

# How TLCD Pioneered Adoption of BIM

## Part Two of a Three Part Series

### Studies in Success

**Company:** TLCD Architecture

**Software on Board:** Revit® Architecture, Globe Link Plug-in for Revit, AutoCAD®, Autodesk® 3ds Max® Design, Google SketchUp Pro, V-Ray for SketchUp from ASGvis, LLC, Google Earth, GoToMeeting, modo® from Luxology, LLC, Adobe® Creative Suite®, Microsoft Office Suite

### Recap of Part 1

TLCD is one of the earliest adopters of BIM as a core methodology for project delivery. The firm initiated its implementation of Revit in 2000. TLCD took a four-faceted approach to its firm-wide commitment: **1.** the creation of a new position focused on emerging technologies **2.** engaging Ideate, Inc. for expert training and support **3.** collaboration with Ideate on hosting professional events to encourage industry adoption of Revit **4.** complete immersion in the new methodology.

### The Result

As early as 2002, TLCD started doing new jobs in Revit. By 2006, BIM was their core methodology for project delivery. The firm's main credo at the beginning of the transition was for each project to start with and adhere to a plan.

According to Don Tomasi, Sr. Principal of TLCD, "Revit is a different way of working. It's not faster at first because you are learning. An important advantage is that you spend more time in schematic design and less time in construction documents."



Along with the well-known consensus building and spirit of collaboration that BIM fosters, TLCD finds that the visualization, scheduling, analysis and phasing capabilities of Revit are behind many of the firm's recent successes.

### Visualization and Software Leveraging

The visualization capabilities TLCD gains with Revit make the tool invaluable. From Tomasi's perspective, "With Revit, we have the raw materials to produce striking, very strong images at any point in the process."

TLCD experience shows that the firm gets better leverage out of Revit when they explore uses in combination with other software.

In the context of the professional community groups that TLCD hosts with Ideate, as one example, the firm has been engaged in doing energy analysis using Revit. With expert Ideate technical consultants providing tips and insights on using 3D Studio Max in concert with Revit, the architects and engineers in attendance gain new perspectives.

### Mini Case Study – Mendocino College, Ukiah, California

The Mendocino College Library and Learning Resource Center and Maintenance Facility, both currently in the process of agency approval, serve as an example of what TLCD calls Collaborative Project Delivery (CPD).

In fact, the firm acknowledges the Mendocino College project as its most resolved collaborative BIM project to date. TLCD has coordinated, in real time, the architectural, engineering and construction virtual models to form a holistic prototype. Consulting mechanical engineers work in Revit MEP, structural engineers in Revit Structure and the TLCD design team in Revit Architecture. With all three models collaboratively linked together, TLCD is able to coordinate systems, resolve potential construction conflicts and manage changes virtually, long before ground is broken.

Employing Revit sets the stage for collaboration, and that makes achieving an integrated approach to project delivery more viable than was ever possible with traditional methods.



### Mini Case Study – Monterey Peninsula Community College, Monterey, California

A project for Monterey Peninsula Community College provides another example of Revit data being used for visualization. The Public Safety Training Center would occupy what was once the site of the U.S. Army Fort Ord. A new firing range and emergency vehicle operations course was not an easy visualization for a diverse group of project stakeholders.

To help the client visualize, the TLCD team utilized an imaging tool with which the client was familiar, Google Earth. Starting from an outer space perspective high above earth, they zoomed toward the North American continent and Northern California until recognizable Monterey Bay area landmarks appeared to orient the client to the location. They dropped the 3D Revit model into its proposed site and the client could easily envision the Public Safety Training Center as it would be.

What the client needed for buyoff was contextual data. TLCD was able to provide it and sell the project.



### Managing Data and Creating Schedules

For TLCD Interior Designer Vanessa Ottenbreit, a key Revit focus is creating schedules. Revit allows Ottenbreit to schedule all aspects of interiors – lighting, materials, finishes, fixtures and furniture – and to sort by a variety of criteria: type, manufacturer, room, etc.

