MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 12/28/2023
Agenda Item #: 11.1
Request for Board Action

Title:	Authorization to Release RFP for Watershed-wide Model Build and Purchase of Watershed Modeling Hardware
Resolution number:	23-083
Prepared by:	Name: Brian Beck Phone: 952-471-8306 bbeck@minnehahacreek.org
Reviewed by:	Name/Title: MCWD Legal Counsel
Recommended action:	Authorize the release of a request for proposals (RFP) for consultant services for building the watershed-wide model for climate planning
Schedule:	12/29/23: RFP release 1/19/24: Proposal submissions due 2/22/24: Anticipated recommendation for contract award

Budget considerations:
Fund name and code: LCCMR 5-5008-4320-001 and
Fund budget: $738,000
Expenditures to date: 0
Requested amount of funding: NTE $628,234
Fund name and code: MCWD IT Equipment Budget 1-1003-4570
Fund budget: $30,000
Expenditures to date: $ 11,981.81
Requested amount of funding: NTE $13,000

Past Board action:

Res # 23-061	Title: Acceptance of Pilot Model Project Summary Report
Res # 23-055	Title: Awarding Contract for Watershed-wide Model Input Refinement
Res # 22-076	Title: Authorization to Award Contract for Stormwater Infrastructure Data Standardization
Res # 22-038	Title: Authorization to Submit Proposal to LCCMR for Development of 2D Watershed Model
Res # 21-091	Title: Authorization to Execute Contract for 2D Pilot Model
Res # 21-024	Title: Authorization to Submit Proposal to LCCMR for Development of a 2D Watershed Model

CLIMATE CONTEXT

Climate change is measurably changing the distribution, frequency, and intensity of rainfall in Minnesota. Between 2013 and 2019, the MCWD experienced the wettest seven years ever recorded. Over the past 10 years, Minnesota has experienced both record flood conditions and statewide drought that has negatively impacted aquatic ecology, stressed stormwater infrastructure, and cost billions in property damage. To successfully adapt to the increasingly volatile extremes in weather, MCWD and communities must be able to identify what landscape interventions are needed, where they are needed, and how much investment is needed.

The first stage of the MCWD's Climate Action Framework is to "Understand and Predict" the impacts of climate change using new data sets and modeling to forecast scenarios, evaluate vulnerabilities, and make decisions about adaptation strategies. These data will create a foundation for MCWD to engage with partner agencies in climate conversations and develop actionable plans for resilience at a system and community scale.

MODELING NEEDS

One of MCWD's principles is to "Rely on sound science to make credible, result-based decisions, and build trust", which requires decisions to be evaluated through a quantitative lens. One of the most common ways MCWD quantitatively assesses project and policy decisions is using watershed models. The District relies on multiple models, all constructed and designed to serve unique needs and answer specific questions. One critical model to the District's operations is its watershed-wide Hydrology and Hydraulic XP-SWMM model (XP-SWMM), which was developed in 2003. It was designed to characterize the total volume and pollutant runoff from the landscape and understand the impact of runoff on receiving water bodies. Over the years, this model has served as the District's day-to-day operational model and has been used to estimate pollutant loading, conduct creek flood forecasting, support floodplain management, aid permitting assessments, and provide boundary conditions to District partners. These uses are still needed and continue to be met today by the XP-SWMM model. However, a series of new questions surrounding localized impacts of climate change and potential adaptation strategies has been asked in recent years by policy makers, partner agency staff, and District staff that are beyond the limits of the XP-SWMM model. Thus, the District identified a need to build an additional watershed-scale modeling tool that would be designed to support long-range climate planning. To fund this work, the District secured a grant of $738,000 from the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

This new watershed-wide climate model will take advantage of available high-resolution public datasets to develop a granular representation of the physical watershed. This provides the opportunity to not only quantify runoff volumes, but also represent how water moves across the landscape via runoff, storm pipes, wetlands, best management practices, and surficial groundwater. With the understanding that the model would be used to holistically understand volume management across the 178 square miles, while also characterizing localized flooding issues, District staff worked to evaluate and identify modeling software that would best serve the District's needs. Key components identified during the evaluation included the ability to (1) model overland flow (2D surface), (2) incorporate detailed stormwater pipe networks (integrated 1D-2D model), and (3) integrate a realistic representation of the water table (integrated surface-water groundwater model). District staff ultimately narrowed down to two modeling software that met the most criteria to support MCWD's Climate Action Framework.

WORK TO DATE

Leading up to the watershed-wide model build, and while waiting to secure LCCMR funding, the District pursued three projects designed to (1) mitigate for technical challenges and risk points associated with a large scale 2D model build, (2) inform effective watershed-scaling, and (3) make measurable progress in areas of known work ahead of the model build. The status, objectives, and outcomes of this work are described below:

- Pilot Model Build (completed): The pilot model was designed to further evaluate the two selected model platforms (ICM and ICPR) and to address the technical challenge of incorporating numerous high-resolution datasets into a modeling tool, specifically the challenge of integrating the unique stormwater datasets from the 29 different communities within the District. The project successfully produced a scalable and automated framework to standardize and correct the pilot geography datasets. Both modeling platforms were built and

evaluated across a variety of metrics relating to its core abilities and its functionality. On October 12, 2023, the Board of Managers accepted the project summary report and concurred with the findings and recommendation to select Interconnected Channel and Pond Routing Model (ICPR4) as the platform to best suit the District's climate planning needs.

- Stormwater Data Standardization (completed): This project built upon the automated workflow established in the pilot. The project gathered the stormwater infrastructure datasets from all the agencies and communities within MCWD's boundary and developed a deep understanding of each dataset's unique structure and naming conventions. Scripts were then developed to transfer each unique dataset into single standardized geodatabase format, referred to as MGIS. This project produced a comprehensive and standardized watershed scale stormwater infrastructure dataset to be used beyond just the upcoming model build.

- Watershed-wide Model Input Refinement (ongoing): This work begins to draw on LCCMR funding and is actively ongoing. The scope includes three primary outcomes to (1) collect stream channel cross-section data on a subset of the District's stream systems, (2) Refine the pilot model scripts to account for the range of issues and data gaps present within the watershed-wide stormwater dataset, in order to produce a model ready dataset, and (3) understand the number of culverts that require field surveying in the upper watershed.

COMPUTING NEEDS

An important learning during the Pilot Model was that model runtime using standard enterprise laptops can result in prohibitively slow model runtimes. For example, model runtimes for a relatively small area draining to Lundsten Lake (1.2 square miles) took approximately 100 minutes a scenario, which reduced the speed at which the model could be built. As we look ahead, the model being built for the entire MCWD area will be more than 700 times larger than the pilot model, which could result in model runtimes that last several days based on the speed of the computer used to build the model and run scenarios.

