Section 4 – Technical Lessons Learned

PARTICIPANTS

One of the first lessons learned on this project is that the Grantees are working very hard with limited resources to provide legal services in Southern California. As with anything that is new or requires change, this project could have been met with skepticism and resistance. Instead, the Grantees on this project welcomed and embraced the project as one more possible tool they could use to assist them in better managing and serving the people who need their help.

There were, however, many technical issues encountered during the course of this project. Not surprisingly, most of these challenges were related to the management of data. A brief overview of the issues encountered is provided below. A more detailed description of each type of data used on this project and the challenges encountered with using the data is included in Section 5.

DUPLICATE CASE RECORDS

The data provided by the Grantees contained duplicate case records. A technical solution for identifying duplicate records was developed, as described in "Deemed Duplicate Records" in Section 5, and the duplicates were removed from the database. While this process could be incorporated into the standard processing for case record data, the potential exists for deleting case records that appear to be duplicates but which are actually new cases. In the future grantees should employ processes to identify or eliminate duplicate case records prior to future legal services mapping projects.

MATTERS

For this project, the Grantees provided a variety of matters data. This project required that these data be geocoded to create the geometry for mapping. Many different types of matters data were submitted, many of which did not have associated address information. There were many more instances where multiple matters records pointed to the same address because they were associated with a meeting or kiosk at a specific location.

Because the geocoding process requires that records contain an address or at least a ZIP code, mapping of many of the matters was not accomplished. Some standardization in the documentation and reporting of matters may increase the usefulness of this data, but it should be recognized that meaningful mapping requires location information. Many types of matters activities simply do not contain sufficient location information to make mapping of them practical. Examples are general matters activities such as community service, presentations to groups or meetings, distribution of brochures and pamphlets, media outreach and advertising, and advocacy activities. This lack of geocoding ability of many of the grantee matters was primarily a function the lack of recording keeping for these kinds of activities including a valid address.

NON-CSR CASE RECORDS

The original set of data provided by the grantees in some cases also contained records for cases that do not meet the LSC Case Services Reporting (CSR) requirements. These records were not initially identified in any way that permitted them to be recognized or systematically managed. This required the grantees to provide additional data in the form of lists for the case records identified as Non-CSR. In order to permit the greatest flexibility for mapping CSR and Non-CSR case records, the grantees should attach an identifier to case records to indicate whether they are CSR eligible cases. At the outset of a mapping project it should be decided whether all cases, only CSR-eligible cases or both will be mapped.

CSR CASE RECORDS

The case record data submitted by the Grantees did not conform to any uniform standard with respect to the types of data recorded, field names, data types within the fields or domain of acceptable data within a record.

Some examples of data that were not uniformly provided include Private Attorney Involvement, Funding Source or Code, Outreach Sites, Special Programs, Clinics, Language, Family Size, Family Type, Income Source or Code, Residence Type, Education, Gender, Ethnicity, Intake Method or Code, Age, Case Open Date, Case Closed Date, etc.

This variation caused an immediate departure from the goal of automation of the project. The challenge was addressed by customizing the input from each grantee to make it conform to one master database for all case records from all grantees as detailed in Section 8 of this report.

The development of a standard database design and data dictionary that accommodates all of the expected and intended data is essential if this type of project is undertaken for more than a handful of grantees, in order to reduce costs through automated data processing.

GEOGRAPHIC COORDINATE SYSTEM

In this project, the universal geographic coordinate system was to be used for all data and maps were to be projected “on the fly” into the local state plane coordinate system. In addition, the source geographic data was to be housed in a uniform data store. While projecting on the fly was acceptable for display purposes, accurate analysis and selection across themes was not possible. This required all data to be projected into the state plane coordinate system and stored in that format.

WATER FEATURES

Geographic (streets, political boundaries, census boundaries, etc.) data provided by GDT, Inc. contained very detailed water features that were separate from the land features of the geography. As separate data, the land and water features had cartographic border lines drawn around them. These additional boundary lines made it difficult to identify country, state, county and other geography borders from the land and water borders, causing some confusion when looking at the maps. For this project the detailed boundaries included with the water features were removed, which was a significant effort for a large scale mapping project of this type.

The water features were also extremely detailed along coastlines. The mapping software had difficulty in representing the highly detailed lines provided with these water features, creating unclear lines in these areas. These detailed boundaries were systematically and manually edited to "smooth" them to provide a more cartographically pleasing result. This could be a very large effort for a project involving many grantees and a larger geographic area.

TRANSPORTATION DATA

Determining what interstates, freeways, U.S. highways, state highways, county roads, and railroads should be displayed on maps of different types and scales was a challenge. The cartographic display and labeling associated with these transportation features was also a challenge. For this project, standards were established and incorporated in the maps produced for all five grantees. It would be useful to establish similar standards for universal use in future legal services mapping projects.