**“...using Revit also saves time spent on redundant work. That’s the very noticeable savings.”**

—Vanessa Ottenbreit,  
Interior Designer, TLCD

In the pre-Revit era, the commonly used method was a separate database and the process was very redundant. With Revit, schedules and quantities are live views of the building database. Interior designers can utilize what-if scenarios to explore design options for cost efficiencies and other criteria.

Not only does Revit make exploring a range of opportunities easy, the same capability enables a reliable reduction in errors, especially human errors in counting. Ottenbreit uses the scheduling and database capabilities of Revit and is still discovering new ways to use it. TLCD is creating its own templates.

As Ottenbreit explains, “Often, you schedule and sort several times during a project. With Revit, you get more accurate preliminary costs. You can inform the client earlier in the process. In addition to the accurate count saving time, using Revit also saves time spent on redundant work. That’s the very noticeable savings.”

An interim step that used to be necessary has also gone by the wayside. In the world before Revit, a designer would have needed a renderer, one who may or may not understand what the designer had in mind. Now, instead of taking a half hour to explain intent and then wait for another person to interpret the design, the interior designer can create a visual in a couple of hours and send it directly to the client.

Ottenbreit explores design perspectives and design options earlier than was possible without Revit. Per Ottenbreit, “Clients can now visualize quickly with a surprising level of detail even in the early conceptual modeling stage. The client can make decisions early. You can show them 3D use of space, the functionality.”

The TLCD Interior Design Practice also uses Revit as a means of communication with custom furniture manufacturers. And as Ottenbreit says, “It doesn’t even add an extra step. We can sketch in model form to show relationship, scale and proportion.”

### Mini Case Study – Napa Valley College, Napa, California

The Napa Valley College Library and Learning Resource Center provides an example of scheduling with Revit. In the TLCD original design for an open learning resource center, a key component was the reading tables for computers. The design was for a series of long, expansive tables facing one direction to encourage an open, more collaborative learning and study space. Unlike study carrels of old, these did not have traditional barriers between students. Instead, they featured a translucent screen to obscure distraction in the student’s direct field of vision. The client was concerned that the backs of the computers would be unattractive on the open tables.



TLCD provided the client with design options, costs and even showed the client 3D views of the area from three different vantage points within the library to illustrate how added partitions would affect the space. The client and the design team discovered that in the most populated circulation areas, the line of sight is primarily to the side – not back – of the computers, and adding a partition did little to screen this. The translucent screen would permit entry of limited light, but it also isolated the student more than was intended.

While collaborating with the furniture manufacturer on these studies, the team realized that an adjustment could easily be made. The design of the screen allowed for a clip on which the screen could be attached or detached. With the manufacturer’s flexibility and cooperation, the client opted to have their furniture manufactured without the barrier, but with the option that they could add it later if they desired.

TLCD is able to suggest and offer their clients alternatives and suggest scenarios for customizations and cost-efficiencies. The accuracy they are able to achieve with Revit is very instrumental in this.

Ottenbreit gives another example of what can be achieved in the Revit model. For one client, she may want a four-legged upholstered chair with metal legs and other specifics including upholstery fabric, hard casters for carpeted floor surface, etc. The designer adds this into the model, tags the piece of furniture, and puts the image on a sheet of paper for bidding purposes. Doing this requires no additional work, and now it is embedded in the object. Everyone else involved in the project can see it and it is updated throughout the model.

Startlingly accurate comparisons from inception to completion are simply a bonus, per Ottenbreit. One can model the space and then compare the model to the finished product, to track how remarkably accurate the model is.

