administration (MTA)	Holly Arnold, Manager, Office of Capital Programming Mike Helta, Chief, Office of Capital Programming
Maryland Motor Vehicle Administration (MVA)	Tim Herman, Senior Planner, Office of Planning & Programming
Washington Metropolitan Area Transit Authority (WMATA)	Cristin Tolen, Acting Director, Washington Area Transit Programs
Transportation Secretary's Office (TSO)	Dan Favarulo, Capital Program Analyst
Maryland Department of Legislative Services (DLS)	Jonathan Martin, Policy Analyst Steve McCulloch, Policy Analyst

3.0 RISK ASSESSMENT

The Department of Transportation Secretary's Office Audit Report dated November 2012 cited the following CPMS risks:

- MDOT had not established adequate procedures to verify the accuracy of expenditure and estimated cost data recorded in CPMS by MDOT's modals to help ensure the reliability of data used for decision making purposes.

- Access to CPMS was not adequately documented or monitored as there was no formal process for documenting user access requests and approvals.

The contractor, MDOT Audit, and MDOT HQ indicate the following risks:

- Maryland Department of Transportation (MDOT) Office of Planning & Capital Programming (OPCP) inexperience in the management of IT system contracts. OPCP is a transportation planning and programming office and lacks the necessary expertise to continue the management of IT systems.

- CPMS is not integrated into MDOT HQ systems or modal administration systems. As a result, there is often conflicting capital program information between the modal databases, the various MDOT CPMS modules, and other financial systems.

4.0 ASSUMPTIONS

Section 6.1.1 Statement of Business Requirements contains duplicate business requirements under the 'Business Requirements Detail' area. Many of the modal administrations and MDOT HQ suggested similar business requirements.

5.0 STATEMENT OF BUSINESS REQUIREMENTS

5.1 Background

Computer Sciences Corporation (CSC) created CPMS for the Maryland Department of Transportation (MDOT) Office of Planning & Capital Programming. CSC developed CPMS to:

- Manage project data and schedules
- Develop the draft CTP and final CTP
- Create the quarterly CWS
- Perform quarterly Federal Aid assumption analysis
- Forecast project cash flows
- Move date to and from other non-CPMS systems

CSC provides system maintenance and programs new system updates. MDOT and each mode has the ability to request CSC to perform system fixes and upgrades.

CSC defined CPMS as a core system with customized subsystems.

Name	Core	Subsystem	Description / Function
CPMS Application	X		A customizable mode specific Microsoft Access Database. Allows user direct input into the database through a series of Microsoft Access custom built input areas (forms).
CPMS Version Update Utility		X	A Microsoft Access Database Macro. Allows user to run a manual macro that retrieves the latest version of the CPMS Application that resides on a shared / network server.
Ad Hoc Reporting Database		X	A Microsoft Access Database series of open queries and reports. Allows user to query and / or pull Microsoft Access Reports from database tables found in the CPMS Application.
Quarterly Snapshot		X	A Microsoft Access Database series of defined queries / reports. Allows user to pull and save a Microsoft Access Report specific to a defined time period.
Analyze		X	A Microsoft Access Database defined query / reporting tool. Allows user to query and / or pull Microsoft Access Reports from database tables found in the CPMS Application with defined formulas / calculations applied.

Initially, CSC created 4 distinct CPMS modules and describes them in the following manner:

MDOT CPMS - consists of 1 Headquarters CPMS application, 1 version update utility, and 1 Ad Hoc subsystem.
MTA CPMS – consists of 1 MTA CPMS application, 1 version update utility, 1 Ad Hoc subsystem, 1 quarterly snapshot subsystem, 1 analyze subsystem, and 1 import FA subsystem.
SHA CPMS – consists of 1 SHA CPMS application, 1 version update utility, 1 Ad Hoc subsystem.
Generic CPMS – consists of 1 generic CPMS application, 1 version update utility, 1 Ad Hoc subsystem, 1 quarterly snapshot subsystem.

CSC created the Generic CPMS application for use by all modes except MTA and SHA. Generic CPMS versions were later transitioned into specific CPMS modules for MDTA, and MVA.

CSC created and describes these updated generic CPMS modules in the following manner:

MDTA – consists of 1 generic CPMS application, 1 generic version update utility, 1 customized Ad Hoc subsystem, 1 generic quarterly snapshot subsystem.
MVA - consists of 1 generic CPMS application, 1 generic CPMS application used for CTIPP data, 1 generic version update utility, 1 generic Ad Hoc subsystem, 1 generic quarterly snapshot subsystem.

5.2 Current Environment

CPMS is a data input and reporting tool. However, many transportation modes use CPMS for the day-to-day management of their capital program to monitor and track project status and schedules.

Currently, each modal administration (except WMATA) is assigned a CPMS Module. Each mode is responsible to input project data and cash flow information into their CPMS Application (access

database) each quarter. The mode saves their data and then manually provides MDOT HQ with a copy of the saved database file. MDOT HQ manually uploads the database file into the MDOT HQ CPMS Application (access database).

Depending on the quarter, MDOT HQ prepares the following:

- ✓ A quarterly Comprehensive Work Schedule (CWS) document
- ✓ A 1st quarter draft Consolidated Transportation Program (CTP) report
- ✓ A 3rd quarter final Consolidated Transportation Program (CTP) report

Current CPMS Overview
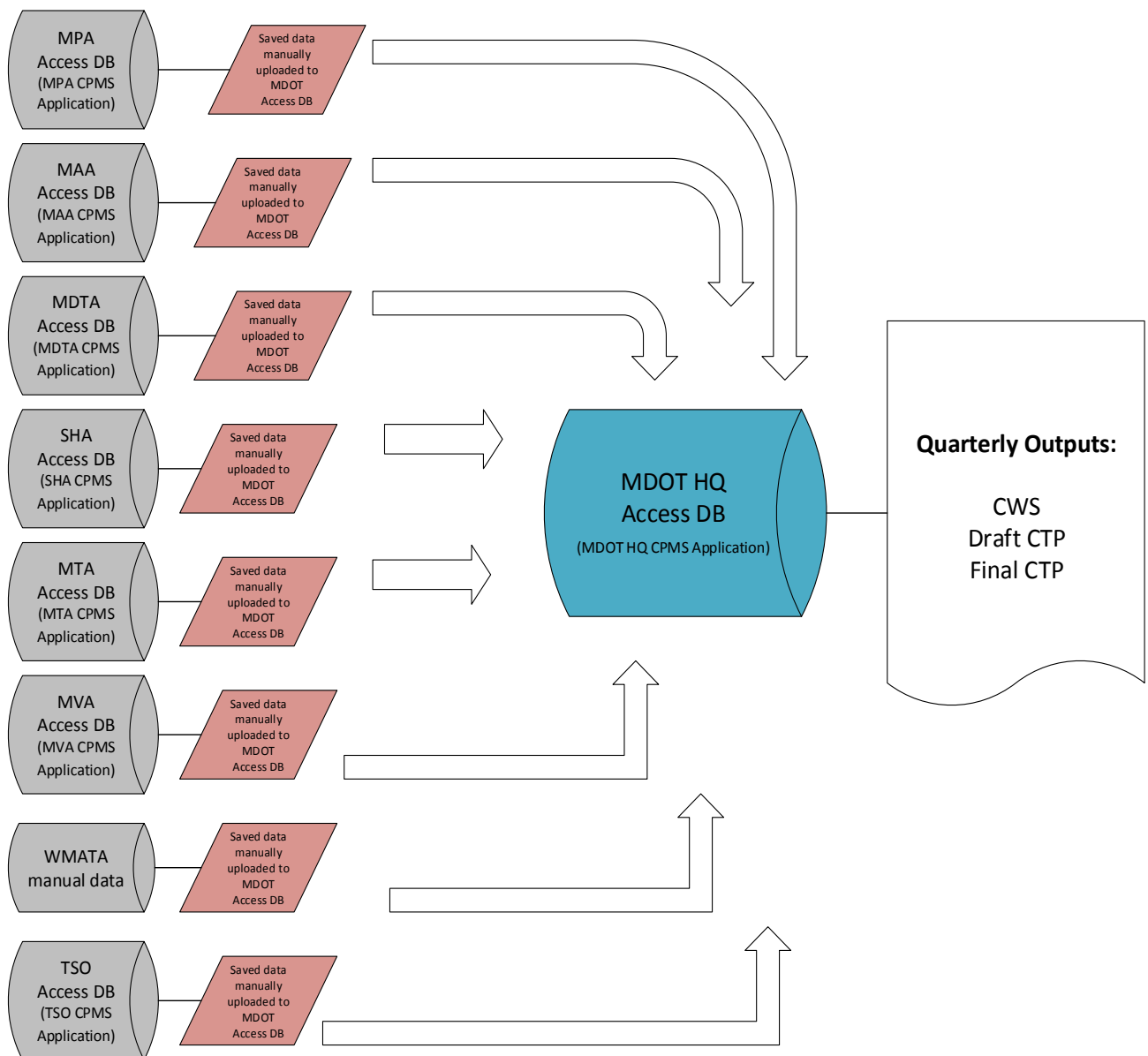
CSC currently supports the following CPMS Modules:

MDOT CPMS - consists of 1 Headquarters CPMS application, 1 version update utility, and 1 Ad Hoc subsystem.
Generic CPMS – consists of 1 generic CPMS application, 1 version update utility, 1 Ad Hoc subsystem, 1 quarterly snapshot subsystem. The Generic CPMS Module is used by MPA and MAA.
MTA CPMS – consists of 1 MTA CPMS application, 1 version update utility, 1 Ad Hoc subsystem, 1 quarterly snapshot subsystem, 1 analyze subsystem, and 1 import FA subsystem.
SHA CPMS – consists of 1 SHA CPMS application, 1 version update utility, 1 Ad Hoc subsystem.
MDTA CPMS – consists of 1 generic CPMS application, 1 generic version update utility, 1 customized Ad Hoc subsystem, 1 generic quarterly snapshot subsystem.
MVA - consists of 1 generic CPMS application, 1 generic CPMS application used for CTIPP data, 1 generic version update utility, 1 generic Ad Hoc subsystem, 1 generic quarterly snapshot subsystem.
TSO CPMS - consists of 1 generic CPMS application, 1 generic version update utility, 1 customized Ad Hoc subsystem, 1 generic quarterly snapshot subsystem. MDOT HQ is the only user of the TSO CPMS Module.

MDOT HQ manually inputs WMATA CWS, Draft CTP, and Final CTP data into the MDOT HQ CPMS Application.

Additionally, the MDOT IT Group maintains Oracle Servers and has an employee knowledge base related to Oracle servers and databases.

5.2.1   Transportation Mode CWS, Draft CTP & Final CTP Preparation

Each mode prepares information to be included in the MDOT HQ deliverables: quarterly CWS, the draft CTP, and the final CTP.

