Department New Request Form
Fiscal Year 2020

Major Department	**Development Services**	***Rank:***	1
Division/Sub-Department	Engineering	***Title of New Request:***	Updating Construction Assessment software
Request Category	**Service Module Change**		
Request Rating	**Expand Level of Service**		Funded?

1. Request Rationale:

City Council and Administration is requesting modifications to the Road District subsidy requirements as part of the Annual Sidewalk Program. The existing Construction Project Assessment Program (CPAP) software requires urgent updates in order to facilitate the new requirements. The update will include a new field data collection system that will enhance staff's ability to complete projects in a timely fashion and provide the ability for staff to track recently constructed improvements for asset management purposes.

2. Service Delivery Impact:

Engineering staff will not be able to utilize existing software to manage annual assessment projects without the update. Without the software, staff will lose critical time and projects will be delayed.

3. Personnel Requirements (# FTE's required):

NA

4. Cost Impact of New Program:

Account #	Item	Qnty	Unit Cost	Requested One-Time	Requested Ongoing	FY 2020 Unfunded	FY 2020 Funded	Proposed FY 2021 Ongoing
2522.250.439000.350	Assessment Software	1	80000	80,000	-	-	80,000	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
					-	-	-	
			Expense Sub-Total	**80,000**	**-**	**-**	**80,000**	**-**

Revenue Offset:

Account #		Revenue Description	Proposed Onetime Revenue	Proposed Ongoing Revenue
2522.000.381010.00	N	Proceeds from Capital Lease	80,000	-
		Revenue Sub-Total	**80,000**	**-**

Net Cost of Impact for New Program	**-**

City of Missoula

ENGINEERING DIVISION

Proposal:

Construction Projects Assessment Program

Prepared By:

AXIOM IT SOLUTIONS INC

Software-Based Business Solutions

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Introduction

The City of Missoula Development Services has requested system improvement for the Construction Project Assessment Program (CPAP) system, used to manage and track custom curbs, sidewalks, and assessment projects. The program updates were prompted by the loss of a staff member and a potential regulatory change.

This document provides high-level break down of the system improvements and corresponding 3-point estimates. These estimates can be used to help the City prioritize their needs and aid in their budgeting requests.

Outline

The City of Missoula Development Services has requested system improvement for the CPAP system. The CPAP system is custom Curb, Sidewalks, and Assessment project tracking system. The program updates were prompted by the loss of a staff member and a potential regulatory change.

Through our initial discovery meeting, we identified five areas of system improvements

Item	Description	Priority
1	Subsidy Calculation Change – Add support for having an additional subsidy calculation credit at the parcel level.	1
2	Onsite Data collection – From an iPad or mobile device all for a city engineer to add work items.	2
3	GIS Integration - Remove data entry duplication in their CAD system – The CAD system is used to produce maps that have work item information at the parcel and provide an easy way to calculate work item quantities. To remove this step and create maps with CPAP work item data, AXIOM with work with the city's GIS department to provide them access to the CPAP work item data per parcel.	3
4	System Training – Provide system training for CPAP primary users and train/review the system's external department teams that request reports from the CPAP system. Primarily focused on budgetary reports for finance.	4
5	System changes/fixes – The Development services department has a list of various improvements/updates they would like addressed.	5

AXIOM reviewed each of the five areas of improvement and analyzed the core concepts of the change, how that change affects the CPAP system, and what AXIOM would change to meet the requirements. Below is a list of requirements for each improvement. From this high-level list of requirements, the AXIOM team created tasks associated with each item and estimated their effort. Using a 3-point estimating process, those tasks were summarized in the individual item estimates.

CPAP – Subsidy Calculation Change

SCOPE

Subsidy Calculation Change – Add support for having an additional subsidy calculation credit at the parcel level.

1) Update the business logic to support an additional CreditCategory item (New Subsidy).
2) Only allow one subsidy credit to be applied per parcel
3) The new subsidy will cap the homeowner out-of-pocket at $9000. The subsidy calculation will be the same as the current subsidy except that once the homeowner has paid $9000, the city picks up the rest of the tab. Subsidy calculation needs to support inflationary cap - allow for easy adjustment of values.
4) Any reports or onscreen values will show the correct credit information

DELIVERABLES

Update the CPAP application, database structure, reports, and reporting views.