Therefore, MCWD staff worked closely with the developer of the model being used for the climate action framework (Streamline Technologies) to identify computer hardware that would be optimized for running its model. In addition, MCWD staff tested the modeling software on several high powered desktop computers that indicated that performance gains could reduce runtime from 100 minutes to 15 minutes. Staff used those recommendations and computer benchmarks to assemble a cost estimate for a high-powered workstation computer that can be used by MCWD staff and the selected consultant to dramatically reduce model runtimes and the model development process.

WATERSHED-WIDE BUILD APPROACH AND RFP PROCESS

Oftentimes, model development work is consulted out to take advantage of engineering expertise and/or familiarity with the modeling software of choice. However, MCWD places a premium on ownership of the tools being used for decision-making, which can be difficult when much of the learning is gained during the tool development processes. Without this deep level of understanding, it can be challenging to stress-test model build decisions and it increases the likelihood of relying solely on a consultant for future model related work.

Like the XP-SWMM model, the Watershed-wide climate model will be broken out into two models: the upper watershed and lower watershed; Grays Bay Dam offers a unique clear hydrologic break between the systems and this approach will mitigate run time issues. To ensure there is internal ownership, and a deep level of understanding of the model and its functionality, staff will be building the upper watershed portion of the model alongside the consultant's led portion. And while the consultant will only be constructing the lower watershed model, it will still be carrying out the prerequisite work at the watershed scale. The scope of work has been structured to support this approach and puts emphasis on gaining a high degree of clarity around model build decisions so the District and Consultant can work in synchrony.

At the December 28, 2023 Board of Managers meeting, staff will present on the major elements of the Watershed-wide climate model build and outline key elements of work within the scope. These project elements include:

1. ***Data Discovery and Data Review:*** *The consultant will perform an initial review of the available datasets necessary for the ICPR4 model. This includes, but is not limited to, evaluating stormwater infrastructure, stream channel cross-sections, and soils data, along with LiDAR and municipal hydrologic models. The goal is to identify critical issues or gaps that could impede a preliminary model build, focusing on ensuring data integrity and readiness for model development. The consultant will be tasked with reviewing the data on a watershed-wide scale.*

2. ***Development of the Model Approach:*** *The consultant will conduct a series of workshops with District staff to align on the critical decisions for the model build. These decisions include 2D mesh resolution, groundwater zone construction, and other vital components of the model. The workshops aim to develop a shared understanding of the model build approach and document the decisions in a technical memorandum.*

3. ***Non-pipe Stormwater Dataset:*** *This task focuses on developing strategies to characterize storage and hydraulic control structures within the watershed. It involves identifying methodologies for data gap identification, criteria for making assumptions, and strategies for data collection or mining. The task aims to enhance understanding of landscape storage for climate change planning.*

4. ***Review and Refinement of Programmatic Data Processing Scripts:*** *The consultant will review and refine the District's existing Python stormwater infrastructure scripts to integrate new datasets (layers, fields, and/or attributes) developed in Task 3. This includes developing new Python scripts to create a model-ready stormwater dataset, incorporating storage and hydraulic control structures. The process will be iterative, utilizing spatial analysis to ensure dataset quality, and critical assumptions will be clearly flagged.*

5. ***Preliminary Model Build:*** *The preliminary model build will be based on currently available geographic data, aiming to identify key data gaps for further refinement. The consultant will lead the Lower Watershed Model and the MCWD will lead the Upper Watershed Model preliminary build. This task includes running initial model simulations, documenting data gaps or issues, and developing a prioritized list of data gaps.*

6. ***Data Collection and Data Processing:*** *The focus of this task is to strategically address data gaps crucial to the hydrologic and hydraulic model's accuracy. The consultant, in partnership with the District, will prioritize data gaps based on their impact on model quality and budget considerations. A detailed plan will be outlined in a technical memorandum, specifying prioritized data for collection, data collection methods, and documentation strategies. This task also includes the data collection effort itself.*

7. ***Model Build:*** *The model build involves integrating processed datasets into the ICPR4 models, conducting initial test runs, and applying a calibration strategy. The Upper Watershed Model will be built by District staff, and the Lower Watershed Model will be built by the CONSULTANT. The CONSULTANT will adjust the Lower Watershed Model to accurately reflect the watershed's hydrologic behavior and document the calibration process. A comprehensive Model Build Report for the Upper and Lower Watershed will be prepared by the District and the CONSULTANT, respectively. These reports will characterize critical aspects of the model build, data collection, and calibration results based on standardized model documentation developed by the CONSULTANT.*

The draft request for proposals (RFP) is intended to attract a consultant firm with a strong track record in collaborating with clients on complex projects, experience building large-scale watershed models using ICPR, and experience working within the MCWD geography. The RFP comprises four main sections:

- Background and Project Overview: Includes context for the project and an overview of each project element.
- Scope of Services: Required tasks and deliverables.
- Instructions to Proposers: Submittal requirements, timeline, and evaluation and selection criteria.
- Disclosures: Documentation of the District's rights and proposer's liabilities in the preparation of responses to the RFP.

Following the presentation at the December, 2023 Board of Managers meeting, staff will answer questions regarding the RFP process, strategy, and timeline. It is staff's recommendation that the Board of Managers approve resolution 23-083, authorizing the release of a final RFP for consulting services for the watershed-wide model build and purchase of computing equipment.

Supporting documents (list attachments):
Draft RFP package
Workstation Computer Cost Estimate

MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

RESOLUTION

Resolution number: 23-083

Title: Authorization to Release RFP for Watershed-wide Model Build and Purchase of Watershed Modeling Hardware

WHEREAS climate change is measurably changing the distribution, frequency and intensity of rainfall in Minnesota;

WHEREAS a key pillar in Minnehaha Creek Watershed District's (MCWD or District) climate action framework is to understand and predict the impacts of climate change using new data analytical and planning tools;

WHEREAS to support this strategy, the District has identified the need to develop a watershed-wide two-dimensional (2D) model that incorporates high resolution stormwater infrastructure and land surface data to improve our ability to inform current and future water resource management decisions in the face of climate change;

WHEREAS in June 2022, the Board of Managers authorized staff to submit a proposal for $738,000 to the Legislative-Citizen Commission on Minnesota Resources to develop a watershed-wide model;

WHEREAS in advance of the watershed-wide build, the District chose to pursue a pilot 2D model build to constrain the technical and relational risk associated with a large scale, high-resolution model build;

WHEREAS the pilot model effort was designed to answer outstanding technical questions related to building a 2D H&H model for the entire District, which includes developing automated workflows for stormwater infrastructure, landuse, soils and topography data; understanding benefits and drawbacks of tested software; and identifying which software is best suited to scale watershed-wide;

