

# **Use of Wiki Software for Intra-Agency Communication and Data Management in the Area of Travel Simulation Modeling**

Christopher M. Puchalsky, Ph.D.

Senior Transportation Engineer

Delaware Valley Regional Planning Commission

190 N. Independence Mall West

Philadelphia, PA 19106-1520

215.238.2949

cpuchalsky@dvrpc.org

## **Abstract**

Wikis are a new and effective tool that allow for the easy creation and editing of web pages. They are currently used at many organizations, both public and private. This white paper proposes that wikis can improve the internal communication of model theory and model results, especially at large MPOs and state agencies. It is also proposed that wikis can improve model data management.

## **1. Introduction**

Communicating model theory and results to the general public and decision makers has never been easy. The problem of external communication will only increase as sophisticated techniques such as activity-based models and dynamic assignment become widespread.

Large MPOs with complex models and sizeable staff face additional, internal communication challenges. A gap often forms between technical and non-technical staff,

here referred to as “modelers” and “planners,” with each side suspicious of the other. Planners can view travel demand models as opaque, overly complex, and somewhat arbitrary. Modelers can become frustrated when planners fail to fully comprehend complicated model intricacies at first grasp. Bridging the gap between various MPO staff is critical for the proper application of models and the interpretation of model results. A clear understanding by all parties within an MPO is also the first step towards effective external communication.

Large MPOs face additional challenges in the area of communicating and managing modeling projects. It is common for modeling groups to manage over a dozen projects with a modeling component simultaneously. Managing input data, processing the model, and disseminating and communicating the results to the various internal and external project managers can be a challenge.

This white paper addresses the use of wiki technology to address the issues that large MPOs have in communicating model theory and results and managing model input and output data. It is proposed that an internal wiki can be effectively used to track, manage, and communicate modeling theory, projects, and results.

## **2. What are Wikis?**

A wiki is a software tool that allows users to easily create and edit web pages. Ward Cunningham, the creator of the first wiki, described a wiki as “the simplest online database that could possibly work.” Wikis are not communication in and of themselves, but they are a tool that has allowed diverse communities to effectively communicate.

One of the most popular public wikis is *Wikipedia*, an online encyclopedia. While there have been several well publicized errors on *Wikipedia*, controlled studies have found it to be equivalently accurate to similar reference works.

Since wikis are a form of web\_page they can be immediately used by anyone with a web browser. No knowledge of HTML is required to create and edit wiki pages. Instead web pages are created and edited using a simplified markup language that allows users to get started with a very shallow learning curve. All changes are efficiently saved in a revision history; if an undesired change is made then a previous version can easily be reverted to.

Wikis work on an open development system where nearly any user with access to a wiki can edit any other previously created pages. This entrepreneurial and community spirit allows content to be quickly created, updated, and corrected. At first glance this approach might also lead to many difficulties such as inaccurate information. Experience has shown that inaccuracies are often quickly corrected by other users. Wikis take the approach of making problems (e.g. mistakes, inaccuracies, and even outright vandalism) easy to correct instead of preventing problems in the first place. While vandalism and malicious editing can be a problem on wikis on the , a wiki located on an MPO or other agency's intranet should not suffer the same issues.

### **3. Use of Wiki's for Internal Communication**

Because of its ability to aid in collaborative and team processes, the use of wikis for intranets, including in the public sector, has grown rapidly. Modeling staff inside of large MPOs can use wikis both as a method of effectively explaining modeling basics to other staff and as a method of content management. Each is briefly explored below.

Although created electronically, model documentation is typically formatted for hard copy publication. This information is often updated on a 5-10 year schedule as modeling procedures and model input data are updated. This documentation is often written by technical modeling staff for consumption by those with a technical background. Those with a less technical background, as might be typical of the large quantity of MPO staff, often have a hard time digesting and clarifying points in the documentation. It is especially important for technical modeling staff to relate model theory to general

planners as innovative modeling techniques which deviate from the traditional four-step process typically taught in planning schools, such as activity-based models or Evans-based combined equilibrium formulations, are introduced.

It is proposed that the use of a wiki will aid the process of communicating modeling theory and procedures between modeling staff and planners or project managers. A suggested implementation of wiki technology for effective internal communication is as follows: Wiki pages describing the particulars of model operation at an MPO would first be created by modeling staff with an intimate knowledge of the subject. This description would then be read by other staff members who use model results. Where confusion or additional clarification is needed, the issues could be discussed on “talk pages” on the wiki, where content is discussed. These talk pages would serve as an extended knowledge base for future staff wishing to understand the model. Points of confusion could then be edited on the wiki by modeling staff, or preferably by the planning staff in their own, less technical, language. If edits were made that were technically inaccurate, previous versions of the page could be reverted to, or integrated with the new content. Mistakes, such as misprints in data, could be corrected immediately and online. This is in contrast to paper hard copies where erroneous data can exist for years uncorrected.

A similar approach could be taken on individual projects. Project pages would be created. Input files and modeling approaches could be described and clarified online. This might prevent confusion about what is being modeled, alternatives, etc.

Wiki technology also has a potential application for data or content management for modeling. Modeling groups at large MPOs often have a difficult job managing the many input and output files used on projects, some of which have multiple concurrent versions. Several possible processes are possible for using wiki technology to manage modeling data. The most straightforward is to directly upload files to wiki project web pages. This approach is similar to the use of a shared network directory. The use of a wiki for this function, however, has several advantages – the wiki allows the easy use of metadata to document changes and differences between files and file versions. Earlier versions can

be reverted to in case of mistakes or to track data changes due to the revision history. Furthermore, since wikis encourage the use of metadata and comments when making changes, they form clear electronic paper trails so that it can be easily documented exactly why, for example, a set of speed-volume curves were adjusted. In this way the file history can be tracked without resorting to cumbersome naming conventions (e.g. HBW\_Table\_1, HBW\_Table\_2, ...). Another possibility would be to link a wiki to a version control system (CVS). This would be especially efficient for storing many text-based files with little memory use. What specific method and process is used to implement a data management system using wiki technology will depend both on technical and human feasibility. The latter is a measure of the degree to which the technology can add value to the modeling process.

#### **4. Conclusion**

Wikis are a relatively new and rapidly growing technology that has been adopted by many organizations for internal communication, intranets, and knowledge bases. Wikis show promise for use in improving travel modeling processes. Wikis can improve internal communication between various staff and departments, especially in larger MPOs. It should be noted, however, that a wiki is a tool that enables communication, not a replacement for communication. Wiki technology also shows promise in managing, organizing, and documenting data. Similar to the caveat above, wiki technology should be viewed as a tool for the discipline of data management, and not a replacement for the discipline needed for data management.