RISKS

1) We identified 15 reports that are affected by this change and accounted for time to review, but changes could be more complicated than anticipated.

ASSUMPTIONS

1. A parcel can only have one Subsidy credit applied to it.
2. Any changes to the subsidy variables will be stored in an application configuration file.

HOURS & COST

Optimistic Hours		98.50	<-
Typical Hours		145.50	<-
Pessimistic Hours		220.00	<-
3-Point Estimated Hours		**150.08**	
AXIOM Hourly Rate	$	99.50	
Estimated Cost	**$**	**14,933.29**	

CPAP – Onsite Data Collection

SCOPE

Onsite Data Collection – From an iPad or mobile device all for a city engineer to add work items.

1) Create, test, and deploy a mobile targeted web application to address the CPAP basic work items (Add/Update/Delete) at the parcel group level.
2) Publicly facing mobile site
3) Authentication – Forms Authentication
4) View & Select projects
5) View & Create parcels (Only basic parcel information. Like the "Anonymous parcel" screen. Advanced editing can happen at the office.)
6) Add Work items (same workflow and data fields as the current program)
7) Delete and Edit work items from the parcel screen

See Appendix A for more details.

DELIVERABLES

Publicly facing password-protected web site specifically designed to add work items into the CPAP system using a mobile phone or iPad

RISKS

- This approach requires that the user have internet connectivity for the application to work.

ASSUMPTIONS

1. The city will host the public facing web site
2. The web site will have access to the CPAP database.
3. You can only edit a work items if NO payments have been made against it.
4. No separate user roles are needed. User password will be set in CPAP.

HOURS & COST

Optimistic Hours	188.50	<-
Typical Hours	249.25	<-
Pessimistic Hours	330.00	<-
3-Point Estimated Hours	**252.58**	
AXIOM Hourly Rate	$ 99.50	
Estimated Cost	**$ 25,132.04**	

CPAP – GIS Integration

SCOPE

AXIOM will work with the City GIS department to provide a SQL Server view or stored procedure that has a common parcel ID (State Geocode), and work item information (Work Item type & Qty).

- Work with and verify that the ARC Map generated maps correctly show all of the work items associated with the parcel data in CPAP

DELIVERABLES

SQL Server view or stored procedure. Access information and accounts if needed to all the City's GIS team to pull information from CPAP. Deployment steps and scripts.

RISKS:

1. Esri may require a different approach to import CPAP work items.

ASSUMPTIONS

Only a data view or stored procedures is needed to pull information from the CPAP SQL server in Arc Map.

HOURS & COST

Optimistic Hours		7.00	<-
Typical Hours		13.00	<-
Pessimistic Hours		23.00	<-
3-Point Estimated Hours		**13.67**	
AXIOM Hourly Rate	$	99.50	
Estimated Cost	**$**	**1,359.83**	

CPAP – System Training

SCOPE

AXIOM will provide two 4-hour training sessions to review the current system for the engineering staff.

DELIVERABLES

- Onsite system trainer and session outline (2 sessions)
- Existing system documentation (Parcel Export process and SSRS training documents)
- Training notes

ASSUMPTIONS

1. A couple of hours of preparation and training notes write-up time after each session is required.
2. If training sessions need to be tailored to a specific user group, AXIOM will be informed with enough time to adjust the material.

HOURS & COST

Optimistic Hours		11.00	<-
Typical Hours		14.00	<-
Pessimistic Hours		16.00	<-
3-Point Estimated Hours		**13.83**	
AXIOM Hourly Rate	$	99.50	
Estimated Cost	**$**	**1,376.42**	

CPAP – System changes/fixes

SCOPE

CPAP System changes/updates. AXIOM received a list of 17 items to address. Of those, 17 items five of them require more analysis. This estimate covers the remaining 12 items. The level of effort to address these changes was not evenly distributed among these 12 requests. Included is break down of effort for each task. This will allow the City to prioritize our development efforts.

Change request Items:

1) Move work items
2) Split Project
3) Next and Previous parcel/group navigation
4) Bond Sale documents updates
5) Lock down work items after payment
6) Scroll through cost reports
7) Tab through parcels when adding work
8) Keep date on bid proposal
9) Lock top bar on parcel cost report
10) Add Qty to Project Engineering Estimate report
11) Updated Payment invoice - spelling error
12) Invoice work to additional contractors

See Appendix B for more details.