5.2.1.1 MPA General Process & Sub Process Identification

MPA inputs data manually into CPMS on a **quarterly** basis. Several MPA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of MPA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the MPA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- MPA Spreadsheet (***sub process***)
- Financial data downloads (administered by Web Focus) from FMIS (***sub process***)
- Bid, Notice to Intent, Notice to Proceed
- Bi-Monthly Meetings with Executive Director, Operations, and Engineering
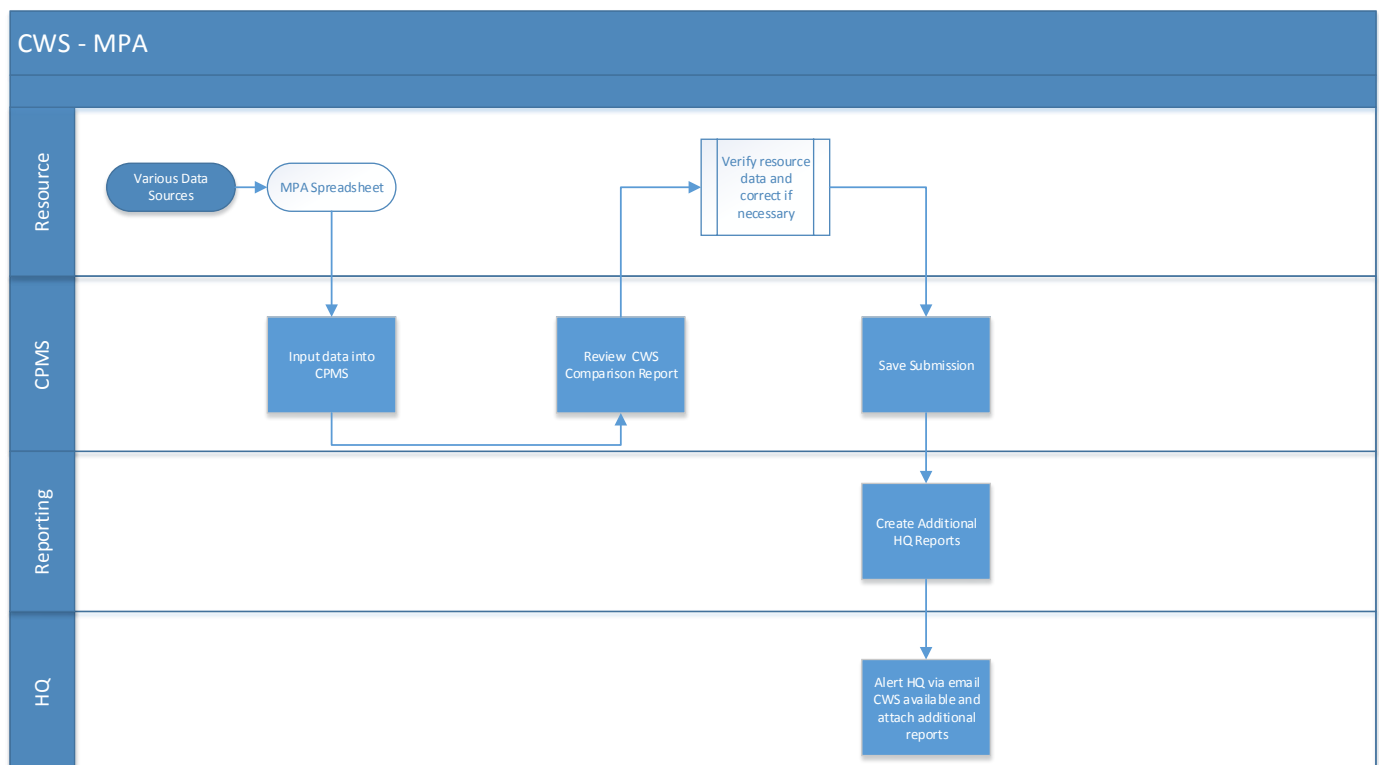
MPA CPMS User(s)
1 (admin. level security)

Steps (CWS)

- Input data into MPA Spreadsheet from various data sources
- Input MPA Spreadsheet data into CPMS
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- Cash flow adjustments made in MPA Spreadsheet – using CPMS Override functionality to update CPMS
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views and to analyze quarters
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that Major and Minor project information available (via email)
- Optional: Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs) (MPA has not used this option for some time)

CWS - MPA

Resource	Various Data Sources → MPA Spreadsheet		Verify resource data and correct if necessary
CPMS	Input data into CPMS	Review CWS Comparison Report	Save Submission
Reporting			Create Additional HQ Reports
HQ			Alert HQ via email CWS available and attach additional reports

Steps (Draft & Final CTP)

- Input data into MPA Spreadsheet from various data sources
- Input MPA Spreadsheet data into CPMS
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- Cash flow adjustments made in MPA Spreadsheet

- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends MPA a list of questions to address and MPA responds (performed every quarter)
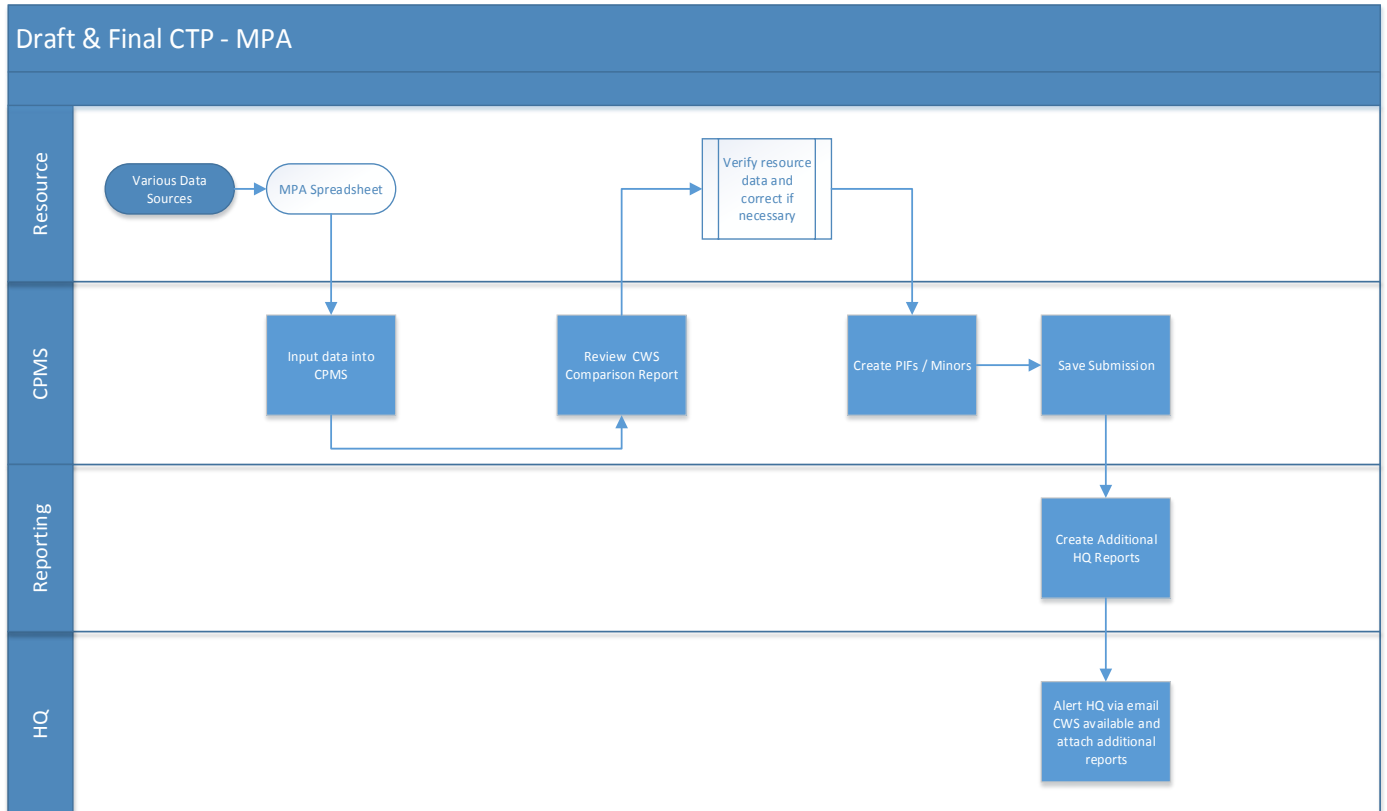
In addition to providing CWS and CTP information, every 2nd quarter MPA reconciles the dollars budgeted to the dollars spent. MPA achieves this by ensuring close #'s match the data downloaded from FMIS (*sub process*).

5.2.1.2 MAA General Processes & Sub Process Identification

MAA inputs data manually into CPMS on a **monthly** basis. Several MAA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of MAA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the MAA sub processes may benefit by being explored in future CPMS development efforts.
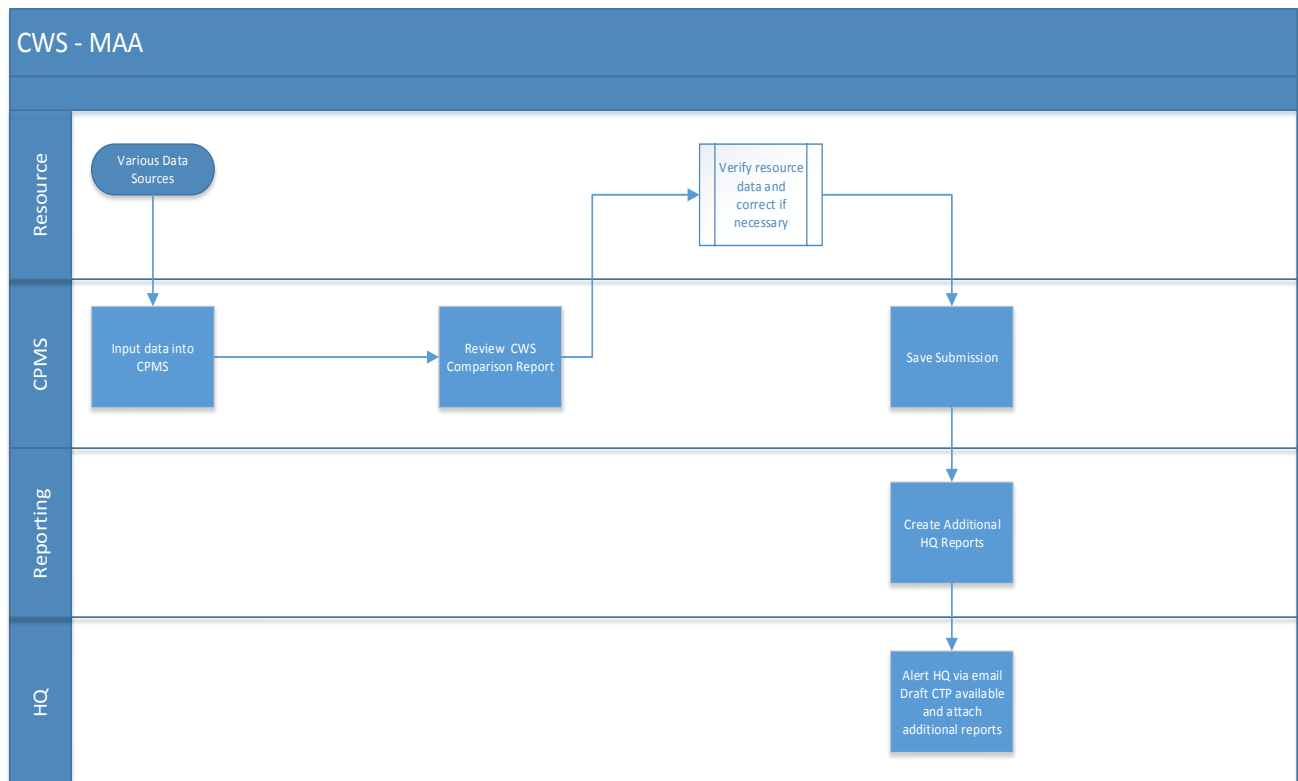
Data Source(s)

- Capitol Project Request Form (***sub process***)
- Project Schedule Updates (formats in Microsoft Word, PowerPoint, & Excel)
- FMIS Report
- FMIS Cash Flow Report (spreadsheet)
- Checkbook Accounts (manual invoices, records of transmittals, etc.)

Users
5 users (various security levels)

Steps (CWS)

- Input data into CPMS from various data sources
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)


Steps (Draft & Final CTP)

- Input data into CPMS from various data sources
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends MAA a list of questions to address and MAA responds (performed every quarter)
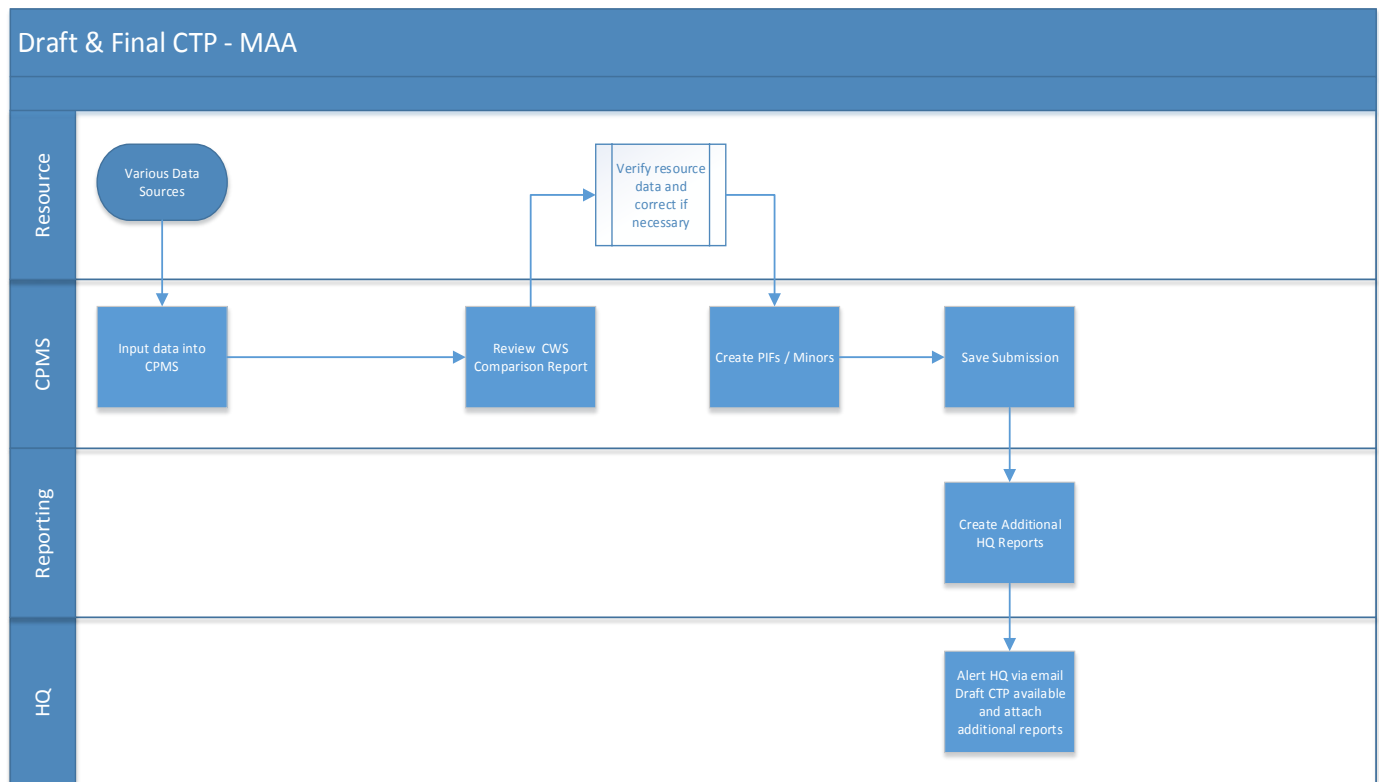
In addition to providing CWS and CTP information, every 2nd quarter MAA reconciles the dollars budgeted to the dollars spent. MAA achieves this by ensuring close #'s match the data downloaded from FMIS (**sub process**).

