

HYDRAULIC MODELING In-house vs. Outsourcing (or Both?) – IDModeling, Inc.

The hydraulic model is recognized as a tool to reduce planning, design, and operational costs, while engaging operators and engineers' collaboration for better w/ww/rw/sw system management. With that understanding, the real question is: who will create and maintain this powerful tool? In-house utility staff? Outside Consultant team? Combination of both?

Please find a summary of advantages to support either decision, complemented by an approximated costing analysis to assist with answering this important question.

In-House Advantages:

What are the advantages of assigning and/or hiring an in-house modeler?

- **Timeliness** – If a staff member is responsible for developing, calibrating, and maintaining a hydraulic model, the utility will have greater control of how a model is used and when it is updated. If you are relying on a consultant to post time-sensitive or urgent material, you may have to take your place in a queue behind other customers. This can be especially frustrating when only minor scenarios need to be run. Changes that could be completed by in-house staff within a day, could take a few days from a consultant.
- **Content quality assurance** – A Utility employee may be able to recognize discrepancies in a drawing before a consultant would see the problem. This results in fewer errors on the data retrieval end and allows the Utility to have more confidence in the model.
- **Efficient data retrieval with internal departments** - In-house staff has ready access to up-to-date as-built information and even soon-to-be-completed projects. SCADA data is more readily available and recognizable by an in-house modeler because of the familiarity with the system.
- **Gain the knowledge base to train fellow colleagues** – Having in-house capability can be an asset allowing multiple people on your staff to

have model experience and knowledge of model uses for “what-if?” scenarios.

- **Financial predictability** – It is easier to estimate how much money you will spend on modeling projects when staff time is included in the utilities budget. Consultant prices may fluctuate, and the amount they charge for individual projects may go beyond what you could accomplish with in-house staff. This trade-off may be difficult to assess in the budget forecasting process.

Outsourcing Advantages:

What are the advantages of contracting with a consulting firm to complete a model?

- **Technical expertise** – Even if a Utility decides to hire in-house technical experts, it is unlikely that they will be buying the depth and diversity of expertise that is present within consulting firms that perform hydraulic modeling. While a Utility will probably be working with one main person assigned by your vendor, that person has access to the expertise of all of his/her colleagues when it comes to harnessing the full capability of the modeling software, as well as solving problems that may arise. In order to stay competitive, vendors also tend to be on the cutting edge of technology, whereas in-house staff may have more difficulties updating their skills.
- **They typically own all of the software necessary to build, develop, and calibrate a model** – Not only can purchasing software be quite costly, but some modeling tasks are more efficiently completed in multiple software interfaces and consultants typically have access to many of these applications.
- **They are easier to replace** – If a Utility is unhappy with the services provided by a vendor, it is much easier to switch to a new vendor than it is to fire poorly performing in-house staff and hire new people.
- **More cost effective for specific jobs (see comparison table below)** - As all employers with

payrolls are painfully aware of, the base wage they pay their employees is only a portion of their actual cost. When you include federal and state payroll taxes, FICA, insurance benefits, vacation pay, equipment, office space and training, the “real” cost of an employee can be over twice their “base” pay. Aside from payroll itself, employee benefits are one of the biggest cash drains on businesses both small and large.

- **Learning Curve** – This can be a double-edged sword. In most cases, a consultant will need little or no time to learn the software, its capabilities, and efficient applications. However, the consultant will need additional time to learn the system that they are attempting to model.

What are the advantages of contracting as-needed hydraulic modeling services?