DELIVERABLES

Update the CPAP application, database structure, reports, and reporting views.

Level of Effort break down for each item:

Item:	Optimistic	Typical	Pessimistic	3-Point Estimate
1	40.50	54.25	87.00	57.42
2	40.00	55.25	87.00	58.00
3	12.50	17.75	27.00	18.42
4	13.50	22.75	34.00	23.08
5	7.00	10.75	15.00	10.83
6	8.00	10.75	15.00	11.00
7	12.00	20.75	27.00	20.33
8	9.00	11.75	18.00	12.33
9	5.50	6.75	10.00	7.08
10	7.50	12.75	19.00	12.92
11	2.50	2.50	4.00	2.75
12	116.50	161.25	233.00	165.75
Totals:	**274.50**	**387.25**	**576.00**	**399.92**

ASSUMPTIONS

1. Each item's estimate is independent.
2. If we address item #1 and #2, some reduced cost with duplication of effort.

HOURS & COST

Optimistic Hours	274.50	<-
Typical Hours	387.25	<-
Pessimistic Hours	576.00	<-
3-Point Estimated Hours	**399.92**	
AXIOM Hourly Rate	$ 99.50	
Estimated Cost	**$ 39,791.71**	

Hours & Cost Summary

Item Description	Optimistic	Typical	Pessimistic	3-Point Estimated Hours
#1 - Subsidy Calculation Change	98.5	145.5	220	**150.08**
#2 - Onsite Data collection	188.5	249.25	330	**252.58**
#3 - GIS Integration	7	13	23	**13.67**
#4 - System Training	11	14	16	**13.83**
#5 - System changes/fixes (*)	274.5	387.25	576	**399.92**
Total hours:	579.5	809	1165	**830.08**
Total Cost:	$57,660	$80,496	$115,918	**$82,593**

(*) Level of Effort break down for each system changes / fixes:

Item:	Optimistic	Typical	Pessimistic	3-Point Estimate
1	40.50	54.25	87.00	**57.42**
2	40.00	55.25	87.00	**58.00**
3	12.50	17.75	27.00	**18.42**
4	13.50	22.75	34.00	**23.08**
5	7.00	10.75	15.00	**10.83**
6	8.00	10.75	15.00	**11.00**
7	12.00	20.75	27.00	**20.33**
8	9.00	11.75	18.00	**12.33**
9	5.50	6.75	10.00	**7.08**
10	7.50	12.75	19.00	**12.92**
11	2.50	2.50	4.00	**2.75**
12	116.50	161.25	233.00	**165.75**
Totals:	**274.50**	**387.25**	**576.00**	**399.92**

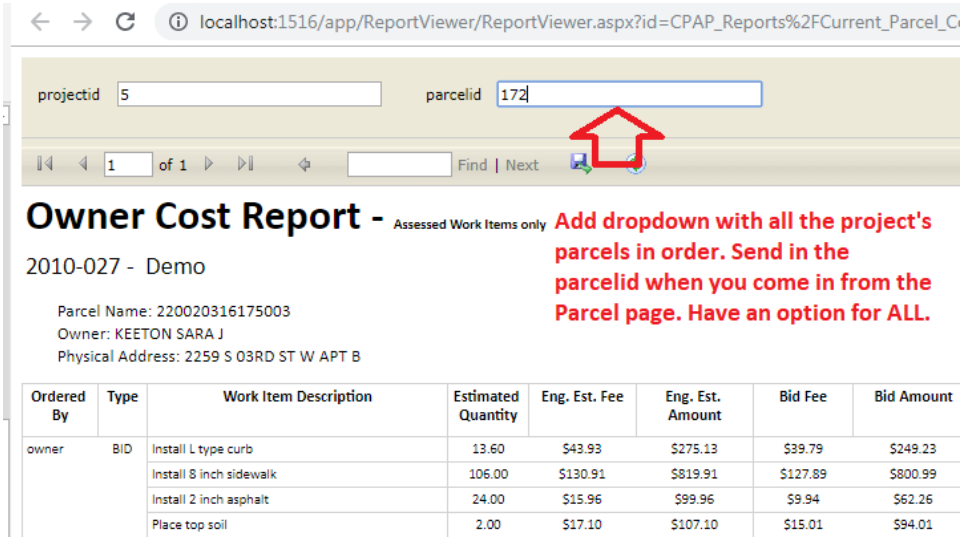
Appendix A – Onsite Data Collection Details