5.2.1.3 MDTA General Processes & Sub Process Identification

MDTA inputs data manually into CPMS on a **daily and monthly** basis. Several MDTA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources

consists of MDTA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the MDTA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- Project Action Form (PAF) (this is a ***sub process*** that requires meetings, approvals, etc.)
- Monthly Project Action Form Meeting
- Quarterly Meeting (this is a ***sub process*** that depends on a completed CPMS process)
- Various spreadsheets (Finance, Engineering, etc.)
- Advertisement (Ad) / Notice to Proceed (NTP) Schedule Spreadsheet (this is a ***sub process*** that requires reviews, approvals, etc.)
- Monthly NTP Meeting
- Solomon (MDTA uses Solomon not FMIS)

Users
2 users (admin. level security)

Steps (CWS)

- Input data into CPMS from various meetings, PAF Forms, NTP, etc.
- If new project: Review the completed Project Action Form. Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Review updated Project Action Form or other data sources. Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase (construction funds not placed in until project is 60% design) select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs) (MDTA Does not do this)
- After receipt of submission, HQ sends MDTA a list of questions to address and MDTA responds (every quarter)

CWS - MDTA

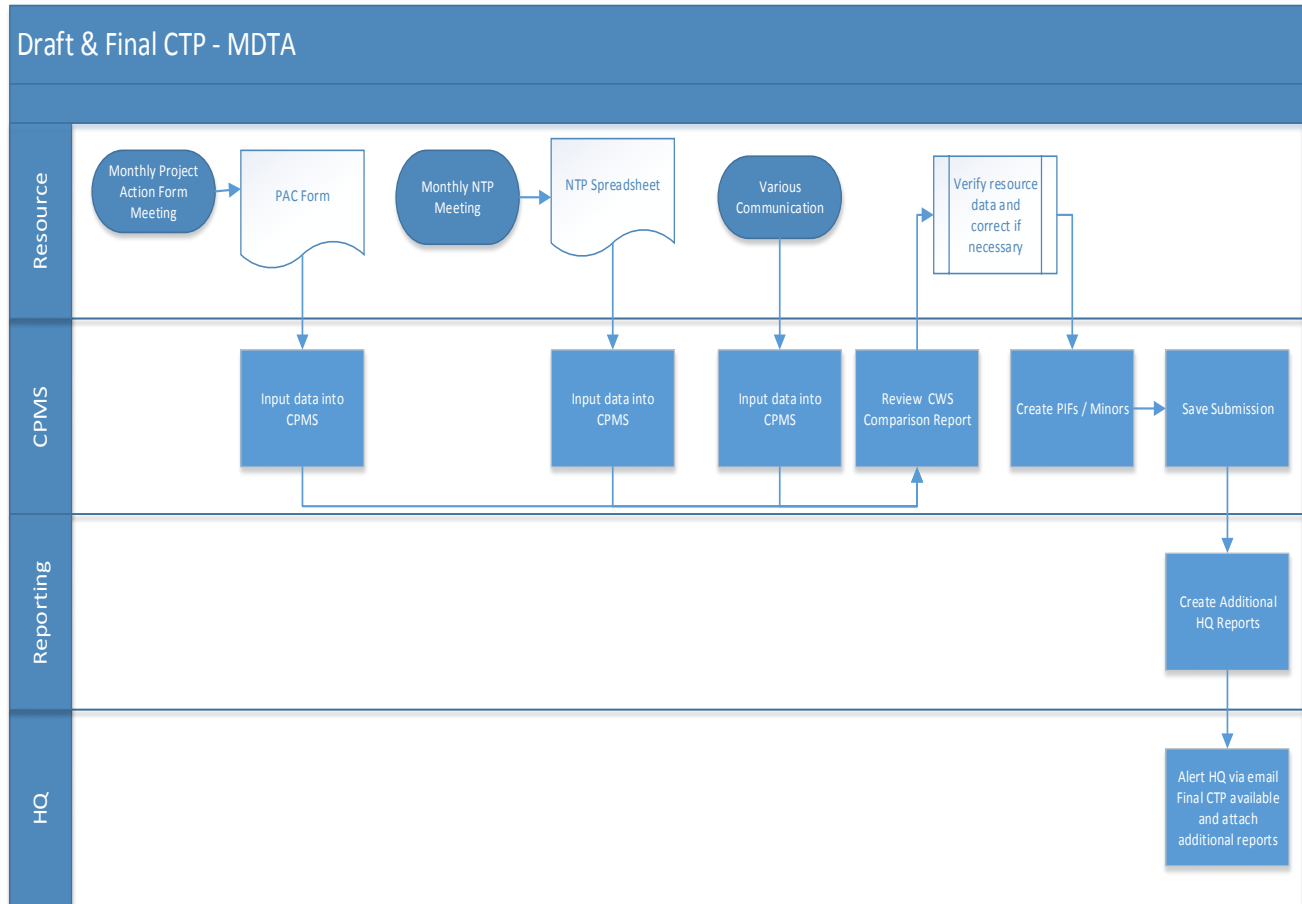| Resource | Monthly Project Action Form Meeting | PAC Form | Monthly NTP Meeting | NTP Spreadsheet | Various Communicaiton | | Verify resource data and correct if necessary |
CPMS		Input data into CPMS		Input data into CPMS	Input data into CPMS	Review CWS Comparison Report	Save Submission
Reporting							Create Additional HQ Reports
HQ							Alert HQ via email Draft CTP available and attach additional reports
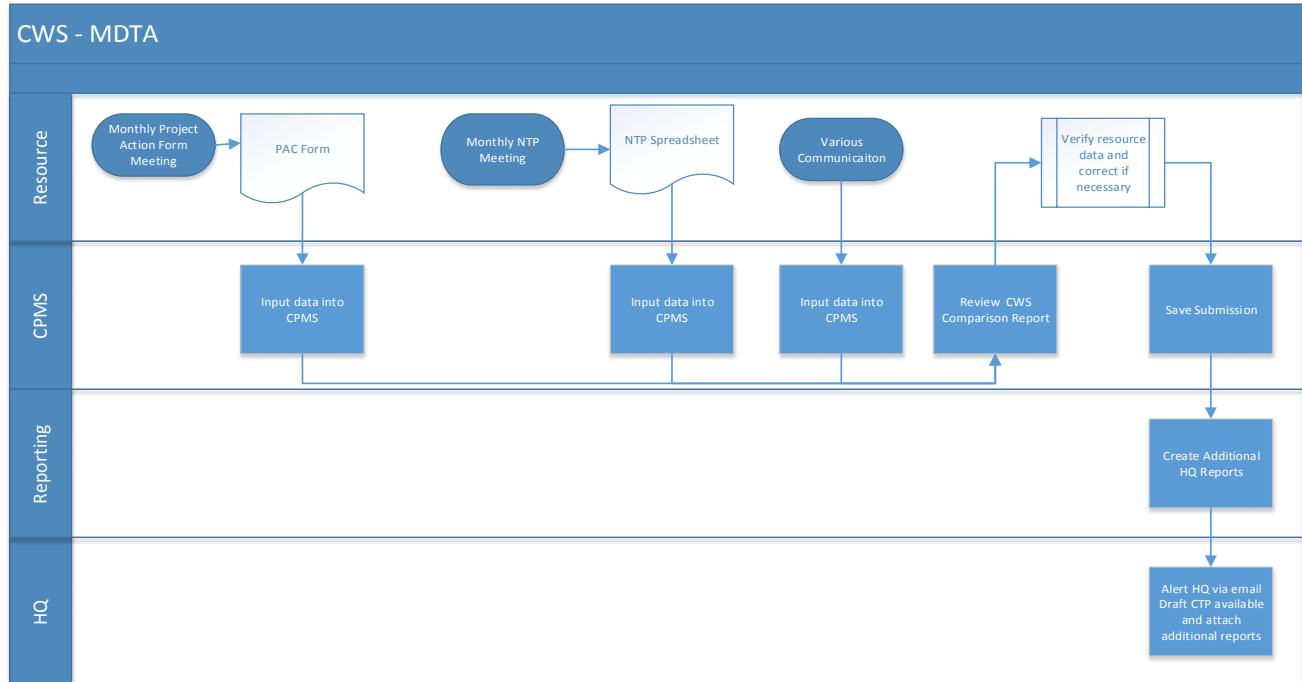
Steps (Draft & Final CTP)

- Input data into CPMS from various meetings, PAC Forms, NTP, etc.
- If new project: Review the completed Project Action Form. Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Review updated Project Action Form or other data sources. Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase (MDTA typically retains all funds in one phase) select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends MDTA a list of questions to address and MDTA responds (performed every quarter)

Draft & Final CTP - MDTA

Resource

Monthly Project Action Form Meeting → PAC Form

Monthly NTP Meeting → NTP Spreadsheet

Various Communication

Verify resource data and correct if necessary

CPMS

Input data into CPMS

Input data into CPMS

Input data into CPMS

Review CWS Comparison Report

Create PIFs / Minors

Save Submission

Reporting

Create Additional HQ Reports

HQ

Alert HQ via email Final CTP available and attach additional reports

Steps (Quarterly Meeting) – no process flow depiction

- Pull ad hoc reports from CPMS to use during Quarterly Meeting
- Print reports and review during Quarterly Meeting (approx.150 – 200+ pages)

In addition to providing CWS and CTP information, every 2nd quarter MDTA reconciles the dollars budgeted to the dollars spent (***sub process***).

