

Operating Manual

15 September 2013

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Overview

The Austin Historical Survey Wiki brings together citizens' local knowledge with the expertise of preservation professionals through an on-line application to improve the transparency, accuracy, and timeliness of historical survey information. Users are able to look up information using interactive maps and query tools, share information about historic places, and access and upload photographs and

documents of historic places. While the Wiki was developed as an information system and public engagement tool for the City of Austin, the project is intended as a replicable model that can be used in other communities.

The application allows users to search and view historical and architectural data about places in Austin. It also allows users to create accounts, create new places, add or edit data about these places, and submit photos and documents for each place. Users submit new places, data, and uploaded files to a moderation queue where they can be published by a moderator and promoted to various review levels. The application displays data about places alongside meta-data compiled per field. This meta-data includes a list of users who edited the field, timestamps per field, and a list of the field's revision history. There are currently 25 fields per place record covering location data, identification data, historical data, architectural or descriptive data, and photo and document files.

The Austin Historical Survey Wiki resides on an Amazon Elastic Compute Cloud (EC2) virtual server. It is built on Drupal 7 with a mixture of core, contributed, and custom modules. Full technical details are in Appendix I.

Development of the Austin Historical Survey Wiki was supported by funding from a Preserve America grant administered by the National Park Service, Department of the Interior, the National Center for Preservation Technology and Training, a Certified Local Government grant administered by the Texas Historical Commission, the City of Austin, and by University of Texas at Austin's Mike Hogg Fund for Urban Governance, Graduate Program in Historic Preservation, and Center for Sustainable Development.

This document

This document is provided to the City of Austin by the University of Texas at Austin as part of the process of migrating the Wiki from UT to the City. It is intended, first, for staff of the City Historic Preservation Office (HPO) and Communications & Technology Management (CTM), moderators, and others who will operate the Wiki. It is also intended for the larger audience of Wiki users and others who wish to understand how it works, what intentions and expectations are built into its design, and what we see as directions for its future development in Austin. Finally, since the Wiki's state and federal support intended that it be exportable beyond Austin, this document addresses the audience of others who may wish to adapt the Wiki or its principles elsewhere.

These categories of text may appear in each section, distinguished by font and color:

1. *operating instructions*;
2. underlying thinking & discussion;
3. future directions, both for Austin and for application elsewhere.

Cast of characters

We use the terms below within this Manual to describe roles in the operation and maintenance of the Wiki. The roles may of course be mapped to individuals with titles different from the ones we use here. Each role needs to be filled for the Wiki to operate sustainably.

The **Survey Manager** is a member of HPO staff, with overall responsibility for the City's historical survey, for which the Wiki is a tool. The Survey Manager is an individual person.

The Wiki **Administrator** is responsible for understanding Drupal 7, and the Wiki's programming and hosting environment. The Administrator ensures that the Wiki is operating as intended, that its operators have the information and access they need to interact with Drupal interfaces, and that the Wiki is adapted over time as needs or problems are identified. The Administrator is an individual person, for the purposes of ongoing operation, whose role may be supplemented by others for additional programming or training.

The **Wiki Team** – as used in the past tense, refers to the people who developed the Wiki, starting with faculty, students and staff at UT-Austin, and expanding to include City HPO and CTM staff, as the Wiki has been developed and as the time has approached for hand-off from UT to the City. This elastic group always included at least three or four, and as many as a dozen people, representing specialties (among others) in database management, web design, programming, and cultural resources. The Wiki would not have been possible without a continuing conversation among a diverse team.

The Wiki needs an ongoing management group. In City of Austin terms, that means representatives of the UT team, City HPO, City CTM, and user groups. To facilitate this a Service Level Agreement has been executed between UT, City HPO and City CTM staff. The Wiki Team must actively include multiple individuals.

The **Moderator** refers to a role, played by members of the Wiki Team. The Moderator necessarily must be multiple individuals, in order to provide timely service.

A bracketed asterisk [*] indicates operations that do not have a fully-programmed interface. These operations require use of Drupal admin interfaces, and in some cases additional programming. The **Administrator** is responsible for these operations. We intentionally do not provide step-by-step instructions. Some of these

operations are simple; some may be more complicated and carry the potential for losing or corrupting data, or inadvertently changing settings or functions. It is essential that the Administrator be actively involved, not necessarily performing all these operations, but deciding which can be done by other members of the team, and providing the permissions and instructions for working in the Drupal interfaces.

We started the project aiming to make all necessary functions into pre-programmed interfaces that would require no Drupal or programming capability. We gradually came to understand that this was not desirable. Many functionalities, even if predictable, will be required infrequently and are best approached as adaptations as needed, based on understanding of both the programming environment and the personnel. In other words, the Administrator must be interacting with the people as well as the program. The Wiki has been designed and programmed through close interactions with its users (staff and professional as well as public). Continuing active involvement by the Administrator ensures that issues can be identified promptly, and solved in ways that address real user needs and staff capacity.

History: where the Wiki came from

Austin has a recent history of historical surveys accomplished by volunteers, working in collaboration with preservation professionals. The Local Historic District (LHD) ordinance adopted in 2004 relied on neighborhood initiative; requiring that a majority of property owners petition for a district and submit a district-specific preservation plan and design standards. It also required an up-to-date historical survey, and since the City was not carrying out surveys, neighborhoods took the lead. Several tried raising money for consultants to undertake surveys; in most cases funding was only enough for a professional to work with volunteers, guiding and reviewing their work. The City HPO further reviewed the work of these teams before LHD designations proceeded, occasionally challenging lists of contributing buildings and sending them back for reconsideration or additional research. While the process sometimes seemed long and arduous, it produced groups of Austin residents who were deeply familiar with their historic resources and how they were evaluated. It demonstrated that volunteer surveys worked.

It also demonstrated some of the challenges in accomplishing surveys this way. Volunteers (or consultants) needed to find ways of sharing and compiling their data. Digital sharing through online spreadsheet services helped the largest efforts, but was also vulnerable to quality-control and data-loss issues. Separate arrangements had to be made to disseminate the survey among residents and property owners. Legacy surveys, including the only citywide one, conducted in 1983-84, were not readily available.

The Graduate Program in Historic Preservation at the University of Texas at Austin, working with the UT-Austin School of Information, the City HPO, and Preservation Austin (then the Heritage Society of Austin), set out to create a "Web Tool" that could support these efforts. We examined prototypes of web-based public data collection and display, within preservation, within the broader field of public

memory, and the even broader fields of crowdsourcing in citizen science and other domains.

We started with existing City of Austin process and forms. We were not charged with redesigning the survey form or process, simply providing a new, digital platform for it.