**Estimating**

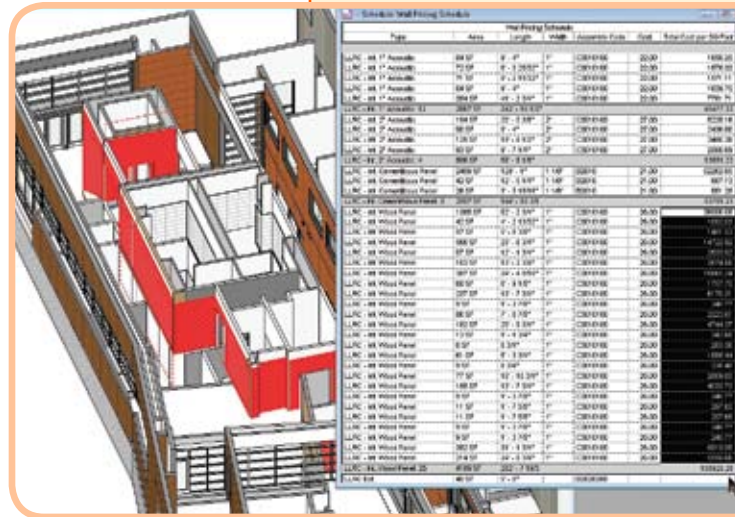
Alan Butler, Sr. Principal, TLCD, sees a great potential in Revit for use in real time estimating and cost benefit analysis. As Butler explains, “Revit has the ability to extract and summarize quantities of materials. We are working with an international estimating firm to integrate the Revit model into their estimating software.”

Historically, estimating was done at fixed episodic points. TLCD is focused on a different, new model, where cost and quantity data is not constrained by landmark points in time but instead is continuous and fluid in real time. TLCD views real time estimating as an integral factor in a future that utilizes cost benefit analyses for sustainable designs.

Real time estimating will enable the firm to determine a measurable value for virtually any and all design features, to test them in the model and weigh their benefits. The process provides almost limitless if-then scenarios. If one design measure, a particular durable finish for example, is selected, it will cost a specific amount but will save a calculable amount of energy. Given the availability of this data, at any point in the process from conceptual to construction, the firm will be able to extract information and quantify its effect on the overall cost of the building.

Mark Adams, TLCD Practice Leader for Civic Projects, is directly associated with client relations and business development.

As Adams says of Revit’s estimating capabilities as a competitive advantage, “We can show clients the cost implications of each model snapshot and offer scenarios. Here is the wall. Here is how much wallboard, the actual quantity that will be needed for real assemblies. Here is the wall with one specific wood paneling and then with a different alternative. We have many ways to fine tune. We have more tools. We can do cost estimation on the fly as an integrated part of the dialogue. This gives us a leg up.”



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Adams notes that in general, TLCD clients who understand the construction process view the capabilities of BIM as important. Those who have ongoing responsibility for a building or those who are involved with project performance are especially interested in the process.