5.2.1.4 SHA General Processes & Sub Process Identification

SHA inputs data manually into CPMS on a **quarterly** basis. Several SHA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of SHA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the SHA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- Form 42 Project Data Form (this is a ***sub process*** that requires meetings, approvals, etc.)
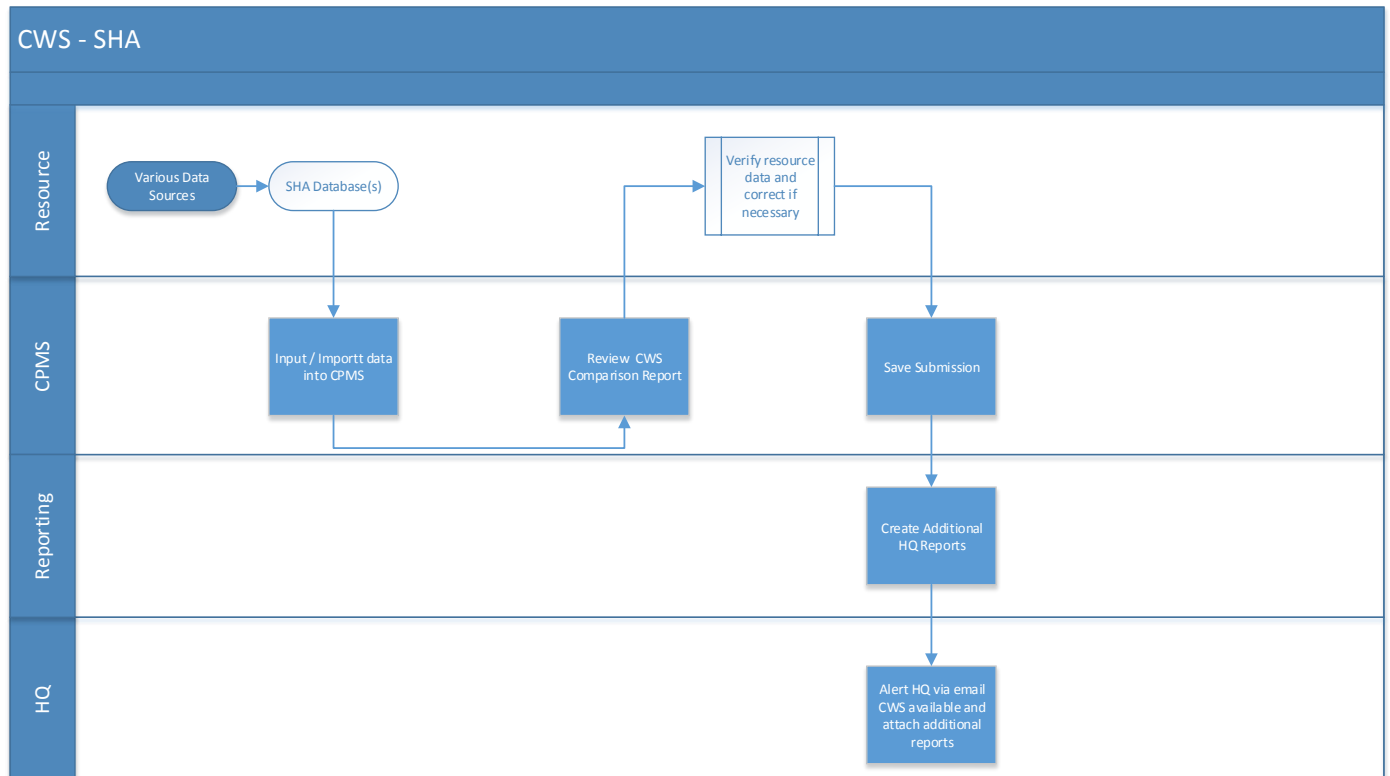- Quarterly Finance Report (Capital Forecasting System - CFS)

- SHA Database (Major Projects)
- SHA Database (Minor & System Preservation Projects) (*sub process*)
- Form 30 (**sub process**)
- Financial Advertisement Schedule (**sub process**)
- Internal SHA Spreadsheet (contains federal and state split percentages).

Users
3 users (admin. level security)

Steps (CWS)

- Input / Import data into CPMS from SHA Database(s)
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Save Submission (SHA does not have the snapshot subsystem)
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends SHA a list of questions to address and SHA responds (performed every quarter)
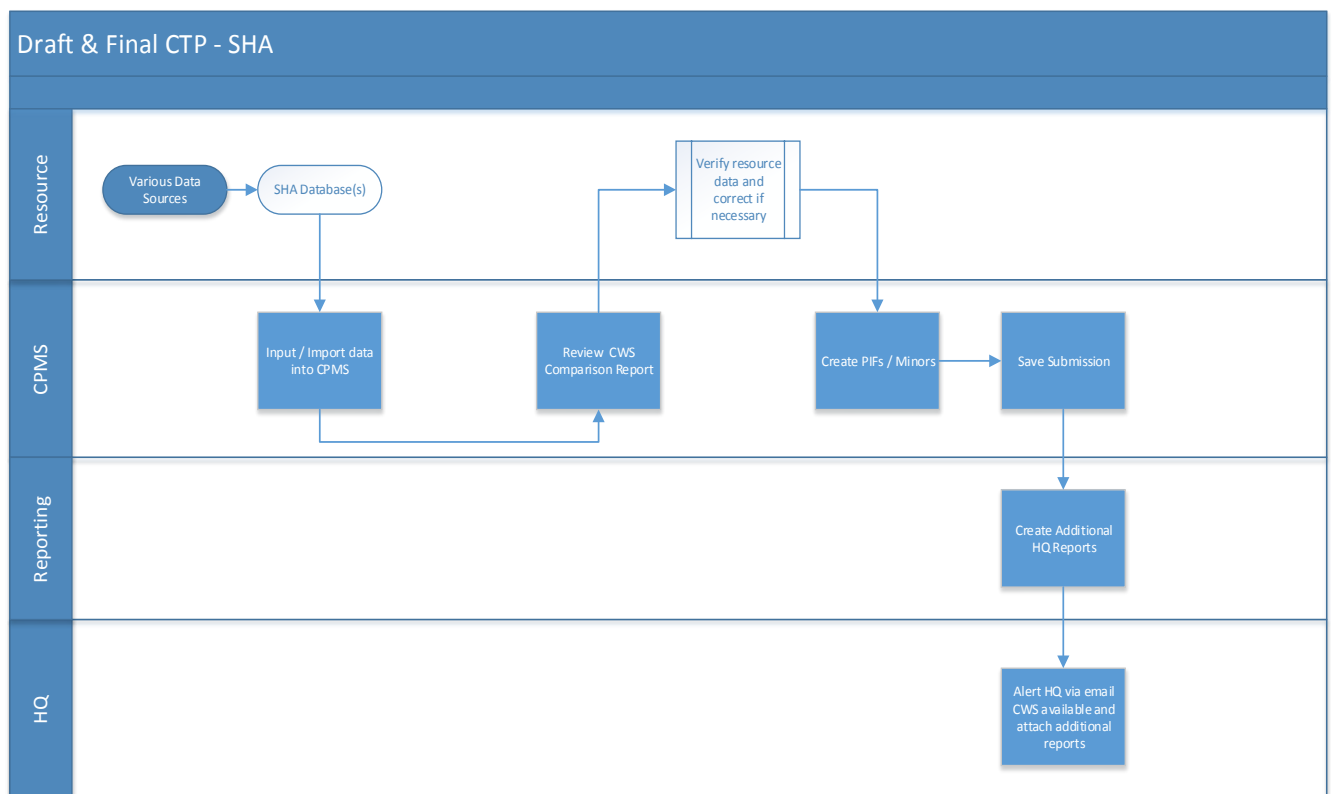
Steps (Draft & Final CTP)

- Input / Export data into CPMS from SHA Database(s)
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission (SHA does not have the snapshot subsystem)
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends SHA a list of questions to address and SHA responds (performed every quarter)

Steps (System Preservation) – no process flow depiction

- PM creates Project Form 42 (this form details anticipated project information, requests planning funds and / or design funds, and indicates what fund the project belongs to)

- PM sends Project Form 42 for approval
- If approval provided, PM will use the same form to request additional funding for other project phases (PE, Construction, etc.). Project Form 42 is an iterative process.
- Data from the approved form is moved into CFS and a request is made to add data into FMIS (Form 30). FMIS does not capture all Project Form 42 data only the elements relevant that allow SHA to administer payments through CFS. CFS does not capture and / or use all Project Form 42 data. However, detailed Project Form 42 data is placed into the Financial Advertisement Schedule. This spreadsheet captures System Preservation individual project details, advertisement data, and later phases of the project).
- The Financial Advertisement Schedule (detail view) is made available to internal SHA and MDOT personnel. Summary only views are shared with the public, consultants, etc.
- SHA works with their PMs and Fund Managers to gather cash flow information related to the identified master fund. This roll up data (fund data) is contained in an internal SHA spreadsheet where federal and state split percentages are manipulated.
- Fund data is moved to the SHA Database (Minor & System Preservation Projects).
- The SHA Database information is then moved to CPMS (Refer to the SHA CPMS CWS and CTP steps).

In addition to providing CWS and CTP information, every 2nd quarter SHA reconciles the dollars budgeted to the dollars spent (**sub process**).

5.2.1.5 MTA General Processes & Sub Process Identification

MTA inputs data manually into CPMS on a **daily, weekly, and quarterly** basis. Several MTA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of MTA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the MTA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- Project Manager Meetings and informal discussions
- Weekly FMIS download auto import into CPMS
- 2nd Quarter FMIS download
- MTA Quarterly Spreadsheet manually manipulated auto import into CPMS
- Pre-Quarterly Meetings
- CPMS Status Forms (**sub process**)
- MTA Federal Analysis Project Sheet (**sub process**)

Users
12 users (admin. level security) (varies)
Approx. 200 users (lower level security – PM and Supervisor) (varies)

Steps (CWS)

- Input data into CPMS from various data sources (numerous sub processes)
- If new or existing project: Go to Update CTP - CWS Maintenance make necessary updates in the 'Description, Schedule, Status, Cash Flow, etc. tabs) (if add new project select button to do so)

- o To view cash flow for a specific phase select 'Display CF'(sub process - MTA Federal Analysis Project Sheet)
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs (make updates if necessary)
- Perform process to Save Submission
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends MTA a list of questions to address and MTA responds (every quarter)
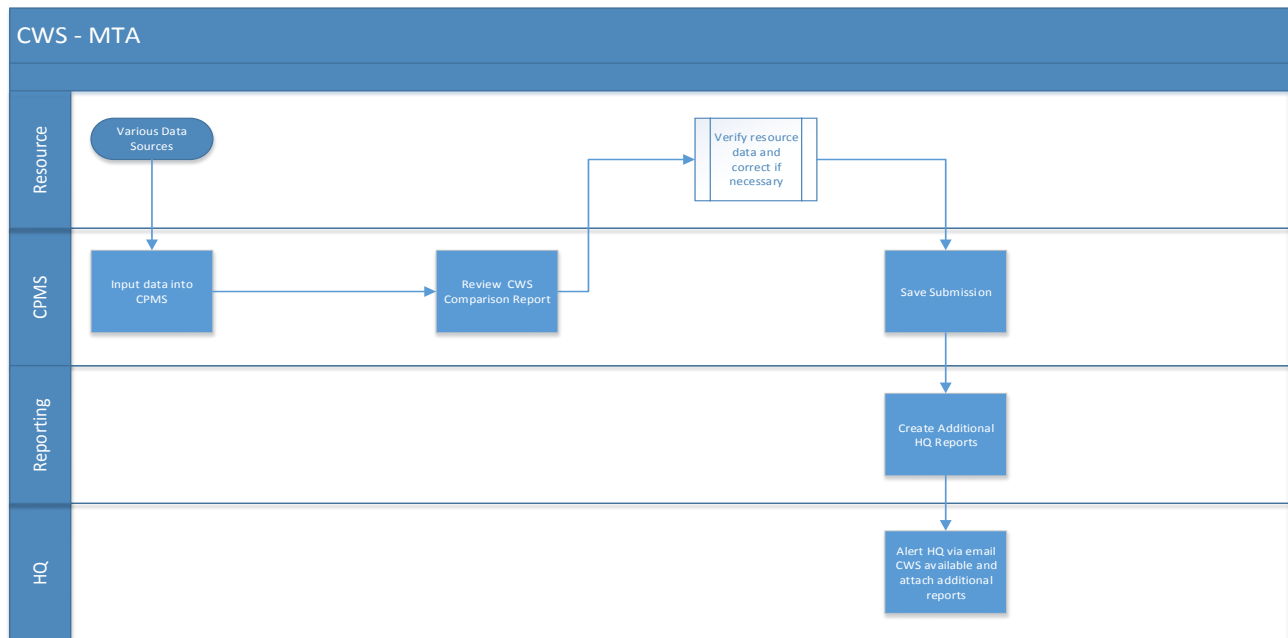
Steps (Draft & Final CTP)