First principles

From our understanding of the survey process in Austin and elsewhere, and our explorations of web prototypes, we arrived at several first principles. These are not a description of the Wiki and its operation, but of the axioms we used in designing it, not as fixed rules but rather as guides. We offer them for insights they can provide both in understanding the Wiki, and in continuing to shape it:

1. Official data is not necessarily the most accurate.

There is an inherent trade-off between thoroughness and timeliness. Reviewing data takes time. The building observed by a surveyor in the field may be demolished or altered by the time the field survey is finalized. To revise an official survey takes resources (staff time or consultant funding), so it is undertaken only periodically. Meanwhile other survey efforts, including some by volunteers, can include photographs and field observations that are current but have not been reviewed.

There is also an inherent trade-off between the hyper-local knowledge of homes and neighborhoods by their residents, and the expert but less specific knowledge of professionals.

2. Show levels of review.

Like official data, publicly-supplied data is not necessarily accurate, and even when accurate it may not be framed within the vocabulary or standards that can be important for surveys when used in a regulatory context. The experiment of opening an official survey directly to public input ought to make visible its experimental nature by clearly labeling which information has come from the public, and which has been produced by, or vetted by, preservation professionals. This will make the Wiki format more sustainable, because users can draw their own conclusions which levels of data review are most useful for their purposes.

3. Openness: any data field may need editing.

All fields should be editable. The need for editing may arise from a variety of causes: changes in fact (e.g. demolition or alteration); changes in available information (e.g. newly-available historical sources); changes in interpretation; simple error.

4. Transparency: make the full edit record visible to all.

This allows all users to see the evolution of information in the survey. It provides a finer grain of provenance than Levels of Review.

5. Display first, curate later.

Avoid requirements for curation; aim for automaticity. The less maintenance required, the more likely the survey tool will be sustained. Curated displays of information (editing, selecting, verifying) are opportunities to fall behind.

6. Avoid over-determination.

Controlled vocabularies do not stay fixed for long in cultural fields. Terminology evolves. This was amply demonstrated as we uploaded legacy data sets, no two of which used exactly the same field structure or controlled vocabularies.

Field structure (and fixed vocabularies) should adopt the simplest schema that will support major search strategies (e.g. chronology, location), bearing in mind the availability and adaptability of free-text searches.

Levels of review

Each data field is marked with one of three levels of review: Unreviewed, Professional, or Preservation Office. The Wiki displays three columns for each field, with up to three simultaneous entries; users may toggle among them. A new entry overwrites data at its own level, and at any lower level. That is, a new entry at the Professional level will overwrite any older Professional or Unreviewed data (leaving it in the edit record) but leave untouched any older data at the Preservation Office level of review.

Levels of Review attach to the role, not the person.

"Professional" and "Preservation Office" log-in and review level are to be used only when the user is performing in that role (completing a professional survey; reviewing LHD or other publicly-entered data for the City HPO). When a professionally-qualified individual is entering material as a citizen volunteer, the data should be entered at Unreviewed level. It follows that any individual wishing to play multiple roles will need multiple log-ins.

Who is qualified as a "Professional"?

Professional standards are set by the U.S. Secretary of the Interior, National Park Service: http://www.nps.gov/history/local-law/arch_stnds_9.htm. Generally the requirement is for a graduate degree in history, architectural history, art history, historic preservation, or closely related field, or a similar bachelor's degree with two

years of professional experience. The City of Austin Historic Preservation Office determines whether an individual or firm meets these standards.

These standards are referenced by Austin Code (§25-2-353(C): "An evaluation under Subsection (B)(1) must be made by a person who meets the Secretary of the Interior's professional standards for expertise in "history" or "architectural history" as described in Code of Federal Regulations Title 36, Chapter I, Part 61 (Procedures For State, Tribal, And Local Government Historic Preservation Programs).") This section of the Austin Code refers specifically to qualifications for evaluating contributing and non-contributing status of each structure in a local historic district application. Subsection §25-11-213(B)(2) also refers to "a professionally prepared survey of historic structures."

What is "Professional Review"?

The Professional Review tag is applied to information from professionally-produced surveys undertaken for clients other than the City of Austin (for example, TxDOT) or to City-commissioned professional surveys while they are in progress.

For promotion of Unreviewed data, "Professional Review" means that a qualified professional has specifically reviewed any determination of eligibility (for local or National Register standards) for each property, and has generally reviewed other fields for terminology, internal consistency (for example, of descriptions with photos), and consistency with known historical context.

The HPO may accept, as meeting the standards of §25-2-353(C), surveys prepared by neighborhood volunteers whose work has been reviewed by preservation professionals (and has done so for the Castle Hill and Hyde Park Local Historic Districts).

The field-by-field Review Level tag makes it possible for reviewers to promote all fields of each record, or to leave some as Unreviewed.

What is "Preservation Office Review"?

The Preservation Office Review tag is applied to information from Austin Historic Landmark or Local Historic District nominations that have been approved by City Council. It is applied to information from approved nominations to the National Register of Historic Places or as Recorded Texas Historic Landmarks or State Archeological Landmarks. It is applied to completed surveys commissioned by the City of Austin or information that has been entered or reviewed and approved by City HPO staff.

Contributing and non-contributing status of properties within Local Historic Districts carry a regulatory meaning under Austin code, and the Preservation Office Review (official) data can be changed only by City Council.

For promotion of Professionally-reviewed data, review standards and process are up to the City HPO. As with Professional Review, Preservation Office Review cannot practicably mean that every data field has been independently verified by HPO staff.

Austin City Code §25-11-213(B)(2) refers to listing "in a professionally prepared survey of historic structures approved by the historic preservation officer" as one of seven triggers for HPO review of demolition permits. It does not further define an approval process or criteria. Austin is a Certified Local Government, and as a CLG has agreed to perform and maintain surveys according to federal standards, as administered by the Texas Historical Commission as the State Historic Preservation Office.

Some historical data within approved Historic Landmark or Historic District nominations may be found to be inaccurate - dates of construction, for example. These data fields seem appropriate for revision at Preservation Office Review level, as they do not have direct regulatory meanings under Code. Similarly, physical changes to designated properties, after designation, may be reflected in revisions at the Preservation Office Review level.

How is data promoted from one review level to another?

Data is promoted through the data review page, an interface similar to the moderation page. The HPO can log in to this interface to promote data among any of the three levels. The HPO can also provide a log-in for promoting data from Unreviewed to Professionally-reviewed, as when a preservation professional is vetting a voluntary survey effort for a Local Historic District nomination.