WHEREAS in January, 2021, the Board of Managers authorized a contract with Kimley-Horn to deliver on the pilot model's scope of work that involved two stages of work, which included (1) data processing and (2) model platform evaluation;

WHEREAS the data processing work resulted in the creation of a semi-automated data processing framework for model inputs to streamline the model build process, and the framework effectively addressed the challenge of incorporating and standardizing the numerous unique stormwater infrastructure datasets within MCWD;

WHEREAS the model platform evaluation phase assessed two modeling platforms, ICM and ICPR, to determine which best aligns with the District's climate planning needs and informs how to effectively scale watershed-wide;

WHEREAS in October 2023, the Board of Managers accepted the pilot model project summary report and concurred in the selection of ICPR for construction of the watershed-scale climate planning model;

WHEREAS the Pilot Model report identified potential risk surrounding model runtimes that are prohibitively slow, which may impact the Districts ability to build an ICPR4 model at a watershed wide scale;

WHEREAS MCWD staff tested a variety of computer hardware to identify how to optimize model runtimes to ensure that an ICPR4 model could be built and functionally applied at the watershed wide scale;

WHEREAS in September 2023, the Board of Managers authorized a contract with Bolton & Menk for Watershed-wide Model Input Refinement (MIR), which starts to draw on the secured LCCMR funds. This work begins to fill data gaps identified through the pilot model and refine the automated script package to account for the range of issues present watershed-wide;

WHEREAS the watershed-wide build scope has three key elements: (1) Processing data into a model-ready format, (2) Identifying and filling data gaps for the model, and (3) Production of a calibrated Upper and Lower Watershed model that will be used for climate planning;

WHEREAS the RFP process seeks a consultant team with a strong track record in collaborating with clients on complex projects, experience building large-scale watershed models using ICPR, understanding of municipal stormwater infrastructure datasets, and experience working within the MCWD geography;

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers authorizes the District administrator to release a request for proposals for the watershed-wide model build, as presented and with final edits on the advice of counsel.

BE IT FURTHER RESOLVED that the Minnehaha Creek Watershed District Board of Managers authorizes the District administrator to purchase a workstation computer for an amount not to exceed $13,000.00.

Resolution Number 23-083 was moved by Manager _____, seconded by Manager _____. Motion to adopt the resolution ___ ayes, ___ nays, ___abstentions. Date: 12/28/2023

_____ Date: _____

Secretary

REQUEST FOR PROPOSALS
Consulting Services for Developing a 2D Watershed-wide Model for Minnehaha Creek Watershed District

PART 1: BACKGROUND AND PROJECT OVERVIEW

General

The Minnehaha Creek Watershed District (MCWD or District) is seeking a qualified CONSULTANT team to support MCWD staff in building a two-dimensional (2D) coupled surface water-groundwater model for the Minnehaha Creek Watershed District. This work will directly support the District's need to understand and predict the impacts of climate change, which represents the first phase of the District's Climate Adaptation Framework.

The work described in this request for proposals (RFP) will build upon findings, processes, and datasets that were developed in three preceding, related District efforts: 1) the Pilot 2D Model Project ("Pilot Model"), 2) the 2D Model Data Standardization Project, and 3) the Model Input Refinement Project ("MIR Project"). More details on the Pilot Model Project can be found in Exhibit B.

The overarching aim of these projects has been to minimize technical risks inherent in constructing a large-scale, high-resolution hydrology and hydraulic (H&H) model. The District has tackled the challenge of devising a streamlined approach to process and assimilate unique stormwater infrastructure data from the cities and agencies within the District. Through these efforts, the District has developed an automated framework and a baseline Python script package, which together serve to process stormwater infrastructure datasets, address critical data gaps for the watershed-wide climate model, and unify each municipal/agency dataset within the watershed into a single, standardized geodatabase.

The final phase of the watershed-wide build project is to leverage learning from past projects to build a watershed-wide 2D H&H model that can help answer critical questions surrounding climate change adaptation for MCWD. This project is unique since it will require a strong partnership between the CONSULTANT and MCWD to build a watershed model that encompasses the Minnehaha Creek Watershed District (Exhibit A). At a high level, the roles for this project are as follows:

1) **Data Processing and Python Scripting:** The CONSULTANT will lead data review and data processing to produce baseline datasets that will be used in the watershed models.
2) **Upper Watershed Model Development:** MCWD staff will lead the development of the Upper Watershed model that will be reviewed by the CONSULTANT.
3) **Lower Watershed Model Development:** The CONSULTANT will lead the development of the Lower Watershed model.
4) **Data Collection:** The CONSULTANT will lead field data collection and MCWD staff will support field data collection where necessary.

This collaboration between the MCWD and CONSULTANT aims to leverage the distinct expertise and insights of both parties to the project to create a comprehensive and effective watershed model. Project success will require a strong background working with large-scale hydrologic and hydraulic ICPR4 models, stormwater infrastructure data, Python scripting, and the ability to work in a highly collaborative environment.

Project Background

Climate change is measurably changing the distribution, frequency and intensity of rainfall in Minnesota. Between 2013 and 2019, the MCWD experienced the wettest seven years ever recorded. Over the past 10 years, Minnesota has experienced both record flood conditions and statewide drought that has negatively impacted aquatic ecology, stressed stormwater infrastructure and cost billions in property damage. To successfully adapt to the increasingly volatile extremes in weather, MCWD and communities must be able to identify what landscape interventions are needed, where they are needed, and how much investment is needed. Recognizing these challenges, the MCWD has initiated an effort to develop a more robust understanding of how water moves through the Minnehaha Creek Watershed District and how climate change will impact the built and natural environment through the Climate Action Framework.

The first stage of the MCWD's Climate Action Framework is to "Understand and Predict" the impacts of climate change using new data sets and modeling to forecast scenarios, evaluate vulnerabilities, and make decisions about adaptation strategies. To accomplish this goal the District identified the need to develop a model that better represents 1) stormwater infrastructure, 2) surficial groundwater, and 3) storage. In 2023, the District was awarded a grant from Legislative Citizen Commission of Natural Resources (LCCMR) to fund the watershed-wide model development.