CENSUS TRACT CHANGE MAPS 1990 – 2000

The analysis required the calculation of the change or percent change in population from 1990 to 2000 in Census Tracts. This calculation is complicated because the shape and number of tracts changes from census to census. The Census Bureau releases population-based Tract Relationship files that are used to determine the proportion of the 2000 population within each unique tract portion. This population-based comparison is valid for calculating change in total population. However, using this same method to calculate the change in 125% poverty population assumes an even distribution of poverty population, i.e. that the 125% poverty population distribution is the same as the total population distribution. This assumption can be misleading. The two solutions are to a) use the Tract Relationship Files and put up with the potential inaccuracy, or b) only use political boundaries that do not change over time to map changes in poverty, such as counties.

DATA PROCESSING AUTOMATION

One of the goals of the project was to develop processes that would be reusable for future projects. This goal was partly unrealized. In future projects, increased automation would be achieved if prior to extracting case data from the case management database, grantees were provided a spreadsheet or database template with smart data-checking features into which they would extract their case records for mapping. This would ensure that all the relevant fields are attached to the case records in a standard way, and that all the fields would be available for mapping. No manual labeling or manipulation of the case data would then be required prior to geocoding.

DYNAMIC LABELING

The mapping software used for this project has dynamic labeling capability allowing for labels for multiple data layers to be automatically placed by the software. When using automated methods cartographic quality is often compromised, though generally not significantly. During map template production, it was determined that dynamic labeling was not acceptable cartographically for this particular project.

Therefore, additional time was required to hand place labels for maps at varying scales. If the goal of automation and efficient map production is to be achieved, cartographic compromises will have to be made and dynamic labeling will need to be utilized. It is likely that future enhancements in the mapping software will have additional labeling controls that would be helpful for future projects.

MAP PAGE LAYOUT

During the initial design of map templates for the grantees it was determined that the combined dense and sparsely populated services areas of some grantees made it difficult to produce maps with sufficient detail using 8-1/2" x 11" letter size map sheets. It was recommended that this project be conducted using 8-1/2" x 14" legal size map sheets instead.

While this did produce more detail in the maps, it also created several new challenges. The most significant of these was the development of all new map template designs, since those from the previous project were no longer reusable. Additional challenges were largely related to the printing, binding and presentation of maps of a size that is less commonly used.

The paper map limitations are largely negated by the production of very high quality digital Adobe PDF files. The user can digitally zoom in on areas of interest to visualize greater detail or print hard copy at any larger sheet size as needed to see the additional detail. Given this capability, it may be more efficient to establish letter size map templates as the universal standard and utilize the digital copies of these documents for zoom in views or hard copy plots.

LEGENDS

One of the goals of this project was to test the legends produced in the initial mapping project. These legends were, indeed, put to the test in the highly urban and populated areas of Southern California. While most of the legends did survive in there general form, some modifications were made to adapt them to the denser geography. According to UCI Professor James Meeker "The metric and legend used should be defined by the problem you are addressing." Participants have differing views of the effectiveness of the legends used here based on analysis perspectives – local, urban, rural or standardized national map standards. In a subsequent Montana project, rural mapping legends were created.

NOTES

Map template notes continue to be a subject of debate and discussion among the interested parties. As with the legends, great strides were made during this project toward standardizing these notes.

ATTORNEY ZIP CODES

One of the desired maps includes the display of the density of attorneys. The attorney data received was aggregated by ZIP code. Since ZIP codes are quite dynamic, no matter what the vintage of attorney data received, it never matches up with the ZIP code geographies being

mapped initially. This was resolved by simply submitting the attorney data to the geocoding processes in order to ensure the coordination of the data with the map geography.

ZOOM IN MAPS

A stated goal of this project was to investigate the opportunities for more neighborhood scale or zoom in maps. While encouraged to consider these, the participants were largely more interested in visualizing additional data sets for their entire service areas rather than similar data sets zoomed in to various portions of the service area. In addition, these zoom in maps greatly complicated the standardization of labels and base data to be displayed because of the random change in scale from the established map templates.

The desire for zoom in maps and the labeling complications associated with them were largely negated by the production of very high quality digital PDF files. The users are able to digitally zoom in on areas of interest to visualize greater detail or print hard copy at any larger sheet size as needed to see the additional detail. This ability actually generated even greater reason to include the entire service area for any map data set produced, since it was useful to have the entire service area available for this digital zoom in capability.

Given this capability, it may be more efficient to establish letter size map templates as the universal standard and produce maps of various data sets for the entire service area while utilizing the digital copies of these documents for zoom in views or hard copy plots.

MAP CHANGES

For any project of this nature to be accomplished in an efficient manner, the complete list and specifications of desired maps to be produced must be established at inception and remain unchanged throughout the project.