- Create, test, and deploy a mobile targeted web application to address the CPAP basic work items (Add/Update/Delete) at the parcel group level.
- Publicly facing mobile site
- Authentication – Forms Authentication
- View & Select projects
- View & create parcels (Only basic parcel information. Like the "Anonymous parcel" screen. Advanced editing can happen at the office.)
- Add Work items (same workflow and data fields as the current program)
- Delete and Edit work items from the parcel screen
- The application will have seven main views:
    - Home screen:
        - Collects username and password
    - Home screen:
        - Select the project
    - Home screen:
        - List project name, parcel grid, & side menu (Add Parcel, Change Project)
    - Add Parcel:
        - Selector for parcel type (Individual (default), Anonymous, Condo). Condo option requires the user to select a new condo or add to an existing condo.
    - Add Parcel details:
        - Simplified parcel data collection. (Fields: Name, Physical Address fields, notes).
        - This page will be used to edit the parcel if needed.
    - View Parcel:
        - Show parcel name and physical address.
        - Have a button to “Add Work Items”.
        - Show a grid of all the work items for this parcel.
        - Edit or delete work items from the grid.
        - Top of page has << >> buttons to jump to the next parcel.
        - Menu items: Edit, Project Home, Switch Project
    - View Parcel – New Work Item/Edit Work Item
        - This page is a “popup” or “slide out” over the view parcel page. The data entry section should not cover the whole parcel page. The uses should be able to tell what parcel they are either editing a work item or adding one.
            - Cancel X button at top
            - Top of page has << >> buttons to jump to the next parcel.
            - Top menu: Project home
        - Data fields:
            - Work Item Type dropdown.
            - Checkbox SRU (Show rarely used work items)
            - Fund dropdown
            - Ordered by dropdown
            - Quantity
            - Cost
            - Contractor - This only applies if we choose to allow work to be added to other contractors that didn’t win the bid.

- Action bar: on the bottom of the page
    - New Work Item: Save & Save Next. Save, saves the item and returns to the parcel details page. Save next, save the item and allows the user to add another work item to the parcel.
    - View/Edit existing work item: Save button and >>, << buttons to skip between work items quickly.

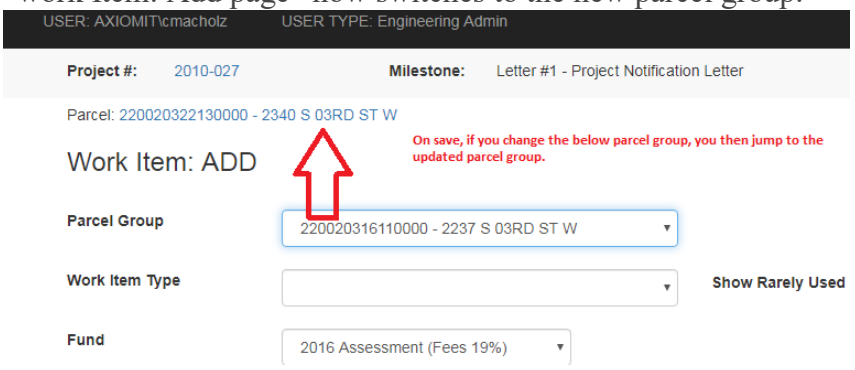
Appendix B – System Changes/Fixes Details