- Input data into CPMS from various data sources (numerous sub processes)
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button (sub process - MTA Federal Analysis Project Sheet)
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Perform process to Save Submission
- Alert HQ that Major and Minor project information available (via email)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- After receipt of submission, HQ sends MTA a list of questions to address and MTA responds (every quarter)
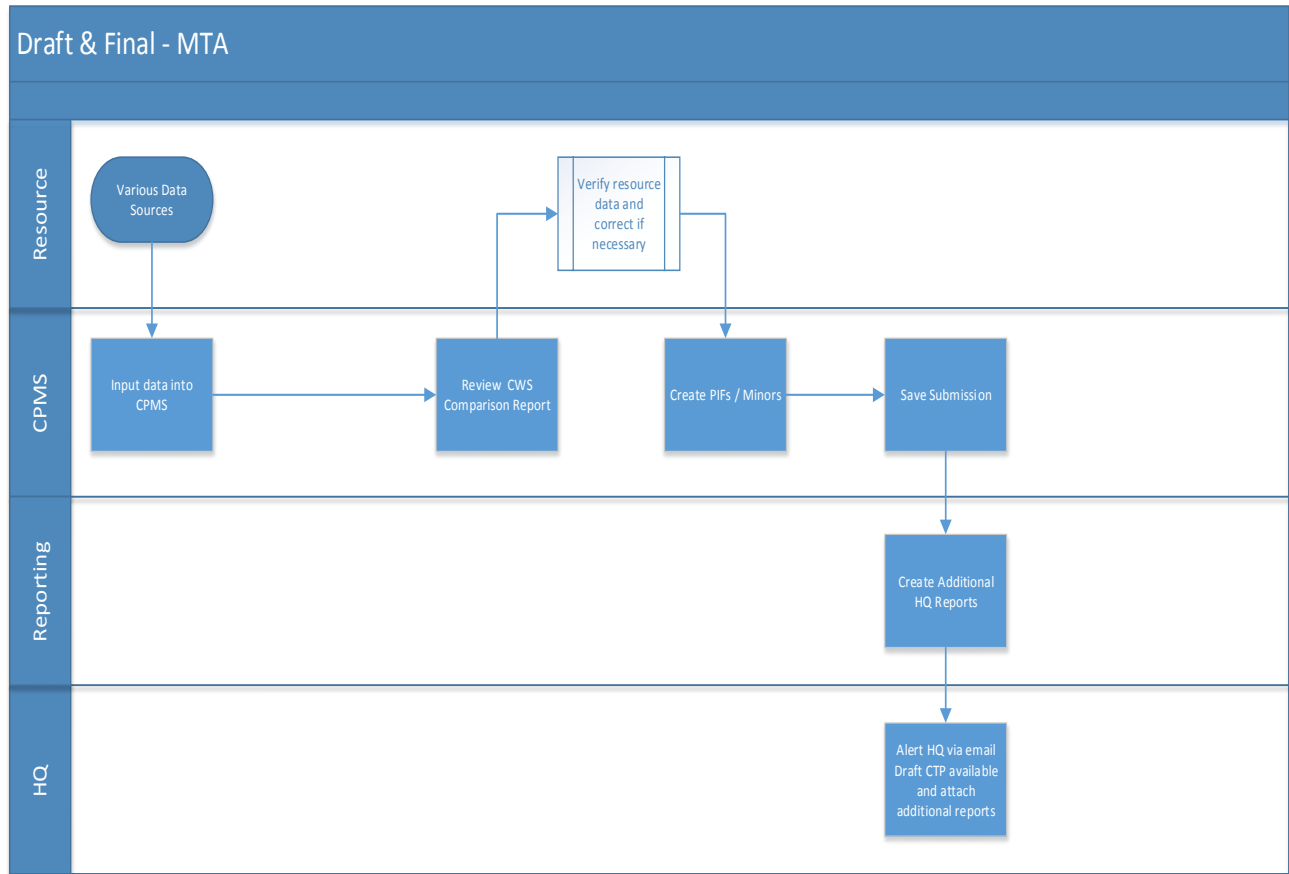
In addition to providing CWS and CTP information, every 2nd quarter MTA reconciles the dollars budgeted to the dollars spent. MTA achieves this by ensuring close #'s match the data downloaded from FMIS (**sub process**).

5.2.1.6 MVA General Processes & Sub Process Identification

MVA inputs data manually into CPMS on a **quarterly** basis. MVA also inputs operation funding information into a duplicate MVA CPMS application named CTIPP. CTIPP data is submitted to Finance and the CIO. Finance provides MDOT HQ with general MVA operation funding information to include in the CTP. Several MVA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of MVA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the MVA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- Internal Agency Project Stakeholders
- Financial Management Information System (FMIS)
- Board of Public Work Agendas and Meeting Transcripts
- MDOT – Inflation Factors (yearly report)

- MVA Access Database (Project Financial Reports) – **sub process** contains current FMIS data allows comparison of CPMS data
- Project Initiation Form (**sub process**)
- CTIPP (**sub process**)

Users

1 user (admin. level security)

Steps (CWS)

- Input data into CPMS from various data sources
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
- Alert HQ that project information available (via email)

Steps (Draft & Final CTP)

- Input data into CPMS from various data sources
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
- Provide additional reports (outside of CPMS) to HQ (refer to HQ additional reporting needs)
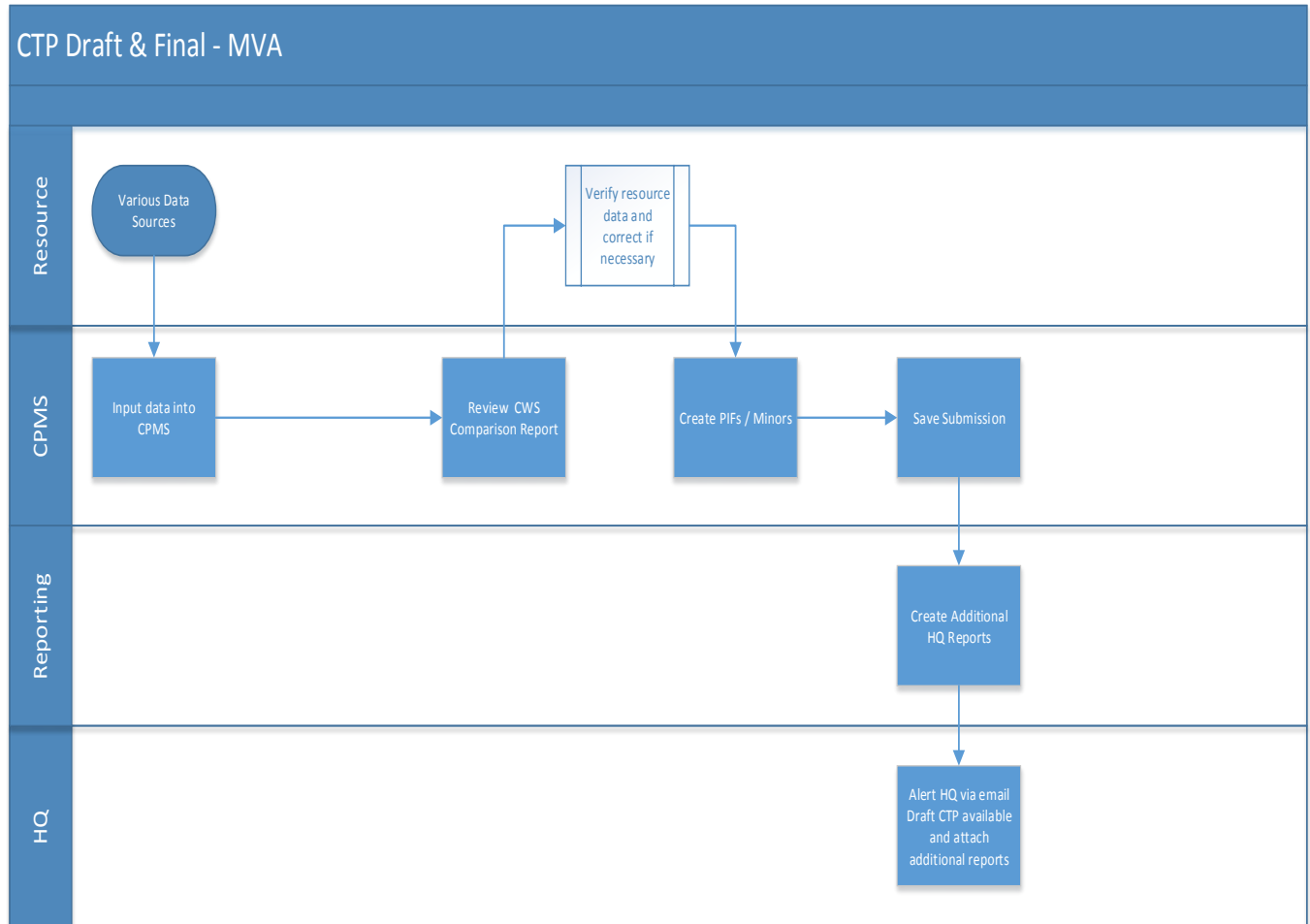- Alert HQ that project information available (via email)
- After receipt of submission, HQ sends MVA a list of questions to address and MVA responds (performed every quarter)

CTP Draft & Final - MVA

Resource	Various Data Sources	Verify resource data and correct if necessary
CPMS	Input data into CPMS → Review CWS Comparison Report → Create PIFs / Minors → Save Submission	
Reporting	Create Additional HQ Reports	
HQ	Alert HQ via email Draft CTP available and attach additional reports	

In addition to providing CWS and CTP information, every 2nd quarter MVA reconciles the dollars budgeted to the dollars spent. MVA achieves this by ensuring close #'s match the data downloaded from FMIS (*sub process*).

5.2.1.7 WMATA General Processes & Sub Process Identification

WMATA provides manual data to MDOT HQ on a **quarterly** basis. Several WMATA data sources contribute to the information needed for the CWS, draft CTP, and final CTP. Many of the data sources consists of WMATA specific internal steps (sub processes). These sub processes are not specific to the MDOT HQ CPMS general process. However, the WMATA sub processes may benefit by being explored in future CPMS development efforts.

Data Source(s)

- Financial information from WMATA (i.e. budget documents, quarterly bills, etc.)
- WMATA (working) Liaison Spreadsheet (*sub process*)
- WMATA (presentation) Liaison Spreadsheet (*sub process*)
- Quarterly WMATA Progress Report
- WMATA Narrative (handwritten comments included on CTP Form)

Users
No WMATA users

Steps (CWS, 2nd Quarter, Draft, and Final CTP)

- Prepare data from WMATA
- Alert HQ that project information available (via email)
- HQ inputs WMATA data into MDOT HQ CPMS Application
- MDOT HQ sends the WMATA liaison a list of questions to address and the WMATA liaison responds (this may or may not be performed every quarter)

5.2.1.8 TSO General Processes & Sub Process Identification

MDOT HQ manually inputs TSO data into the MDOT HQ CPMS Application on a quarterly basis.

Data Source(s)

- Quarterly meetings with program managers
- FMIS downloads

Steps (CWS)

- Input data into CPMS from various data sources
- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)

Steps (Draft & Final CTP)

- Input data into CPMS from various data sources

- If new project: Go to CPMS select 'Projects – New' and create necessary information in the 'Description, Schedule, etc. tabs)
- If existing project: Go to CPMS select 'Projects – Existing' make necessary updates in the 'Description, Schedule, etc. tabs)
- To view cash flow for a specific phase select 'Projects – Existing' select 'Cash Flow' button
- To confirm data entry correct view CWS Comparison Report – select various report filters to display numerous report views
- Create and review PIFs / Minors (make updates if necessary)
- Save Submission Process - Go to CPMS Snapshot Icon select 'Create Snapshot'; Open Snapshot then Go to CPMS select Create submission (this saves the submission)
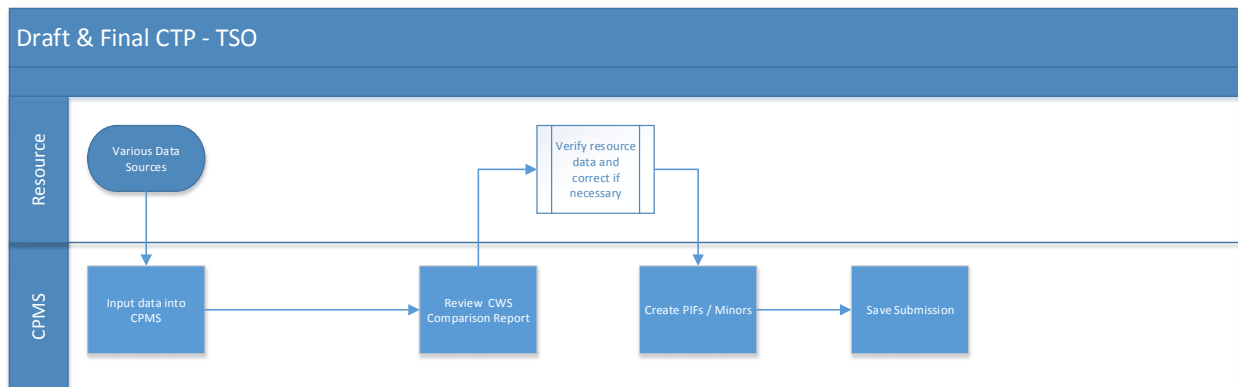

During the 2nd Quarter MDOT HQ reconciles the TSO dollars budgeted to the dollars spent. MDOT HQ achieves this by ensuring close #'s match the data downloaded from FMIS.