Project Objectives

The project has three primary objectives:

1) Processing datasets into a format that can be loaded into ICPR4 based on the model input requirements using repeatable processes developed in past projects (Exhibit B)
2) Identifying data gaps or data needs for the watershed-wide model that need to be filled through data collection for the final watershed-wide model to support the District's Climate Action Framework
3) Build, calibrate, and document the watershed-wide model to support climate planning based on data developed in previous projects or during this project

Project Elements

The project comprises seven key elements to achieve the project's objectives:

Task 1: Data Discovery and Data Review

The CONSULTANT will perform an initial review of the available datasets (Exhibit C and Supplemental Materials) that MCWD has obtained or developed to determine if additional data processing is necessary to build the ICPR4 model. This includes, but is not limited to, evaluating stormwater infrastructure data, stream channel cross-sections, USDA soils data, geologic information, and LiDAR. The goal is to identify critical issues or gaps that could impede a preliminary model build, focusing on ensuring data integrity and readiness for model development. The CONSULTANT will be tasked with reviewing the data on a watershed-wide scale.

Task 2: Model Build Approach

The CONSULTANT will conduct a series of workshops with District staff to ensure there is alignment on the critical decisions for the model build. These decisions include 2D mesh resolution, groundwater model approach, model calibration and validation approach, and other vital decision points for the model. The workshops aim to develop a shared understanding of the model-build approach and document the decisions in a technical memorandum that will aid in model-build consistency between the Upper Watershed Model (built by District staff) and the Lower Watershed Model (built by CONSULTANT).

Task 3: Non-pipe Stormwater Dataset

The CONSULTANT will be responsible for developing a comprehensive geodatabase of storage, such as ponds and BMPs, and hydraulic control structures critical for climate change modeling and planning across the entire watershed. They will develop a methodology to locate critical data gaps and criteria for filling gaps, which includes reviewing partner agency geospatial data and potentially collecting field data.

Task 4: Review and Refinement of Programmatic Data Processing Scripts

The CONSULTANT will review and refine the District's existing Python stormwater infrastructure scripts to integrate new datasets (layers, fields, and/or attributes) developed in Task 3. This includes developing new Python scripts to create a model-ready stormwater dataset, incorporating storage and hydraulic control structures.

Task 5: Preliminary Model Build

The preliminary model build will be based on currently available geographic data, aiming to identify key data gaps for further refinement. The CONSULTANT will lead the Lower Watershed Model and the MCWD will lead the Upper Watershed Model preliminary build. This task includes running initial model simulations, documenting data gaps or issues, and developing a prioritized list of data gaps.

Task 6: Data Collection and Data Processing

The focus of this task is to strategically address data gaps crucial to the hydrologic and hydraulic model's accuracy. The CONSULTANT, in partnership with the District, will prioritize data gaps based on their impact on model quality and budget considerations. A detailed plan will be outlined in a technical memorandum developed by the CONSULTANT, specifying prioritized data for collection, data collection methods, and documentation strategies. This task also includes the data collection effort itself, which will be led by the CONSULTANT with support from District staff if necessary.

The CONSULTANT will process the collected data using Python scripts developed in Task 4. These data will then be used to create a watershed-wide model-ready dataset. The focus is on integrating all processed datasets into the ICPR4 model, ensuring functional and cohesive model components.

Task 7: Model Build

The model build involves integrating processed datasets into the ICPR4 models, conducting initial test runs, and applying a calibration strategy. The Upper Watershed Model will be built by District staff, and the Lower Watershed Model will be built by the CONSULTANT. The CONSULTANT will adjust the Lower Watershed Model to accurately reflect the watershed's hydrologic behavior and document the calibration process. Model reports will be developed for the Upper Watershed Model by the District and Lower Watershed by the CONSULTANT. These reports will characterize critical aspects of the model

build, data collection, and calibration results based on standardized model documentation developed by the CONSULTANT.

PART 2: SCOPE OF SERVICES

The CONSULTANT will work in coordination with the District to complete tasks 1-7, below. The expected completion date for the scope of services is May 31, 2025. The District estimates a project budget of $580,000-$620,000.

For the purpose of the RFP, the scope of services is as follows:

Task 1: Data Discovery and Data Review

Task 1a. Data Discovery

The CONSULTANT will first conduct an initial review of the datasets available and needed to develop the ICPR4 model. The CONSULTANT will review each dataset to identify any critical issues or gaps with the datasets based on its professional judgment. The goal of this task is to ensure that there are no critical errors, however, it is only meant to identify the issues that will prevent a preliminary model build. The datasets MCWD curated prior to this project are summarized in Exhibit C.

Task 1b. Data Review Documentation

The CONSULTANT will create a technical memorandum that documents the current state of each dataset and potential gaps that would prevent a successful preliminary model build. The document will cover three elements including:

- Identifying critical issues or gaps within the datasets provided to develop the ICPR4 model
- A description of the issues or gaps within the datasets and why they need to be filled prior to model development
- The data sources, methods, or assumptions that will be used to fill the data gaps or erroneous data

Task 1 Deliverables:

- Data review assessment technical memorandum that includes:
    - Specific gaps or erroneous data across the watershed-wide datasets
    - A description of the issues or gaps within the datasets and why they need to be filled prior to model development
    - The data sources, methods, or assumptions that will be used to fill the data gaps or erroneous data

Task 2: Model Build Approach

Task 2a. Model Build Approach

After reviewing the data, the CONSULTANT and the District will collaborate to arrange a series of four meetings to discuss the approach for building the model. The goal of this task is to develop a shared understanding between the CONSULTANT and District staff about critical model build decisions such as 2D surface mesh resolution, groundwater model approach, use and resolution of 1D components, calibration approach, and other critical model decisions that will set the direction for the model build.

The CONSULTANT will collect notes from each meeting, which will be used to document the agreed-upon model build approach through a technical memorandum.

Task 2 Deliverables:

- 4 in-person 1-hour (more or less) workshops
- Workshop summaries for each meeting describing the decisions made during the meetings
- A technical memorandum that summarizes the model approach developed by the CONSULTANT in collaboration with District staff

Task 3: Non-pipe Stormwater Dataset

Task 3a. Non-pipe Stormwater Dataset Strategy Development

One of the most important aspects of developing a watershed-scale 2D H&H model for climate change planning is characterizing the amount of storage that currently exists in ponds, lakes, wetlands, best management practices, and soil pore space. Characterizing the storage currently on the landscape will be an important first step to help the District, and its partner communities, understand where additional storage may be needed to adapt to increased precipitation. However, the District's initial review of the stormwater infrastructure datasets revealed that very limited data exist about storage and outlet control structures making it difficult to characterize the current extent of storage within MCWD. Therefore, the goal of this task is to:

1) Characterize a methodology for locating critical data to fill gaps in:
    a. Wetland/pond/lake storage volumes
    b. Wetland/pond/lake outlet control structures
2) Develop criteria for when and how assumptions will be relied on to fill data gaps for storage (ponds, wetlands and BMPs) and hydraulic control structures
3) Identify a strategy for filling critical data gaps in storage and hydraulic control structures through mining existing data sources or collecting data in the field.