- **Utility staff is liberated** – Utilities have not typically performed in-house hydraulic modeling to-date due to time and experience constraints, and the need to prioritize hydraulic modeling with the other day-to-day “fires” which are immediately impactful to customer service that require their attention.
- **Less time spinning wheels** – Being able to call upon a modeling expert when a modeler is limited by their experiences to seek solutions will significantly reduce time spent on modeling
- **Expedite the learning process** – Most “modelers-in-training” will tell you that being able to have a modeling expert to call upon when they hit a wall in their experiences or are just simply looking for a more efficient way to complete a modeling task, is one of the most effective ways for them to learn modeling
- **Build a stronger team** – A well-trained and supported modeler is a utility’s best friend. Training and on-call modeling support builds the knowledgebase of any in-house modeler(s) which extends to linking departmental data and modeling simple to complex what-if simulations.
- **Budgets are more predictable and easier to manage** – As-needed contracts put a cap on money spent on outsource modeling by the utility and thus allow them more control of their

hydraulic modeling budget

Other challenges to consider

- **Sustainability** – If a Utility invests in hiring full-time staff to run the hydraulic model, you will have to maintain a steady stream of income to pay their salaries year after year. If you are dependent on government funding, the loss of major income sources may force you to lay off staff.
- **Ambiguity in pricing** – There is a wide variety of pricing for modeling software. At the same time, the billing rates and cost per modeling task can vary greatly from consultant to consultant.
- **Data Integration** – To maximize your modeling investment, it is important to link to various data platforms to extend the use of the model including linking to SCADA, Asset Management Systems, GIS, CAD, Customer Billing, and more. These practices of interoperability are still being developed and there are several consulting firms and software vendors leading the effort which could bring efficiencies and sustainability of the hydraulic model database.
- **Freeware vs. Commercial Software** – “Free” is a great way to cut down on costs, but will using free government software ultimately save your organization money? Depending on how you build and update the model as well as how you apply the model, will weigh in the decision on the software platform. Also, support for free government software is lacking versus the reliable paid support and training of commercial software packages.

Costing Analysis

Every Utility is different. Each one has their set of challenges, specific requirements, set number of resources, budget constraints, revenue streams, etc., but the one item that they all share is the need for maintaining a well-calibrated hydraulic modeling tool to assist them to reduce the costs of planning and operating their systems.

Below is a sample **Cost Analysis** that goes over the basic costs of performing hydraulic modeling in-house, outsourcing to a consultant and via an

as-needed modeling services. Note that the costs below are estimated costs with no salary increase or cost of inflation built-in to the 'Projected 5-Year Costs'.

Quick Cost Comparison Table

Compare Costs:	Pay Rate	Yearly Pay	Overhead Cost	"Actual" Annual Costs	Projected 5-Year Costs
Employee on Salary	\$65,000 per year salaried employee	x 1 year = \$65,000	+ 30% overhead of \$19,500	\$84,500	\$422,500
Sub-Contracting Modeling Work	~\$65,000 for modeling project	One time cost	ZERO	\$65,000	\$325,000
As-Needed Modeling Service	~\$1,995 per month	x 12 months = \$23,940	ZERO	\$23,940	\$119,700

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About IDModeling:

IDModeling positions itself as utility backup-support for in-house model maintenance, available to create or sustain modeling momentum for continued in-house productivity, on an as-needed basis. Alternatively, IDModeling serves as an extension to utilities and consulting firms, performing as the dedicated hydraulic modeling staff for day-to-day needs and/or larger planning, operational, or engineering studies.

IDModeling is a specialized Engineering Technology Company, employing advanced hydraulic modeling applications to enable water/wastewater utilities to upgrade and maintain aging infrastructure, reduce energy and carbon emissions, improve water quality, and comply with mandatory government environmental, health and safety regulations. IDModeling delivers consulting services and analysis tools, focusing on model construction, calibration, GIS/SCADA integration, infrastructure planning, and customized training & support. Bringing a customer-first approach, IDModeling works with utilities and consultants to help satisfy SBE, MBE, and DBE requirements. IDModeling serves clients in over 20 states from regional office locations in Pasadena-CA, Irvine-CA, Tacoma-WA, Albuquerque-NM, Centennial-CO, Tampa-FL, and Wakefield-RI.. For more information, visit www.idmodeling.com.