#### Phasing

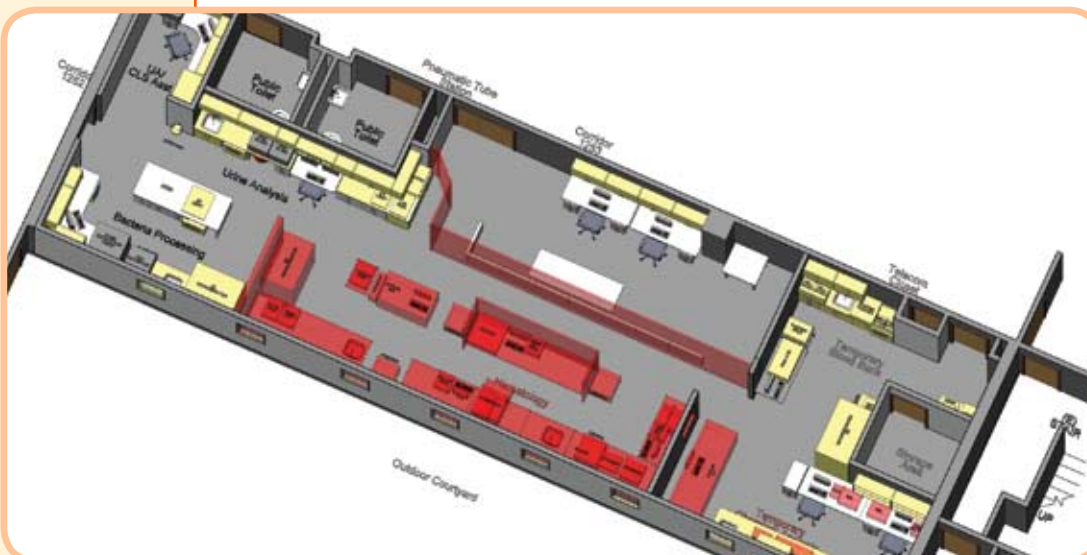
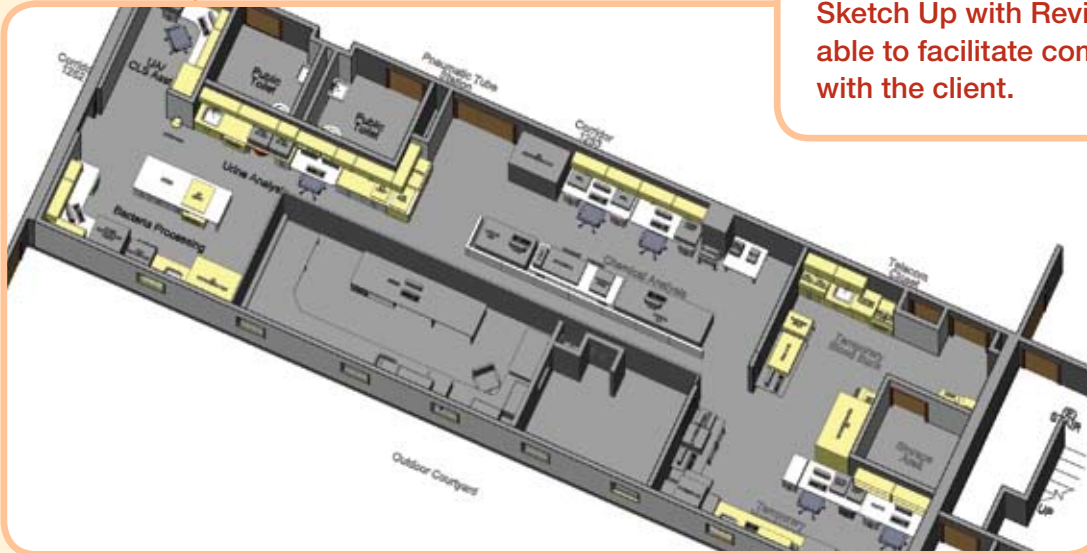
At TLCD, renovations of existing spaces are the practice area of Stephen Peakes, Project Manager – Healthcare Projects. Peakes has a special interest in the phasing capabilities of Revit, since tenant improvements (TIs) proceed in phases. Each phase represents a distinct time period in the life of the project.

Just as Microsoft Office Project creates timelines that can be tracked for business projects, Revit enables a similar kind of tracking for the model so that a sequential approach for each stage of the project can be established.

#### Mini Case Study – San Rafael Clinical and Pathology Lab, San Rafael, California

“In Revit, you create a snapshot of the construction process and Revit organizes the project,” explains Peakes. One recent TLCD example in an existing space was the Kaiser Permanente San Rafael Clinical and Pathology Laboratory. Because hospitals never shut down, the design team provides disruption planning to allow continuing operation of facilities during construction.

**By using GoToMeeting and Sketch Up with Revit, TLCD was able to facilitate communication with the client.**



According to Peakes, Revit was very instrumental in the orchestration of phasing, enabling the client to coordinate staffing and plan for materials management. By using GoToMeeting and Sketch Up with Revit, TLCD was able to facilitate communication with the client.

Utilizing Revit for phasing also helps the contractor visualize what a space will look like. As Peakes says, “The 3D view doesn’t even have to be particularly sophisticated. It can be very simple. Revit is a good tool for communicating with clients.”

The visualization that Revit provides right out of the box has been very useful to TLCD. In the design of medical clinic examination rooms, for example, health practitioners need to see details such as placement of sinks and electrical outlets in proximity to exam tables.

Issues such as patient safety are at stake. With Revit, TLCD is able to provide visualizations and offer a number of alternatives. It is in the what-if scenarios that the client discovers what works, what doesn’t work, and what are the best alternatives.

Peakes would not want to go back to AutoCAD, he says, “With Revit, you have changed the paradigm for the industry.”

As for the clinical lab, according to Peakes, “The process went more smoothly than we could have imagined.”

**“With Revit, you have changed the paradigm for the industry.”**

**Stephen Peakes, Project Manager –  
Healthcare Projects, TLCD**



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