Task 3b. Initial Non-Pipe Stormwater Data Mining and Data Collection

The findings from Tasks 2a and Task 3a will be used to guide data collection for storage volumes, hydraulic control structures, and other datasets identified as critical for model accuracy. This task will focus on reviewing data from existing geospatial data sources or field data collection of critical model features identified in task 3a to support the preliminary model build.

Task 3 Deliverables:

- A non-storm pipe data assessment technical memorandum that includes:
    - A method for locating critical storage and hydraulic control structure data gaps
    - Develop criteria for when assumptions will be made about storage and hydraulic control structures
    - Articulate the strategy for filling critical data gaps in storage and hydraulic control structures
- A second technical memorandum summarizing the storage and hydraulic dataset produced for the preliminary model build
- Populated geodatabase, in an agreed-upon structure, that contains the recently developed storage data

Task 4: Review and Refinement of Programmatic Data Processing Scripts

Task 4a. Existing Stormwater Infrastructure Script Review

It's important that the CONSULTANT first develop an understanding of the overarching framework and the two associated script packages ("Raw to MGIS" and "MGIS to Model Ready") that were developed in previous projects to (1) convert each municipality's infrastructure dataset into the Metro GIS Stormwater Geodata Standard (MGIS) and (2) address topology issues, gaps, erroneous values. District Staff will provide all the scripts and associated documentation to the CONSULTANT for its review to serve as the baseline for subsequent tasks.

Task 4b. Existing Stormwater Infrastructure Script Refinement

The CONSULTANT will focus on refining or creating Python scripts to develop a comprehensive stormwater infrastructure, storage, and hydraulic control structure dataset, aligning with model requirements developed in Task 2. This task is expected to be an iterative process, involving continuous spatial analysis to evaluate the impact of script modifications on data quality and to determine the need for incorporating additional script functions. Furthermore, the CONSULTANT will leverage other spatial datasets, like LiDAR, to effectively address and rectify dataset deficiencies. Throughout this process, it is crucial to distinctly mark any assumed values within the dataset, ensuring future modelers can easily differentiate between field collected and estimated data. The ultimate objective is to prepare a robust, model-ready dataset that will serve as a key component in the District's forthcoming climate planning model development.

Task 4c. Script Documentation

Once scripts are finalized in task 4b and a model-ready dataset has been generated, the CONSULTANT will thoroughly document each script that outlines the purpose, required setup and source datasets, and pseudo code descriptions. Existing documentation from past projects can be built upon (Exhibit B) or new documentation can be developed as part of this project. Documentation must clearly identify where gaps are being filled or assumptions are being made.

Task 4 Deliverables:

- Revised package of stormwater infrastructure scripts with associated documentation
- Geodatabase(s) of watershed-wide model-ready datasets based on the model approach Task 2

Task 5: Preliminary Model Build

Task 5a. Model Build

The CONSULTANT will build a preliminary 2D H&H ICPR4 integrated surface water-groundwater model for MCWD's Lower Watershed (Exhibit A) using the approach guidelines developed in Task 2 and datasets developed in Task 4. District staff will develop the 2D H&H ICPR4 model for the upper watershed (Exhibit A), which will be reviewed by the CONSULTANT. The focus of this task is to create a functional ICPR4 model that can be used in subsequent tasks to identify critical data gaps and is not intended to serve as the final model for the project.

Task 5b. Initial Model Run and Review of Model Issues.

One of the key insights from the 2022 Pilot Watershed Model Build (Exhibit B) was that geographic data gaps have the greatest impact on model quality and should be filled before manipulating model parameters for calibration. Therefore, the purpose of the preliminary model build is to create a working model version based on geographic data that are currently available or data that require little effort to obtain. The preliminary model will help the CONSULTANT and District identify key geographic data gaps based on model runs that will help refine the key data gaps.

The CONSULTANT will conduct event-based and continuous model runs to characterize and document three critical elements:

- Erroneous data that cause issues with model stability or poor model results
- Data gaps that cause issues within the model such as poor stability or model errors
- Data gaps that reduce the accuracy of the model based on measured streamflow, stream level, or groundwater level.

Task 5c. Document Data Gaps or Issues

The CONSULTANT will work collaboratively to document data gaps and issues that were identified in Task 5b. Once model runs are finalized in Task 5b the CONSULTANT will thoroughly document the identified data errors and gaps. Documentation must clearly identify:

- The location of the data gap or erroneous data
- The nature of the data gap or erroneous data
- The relative magnitude or importance of the data gap or erroneous data on model performance or accuracy
- A prioritized list of data gaps that need to be filled via further review of existing data sources or field data collection

Task 5 Deliverables:

- A ICPR4 model that has been developed based on datasets created in Task 4 and modeling guidelines in Task 2
- A technical memorandum for the Lower Watershed Model that summarizes:
    - The location of the data gap or erroneous data
    - The nature of the data gap or erroneous data
    - The relative magnitude or importance of the data gap or erroneous data
    - A prioritized list of data gaps that need to be filled via requesting data from partner agencies or field data collection
- A second technical memorandum that summarizes the CONSULTANT's review and recommendations of the Upper Watershed Model built by MCWD staff

Task 6: Data Collection and Processing Planning

Task 6a. Data Collection Prioritization

The extent of data gaps that must be filled is currently unknown, which makes providing a prescriptive data collection request difficult to define. However, the District understands that the model built for this project cannot be a comprehensive warehouse of all geographic data that pertain to hydrologic and hydraulic models. Therefore, the District will work collaboratively with the CONSULTANT to develop a

prioritized list of data gaps that have the greatest impact on model quality, which must balance the level of importance to the model relative to the budget estimated by the CONSULTANT. The CONSULTANT will provide a written plan in a technical memorandum that will serve as an agreed-upon approach for filling data gaps through data collection or further geospatial data requests for the upper and lower watershed.

The CONSULTANT will work with District Staff to develop several items prior to data collection including:

1) A list of data that will be prioritized for data collection or mined through other methods.
2) Data collection forms based on prioritized data to be collected that will serve as long term data collection documentation.
3) A data request plan for data sources the District hasn't obtained from partner agencies or other data sources.
4) A collection plan that outlines the data collection locations, approach for collecting or obtaining each data type, property access for field data collection type, collection methods, CONSULTANT or District role, and documentation approach.

Task 6b. Data Collection and Data Entry

The CONSULTANT will execute any further data collection and geospatial data mining in close collaboration with District staff. District staff will notify private property owners for access, as-needed, prior to field work based on the collection plan developed in Task 6a. The CONSULTANT will then commence field work and collect data outlined within the collection plan.