5.2.1.9 MDOT HQ General Processes & Sub Process Identification

MDOT HQ receives the CPMS mode specific data and manually saves the data files into the MDOT HQ CPMS Application (access database). There are 5 MDOT HQ CPMS users.

Depending on the quarter, MDOT HQ prepares the following:

✓ A Quarterly CWS Document

Data Sources

- Emailed CPMS Access Files from modes
- Existing MDOT HQ CPMS Access Data
- FMIS Data
- Emailed spreadsheets, word documents, etc. from modes

Steps

- HQ contacts Mode indicating deadline for Mode submission
- Mode alerts HQ that data is available (email)
- HQ creates shared drive folder and labels folder based on appropriate time period (working quarter)
- HQ moves mode data file(s) into appropriate shared drive folder

- HQ imports mode data file(s) into CPMS
- HQ moves mode data into appropriate working quarter then CPMS provides auto feedback regarding # of projects, PIFs, and Minors added, etc. "Summary of Results"
- HQ performs comparison using the CPMS 'CWS Comparison Report'
- HQ vets information with modes if necessary to determine explanations for major shifts in dollars, etc.
- HQ creates 'CWS Worksheet' by running appropriate report in CPMS 'CWS Comparison Report'
- HQ manually inputs data into 'CWS Worksheet' – worksheet tabs auto updated based on initial manual input
- HQ updates each tab with cash flow changes and provides explanation (manual input)
- HQ provides 'CWS Worksheet' data, etc. to Finance
- HQ reviews 'CWS Worksheet' with Transportation Secretary
- Finance reviews HQ data and Finance analysis with Transportation Secretary
- After meeting with Transportation Secretary HQ provides Attachment A's (attachment for each mode) to Finance – Finance prepares funding authorization letter to modes (refer to Finance)

Office of Planning & Capital Programming (HQ) CWS Process
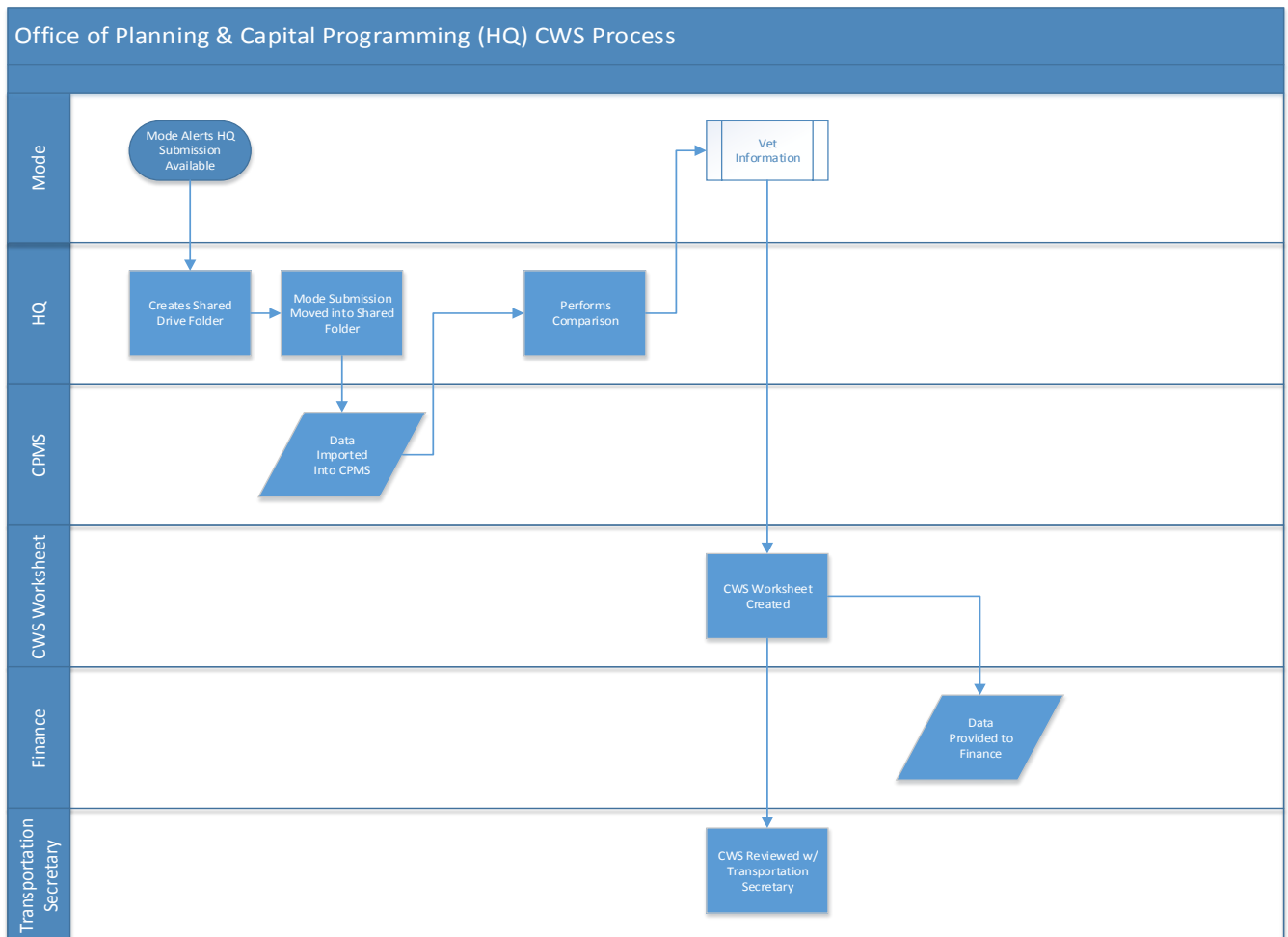
✓ A 1st Quarter Draft CTP Report and a 3rd Quarter Final CTP Report

The preparation of the 1st Quarter Draft CTP Report and the 3rd Quarter Final CTP Report picks up from the CWS process. The additional steps incorporate the preparation of the draft and / or final CTP, the printing of the CTP, and senior leadership review meetings. The steps to prepare the draft and / or final CTP for printing are manual, extremely time consuming, and require the repetitive entry of redundant information.

Additional Steps

- Review PIF information (review system generated reports) compare against CWS and vet with mode(s) if necessary
- Review Minor information (review system generated reports) compare against CWS and vet with mode(s) if necessary
- MDOT HQ Analyst alerts the MDOT Regional Planning & Capital Programming, Assistant Director the CTP data is reviewed
- The Assistant Director makes comments on the hardcopy documents and meets with his team members, when appropriate
- If simple adjustments are needed, the Assistant Director will update the data and / or spreadsheet (if large adjustments are needed the Assistant Director will ask the analyst to perform the update)
- The Assistant Director reviews and / or prepares the CTP Introduction Section (the Introduction of the CTP report is written in voice of Secretary of Transportation and sets the direction for CTP)
- Additional budget reports, charts, financial tables, and diagrams are generated by CPMS and various modal and HQ sources. These items are often uploaded and / or manually input into the appropriate CPMS areas and / or external spreadsheets.
- The Assistant Director has to manually prepare the CTP for printing by compiling and formatting the various report sections.
- Once the Assistant Director is comfortable with the CTP document his team will meet with senior leadership, and other interested parties (if appropriate). The team will provide a sample presentation and feedback will be gathered from senior leaders.
- The team members and senior leadership will meet with Finance to go over the presentation. The Assistant Director will lead the discussion if Finance has any questions and provide follow up after the meeting, if needed. This meeting is considered a dry run before the secretary's meeting.
- The team and senior leadership meet with the Secretary.
- No sign offs are required from the Secretary.
- Stakeholders receive hard copies and / or electronic versions
- Later if addendums are needed, the online CTP report is adjusted. In this instance, the printed CTP report may not be the same as the online document.

5.3 Relevant Business Problems

Each modes uses CPMS to provide the standard deliverables (CWS, draft / final CTP) to MDOT Headquarters (HQ). However, many modes have the need to use CPMS in a more robust manner to connect with other data sources and to manage their capital program on a daily basis. These needs may not necessarily coincide with MDOT needs but are important and specific to the mode. (Refer to Mode Current Environment and Business Requirements Sections).

CPMS does not address all reporting needs. Most modes provide additional reports in addition to their quarterly CPMS submission. (Refer to Resources Section)

CPMS functionality is comprised when Microsoft Access releases a new version.

CSC contractor is retiring and no current institutional programming knowledge exists.

CSC programmed CPMS to perform the following functions:

- Manage project data and schedules
- Develop the draft CTP and final CTP
- Create the quarterly CWS
- Perform quarterly Federal Aid assumption analysis
- Forecast project cash flows
- Move data to and from other non-CPMS systems

However, the current CPMS modules **do not**:

➢ Accurately, manage project data and schedules in a manner consistent with project management standards.
➢ Accurately, perform quarterly Federal Aid assumption analysis for those modes who need this information.
➢ Seamlessly create draft CTP and final CTPs without extensive manual manipulation and external input / reporting.
➢ Seamlessly create quarterly CWSs without extensive manual manipulation and external input / reporting.
➢ Forecast project cash flows correctly based on individual mode needs.
➢ Provide automation to move data to and from other non – CPMS systems.

5.4 Major Functions and Capabilities Required

A new CPMS product will require the following functionality:

- Individual mode access with appropriate security and permission controls
- Ability to manage project data
- Ability to manage project schedules
- Ability to allocate, budget, and track project funding information
- Ability to use automation to develop draft CTP and final CTP reports
- Ability to use automation to create the quarterly CWS document
- Ability to perform quarterly Federal Aid assumption analysis specific to each mode
- Ability to forecast project cash flows specific to each mode
- Ability to use automation to move data into and out of CPMS into other non-CPMS systems, spreadsheets, utilities, etc.

5.5 Impact to Other Systems and / or Processes

Stakeholders	Other Systems / Processes Impacted

MDOT HQ	Emailed CPMS Access Files from modes Existing MDOT HQ CPMS Access Data FMIS Data Emailed spreadsheets, word documents, etc. from modes
MPA	MPA Spreadsheet Financial data downloads (Web Focus) from FMIS Bid, Notice to Intent, Notice to Proceed Bi-Monthly Meetings with Executive Director, Operations, and Engineering
MAA	Capitol Project Request Form Project Schedule Updates (Word, PowerPoint, Excel) FIMIS Report FIMIS Cash Flow Report (spreadsheet) Checkbook Accounts (manual invoices, records of transmittals, etc.)
MDTA	Project Action Form (PAF) Monthly Project Action Form Meeting Quarterly Meeting Various spreadsheets (Finance, Engineering, etc.) Advertisement Notice to Proceed Schedule (Ad) / NTP Schedule Spreadsheet Monthly NTP Meeting Solomon
SHA	Form 42 Project Data Form Quarterly Finance Report (Capital Forecasting System - CFS) SHA Database (Major Projects) SHA Database (Minor & System Preservation Projects)
MTA	Project Manager Meetings and informal discussions Weekly FIMIS download 2nd Quarter FIMIS download MTA Quarterly Spreadsheet Pre-Quarterly Meetings CPMS Status Forms MTA Federal Analysis Project Sheet
MVA	Internal Agency Project Stakeholders Financial Management Information System (FMIS) Board of Public Work Agendas and Meeting Transcripts MDOT – Inflation Factors MVA Access Database (Project Financial Reports) Project Initiation Form CTIPP
WMATA	Financial information from WMATA WMATA Liaison Spreadsheet (working) WMATA Liaison Spreadsheet (presentation) Quarterly WMATA Progress Report WMATA Narrative
TSO	Quarterly meetings with program managers FMIS Downloads

5.6 Limitations, Constraints, and / or Dependencies

- CPMS project funding – MDOT may not have the funding to create a new CPMS application.
- Mode Subject Matter Expert (SME) availability – Modes may not have time to provide personnel to assist with the project.
- Future CPMS responsibility and maintenance – Will the new CPMS application be supported by vendors and / or internal IT resources.
- Application and server capacity – Where will the new CPMS application be housed if on internal server or servers will they be able to handle the number of hits (demands) from users who are simultaneously inputting and extracting data.
- Currently MDOT IT Group supports Oracle environment – Any new development will need to be aware of the current system environment to ensure new products are compatible with the current environment.
- The inability to gather project specific information from modes may require business process adjustments and may not be resolved by a system fix.

5.7 Definition of Completion

Will be determined in future Functional Requirements Document and / or future Technical Specification Document.