When will data be reviewed for promotion to higher levels? The City HPO can determine a schedule for review based on Staff work load and resource allocations. Code requires review before a Local Historic District nomination proceeds. The Wiki serves as an avenue for public contributions to other HLC processes such as individual landmark nominations or demolition reviews. When the HPO has reviewed these contributions and made a staff recommendation, the information in that staff memo is by definition HPO-reviewed, and the survey needs to be updated to show it.

Aside from these process-driven reviews, the HPO will decide if a systematic review should be undertaken from time to time in order to maintain a comprehensive official survey, as staff work loads and funding allow.

Moderation

Moderation ≠ verification or review.

*Moderation is intended as a basic filter against spam, obscenity or other grossly inappropriate content. Moderators check submissions only to be sure that they appear to be actual contributions to the historical survey. Moderators may screen for obvious typographic errors (e.g. "938" instead of "1938"). Any Moderator edit to a user contribution will generate an auto-notification to the user. The Moderator may if appropriate send an additional explanatory message or query to the user [*User e-mail addresses are available in the Drupal User Management panel]*

Moderators specifically are not to apply their own knowledge to correct what they may see as errors of fact or interpretation. They may log in under their own names to make such edits.

Moderators obviously cannot be expected to know every fact about every place in Austin, nor can they be expected to verify every entry in every field. The "Unreviewed" tag is intended to remind both viewers and Moderators that publication on the Wiki represents no expectation of verification or review.

Who moderates?

Moderator log-in status is provided by the City HPO. The Moderator is necessarily not a single individual; multiple members of the HPO staff and also others authorized by the HPO may use these log-ins simultaneously, in order to assure timely moderation of all contributions. Moderators are not required to hold qualifications as preservation professionals.

Moderation was intended as a volunteer role. Our original design intention was that the Moderator could be any reasonably intelligent and responsible high-school student. That may not be realistic - we have not tested it - but it underlines emphatically the principle that the Moderator's role is to exercise general judgment and good sense, not preservation-specific expertise.

Should there be multiple moderators in specific roles? One possibility is that a survey effort coordinator might moderate contributions to that effort. We have received feedback that this could create problems within the inherent tensions of neighborhood dynamics. We have not tested this.

Service level: Moderation is to be completed within 48 hours.

The Wiki promises moderation of all contributions within 48 hours. We have set, and met, an internal goal of 24-hour moderation. The Wiki should continue to meet this standard.

Prompt moderation is essential to the user experience. Moderation is not time-consuming - meeting our 24-hour standard has generally involved only a few minutes a day. The Wiki automatically notifies the acting Moderator(s), by e-mail, whenever there are contributions waiting in the Moderator's queue. This makes it simple to log in and publish user contributions. At times when we expect usage (for example, Wiki open houses), we have been able to accomplish near-realtime moderation, by logging in one of the Wiki Team participants as a Moderator.

Higher-order roles of Moderators: as curator, ombudsperson, first-line monitor

The Moderator is the person who encounters first all contributors' interactions with the Wiki; whatever is going right or wrong is first visible to the Moderator. This gives the Moderator a role that is inherently higher-order: understanding problems as they arise and taking appropriate action. At a minimum this means consultation:

passing questions along, so that the Moderator serves as eyes and ears for the Wiki Team.

The Moderator is the only person who is necessarily giving timely attention to all user contributions. Some users have, for example, embedded questions for the City HPO within their contributions; it is the Moderator's responsibility to recognize and forward such messages (and to let the user know that this is not the best channel for such communication).

A potentially elastic role for the Moderator is as first-line curator: correcting typos and other copy-editing; monitoring the quality of photographs to reject those that are blurred or underexposed. Users sometimes enter data in inappropriate fields (for example substantive data in the Source field). The most important curatorial role is checking text revisions to be sure a contributor does not inadvertently delete an entire field when intending to add to or amend it (note that this error is reversible as the original text remains in the edit record). Note that these forms of curation depend only on information internal to the user contributions; they do not involve verification or expert knowledge.

The attentive reader will note here a conflict with Principle 5, "Avoid requirements for curation." The key is that any curation of contributions must take second place to moderating them promptly.

Users

Creating an account is automated and instantaneous; it does not require training or authorization.

The Create an Account interface allows users to sign up immediately. New users are auto-screened for known spammers, through Stop Forum Spam (www.stopforumspam.com/), "a database of known forum and blog spam, its sources and the email addresses reported as its origins."

*New user accounts are immediately active (as with all users, this simply gives them access to the moderation queue; their contributions do not appear until moderated). The new user ID is auto-sent to the active Moderator(s). The Moderator needs to scan the log-in info to check that the name and address appear to be real. As with other Moderator functions, this is not intended as actual verification, but simply to check for users who have registered with obvious aliases. When someone has done so, the Moderator e-mails the user, explaining the real-name policy, offering the alternatives of re-registering with real name, or not participating. [*De-activating or deleting the user account is accomplished through Drupal User Management.]*

Automated sign-up is essential in order to allow property owners and residents to review and revise the records for their own properties. This is an important user group. Their participation is often one-time and brief, so they are most likely to be discouraged by any training requirement or other threshold. One-time users may be the most likely to make data entry errors (for example, entering information in the

wrong field), but that is balanced by the fact that their errors affect few records, and the information is often uniquely available from them.

The Wiki offers training.

The User Guide is intended as a platform for training both in the use of the Wiki, and in Cultural Resources generally.

[Future directions] The Account creation interface could offer a simple training module – Getting Started with the Austin Historical Survey Wiki.

The Wiki assumes some web competency.

Privacy

Participation is open and public, by analogy to speaking at a public hearing.

Contributing content requires registration with the user's real name. Each contribution is displayed with the contributor's name attached.

Postal address and e-mail contact info are required but treated as private, not for public display. E-mail may be used for communicating to users in general about the Wiki, or for communicating with a particular user in case of any issues or questions [e-mail addresses are available through the Drupal User Admin interface].*

Postal address is for use for verification and enforcement of real-user-name policy.

All data entered is potentially subject to Public Information Requests. That would include postal addresses. However, the City does not share e-mail contact information with the public, and email addresses are redacted from any data or documents provided in response to a Public Information Request.

Minors are not permitted as registered users of the Wiki.

At present, minors (younger than 18) are not permitted as contributors to the Wiki. This is accomplished through the user registration page: "By submitting this form you confirm that you are 18 years or older." There are no age restrictions on viewing and searching the data that is publicly displayed on the Wiki.

Federal law governs online privacy for children under 13 (primarily on commercial websites),¹ and policies for all minors at schools and libraries that receive federal support for internet access.² Neither of these laws appears to apply to the Wiki (whether managed by UT or the City). But they indicate the seriousness of privacy issues for these populations, and the complexity of best practices. For these reasons, we have begun by excluding minors as registered users.