Following data collection, the CONSULTANT will process and organize the data collected within a geodatabase format. Data should utilize NAD 1983 UTM Zone 15N as the horizontal spatial reference and NAVD88 as the vertical coordinate system.

Task 6c. Data Processing

The CONSULTANT will use the refined Python scripts developed in Task 4 to process data collected in Task 6b. The output of this data processing step will be the model-ready data used for the watershed-wide model to support climate planning.

Task 6 Deliverables:

- Data field form templates
- A technical memorandum summarizing the data collection plan and data request plan
- Geodatabase(s) of watershed-wide model-ready datasets based on the model approach Task 2
- Metadata associated with field-collected data

Task 7: Model Build

Task 7a. Model Build

Task 7 represents a culmination of the previous work since it will integrate all processed datasets developed in Task 6 into the ICPR4 model. This integration is pivotal for the development of a cohesive and functional hydrologic and hydraulic model. In addition, the CONSULTANT will need to configure the model parameters and settings that were outlined in Task 2 (Model Build Approach) for the Lower Watershed Model. Initial test runs will be conducted to verify the basic functioning and integration of the model components. These test runs are essential for ensuring that all elements of the ICPR are working correctly and creating model output that can be used for calibration.

Task 7b. Model Calibration and Validation

In this phase, the focus is on applying the calibration strategy outlined in Task 2 to the model. This involves using water level, flow, and precipitation data collected by MCWD and its partners (Exhibit D), with the goal of adjusting the model to accurately reflect the watershed's hydrologic behavior. This step is critical for ensuring that the model's outputs are not only consistent with historical observations but also follow a methodical and scientifically sound calibration and validation process. Documenting the calibration process will include, but is not limited to, a description of final adjustments to the model parameters, the justification for model adjustments, and a comparison of calibrated model results relative to the uncalibrated model and measured data results.

Task 7c. Model Build Report

Task 7c entails the preparation of a detailed Model Build Report. This report is a comprehensive documentation of:

- Introduction and background
- A summary of the datasets utilized for the model
- Detailed documentation of the Python Scripts used to develop the model-ready datasets
- A summary of the preliminary model build and the prioritized list of data gaps
- Detailed documentation of data collection and data mining to serve as a record of datasets created during this project
- Assessment of the accuracy of each model based on calibration and validation results

Task 7 Deliverables:

- A calibrated ICPR4 model for the Lower Watershed of MCWD
- Standardized watershed modeling report outline that can be used for the Upper and Lower Watershed Model
- A technical memorandum that summarizes the CONSULTANT's review and recommendations of the Upper Watershed Model built by MCWD staff
- Draft modeling report for the Lower Watershed
- Final Draft of modeling report for the Lower Watershed

Project Area

The project area for this RFP process is the entire Minnehaha Creek Watershed District that stretches 178-square miles and includes all or part of 27 cities and two townships (cities/municipalities) in Hennepin and Carver counties (Exhibit A)

Project Team

Brian Beck (Primary Contact)
R&M Program Manager, MCWD
bbeck@minnehahacreek.org
952-471-8306

Alex Steele (Secondary Contact)
GIS Coordinator, MCWD
asteele@minnehahacreek.org
952-641-4581

PART 3: INSTRUCTION TO PROPOSERS

Submittal Requirements

Responses to the RFP should be submitted to Brian Beck via email (bbeck@minnehahacreek.org) no later than 4:00 pm on Friday, January 19, 2024. Please visit the RFP webpage located on the District's website: https://www.minnehahacreek.org/

No page limit is imposed; however, respondents will be evaluated on clarity and conciseness. Each proposal should include the following items:

- Cover Letter – Please provide a primary point of contact through the transmission of a cover letter.
- Project understanding – Describe your understanding of the scope of work, the approach to be taken, and your vision for the project. Identify any additional information the District will need to supply or obtain to enhance your understanding of the project and to complete the work, and/or any issues you might anticipate in performing the work.
- Approach and methodology – Describe your detailed approach and methodology for completing the project, organized by task as outlined in Part 2: Scope of Services. For each task, provide a clear outline including your understanding of the task, proposed methodology, the team assigned, anticipated deliverables, and any supplemental tasks not described in the RFP. This structure aims to ensure clarity and facilitate the evaluation process.
- Critical Aspects and Questions: Address the following critical aspects in your proposal:
    - Describe your approach to identifying and filling critical data gaps in the watershed-wide model.
    - What areas of the model build do you anticipate being most challenging? What is your approach or strategy for ensuring a successful model build in the face of these challenges?
    - What are the areas of ambiguity that may cause the greatest risk in this project and what are your strategies to mitigate that risk?
    - How will your team engage with the District staff to ensure alignment on critical model build decisions, such as 2D surface mesh resolution, groundwater model approach, calibration approach, and other vital decision points for the model? Please detail your methodology for facilitating effective communication, decision-making processes, and ensuring consensus on these key aspects of the model build.
- Proposal Structure: Proposals should be organized by task as outlined in Part 2: Scope of Services. For each task, provide a specific outline including understanding of the task, proposed approach and methodology, team assigned to it, and anticipated deliverables. This structure will help ensure clarity and facilitate the evaluation process.
- Cost Proposals Guidance: The proposal should include a detailed spreadsheet showing budgets for each task and subtask. This should break down the costs for labor hours, materials, subcontracting (if applicable), and any other direct expenses. Clearly indicate any assumptions that impact the cost and how those assumptions will impact your project cost.
- Project Assumptions:
    - The District expects that the CONSULTANT has an ICPR4 Expert license to build the watershed model due to the incorporation of 2D surface flow and the incorporation of groundwater into the project models.
    - The District will provide remote access to a 64-core workstation for model runs or model development. It is not a requirement to build the model on the District's

workstation, however, the District does want to make the resource available if the selected CONSULTANT would benefit from using a workstation optimized for ICPR4.

- Milestones and Deliverables: Include a detailed schedule of milestones and deliverables for each task and subtask. Indicate key dates and dependencies to illustrate how your team will manage the project timeline effectively. This should align with the task based NTE budgets and provide a clear roadmap for project completion.
- Qualifications and experience – Provide an overview of the firm(s) and project team member's qualifications. Include descriptions of projects undertaken by the firm(s) and team members that demonstrate a strong understanding of municipal stormwater datasets, large-scale watershed 2D H&H models, ICPR4 modeling software, collaborating with clients on complex projects, and knowledge of the MCWD geography. Speak to the team's ability to deliver the project on time and on budget.
- References – Provide three recent references for your proposed firm or team, including names, addresses, and phone numbers, along with a description of the project and your role. References preferably pertain to work described in this project.
- District Resources – Include a list of resources, expectations, or requirements that the CONSULTANT expects from the District in order to complete the project as proposed.
- Subcontracting – If the CONSULTANT intends to subcontract, identify and describe the subcontractor, describe the intended scope and role of the subcontractor, identify the team members proposed from the firm, and provide the qualifications and experience information requested above for those team members.

