

2025-2026 Recommended Updates to the Commission's H&H Model

The Commission Engineer recommends updates to the Commission-approved watershed-wide hydrologic and hydraulic model, beginning in 2025 and extending into 2026. A primary component of the recommended updates is to move away from the use of the XPSWMM modeling platform due to upcoming changes by the software's parent company in licensing and software support and converting the model to PCSWMM. As part of the model updates, new information on area impervious coverage, topography, precipitation, and stormwater infrastructure would also be incorporated.

The Commission approved their current XPSWMM model in 2022 (for projects completed through 2021). The Commission has no set timeline for updating the Commission's H&H models, but the intent was to wait to update the model until a "significant number of projects" have been implemented within the watershed (based on the annual request for information). Although there may not be a significant number of projects implemented in the watershed, we recommend updates in 2025-2026 for the following reasons:

- Upcoming changes to XPSWMM licensing that will greatly increase its cost and a shift in how Autodesk/Innovyze (the owner of XPSWMM) will continue to support the software, beginning in 2025. To avoid these issues, we recommend converting the XPSWMM model to PCSWMM. Following are additional details about this recommendation, from Barr staff with experience in both softwares:
 - Autodesk/Innovyze is moving away from making upgrades to XPSWMM; instead, they are moving to further develop and support ICM ("integrated catchment model"), another H&H model, which is also expensive – similar to the proposed XPSWMM costs.
 - Currently, XPSWMM only sells subscription-based licenses (renting-to-use license, cannot be shared by people), rather than standalone licenses that can be shared. For Barr or any other entities (e.g., cities) that have standalone XPSWMM licenses (i.e., dongles or network licenses), you can still use these through the beginning of 2025, but you will not be able to run the most current version of XPSWMM. In addition, the software cost will jump significantly in 2025.
 - Barr and some of our clients have started transitioning to PCSWMM, which has comparable functionality to XPSWMM, but at a lower cost.
 - Barr developed a streamlined procedure to convert XPSWMM to PCSWMM and worked through the conversion of several models to better align results between software packages.
 - A summary of pros and cons between the XPSWMM, ICM, and PCWSMM modeling platforms is included in Table 1.

- New LiDAR data should be available for Hennepin County soon.
 - The LiDAR data used within the current model is from 2011.
 - Draft new (2021) LiDAR data is available for the Metro area, but we don't have an official date for when the MnDNR will post-process (hydro-correct) the data and officially finalize the data, or when it will be available by county. We expect/hope that the data will be available for use by the time of model updates in 2025. If the data are not yet finalized, Barr could download the raw data and process it, but that would take some additional time.
 - New LiDAR data can be used to confirm existing subwatershed divides and update watershed storage in the model to better reflect the available storage within the watershed, especially with any changes to storage occurring from 2011 – 2021/2022.

Table 1. Comparison of Models

	XPSWMM	ICM	PCSWMM
PROs	<ul style="list-style-type: none"> • FEMA-approved software • Some may choose to continue use because of past investment in modeling and/or implications in their regulatory program 	<ul style="list-style-type: none"> • Support from Autodesk/Innovyze moving forward • For big models: you can have multiple modelers working on the same model at the same time • More support for cloud computing/forecasting • Allows for some customization (coding) • Download and process NEXRAD data 	<ul style="list-style-type: none"> • FEMA-approved software • More affordable • Better user interface than XPSWMM; comparable to ICM • Ongoing support • Direct export to EPA-SWMM to open without license with same results • Allows for some customization (coding) • Download and process NEXRAD data
CONs	<ul style="list-style-type: none"> • Expensive • Limited Support from Autodesk/Innovyze moving forward – with eventual “sunset” of program • Can export to EPA-SWMM but results will vary • Does not process NEXRAD data 	<ul style="list-style-type: none"> • Expensive • Not officially approved by FEMA • Can export to EPA-SWMM but results will vary 	<ul style="list-style-type: none"> • Relies on updates to EPA-SWMM (slower on updates to background code)
COSTS (per license)	<ul style="list-style-type: none"> • \$7,500/year (unlimited nodes, 1D) • \$15,000/year (unlimited nodes, 2D) 	<ul style="list-style-type: none"> • \$7,500/year (unlimited nodes, 1D) • \$15,000/year (unlimited nodes, 2D) 	<ul style="list-style-type: none"> • \$1,600/year (unlimited nodes, 1D) • \$2,400/year (unlimited nodes, 2D)

- [Atlas 15](#) draft precipitation frequency estimates (update to Atlas 14) is expected to be available in 2025, with the final estimates available in 2026. These estimates will include updates to the design storm events based on historical observations but will also use future climate model projections to generate adjustment factors to apply to the design events.
- Updating the model provides an opportunity to update estimates of impervious surface. The impervious data used in the development of the Phase 2 model was from 2011. The University of Minnesota has more recent impervious data for the Twin Cities that was flown in 2015. These data were not available until a year or so later, so the data was not available for use in our development of the Phase 2 model. If more current impervious coverage data for the Twin Cities becomes available before the update to the modeling begins, we will utilize the most current information.
- Updating the model also provides an opportunity to check and recalibrate the model with more recent precipitation events and based on current land use, accounting for watershed changes since 2015 (storage, imperviousness, capital projects, conveyance/watersheds). Over the past several years, the BCWMC collected flow data at several locations throughout the watershed that can be used for this updated calibration effort.
- The following table presents the Commission Engineer’s recommended timeline and planning-level estimate of costs for making these updates.

Table 2. Estimated Project Cost and Timeline

Task	Estimated Cost	Year	Assumptions
Task 1: Conversion of XPSWMM to PCSWMM	\$30,000 - \$40,000	2025	<ul style="list-style-type: none"> • No updates to inputs • Convert and compare model results
Task 2: Model Updates (new LiDAR/ impervious/ developments)	\$90,000 - \$150,000	2025	<ul style="list-style-type: none"> • Updates based on developments (2022-2025) • Review subwatershed divides • Update imperviousness and slope based on most current data • Update storage based on most current data
Task 3: Recalibration	\$20,000 - \$35,000	2025/2026	<ul style="list-style-type: none"> • 5 locations • Uses existing monitoring and precipitation data
Task 4: Atlas 15 Events	\$20,000 - \$35,000	2026	<ul style="list-style-type: none"> • Design events using Atlas 15 (2, 10, 100 year) • Inundation mapping for 100-year, using FEMA approach and more current LiDAR • Evaluation of future (Atlas 15) climate scenario
Task 5: Reporting & Meetings	\$30,000 - \$45,000	2026	<ul style="list-style-type: none"> • Full report • Up to 8 meetings with member communities
Project Total	\$190,000 - \$305,000		