¹ <http://www.business.ftc.gov/documents/Complying-with-COPPA-Frequently-Asked-Questions>.

² <http://www.fcc.gov/guides/childrens-internet-protection-act>.

The best way to incorporate youth, in our judgment, is to do so with a partner (school or library for example) already familiar with K-12 and youth web policies. We held a number of meetings and conversations with potential partners, but none ripened into a program initiative during the Wiki's development phase.

[Future directions] We think the Wiki would be great for certain youth users, and they could make great contributions to the survey. Students as young as 4th grade, in classroom exercises, have researched their schools and prepared local landmark nominations in Boulder and Denver, Colorado. Some high school students clearly would be capable of working individually on survey tasks. The openness of the Wiki format would allow students or teachers great flexibility in following their own interests or pedagogical needs. Youth talking to elders would be a good way to bridge the gap between those who have first-hand historical knowledge and those who have internet skills.

Data sensitivity

Some privacy issues (not specific to the Wiki) arise from the hyper-accessibility of public information on the web in comparison with information that is technically public but hard to access, buried in file cabinets.

One such issue is photos of people's homes. Some Wiki users objected to photos from legacy surveys that they felt showed houses in less-than-flattering ways that could contribute to stereotyped views of neighborhoods or their occupants. We have not so far removed any photos for privacy reasons. We would be especially reluctant to do so for legacy surveys which may be the only available record of a building or place in a previous condition. These photos are already part of the public record; for that reason one could argue that if they misrepresent a neighborhood it is all the more important that the neighbors should know about it. For current photos, the existence of Google Street View helps define basic expectations about privacy (but note that in some other countries, such as Germany, web display of private dwellings even from the public right-of-way has been viewed as a privacy violation, sufficient that Google has not offered Street View in those places).

A different issue is asking and displaying information about residents of houses, especially current residents but even recent residents. A government-affiliated query on this subject may be perceived as related to immigration enforcement; even if the historical survey is understood as the real and legitimate purpose of the query, there may be worries about the potential for the data to be put to other uses. We have removed the residents field (which was on the original HPO paper forms), and treated it as part of the Associated Persons field – significant individuals may be listed (current, recent or historical), without any implication that occupancy need be documented unless it is relevant to historical significance.

Intellectual property

Users grant non-exclusive license to use their contributions (contributors retain ownership).

When uploading photos or documents, users click a form that says:

You warrant that all images or other materials you submit to the Austin Historical Survey Wiki:

- 1) are original to or owned by you;*
- 2) are in the public domain; or*
- 3) have been provided to you by the owner of the Material, who has granted express permission for you to submit it for publication on the Austin Historical Survey Wiki.*

You grant permission to publish the Material on Austin Historical Survey Wiki, and for the City of Austin to use the Material for Historic Preservation Office purposes, with no compensation and for an indefinite period of time. You also understand that Austin Historical Survey Wiki reserves the right to refuse any Material.

Thus the City has the ability to use any information provided to the Wiki, for HPO purposes. But the City does not own the material; the contributors may continue to use and control it for other purposes. Specifically, this means that while photos and documents may be downloaded by any Wiki user, downloading does not bring rights to publish or use for purposes other than historical survey, nor is the City able to grant those rights.

Policing of IP violations is by complaint.

By clicking the upload form, contributors warrant that they own the rights to the material, or otherwise have the right to contribute it. There is no provision for verifying this (and no practical way to do so). Allegations of intellectual property violations will be handled on the basis of complaints.

No such complaints have been received to date.

[Future directions] Creative Commons licensing [*]

A number of Wiki users have expressed reluctance to upload their photos or other materials without greater control over their use. Creative Commons licensing would provide that, in a form that has come to be almost universally recognized. Creative Commons licensing would also give users the ability to convey greater rights to the general public, if they choose. Incorporating a Creative Commons feature in the Wiki would require:

1. Explaining, or linking to explanations of, the Creative Commons tags;
2. Adding to the contribution interface a set of buttons for Creative Commons tags;
3. Accurately and reliably storing the Creative Commons tag as part of the metadata of each contributed item; and

4. Attaching the correct Creative Commons tag to each item when displayed or downloaded.

Data structure

Records are called "places."

What to call records in the survey was an unexpectedly contentious question. "Properties" – the customary term in Cultural Resource Management – met opposition for several reasons. To some ears it suggested that the survey was oriented toward promoting redevelopment; conversely, to others it suggested an unwelcome regulatory emphasis. To some it seemed to preclude locations, such as rights-of-way or parks, that are not part of the property database for tax assessment. And it seemed to exclude intangible heritage and no-longer-extant resources – admittedly not central parts of the City's landmarks program or of most historical surveys, but important to a broad view of heritage and public history, and potentially useful in evaluating archaeological resources, or in better tracing the fate of cultural resources and program efficacy.

We settled upon *Places*, which echoes the National Register of Historic Places, and seemed clear to users. It emphasizes the essential requirement that while every other field is optional, each record must be tied to a location.

Places are stored as points not polygons.

Points are the simplest form of geo-coding. Interfaces for creating point data are the most widely available and the most familiar to the greatest number of users (as we began developing the Wiki, the Google Maps API offered only point data). Cultural resource survey conventions, in Austin as elsewhere, are not consistent as to whether survey records should attach to building footprints, land parcels, or some other polygon. Polygon layers are not consistently available for locations outside the framework of private, taxable land parcels.

A record may contain other records.

This can accommodate historic districts, for example, or compounds that contain more than one principal structure.

"Contain" sets a master record, whose attributes are shared by the others contained within it. The geocode location of the master may be that of a principal structure, or it may be a centroid or arbitrary point within the district.

This is, obviously, a point-based solution to the problem of the area of a district or site (a polygon) encompassing within it smaller polygons or points. Note that the point-based hierarchy is potentially more adaptable, as "containing" need not be a spatial relationship. This would enable, for example, thematic designations, though these have not to our knowledge been proposed in Austin.

[Future directions] Add a polygon as an optional attribute of a “contains” record. Display the polygon on a map. Include GIS functionalities based upon the polygon (for polygon-enabled “contains” records the relationship would then be defined as spatial, and could be programmed to automatically link to any record located within the polygon).

“Existing”/ “demolished”

“Demolished” in fact means “no longer extant at this location”; thus it includes buildings that still exist but have been moved elsewhere. “Existing” refers to a physical resource; for example, a business that no longer exists should be described within the History or Historic Name fields of an “Existing” record if the building still stands.