Request for Proposal Timeline

A review committee led by the project manager, Brian Beck, along with other select District staff will evaluate proposals. The District staff team will host one information meeting to answer questions about the RFP. Interviews are anticipated as part of the selection process. Following a comprehensive review, the review committee will recommend a CONSULTANT to the MCWD Board of Managers.

The anticipated timeline for the proposal review process, which is subject to change, is as follows:

- **RFP issue date:** Friday, December 29, 2023
- **Informational Meeting:** Tuesday, January 9, 2024
- **Deadline for receipt of proposals:** Friday, January 19, 2024 at 4:00pm
    - **Expected dates for Interviews:** Tuesday, January 30, 2024 to Wednesday, January 31, 2024
- **Expected dates for follow-up questions, as needed:** Thursday, February 1, 2024 to February 7, 2024
- **Anticipated date for CONSULTANT selection:** February 22, 2024 (District Board of Managers meeting)

Proposer's Budget for the Project

The requested services under this RFP will be funded through awarded LCCMR grant funds. Services will be compensated on an hourly basis with a specified not-to-exceed for the entire project. The Contract Maximum, to be set after the determination of the scope of work, is the cap for contractual services including both professional fees and expenses.

Addenda/Clarifications

Any changes to this RFP will be made by the District through a written addendum. No verbal modification will be binding.

Contract

Issuance of this RFP and receipt of proposals do not commit the MCWD to entering into a contract. The MCWD reserves the right to postpone the proposal deadline for its own convenience, to accept or reject any or all proposals received in response to this RFP, to negotiate with other than the selected CONSULTANT should negotiations with the selected CONSULTANT be terminated, to negotiate with more than one CONSULTANT simultaneously, or to cancel all or part of this RFP.

Joint Offers

Where two or more proposers desire to submit a single proposal in response to this RFP, they should do so on a prime-subconsultant basis rather than as a joint venture. The MCWD intends to contract with a single firm and not with multiple firms doing business as a joint venture.

Proposal Evaluation Procedure

Methodology

- *Project Understanding*: Does the proposal make it clear that the CONSULTANT fully understands the scope, goals, and technical requirements of the project?
- *Completeness and Specificity*: How fully does the proposal explain what the CONSULTANT will do to develop the required deliverables?
- *Identification of Needs*: Does the proposal carefully consider what resources will be required to complete the tasks, including staff time, additional technical information, etc.?

Experience

- *Company Experience*: What other projects has the CONSULTANT performed that have developed, used and demonstrated the expertise and capacity required for the proposed work (evaluated via the proposer's submittal materials)?
- *Staff Experience*: What qualifications and work experience do the proposed staff members or sub-CONSULTANTs bring to the project?
- *Area Knowledge*: Does the company or any of the project team have specific knowledge about the geographic project area that would aid in the study?
- *Collaboration Experience*: Does the company have experience collaborating with clients to deliver on complex projects?

Cost

- *Fee:* The proposal must clearly outline the fees and costs to complete all aspects of this project. Include hourly rates for each project team member along with hours for each task and subtask. The final fee, payment structure and not-to-exceed price are subject to negotiation.

Contract

Enclosed with this RFP is the form of contract that CONSULTANT and MCWD will execute. The MCWD may agree to non-substantive document revisions, but CONSULTANT's proposal should be based on the contract form. The proposal should identify any terms of the form of contract that are unacceptable. The MCWD will negotiate a term where it can preserve the

substantive intent of the term but reserves the right to reject a proposal that is conditioned on a material alteration of the contract form.

The proposal also must identify any data or methods of the proposer that would be used in performing the work, and that the proposer considers to be instruments of service that should be accepted from the intellectual property terms of the contract form.

Payments will be based on hourly rates on certification of completion of identified tasks. The payment schedule can be negotiated and finalized through the contract after the selection of a CONSULTANT by MCWD.

Contact

Any questions should be directed to Brian Beck at 952-471-8306 or bbeck@minnehahacreek.org.

PART 4: DISCLOSURES

Non-Binding

The District reserves the right to accept or reject any or all responses, in part or in whole, and to waive any minor irregularities, as deemed in the District's best interests. In determining the most advantageous proposal, the District reserves the right to consider matters such as, but not limited to, consistency with the District's watershed management plan goals, and the quality and completeness of the CONSULTANT's completed projects similar to the proposed project.

This RFP does not obligate the respondent to enter into a contract with the District, nor does it obligate the District to enter into a relationship with any entity that responds, or limit the District's right to enter into a contract with any entity that does not respond, to this RFP. The District also reserves the right, in its sole discretion, to cancel this RFP at any time for any reason.

Each respondent is solely responsible for all costs that it incurs to respond to this RFP and, if selected, to engage in the process including, but not limited to, costs associated with preparing a response or participating in any interviews, presentations or negotiations related to this RFP.

Right to Modify, Suspend, and Waive

The District reserves the right to:

- Modify and/or suspend any or all elements of this RFP;
- Request additional information or clarification from any or all respondents;
- Allow one or more respondents to correct errors or omissions or otherwise alter or supplement a proposal;
- Waive any unintentional defects as to form or content of the RFP or any response submitted.

Any substantial change in a requirement of the RFP will be disseminated in writing to all parties that have given written notice to the District, by email to Brian Beck, of an interest in preparing a response.

Disclosure and Disclaimer

This RFP is for informational purposes only. Any action taken by the District in response to proposals made pursuant to this RFP, or in making any selection or failing or refusing to make any selection, is without liability or obligation on the part of the District or any of its officers, employees or advisors. This RFP is being provided by the District without any warranty or representation, expressed or implied, as to its content, accuracy or completeness. Any reliance on the information contained in this RFP, or on any communications with District officials, employees or advisors, is at the CONSULTANT's own risk. Prospective CONSULTANTs must rely exclusively on their own investigations, interpretations and analysis in connection with this matter. This RFP is made subject to correction of errors, omissions, or withdrawal without notice.

The District will handle proposals and related submittals in accordance with the Minnesota Data Practices Act, Minnesota Statutes §13.591, subdivision 3(b).