6.0 SCOPE

6.1 Specific Functional Capabilities to be Addressed

Provide individual mode access with appropriate security and permission controls for all mode users
Ability to manage project data
Ability to manage project schedules
Ability to allocate, budget, and track project funding information
Ability to use automation to create the quarterly CWS document
Ability to use automation to develop and correctly print draft CTP and final CTP reports
Ability to perform quarterly Federal Aid assumption analysis specific to each mode
Ability to forecast project cash flows specific to each mode
Ability to store and retrieve files and images specific to a project
Ability to use automation to move data into and out of CPMS into other non-CPMS systems, system components, spreadsheets, etc.
Provide canned reports and customizable reports based on historical, current, and future needs

6.1.1   Statement of Business Requirements

Stakeholders provided suggestions and requests for new CPMS needs during a series of requirements meetings. This section provides a summary of the business requirement themes captured and the details of each requirement captured.

Business Requirements Summary:

- Ability for all Modes to input projected, new, and existing project information
- Ability to view and adjust current and forecasted cash flows (real time)
- Ability to archive old data and have remain intact
- Ability to archive old data and reflect real time information
- Ability to view project detail from general to specific
- Ability to attribute appropriate (real time) business rules
- Ability to attribute appropriate (archived) business rules
- Ability to store documents, images, etc. and link to general and specific project detail
- Enhanced Reporting Capability (BI backend) that can mimic input needs and adjust after data input (real time and historical)
- System Maintenance, Level of Service, and Input Agreements (MDOT HQ)
- Ability to communicate with other data sources (real time) – FMIS and mode specific data sources
- Translation Tables and Configuration Tables needed (FMIS and mode specific)
- Easy Search Function – similar to google search (type in few characters and pull up relations)
- Ability to assign ratings and prioritize projects based off weighted goals and factors

Business Requirements Detail:

Mode suggestions / requests were categorized under specific requirement types:

BP = Business Process
DB = Database
S/P = Security and Permissions
UI = User Interface

The mode suggestions / requests resulted in the following requirement types:

Requirement Type:	Total:
BP	20
DB	104
S/P	7
UI	6
Total All:	**137**

Stakeholders	Mode Request	Requirement Type (BP, DB, S/P, UI)
MDOT	There is a need for new internal policies on inputting and maintaining data so all modes are providing the information in a consistent manner.	BP
MDOT	There should be some discussion on re-organizing project data and how it is presented in the system. Is the way we program project information the most effective and usable?	BP

MDOT	The field names within the current system are not the most intuitive as to what data it represents. The re-classification of data may be necessary.	BP
MDOT - Brian	SHA – (need to determine how they break out minor projects by equipment, bridge, etc.) this is a process issue	BP
MDOT - Bob	Be more intuitive have field names make more sense (translation table / data dictionary)	BP
MDOT - Bob	The ability to view SHA project specific information	BP
MDOT - Dan	The system should provide various automated quality control checks and error messages to ensure project data is consistent and complete across system functions and reports.	BP
MDOT - Dan	Ability for system to log and track system maintenance items.	BP
Contract Developers - Jerry / Kerry	Would like modes to use the appropriate CPMS system tools correctly	BP
MAA	Develop a universal project coding description methodology that can be used by all modes. This will effective tracking and descriptions of projects.	BP
MPA	Consider using work days in addition to $$'s	BP
MPA	The ability for the system to calculate a priority rating for each project based off weighted factors and goals met. In addition, system should also have the ability to develop budget scenarios based off those priority ratings.	BP
MDTA	Would like to incorporate Life Cycle Analysis, would like to see CPMS encompass outside 6 years now only does 6 years – if can do this can link to life cycle analysis that is currently owned by engineering, which is based off inspection reports would like the ability to rank projects	BP
MDOT Finance	Expand types of funds to include reimbursable funds	BP
DLS	Public Private Partnerships – the PIF sheets do not show all active capital spending need to see what the private partner is budgeting for construction, etc. – possibly may need to see actual costs (this may not be important)	BP
MDOT Audit	Business needs to determine critical data entry fields that should be monitored if they are altered	BP
MVA	Need new phase descriptions for IT projects – should follow true software development life cycle (SDLC) phases	BP
MVA	Go beyond standard 6 years (forecast)	BP
MVA	Capture true costs of project (example: allocate employee costs against projects, overheads, etc.) – this would give a better understanding of true project costs	BP
MVA	Ability to capture jobs created because of the project (needed for all modes). Example – this project created this many jobs and contributed to the economic impact to XYZ local businesses.	BP

MDOT	The ability to drill down to sub-project details. This is especially the case with SHA, as they often use the System Preservation Project as a catch all for many small minor projects. MTA also lumps their LOTS program funding into one project which does not provide individual county breakdowns of funding. The ability to breakdown some of these sub-projects for funding, facility, and location information is needed. There was also some discussion on the ability to program multiple project phases of under the same project rather than separating them out as individual projects. This is more pertinent to large multi-phase projects.	DB
MDOT	The ability for the system to export data report data into excel is important. The system currently only exports as a PDF or Word document. To analyze the data it needs to be in excel format. Currently staff have to manually type project information into an excel workbook.	DB
MDOT	The ability for the new system to auto-generate the CWS Quarterly Review Report would be very valuable. This is currently created outside the system in a series of excel workbooks that are manually populated.	DB
MDOT	The ability to auto-generate Attachment As would be valuable too. This is currently produced through a workbook outside the system by manual input of data.	DB
MDOT	Analysis queries could prove to be beneficial too. For example, reports that can generate variance analysis in which cash flow changes are over a certain dollar figure would be helpful.	DB
MDOT	There should be the ability to have a live feed to import expenditure data. FMIS is the MDOT's accounting system that should be interfaced. MDTA and SHA also have external expenditure systems that they will probably want to interface with a CPMS replacement.	DB
MDOT	A % Project Completion field may be helpful to capture in the new system.	DB
MDOT	Some sort of 'Flag' ability to call out projects of similar types across modes could be helpful for running queries.	DB
MDOT	It may be beneficial to also enable summary fields to explain major project changes from quarter to quarter cash flows.	DB
MDOT - Bill	Should see all projects (with criteria to adjust) understanding what project belongs to what in specific detail	DB
MDOT - Bill	New system needs to coordinate and include STIP and TIP process	DB
MDOT - Bill	Provide year by year expenditure date needed – wants to run a report where you can see expenditures by year, by quarter, by month, by day, etc. and by other parameters should be adjustable (menu driven – dashboard)	DB
MDOT - Bill	Automate CWS process (allow customized text entry and also intuitive thinking that indicates what happened and why) Example: 1mill moved to new year and system could indicate $ moved to new year	DB
MDOT - Bill	Allow modes to select reason for variance and provide HQ ability to input custom text to discuss reason for variance	DB
MDOT - Bill	Variance analysis – would like to see major increases and why – based on $ threshold	DB

MDOT - Bill	Need method to see what we asked to be spent on a project vs what we actually spent on a project (comparison module)	DB
MDOT - Brian	Pre populate #'s from CPMS into CWS spreadsheet (automate)	DB
MDOT - Brian	Would like new system to have ability to create CWS as an output	DB
MDOT - Brian	Link the CTP Summary document to the word (intro) and charts. Link the new system to auto populate the appropriate areas.	DB
MDOT - Brian	Summary on top of CTP page generates from check boxes – Brian has to delete and redo – would like the new system to have a text function that gives user flexibility to create customized verbiage	DB
MDOT - Brian	Wants to be able to format (text, headers, etc.) within system	DB
MDOT - Brian	Some reports don't communicate in all case with the raw data – user has to input the same #'s CPMS already has into the CPMS report areas	DB
MDOT - Brian	Would like to push button to say generate CTP (produce in pdf)	DB
MDOT - Bob	Ad hoc more user friendly	DB
MDOT - Bob	Sync summary reports (Future Development should determine which summary reports should be synched)	DB
MDOT - Bob	Write queries that can bring attention to variances	DB
Contract Developers - Jerry / Kerry	Old db's not normalized (not adjusted to compensate for excessive database hits / high server usage) correctly – mode run times are sporadic sometimes slow and sometimes fast.	DB
MAA	Need FMIS project contract numbers to translate / relate to 8 digit CPMS # (creation of translation table) – developers will need to explore further	DB
MAA	Ability to download FMIS data directly into the new CPMS	DB
MAA	Ability to download checkbook data directly into new CPMS. Note: MAA's Checkbook data is the accounting system used to track expenditures of their "Other" funds (i.e. PFC, CFC, etc.)	DB
MAA	Believes CPMS should be a full forecast / actual tool that allows user to: maintain and create an inventory (long range planning) 1 – 20+ years of data of asset and engineering data to forecast budgets, identify projects available for alternative funding sources, project prioritization, determine what can be funded, what could be put on hold, trigger project phases, allow projections and actuals.	DB
MAA	Ability to adjust project funding logic to fit needs at any time – leave state open for adjustment (currently state is static and does not allow manipulation)	DB
MAA	Identify fund type and grant type (this requirement may also relate to STIP/TIPP and the obligation of funds)	DB
MAA	System should track project funding with their associated contract(s) #s. Reporting functions should enable the query of all projects funded under a specific contract – a contract may fund several different projects.	DB
MAA	Ability to create and adjust Minor dates correctly (relates to MVA requirement)	DB

MAA	Search Tool – with ability to search by project name instead of scrolling down a drop down list.	DB
MAA	Need ability to view archived projects and ability to archive a project	DB
MPA	Would like the ability to use the automated cash flow function - At this time, CPMS cash flow functionality does not work correctly for MPA. The system should forecast project cash flows based on customized workday schedules.	DB
MPA	CTP PIF – need reminder to "Assign Project" correctly	DB
MPA	Need 'Approve Project' tab to work correctly	DB
MPA	Need the ability to determine federal funds correctly (needs to be intuitive). Future development should further explore this requirement.	DB
MPA	Need ability for long range planning / programming – facility planning, etc. (go beyond current HQ needs). Would like to answer the following question(s) – what do I need to do in the next 15yrs if I want to build XYZ, how much $$ would I need, etc.	DB
MPA	Forecast Tool – that allows potential cost estimates that supports future capital programming (use historical $$ and work days as a benchmark to determine future needs). The ability of the system to estimate project costs based off past projects of similar size and scope.	DB
MDTA	Would like to automate the NTP sub process into CPMS.	DB
MDTA	Would like the ability to create MDTA reports at any time	DB
MDTA	Solomon feed expenditure information into CPMS	DB
MDTA	Would like to get a monthly report that compares expenditures against project cash flows on a monthly basis (need real time)	DB
MDTA	Make PAF after approval downloadable into CPMS (current word form on intranet – filled in and submitted for signatures)	DB
MDTA	Report that compares sending from year to year – what did we do for the past 5 years ability to pull information from more than one snapshot (over span of several years) see differences in budget and expenditures by all project data fields	DB
MDTA	Have the ability see projects at a glance and change without moving to each individual project. Example: pull up table with make changes and system places intuitively move data to appropriate places and ability to open up multiple pages.	DB
MDTA	Would like to keep CTP Tour Form	DB
MDTA	Need 'what if' forecasting analysis formulas in CPMS (business intelligence)	DB
MDTA	In the future may need method to track federal funds (mega project)	DB
MDTA	Track project funding by source (i.e. toll collections, bonds, etc.)	DB
MTA	Would like to have automatic audit tracking – every time $$ moved and ability to prompt user to type in why changed (electronic footprint = user, date/time stamp, field changed)	DB
MTA	When adding project budget amount need to see project cash flow (needs to be intuitive). Current CPMS System has these data inputs on two separate pages.	DB

MTA	Flag Federal Aid over 80% and identify some grants that are 100% - would like to reconcile once cash flow done then ability to make 80%. Have the ability to create automated alert messages that would indicate this cash flow change would break the 80/20 split on Federal Funds or whatever Federal Share is determined to be assigned to that project.	DB
MTA	When a project is built would like the ability for CPMS to assign Federal Aid eligibility status (yes or no selections)	DB
MTA	Maximo (IBM) communication with CPMS (downloads, web service, etc.) – Maximo is a Transit Asset Management System	DB
MTA	Real Time FMIS connection (all quarters) with appropriate translation tables	DB
MTA	TEAM (Federal Grant Management System) communication with CPMS (downloads, web service, etc.)	DB
MTA	Automate Task Order Process – provide breakdown / tracking capability to relate each line item to specific project(s) (relate fund cert to appropriate project and then calculate correct balance that is left over)	DB
MTA	Document Management System: Create Fund Cert Form – provide online approval tracking and submit resolution to database and ability for user friendly form printout / email, etc.	DB
MTA	Propose Project Process - new projects, existing projects to gain or shift more funds, etc. use a justification form (PAF – Project Action Form) (provide online approval tracking and submit resolution to database and ability for user friendly form printout / email, etc.)	DB
MTA	Incorporate TIP/STIP into CPMS	DB
TIP / STIP	Need years federal funds appropriated, what year obligated, what year cash flow – also need to track re-obligation – need to know separations of $$ what is being spent when (track color of $$) – currently getting funds from a number of sources grants, sub grants, (revenue sources) - allocations should be based on different business rules. This need may mean: Track project Federal funding down to the appropriation year and obligation year to meet TIP/STIP reporting process. The system should also track re-obligated federal funds to determine the history of how these funds have been programmed.	DB
MTA	TIP/STIP, Capitol Budgeting, Federal Aid Allocation – CPMS needs to encompass these components	DB
TIP / STIP	Need to understand federal laws. Software needs to be able flexible enough to change when laws changes and then retain historical data. Related to the Federal Share requirements (i.e. they may change for 80/20 to 90/10 for specific projects).	DB
TIP / STIP	Wants the ability to report each quarter in a customizable report, create exportable CPMS data and make available to MPOs	DB
SHA	Auto Import SHA Database(s) into CPMS	DB
SHA	Financial Table (current excel spreadsheet consists of fund sources for all projects – 1page summary) would like to automate input from individuals and be captured in CPMS	DB