We needed a binary data field: extant/ not extant at this site. We did not find that to be clear to all users. This field gives the Wiki the capacity to maintain complete records once a building is demolished or moved, by simply clicking off the “Existing” switch without modifying other fields. It also gives the ability to gather information about places that no longer exist. At a particular location, it allows maintaining multiple records for resources that existed sequentially.

"Overview" field

This field should be a concise summary – preferably a single paragraph – of the place’s description, history and significance.

The Overview field did not appear on the original HPO paper survey form. We added it because the Wiki map display and search results table could show a modest amount of text for each place, but there was no appropriate single field for such a display. The Overview field is also intended as a user-friendly summary for purposes beyond the HPO survey, such as export to tourist apps.

Tags

The “Tags” field allows contributors to add a word or phrase describing a place within user-defined categories. The field offers a pull-down menu of terms already in the database (in descending order of frequency; the user may click to display alphabetically); the user may select one or add a new term. Tags like all content are moderated.

The Tags field is another not in the original HPO paper form. “Free-tagging is a convention of much of the participatory web, allowing participants to originate classification schemes independently. For the Austin Historical Survey, they serve several useful purposes. Almost every user group suggested additional fields they thought should be included in the database; we declined almost every one of these requests in the interest of keeping database architecture and user interface simple. But we recognized that many of these suggestions could have been useful additions. The free-tag field can accommodate these requests, and potentially serve as a proving ground for the evolution of the database. Similarly, the Tag field may serve

as a proving ground for incipient Survey Efforts. It can serve to make the Wiki useful to a variety of groups, for example by tagging all the places on each year's house tours by Preservation Austin, East Cesar Chavez or Hyde Park.

images and documents

(see Intellectual Property, above)

.csv exportability

All records in a current search can be exported as can the complete database by using "Show All." The Wiki exports all fields of each record with the export file serving as a template of the current field configuration. The .csv export function is available only to registered users who are logged in.

The .csv export file can be used to populate a merge document such as a survey form, or for any other user-defined display format. The Wiki design assumes that any user sophisticated enough to want to use the .csv export function will likely have skills in sorting and processing the data, which will be better than our ability to anticipate and program all the uses to which they may want to put it and all the operations these will require.

Requiring log-in for data export is intended partly to help understand who these "power users" are, and provide the opportunity to follow up with queries about how they were using the data, as well as other usage queries. It was also intended to provide an opportunity for follow-up if for any reason data downloads malfunctioned (to our knowledge that has not happened).

User interface

All levels of review are displayed.

Users are always reminded by the display that all three reviews levels co-exist together and may all be populated for any field. The user can toggle among them, deciding which is more relevant to the task at hand, while being aware of other data.

"Draft" data

Draft data is saved, accessible to the logged-in user only, not yet in the moderation queue until the user hits "Submit."

[Future directions] Data entry templates

Additional templates can be created for different categories of resource (for example, a survey focused on downtown rather than a neighborhood), or for different categories of user (for example, for K-12 students).

Survey Efforts

Places may be tagged as part of one or more Survey Efforts. These may be based upon geography (for example a neighborhood-based survey) or thematically-based (for example a resource type or period, or the heritage of a particular group).

User-contributed places need not be tagged as belonging to a Survey Effort. All legacy data should be uploaded with a Survey Effort tag to indicate its source.

Open and Closed Survey Efforts

“Open” Survey Efforts are ones to which users may add Places, by selecting the Survey Effort tag in the pull-down menu. “Closed” Survey Effort tags cannot be user-selected by regular users; all other fields are equally editable. Closed Survey Efforts are intended primarily for legacy surveys, for example the 1984 City survey or once a survey has been completed and approved by a regulatory agency or the City HPO.

Creating new Survey Efforts [*]

New Survey Efforts must be created by the HPO. At present, this requires adding a new Survey Effort to the list of tags in the Drupal admin interface[].*

The intention is that any credible group proposing a survey ought to be recognized. Yes, this benefit-of-the-doubt approach may result in (has in fact resulted in) some survey efforts that are effectively dormant. We see this as a strength of the Wiki: worthwhile but uncompleted efforts are available as works-in-progress, and their availability can help recruit new participants.

[Future directions] Survey effort pages

Each Survey Effort should have its own page, where content can be posted that is general to that effort: context statements and other background documents; the survey report itself for legacy surveys. The Survey Effort page should include:

- an auto-generated map of all records tagged as part of the Survey Effort;
- an interface for uploading and displaying documents common to the whole survey effort. One of these ideally will be an historic context; collectively all these documents together constitute a work-in-progress historic context.
- names and contact info for one or more Survey Effort coordinators. The coordinators may be given some curatorial responsibility and control for content on the Survey Effort page.
- a list of users who have self-identified as part of the Survey Effort. This list could function as a discussion group.

The Survey Effort page could also include stats on recent additions or on completeness of records, as progress benchmarks to reward and encourage participants.

Ongoing operations & maintenance

User service: Report-a-Problem

The Report-a-Problem button appears on every page of the Wiki, and auto-generates an e-mail to a designated list of recipients (so far that has been the same as the Moderator list, or its higher-level members).

“Problems” may include web malfunctions (e.g. programming errors or unknown browser incompatibilities); data errors (some such as duplicate records that require Wiki Admin action, others that could have been user-edited); user feedback on interface design or expectations as to functionality; and even general feedback or communications for the HPO. We have intentionally used a single form without asking users to specify the nature of response required, as that may not always be clear to them.

It is essential that users receive a prompt and straightforward response, even if the problem cannot be promptly solved.

Data maintenance

The Wiki is the City’s historical survey database. This entails the same maintenance commitment as for any database, whether or not it is online:

Uploading of legacy data should be completed.* This is a task involving significant time and effort, even when data is available in good digital form.† It entails:

1. Examining the database, mapping its fields to the current data fields of the Wiki, converting all to proper format (e.g., four-digit integer dates; correct binary existing/demolished). Architectural descriptions and other survey-specific fields and vocabularies must be mapped to a formatted text field.
2. Geocoding the database. Address data must be converted to the City of Austin format used by the Wiki in order to generate geocoding. Non-addressed records must be hand-geocoded. If a survey is already geocoded, the coding should be examined to determine whether it contains significant locational information or should be superseded by address geocoding for consistency.
3. Constructing metadata, by examining the source and notes conventions of the legacy survey, and populating the Sources and Notes fields appropriately, including record-specific and field-specific data where available.

* No contract or grant support has ever been awarded for assembling or uploading data outside of East Austin and the North University neighborhood. The large number of records outside these areas mainly represent Wiki Team work beyond what was funded, as well as user contributions.