Exhibits

Exhibits will be attached to final version of the RFP at 10:00 am on 12/29/2023

Exhibit A: Map of the Upper and Lower Watershed Boundary

Exhibit B: Minnehaha Creek Watershed District Pilot 2D Model Project

Exhibit C: List of curated datasets currently available for this project

Exhibit D: Map of monitoring locations

Exhibit E: LCCMR Grant Agreement

Exhibit F: Contract Template

Supplemental Materials

Weblink to supplemental materials will be released at 10:00 am on 12/29/2023

Exhibit A: Map of the Upper and Lower Watershed Boundary

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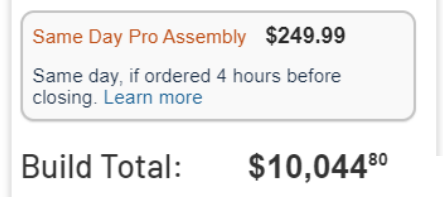
Microcenter Workstation Build Estimate



Core Components

CPU

AMD - Ryzen Threadripper 7980X Storm Peak 3.2GHz 64-Core sTR5 Boxed Processor - Heatsink Not Included
BYOPC

SKU: 642827

SOLD OUT

$4,999.99

Motherboard

Gigabyte - TRX50 AERO D AMD sTR5 eATX Motherboard
Aisle 28, Aisle 21

SKU: 650168

4 IN STOCK

$599.99

RAM

G.Skill - Trident Z5 RGB 64GB (2 x 32GB) DDR5-6400 PC5-51200 CL32 Dual Channel Desktop Memory Kit F5-6400J3239G32GX2-TZ5RK - Black
Aisle 23

SKU: 555458

18 IN STOCK

$219.99

Video Card

Gigabyte - NVIDIA GeForce RTX 4090 Gaming Overclocked Triple Fan 24GB GDDR6X PCIe 4.0 Graphics Card
Aisle 26, Aisle 25

SKU: 505420

SOLD OUT

$1,699.99

M.2 / NVMe SSD

Crucial - T700 4TB TLC NAND Flash PCIe Gen 5 x4 NVMe M.2 Internal SSD
Aisle 22

SKU: 575514

3 IN STOCK

$449.99

2.5" SSD

Samsung - 870 EVO 4TB SSD 3-bit MLC V-NAND SATA III 6Gb/s 2.5" Internal Solid State Drive
Aisle 22

SKU: 216929

SOLD OUT

$279.99

Hard Drive

Toshiba - X300 16TB 7200 RPM SATA III 6Gb/s 3.5" Internal CMR Hard Drive
Aisle 22

SKU: 311712

2 IN STOCK

$350.99

Case

Corsair - 7000D AIRFLOW Tempered Glass eATX Full Tower Computer Case - Black
Aisle 20, Aisle 21

SKU: 297937

SOLD OUT

$229.99

Power Supply

Corsair - HXi Series HX1500i 1500 Watt 80 Plus Platinum Fully Modular Power Supply
Aisle 28, Aisle 27

SKU: 523639

2 IN STOCK

$319.99

Video Capture

Optical Drive

~~Please select a case with a 5.25" external drive bay before selecting an optical drive.~~

CPU Cooling

Heatsink

Thermal Compound

Water Cooling Kits

Corsair - Hydro X Series iCUE XH305i RGB PRO Custom Cooling Kit
Aisle 33, Aisle 32, Aisle 31

SKU: 394726

2 IN STOCK

$549.99

Water Cooling Accessories

Software

Operating System

Microsoft - Windows 11 Pro 64-Bit FPP USB - English
Software

SKU: 603688

25+ IN STOCK

$199.99

Antivirus Software

Office Suites

Peripherals

Keyboard

Mouse

Mouse Pads

Speakers

Headsets

Monitors

Wireless Routers

Printers

Accessories

Case Fans

Noctua - NF-P12 Redux 1700 PWM SSO Bearing 120mm Case Fan
Aisle 30, Aisle 31

SKU: 062398
25+ IN STOCK

$15.99

Case Lighting

Cables and Adapters

Surge and UPS

USB Flash Drives

Welcome to the Micro Center Custom PC Builder

Welcome to the Micro Center Custom PC Builder

For as far as the modern personal computer has come, there's still no one-size-fits-all machine for every type of user. While many pre-built computers can suit many individuals, custom configurations are a great choice for many users, especially when it comes to high-performance computing, gaming, design, and more. Plus, building your own PC is a whole lot of fun, especially if you like to tinker with electronics!

If you're into customizing your setup — whether by building your own computer from scratch or simply upgrading to high-tech peripherals – Micro Center is your go-to resource for PC building, whether you want to start from scratch or with a pre-built base system with customizable components. We can help you choose everything from your hard drive to your power supply to your tower, and it all starts here with our custom PC builder. We will walk you through the process of choosing your **motherboard**, **graphics cards**, **CPU cooler** and more.

Start from Scratch or with a Base System

The first step in building the best PC for your needs is to determine whether you want to customize each component of your computer or start with a base system. If you're into PC gaming, you may want to consider building from scratch or choosing a base system equipped with an AMD or Nvidia graphics card that provides the smoothest gameplay experience to maximize performance and entertainment value for gamers. AMD Radeon or Nvidia GeForce are obvious choices for customized gaming desktop graphics cards.

When you start from scratch, you get to customize literally everything inside and out, starting with the hardware. Select your CPU, motherboard, RAM, video card, SSD, power supply, hard drive, optical drive, PC case, cables, adapters, peripherals, and more.

If you prefer the convenience of prebuilt PCs but want a bit of customization to suit your specific use cases, consider starting with a base system. Simply select a level of performance and customize by choosing an AMD or Intel processor. We'll take things a step further by selecting the ideal motherboard, case, power supply, liquid cooling system, and more for your needs and budget. This way, you get the ideal setup with less stress or decisions.

Gamers won't be disappointed by our selection of high-performance graphics cards and components made just for high-performance PC gaming. With popular options like the Nvidia GeForce RTX 3060, RTX 3080, RTX 3090 as well as AMD's Radeon 6600 XT, Radeon 6800 XT, Radeon 6950 XT, and others, you'll be well-equipped to take your gameplay to the next level.

Ready to build your own PC?

You've come to the right place! Use our **Custom PC Builder** to research and pick PC parts from the thousands of components we have in stock. You can use this to create a gaming PC build with streaming capabilities, or a machine that's specific to your business.

Next Steps

Once you've configured your PC, you can: Save your parts list in the **Build Dashboard** for later, Share your parts list in our **Community Forum**, reddit or other forums to get feedback, print it as a shopping list or view a store map to visit one of our stores, add to cart to reserve your choices for in-store pickup.

Enthusiast PC Builders

For the enthusiast PC builders, you can create and save multiple parts lists in your **Build Dashboard**. Then once you've built your custom PC, don't forget to submit it to the **Build Showcase** to show it off and help inspire others with your selection and creativity.