SHA	Link System Preservation database to CPMS. This db is maintained by SHA.	DB
SHA	Retain existing canned reports	DB
SHA	Projects advertised in current FY (now manual) would like to be automated; summary of bike / pedestrian report	DB
SHA	Need ability to upload images/documents quickly – document management system that sequentially stores image/doc and stores in a central area (ability to link image to the PIF – the DMS should be able to recognize which image belongs to each PIF)	DB
SHA	Ability to pull reports (real time) – this would cover special requests that may be a 1x only request (need a Business Intelligence Tool – BI)	DB
SHA	Need correct associations (project to improvements) need line #'s automated to link correctly to correct project on PIF (reference PIF sheet examples)	DB
SHA	CPMS Divider Sheet – link financial table to divider sheet (share data)	DB
SHA	Ad (Advertisement) Schedule (comes from CFS – Finance controls) would like to link to CPMS (ex. Project # would create relation between Ad Schedule and CPMS – ad date, bid date, ntp date would be helpful to have in CPMS as an automatic transfer only those dates pulled over related to existing project #'s in CPMS; but for minors need more information (80%) from Ad Schedule (need all dates, proj desc, improvement type, project #, cost, and add if project# not found in CPMS – match to fund if fund relevant) do not want to pull over projects that SHA not working on	DB
SHA	Ability to adjust fund allocations (real time) pull in data from FMIS, estimate splits (forecast / intuitive system design), dashboard real time reports	DB
SHA	CPMS to communicate with Financial Advertisement Schedule (spreadsheet) to pull System Preservation project specific data	DB
WMATA	Make sure comparison reports included monthly, quarterly, etc.	DB
WMATA	Ability to upload additional documentation into CPMS (ex. WMATA Quarterly Report, etc.)	DB
MDOT Finance	Ability to determine what the mode spent and what was spent by project – example: This is what the mode has available to spend (from Finance) and here is what the mode has yet to spend	DB
MDOT Finance	A continuous electronic feed from FIMIS so that modes can project what they have yet to spend	DB
MDOT Finance	Finance needs ability to enter in the CTP data specific to their area (from their excel spreadsheet – called mackey files this file houses 3 years of budget data) to populate CTP report so that Brian and HQ don't have to manually put it in	DB
DLS	Need access to draft CTP and final CTP data and the ability to manipulate data for DLS needs.	DB

DLS	Need actual spending by project (communication with FMIS)	DB
DLS	On PIF would like to see source of all funds (what fund goes with what project) do not want to see the term 'other fund' used – need to see project specific information not generic roll ups (SHA issue)	DB
DLS	Need electronic data at the time of the draft and final CTP	DB
DLS	Need consistency between summary page and PIF sheets (dollar value and categories)	DB
DLS	Want actual spending added to PIF sheet	DB
DLS	Would like real time mapping in GIS available related to each project (state using ESRI Arc GIS) to graphically represent project location (link Arc GIS to CPMS) example: link coordinates to project for highways, MARC, and others where appropriate	DB
DLS	Ability to know when one project crosses into 1 or more jurisdictions and the associated details	DB
MDOT Audit	Audit needed on electronic footprints related to critical data fields (what was added, if it was changed - how was it changed, when it was changed, and who changed it)	DB
MDOT Audit	Create new CPMS audit field reports that run automatically and can be accessed by MDOT Audit.	DB
MDOT Audit	Link audit report access and retrieval to existing work time capture system (add audit report as an option to the work time capture system reporting dashboard)	DB
MVA	Continued ability to produce customized Finance / Procurement Reporting – currently found in CPMS 'Reports' area	DB
MVA	Need ability to store project documents and relate to specific project (DMS)	DB
MVA	Combine forecast and actual (CPMS and CTIPP) functionalities – align / translate budget classifications and budgetary needs between the 2 systems and FMIS (all on same page)	DB
MVA	Direct FMIS integration into CPMS	DB
MVA	Customized Fiscal Year End Reporting	DB
MVA	Ability to prioritize projects (record and rank)	DB
MVA	Capture Data exchanges – between major IT project data and Department of IT (customized reporting)	DB
MDOT	Ideally we would like a new system to be used across staff levels at the modes so Project Managers can monitor and maintain their own data in the system. This may prove to be a difficult business process change for the modes.	S/P

MDOT	The system should be web-based to enable multi-modal system used by all agencies anywhere. The ability to work off the same live data is important. To meet some of the modal needs it may be necessary to have a planning module where projects are created and preliminary imputed and then a programming module where planning information is submitted to be final programmed request/data.	S/P
MDOT	HQ functions should have access to all modes whereas each modal agency should only have access to their data.	S/P
SHA	Ability to have multiple CPMS sessions loaded and available for real time input and viewing for all users	S/P
SHA	Possible fund manager direct input (this may be needed in future)	S/P
WMATA	Provide WMATA Liaison with access to CPMS	S/P
MDOT - IT	Need to meet the STATE and MDOT Security Policies as they relate to password complexity and retention	S/P
MDOT	There needs to be more robust user-friendly reporting functions. There is little flexibility in the current caned reporting tools and unless you know Access there is limited ability to create your own reports. This is because many of the data field names are not intuitive on what they populate as well as the user friendly issues with Access.	UI
MDOT	The system presentation and tool menus are not the most efficient. As they are not organized in a logical flow or function way. For example, menu bars could be separated by task – CWS Review, CTP Development, Etc. Currently they are spread out among the different menu bars requiring you to move in and out different menus.	UI
MDOT - Dan	Each modal administration should have a customized user interface that meets their specific data entry and programming needs. (already mentioned)	UI
Contract Developers - Jerry / Kerry	Make web enabled – where modes could access via intranet, etc.	UI
SHA	Need simple way to pull reports – make user friendly (make a reporting dashboard available for canned reports)	UI
MVA	Make CPMS UI Web Based	UI

6.2 Options to Satisfy Requirements

The contractor suggests MDOT HQ continue with the suggested system development steps:

1. Engage Procurement to determine appropriate vehicles for any anticipated vendor engagement if internal skill set is not available
2. Send the BRD out to external vendors and to internal IT groups for request for information and / or request for quote (the deliverable should indicate what technologies the organization will use to develop the new system and general costs estimates that include when appropriate, hardware, software, server(s), customized development, project oversight, etc.)

3. If appropriate send out for request for proposal requesting awarded vendor to provide the following deliverables: functional requirements document, technical specifications document, system development, periodic system demo's, system technical QA, system User Acceptance Testing, system roll out to production plan, system documentation, user system training materials, and if appropriate system maintenance plan
4. After system implementation, determine if a Stakeholder Steering Committee (or other method) is needed to determine ongoing system enhancement development and implementation schedules.

The new CPMS product should provide the following (but not be limited to):

- A Custom off the shelf (COTS) database
  Possible Vendor(s): Oracle database or Oracle compatible database
- Custom web based input areas for each Mode and MDOT HQ that communicate (real time) with the database
  Possible Vendor(s): Awarded Development Vendor
- A dedicated server(s) and / or virtual server space that houses the database and other components
  Possible Vendor(s): Oracle
- COTS Enterprise Content Management System (CMS) – that will allow the easy storage of files and images.
  Possible Vendor(s): Ektron, Documentum, or Oracle compatible CMS
- COTS Enterprise Business Intelligence (BI) Tool – that will retain business rules / logic for all formulas, forecasting tools, federal aid calculations, etc. in this component.
  Possible Vendor(s): Oracle Business Intelligence Enterprise Edition (OBIEE)
- Custom Web Services (bridges) – created by developer(s) that allow buckles (communication links) to all CPMS components, i.e. DB, BI Tool, CMS and create connections between FMIS, and mode specific data sources.
  Possible Vendor(s): Awarded Development Vendor
- Single Sign On (Optional) – if available, configure existing MDOT HQ and mode single sign on protocol to new CPMS product.
  Possible Vendor(s): Awarded Development Vendor
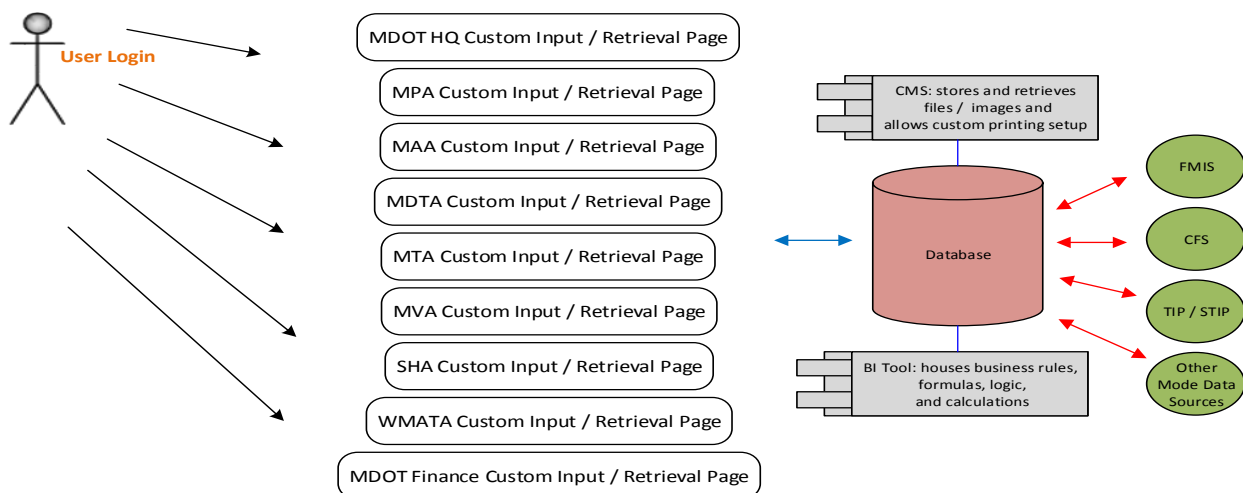
6.3 Other Options Considered

- Do nothing – retain existing CPMS Microsoft Access databases and functionality
- Retain the existing CPMS Microsoft Access databases and functionality and build a Reporting Tool

7.0 IMAPCT URGENCY

CPMS has reached the end of its useful life. The system is currently operating with a series of temporary fixes and solutions that do not provide the diverse functionality needed to manage the complex MDOT Capital Program. Capital programming staff are required to dedicate an enormous amount of time and resources to managing and reporting on the program through various ad hoc excel spreadsheets, manual analysis, and manual data entry.

Additionally, CPMS loses some functionality with each Microsoft Access software update. The functionality is lost because either the function can no longer be programmed in the new software upgrade or programming support with the skill set required is not available.

These issues compromise MDOT's ability to effectively administer the MDOT Capital Program.

8.0 RESOURCES

The following resources assisted in the development of the BRD:

Additional Reports – Contact MDOT HQ Capital Planning Analyst to obtain copies of current mode reports that are normally provided during the CPMS CWS and CTP periods.

Department of Transportation Secretary's Office Audit Report – Refer to MDOT Audit for current audit report.
Data Sources - Contact appropriate modal administration and / or MDOT HQ for the data sources mentioned in the BRD.

MDOT IT Security Documentation – Refer to MDOT IT for current policy.

SHA Financial Advertisement Schedule – Refer to SHA to receive a link to the detailed view of the current schedule. The schedule contains detailed System Preservation project information.

9.0 APPROVALS

Stakeholder	Signatures
Maryland Department of Transportation (MDOT) Office of Planning & Capital Programming	_____ Brian Martin, MDOT Regional Planning & Capital Programming, Assistant Director