† Data is seldom available in good digital form, even defining this generously as any kind of database file, consistently coded, uncorrupted and readable. One eye-opening result of the Wiki project has been how inaccessible and precarious are the digital products of surveys, professional as well as volunteer. Digital archivists are familiar with the issues of format obsolescence and digital media deterioration; we have found the even more fundamental problem that no archiving of databases is even attempted.

4. Identifying duplicate records, and formulating a merge protocol. The legacy data must be assigned a level of review, and duplicate existing records examined for data at that level of review. The respective dates of the surveys will ordinarily determine whether the new legacy batch should overwrite the existing data. It would be possible to adopt a protocol that maintains older data as current if it is judged to be more authoritative, though the more appropriate way to implement that judgment would be to promote the older data to a higher review level.

[* These operations will require custom programming assistance to complete the upload. As can be seen by the description above, there is no formulaic solution, even once the legacy data is wrangled into correct form. It was an early intention that the Wiki should include an automatic batch upload function, but we concluded that any automated batch upload creates an unacceptable risk of losing existing data.]

Uploading of new third-party surveys as they are conducted: surveys are continually carried out by other agencies such as TxDOT (most recently an extensive MoPac survey), Cap Metro, and the Travis County Historical Commission. In the future the simplest solution will be for such surveys to be carried out using the Wiki: their results will be automatically compiled for the City; the surveyors will have access to all current data, and the Wiki will give their surveys a degree of public participation and public accessibility that should be an expectation for historical survey in Austin. Where agencies, or their consultants, choose to use other means of survey, the City HPO should promptly acquire their survey data in digital database (not pdf) form.

Incorporating new survey data into the Wiki will be another batch upload process [*], parallel to legacy surveys, above. It could be simpler in many respects, with cooperation from the data providers.

Uploading Austin Landmark, National Register and other designations, and HLC decisions: as the City's historical survey database, and the only venue in which the HPO provides comprehensive property-specific data, the public will look to the Wiki for timely updates on new designations, and on other outcomes (e.g. Certificates of Appropriateness, demolition and other permits) of HPO processes.

Data clean-up: this is, obviously, an elastic category. Interestingly, it does not arise solely from publicly provided information; there are buckets of inconsistent data in professional surveys, once they are displayed side by side (using the Wiki for future surveys will create the opportunity for professional surveyors to resolve inconsistencies in the record, and the Wiki provides the opportunity to emend them piecemeal as they are discovered). Professional surveyors at least tend to get their data into the correct fields, so that inconsistencies can be viewed and evaluated by any user, reducing the urgency of clean-up.

Volunteer users, especially casual users, are more likely to enter information into inappropriate fields (including a tendency often to enter all information into a single field, usually the Overview). The survey's value will be enhanced by periodically reviewing contributions to enter data into appropriate fields, especially searchable ones such as dates and Associated Individuals.

A parallel clean-up task comes from the opposite direction: landmark and National Register nominations, because they are in mainly text formats, frequently have records that do not have other survey fields populated; sometimes these fields are populated by legacy surveys that are less authoritative than the nominations.

A special clean-up issue is duplicate records. Judgment will sometimes be required as to whether records are in fact duplicate, or refer to sequential or coincident properties on the same parcel. Through Drupal admin interfaces it is possible to delete one or more of a redundant set [*] To do so while maintaining survey integrity requires attention to all fields in each record to avoid data loss, and attention to priority to ensure that the combined record displays the most recent data at the appropriate Level of Review.

Data clean-up = curation, and all of these clean-up tasks are to some extent a result of Axiom 5: *Avoiding requirements for curation* at the front end bumps the need for it until later. Note that these clean-up tasks are normal for any large database. Axiom 5 simply lets everyone see the work-in-progress sooner rather than later, for the good reason that “later” often means never, if there are few resources for curating the data. For the same reason, any data clean-up will be a question of resource allocation; If funding and staff time allow, data clean-up can be undertaken systematically, across the whole survey. If resources are more limited, data clean-up could be more selective, for example in a particular neighborhood as it undergoes a neighborhood plan.

Data review and promotion to higher Level of Review: Data must be reviewed as part of the Local Historic District process. It also makes sense where other public processes are undertaken and agencies outside the HPO wish to know that they may rely upon the historical survey as representing professional standards (Professional review level) or City policy (Preservation Office review level).

Whether data review and promotion make sense on a citywide basis will be another question of resource allocation. It will depend particularly on the extent to which consumers of the Wiki survey data are able to make their own judgments based upon multiple levels of data.

Programming maintenance [*]

Many functions throughout the Operating Manual are starred [*] as requiring Drupal functions or programming assistance. The Wiki Administrator is responsible for these functions (see *Cast of Characters*, above). Based on staff and user experience, the Survey Manager, Wiki Administrator, and Wiki Team will continue to identify issues and improvements that will entail additional programming.

Updating Drupal versions and modules: this will be part of CTM-wide management of the City’s whole web presence. Some update will be optional; some will be required as things become incompatible.

Future directions

Discussions above include:

- a Getting Started training module at the Create an Account page;
- K-12 programs;
- Creative Commons licensing [*];
- adding polygons to “contains” records [*];
- creating additional data entry templates for different categories of users or resources;
- Survey Effort pages.

Other future directions within the context of Austin:

Link to the Austin History Center and other repositories [*]

One of the main resources for researching historic places in Austin – the research that forms the basis for much of the content of the historical survey – is the Austin History Center (AHC), and particularly its Buildings and Streets files. The Wiki audience and the AHC audience largely overlap. AHC volunteers have worked for several years to compile an index to the Buildings and Streets files. As the collection grows, so must the index; like the Historical Survey this is a continuing, volunteer activity. The Wiki could serve it well, and its content would serve the Wiki and its users.

Other repositories, such as the Dolph Briscoe Center for American History and the George Washington Carver Cultural Center and Museum, have their own collection intersections with the subject of the Wiki, and their own indexing. The more that can be brought together as a one-stop site, the more they will all support place research in Austin.

Link to City of Austin GIS [*]

The Google Map API has been used as a convenience. It is almost universally familiar, which is an asset for public users of the Wiki. But for the Historical Survey’s integration into Austin’s planning and development review, it is more important that the Wiki be brought into the City’s own GIS.

Use the Wiki in HLC processes, and do so publicly.

The HLC uses survey information in reviewing demolition applications and other processes, and those processes need to include consulting the Wiki. The Wiki is the City’s channel for disseminating historical survey information. It already includes data not available in the HPO’s paper files – including legacy surveys that were not in the City’s possession, plus thousands of fields contributed by users since the Wiki was opened to the public. When all legacy data is uploaded, the Wiki will be the one-stop reference for historical survey in Austin.