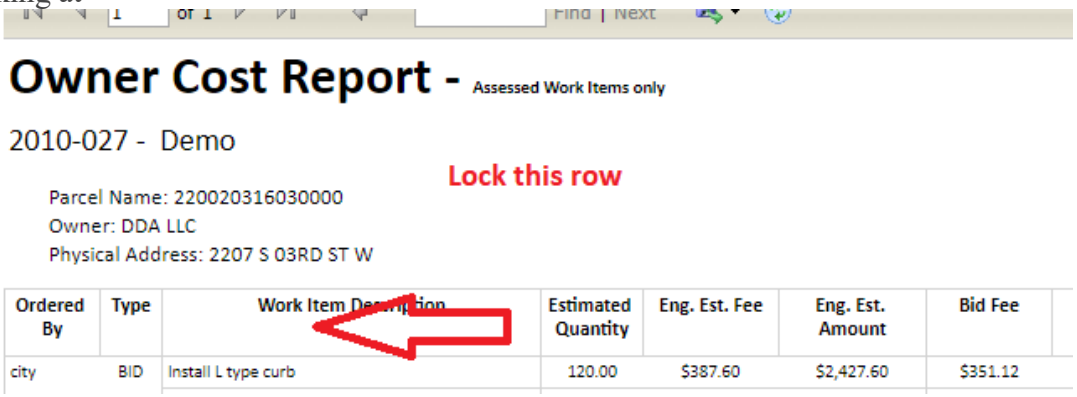
1. Move work items
    a. Once payment has is made on the work item, it cannot be moved.
    b. New Action Item under the Parcel screen.
    c. New Screen where you can select multiple work items and select the parcel group to assign it to.
    d. Add confirm/warning message
2. Split Project – Screen where the user can Move Parcel/Parcel Groups to another project. The user selects the Parcel Groups and the project. Then confirms the move.
    a. Only Parcels that have not invoices or payments applied to their work items can be moved. The user will see a list of error if a parcel can't be moved.
    b. New Action Item under the Project Page
    c. Add confirm/warning message
3. On the PROJECT INFO BAR at the top of a parcel, show the Next and Previous parcel/group in the project as a link. This will allow the user to step through every parcel/group in a project without having to navigate to the project home or Project – Work Item pages.
4. Review and update Bond sale documents. Since the current issues aren't clearly defined:
    a. 4 hours of analysis work with Monte and the finance team
    b. 8-16 hours of development, testing, and deployment
5. "Lock down work items after a payment has been made".
6. "Scroll through cost reports to the next property – want to quickly jump from one owner cost report to another"
    a. Solution:

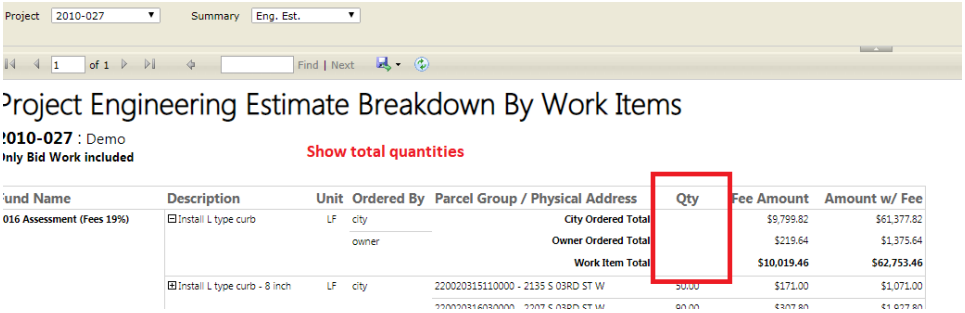


7. "Tab through parcels especially when adding work"
    a. Two things need to happen here:
        i. 1) Implement System changes/fixes #3, the ability to switch parcels.

ii. 2) If they use selects a new parcel group to add the work item to, on save, the "work Item: Add page" now switches to the new parcel group.



8. "Keep date on bid proposal" & "All bids tab not showing date of bid"
    a. This requirement is unclear what date we need to show. Our estimate will be based off assuming we have the date in the CPAP database.
9. "Lock top bar on the parcel cost reports so when you scroll down you know what column you are looking at"
    a. 

10. "Project Engineering Estimate Breakdown By Work Items report – show total quantities for each work item"
    a. 

11. "Period is spelled wrong on Payment invoice"
12. "Is there a way to add additional invoices, such as to outside contractors etc. so they are reflected in the cost summary report? Like Bitterroot welding on Van Buren"
    a. Added Work Items need to have the option to select a contractor
    b. When you make a payment, you would need to select the contractor to make payment to.
    c. Have a way to set a company as a "contractor" that could be used to invoice work items.
    d. Update all the reports that are affected by this.