The Wiki is also the City's ongoing invitation for public contributions of information about historic properties. Making the Wiki a visible part of review processes will be the most effective way to encourage participation, with the result of better information for HLC decisions and better engagement by the public. It will also encourage early consultation of survey information by other decisionmakers, such as owners considering demolition or landmarking.

Appendix I: Overview of Current Application and Server Configuration

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June 01, 2013

The Austin Historical Survey Wiki is built on Drupal 7 with a MySQL 5.5 database and an Apache Solr 3.6 search engine running on an Apache Tomcat 6 servlet container.

The application resides on an Amazon Elastic Compute Cloud (EC2) virtual server and uses an Amazon Machine Image (AMI) virtual machine and an Apache-MySQL-PHP (XAMP) web application stack created by BitNami (<http://bitnami.org>).

Application Configuration

The Austin Historical Survey Wiki is built on Drupal 7 with a mixture of core, contributed, and custom modules. The application currently uses the latest versions of the following core and contributed modules:

Core Modules

Required by Drupal:

Field
Field SQL Storage
Filter
Node
System
Text

Optional:

File
Image
Options
Path (required by Pathauto)
Taxonomy

Contributed Modules

Automatic Nodetitles
Geocoder
geoPHP (required by Geocoder)
Chaos Tools (required by Geocoder)
Pathauto
Sub-pathauto
Token (required by Pathauto)
Search API
Entity API (required by Search API)
Solr Search
Honeypot
reCAPTCHA
jQuery Update
Diff
Workbench Moderation

Core

The application uses the optional core modules File, Image, Options and Taxonomy (as well as the required core modules) for their APIs in the application's custom modules (described below).

The core module Path is used by the contributed module Pathauto (and its associated modules) for creating automatic URL aliases throughout the site, routing 'node/*' to 'place/*'.

Contributed

The application uses the contributed module Automatic Nodetitles to automatically generate titles that Drupal requires for node-based content. This function will soon be handled within the custom modules.

The contributed module Geocoder, and its required modules geoPHP and Chaos Tools, provide an abstracted API to the application's custom modules for geocoding and reverse geocoding data. The Geocoder module provides a set of included plugins for geocoding via a number of services. This application also includes a custom plugin for geocoding via the City of Austin's ArcGIS Server's REST API (located within the Geocoder module's plugin folder).

The Seach API module and the Solr Search module interface with the Apache Solr search engine to provide indexing and rapid searching of text data via the application's custom modules.

The Honeypot and reCAPTCHA modules provide functions to prevent spam and unauthorized submission of the site's log-in forms.

The Diff and Workbench Moderation modules provide APIs to the application's custom modules that allow for content (Places) to progress through a 'In Draft' > 'In Moderation' > 'Published' workflow.

Custom Modules

The application's core functionality is currently built through a set of 5 custom modules:

- HistoricalSurvey Fields
- HistoricalSurvey Place
- HistoricalSurvey Maps
- HistoricalSurvey Search
- HistoricalSurvey Workflow

There is also a 6th custom module HistoricalSurvey Admin which contains debugging functions and batch data import/export functions used only by the application's administrator.

The application uses a custom theme, HistoricalSurvey Theme, to alter core templates and add site-wide CSS.

All custom modules are dependent on each other. Their functions are organized into separate modules for the sake of programming clarity. The modules are located in the 'historicalsurvey' folder in the contributed modules directory. The descriptions below are a general outline of their functions. More detail documentation of each function can be found in the code.

HistoricalSurvey Fields

The HistoricalSurvey Fields module interacts with Drupal's core Field API to declare and define custom generic field types used by the Place entity's field instances. The module separates out hook implementations, callbacks, and helper functions into the main .module file and three .inc files for programming clarity (historicalsurvey_fields.widgets.inc, historicalsurvey_fields.formatters.inc, and historicalsurvey_fields.theme.inc).

The install file of this module creates (and deletes upon de-installation) all the custom Taxonomy terms used by the fields.

The module contains all the CSS and Javascript (mostly jQuery) used by the field widgets and formatters.

These functions currently define 6 custom generic field types, some of which are implemented once by the Place entity and some multiple times for a number of similar fields:

- historicalsurvey_location – for address data and geo-data (lat/lng)

historicalsurvey_construction_year – for actual and estimated years and year ranges

historicalsurvey_term_reference – for fixed vocabulary data

historicalsurvey_text – for plain text data

historicalsurvey_photo – for photo file data and associated meta-data

historicalsurvey_document – for document file data and associated meta-data

Each of these custom fields also contain common database columns for notes, “replaced” (A boolean indicating whether the field's value was replaced or simply edited. Used to determine potential multiple authors for a field), and several columns to describe the field's “data review” history.

HistoricalSurvey Place

The HistoricalSurvey Place module creates the “Place” content type, which extends Drupal's core 'node' content type. It creates the new field instances based on the custom generic field types defined in the HistoricalSurvey Fields module, defines the functions for creating, viewing and editing of Place records, and creates an admin interface for setting relevant variables. The module separates out hook implementations, callbacks, and helper functions into the main .module file and three .inc files for programming clarity (historicalsurvey_place.admin.inc, historicalsurvey_place.create.inc, and historicalsurvey_place.theme.inc).

The install file of this module creates (and deletes upon de-installation) the 'Place' content type and creates the field instances.

The module contains a couple of external template files (*.tpl.php) defining the viewing and editing interface for the 'Place' content type. It also contains the Javascript files (mostly jQuery) used by these view and edit templates.

HistoricalSurvey Maps

The HistoricalSurvey Maps module defines the themes that organize the many maps shown throughout the application, as well as the main map page showing all the records at once. All of the functions for this module are contained within the .module file.

The module contains an external template file (*.tpl.php) defining the main page page. It also contains the Javascript files (mostly jQuery and Google Maps API V3) used to show the maps.

The module defines four different types of maps ('viewmodes'):

main – for the main page, showing all the pins

mini – the small map used on each 'Place' record page, showing only the immediate surroundings

create – the interactive map used to create and edit pin locations

search – the map used to show the results of a search

HistoricalSurvey Search

The HistoricalSurvey Search module defines the search forms and functionality of the application. The module separates out hook implementations, callbacks, and helper functions into the main .module file and two .inc files for programming clarity (historicalsurvey_search.queries.inc, historicalsurvey_search.theme.inc).

The module searches text data via the Apache Solr search engine and the Solr Search module API. It also searches Taxonomy terms, construction years, and addresses, and displays the results as a list and in a map.

The module contains a couple of external template files (*.tpl.php) defining the search form and search results interface. It also contains the Javascript files (mostly jQuery) used by these templates.

HistoricalSurvey Workflow

The HistoricalSurvey Workflow module creates the moderation pages for the application. It is dependent on the Workflow Moderation and Diff functions for showing data in the moderation queue. The module creates a dashboard for the management of 'Places' through the workflows defined via the Workflow Moderation module, from 'In Draft' to 'In Moderation' to 'Published'. All of the functions for this module are contained within the .module file.

Server Configuration

The application resides on an Amazon Elastic Compute Cloud (EC2) virtual server and uses an Amazon Machine Image (AMI) virtual machine with an Ubuntu Linux operating system and an Apache-MySQL-PHP (XAMP) web application stack created by BitNami (<http://bitnami.org>).

The BitNami application stack contains all components under a single directory (/opt/bitnami) for ease of backup and migration. BitNami provides extensive documentation on the management of their Amazon EC2 servers via the Amazon Web Services Management Console as well as via SSH:

BitNami and Amazon Web Services: http://wiki.bitnami.com/Amazon_cloud

BitNami and Drupal: http://wiki.bitnami.com/Applications/BitNami_Drupal

The Apache Solr 3.6 search engine runs on an Apache Tomcat 6 servlet container as a separate installation from the BitNami stack. This installation is conventional for Apache Solr and its management is documented here:

(Drupal) Search API Solr search : <https://drupal.org/node/1999280>

(Apache) Solr 3.6.2 Tutorial: http://lucene.apache.org/solr/api-3_6_2/doc-files/tutorial.html

Appendix II: Summary of user feedback and design adjustments

This Appendix summarizes feedback, and actions taken to address it, from two distinct periods, Beta Testing, and Public Launch. Beta testing began February 25, 2011, with a small set of users in the North University neighborhood (under a CLG grant and City of Austin funding that preceded the Preserve America and NCPTT support), and continued through a broad “soft launch” in Spring 2012 with preservation and neighborhood groups in East Austin and then citywide. Public launch took place in a City Hall ceremony on June 4, 2012.

Feedback has been gathered through two basic channels: online, including through the “Report-a-Problem” button, and in person through instruction sessions, user interviews and focus groups. The “Report-a-Problem” button has been used more than 60 times, communicating malfunctions, complaints or suggestions about functionality or interface design, and requests for help or instructions. All reports are treated as design feedback. Online feedback also includes observing the errors and unintended uses made by users, and analyzing user stats provided by Google. In-person instruction sessions with neighborhood groups, graduate students and others gave Wiki Team members the opportunity to hear user questions and expectations, to see which instructions and concepts were understood clearly and which were not, and to observe firsthand how users expected the Wiki to work. Experienced groups of users and individual users, including City staff and other Wiki team members, were interviewed for impressions, problems and suggestions.

We made ongoing adjustments as necessary and feasible, and accomplished many others through “Wiki 2.0,” the comprehensive redesign and re-programming made necessary and possible by City of Austin CTM’s requirement that the Wiki be delivered in Drupal 7 (Drupal 6 was the current version when we began programming). Wiki 2.0 was delivered to City of Austin management in July, 2013, as a soft launch, and revisions have continued since then.

Speed it up: the Wiki loaded very slowly in its earliest beta version, when it was hosted on UT-Austin servers, which did not permit us to change server settings to optimize Drupal performance. Speed improved significantly when we moved to Amazon EC2 hosting. It improved again when we moved to Drupal 7. Speed of loading remains slower than some users would like, and probably always will be, when user expectations are shaped by Amazon and Google themselves. Many speed issues are browser-dependent. Speed will improve over time with improved faster servers and browsers. On the other hand, it may suffer as the survey database grows from N in the thousands to N in the tens of thousands (current Wiki N > 5,000. We estimate buildings over 50 years old N = ±40,000).

Eliminate log-in for viewing data: In the early months of beta testing we required users to log in to view any data beyond the front page of the Wiki. The intention was to be sure that we understood when the Wiki was being used and by whom, at a period when we did not know what problems to expect. We were particularly

concerned to ensure that no user data was lost. The design intention was always to open to full public data display, and we did so early in the soft launch.

Eliminate multiple tabs per record: Throughout the Wiki 1.0 period, each record displayed on four separate tab-navigated pages, one each for identifying information and overview, history, architectural description, and significance. Usage stats showed that the great majority of users did not progress beyond the first page; user observation and interviews showed that many were unclear what to expect or why to click on the additional tabs. User contributions to the Wiki showed a strong tendency to enter the contributions in a single field, most often the Overview field on the first page. The purpose of the multiple tabs was mainly to avoid an overly-long page, but user feedback indicated that scrolling through a single page is a more instinctive navigation than clicking on tabs whose purpose is not clear. Wiki 2.0 displays each record as a single page.

Eliminate expandable data field displays; simplify field structure: Throughout Wiki 1.0, the Architectural description tab used all the fields of the original paper form. In order to simplify the display, multiple fields within a category (e.g. porch description) were set to expand only upon clicking the category. This was not intuitive to users, who generally had no prior knowledge of the field structure. In a related and important change, we have simplified the field structure as stored in the Wiki database.

Create Draft records and store them until users submit them to the moderation queue: this allows users to save and edit their work-in-progress. It solves a number of problems identified through user feedback. Contributors lost data by logging out (or timing out) before submitting. They identified errors after submitting, and could not edit through the Wiki because their submission was in the moderation queue, inaccessible to all but the Moderator. This change also addresses an issue identified by Moderators, allowing them to moderate the complete record as intended by the contributor, rather than field by field.

Display Levels of Review in a single table: In Wiki 1.0, data at different levels of review in the same field were stacked vertically in the same display. Users who were not attuned to the idea of levels of review perceived them as duplicates; even users who were familiar with the concept had to pay attention to the text display in the Review Level field. In Wiki 2.0, we redesigned the display to create a single table showing the three levels of review as three columns. Only one is fully displayed at any time; the other two are partially visible, with user ability to toggle immediately among them. The concept of simultaneous data at multiple levels is graphically intuitive.

Show sources and notes as a single display: Wiki 1.0 stored a separate sources & notes field for each data field. Many users noted the inconvenience of duplicating source information in multiple fields; even more users implicitly gave the same feedback by failing to fill out the multiple source fields. A more serious though less-noted issue was that some users entered substantive information into the notes field rather than the data fields. There the information was nearly inaccessible. The

single Sources & Notes field makes it available, and provides a single locus for anyone looking to research further, or understand the sources for, a particular property.

Include a locator map on each record page: we've done it.