2010 GNIS Cultural Updates - Final Report 2

Updating Cultural Features: Golf Courses, Prisons, Hospitals, Bridges, & Shopping Centers

Final Report

Agreement Number: G10AC00631

Proposal Title: GNIS Cultural Features Project for West Virginia: Golf Courses, Prisons, Hospitals, Bridges, and Shopping Center

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Data Themes: Structures and cultural features

GNIS Themes: Golf Courses, Prisons, Hospitals, Bridges, and Shopping Center

EXECUTIVE SUMMARY

In collaboration with the U.S. Geologic Survey (USGS), the WV GIS Technical Center (WVGISTC) updated 864 structures and cultural features in the Geographic Names Information System (GNIS) for the state of West Virginia. Includedin this feature update were golf courses, bridges, hospitals, prisons, and shopping centers. While comprehensive listings existed for some features, others were limited in their extent. In addition to the use of any existing data information, federal, state and professional agencies were contacted in order to validate each feature. While the updated listings do include the most up-to-date data at the time of the study, it should be noted that cultural features continuously change in status and new features are added regularly. Therefore updating the GNIS is an ongoing process, requiring a periodic, but frequent maintenance process.

FEATURES

Golf Courses:

Prior to the updates made by the WVGISTC, there were 15 golf course features in the GNIS, updated last in 1983. Since then, the state has experienced a substantial increase in the number of public and private golf courses.   As of the date of this project (summer 2010), there were a total of 122 new golf courses entered in the GNIS, as well as 15 updated features. A shapefile including these 137 features was created. Each identified feature was visually verified and electronically submitted to the GNIS headquarters in Denver, Colorado.

Sources and Data Collection

In order to obtain a complete listing of all golf courses in the state, two primary agencies, the Professional Golf Association (www.pga.com) and the West Virginia Golf Association (www.wvga.com), were consulted. These two agencies represent the most complete listings available for public and private courses in the state. Once a comprehensive list of courses was collected, each was visually verified and given spatial attributes as a part of the final shapefile.

Verification and Validation

During data validation, golf courses were selected individually and spatially validated using the highest quality aerial photography available for the area. Fortunately ortho-rectified aerial imagery via the 2009 National Agriculture Imaging Program (NAIP) was available when visually verifying each feature. While many features are difficult to discern in any imagery due to small size or unrecognizable features, golf courses span several acres and have been landscaped extensively, making identification, once the respective community was obtained, a relatively expedient process. Some problems did arise when determining whether or not some older, more unkempt golf courses were in fact still open. To verify the status of the golf course, first, a search was executed for any official website for the golf course, and then followed up by a phone call to the course to ensure accuracy. Any collected information and notes concerning individual features were recorded in an excel spreadsheet that contained all attribute fields that were made part of the project shapefile. All golf courses listed with the Professional Golf Association and the West Virginia Golf Association were either visually verified or otherwise verified as closed. This not typically the case with cultural features as it is difficult to, first obtain a comprehensive list, and second, visually locate each feature on imagery.

Reconciliation

Data reconciliation consisted of creating additional point features within the original shapefile (1983), as each was visually verified. Given that the original shapefile only consisted of 15 features with basic identifying attributes (Feature ID, Name of Feature, County), comprehensive data was not only included

with the new features, but added to the existing features as well.   Also, with relatively small number of existing features, as well as only two, but comprehensive sources, merging data was a non-issue.

Submission

Data was electronically submitted to the USGS GNIS office in Denver, Colorado via their online database system. Features were then verified by GNIS personnel and any concerns/questions addressed by the WVGISTC to ensure data accuracy. In addition the updated shapfile will be added to the West Virginia State GIS Data Clearinghouse as of December 2010.

Prisons:

Sources and Data Collection

In addition to a shapefile already a part of the West Virginia Data Clearinghouse, created by the Homeland Security Information Program (HSIP Freedom) and dated 2009, the West Virginia Regional Jail Association (wvrj.com), the West Virginia Department of Corrections (www.wvdoc.gov), and the Bureau of Federal Prisons (www.bop.gov) were consulted in order to obtain a complete listing of all prisons in the state. The biggest challenge faced when updating prisons data was transference of jurisdiction from local jails to regional facilities. Begun in 2001, this process wasstill ongoing during the time when the 2009 HSIP Freedom file was created by Technigraphics, Inc. Therefore, several local jails that are no longer holding facilities that were originally included in that dataset required deletion in the updated version. Also, given that the transference is on-going, there are still 6 local jails that were not deleted and are included with the updated information. There were however, specific criteria required in order to be included in the updated set, which included that the jail must be capable of routinely holding inmates for more than 24 hours. In order to verify the presence of a more than 24 hour facility at the county level, a phone call was made to the police stations in question. Once a comprehensive list of courses was collected, each was visually verified and given spatial attributes as a part of the final shapefile. The 2009 HSIP Freedom file, as a federally funded project, was completed under strict guidelines and therefore provided exceptionally accurate information and spatial data. Also of note, not included in the data are juvenile detention centers. Although technically correctional facilities, the features are listed with the West Virginia Department of Education and included in the statewide school update. Therefore, it was decided by both WVGISTC and the USGS GNIS office in Denver, Colorado, that they would be remained classified as "schools."

Verification and Validation

During data validation, prisons were selected individually and spatially validated using the highest quality aerial photography available for the area. Fortunately,ortho-rectified aerial imagery via the 2009 National Agriculture Imaging Program (NAIP) was available when visually verifying each feature. Given that all the state's regional jails have been constructed within the last 10 years, the features were relatively easily identified. Where discrepancies existed, state and federal correctional agencies were

consulted to verify the information. As stated previously, to verify the status of a local jail, a phone interview was conducted to the local sheriff, county or municipal police office. Any collected information and notes concerning individual features were recorded in an excel spreadsheet that contained all attribute fields that were made part of the project shapefile.   All prisons listed with state and federal agencies were either visually verified or otherwise verified as closed. In this case the federal government commissioned a similar dataset completed, just 1 year prior to the completion of the GNIS update, which was accurate and comprehensive.

Reconciliation

Data reconciliation consisted of merging any additional point features with the HSIP Freedom shapefile,visually verifying each point. Given that the original shapefilecontained all but one feature, including accurate spatial coordinates, the bulk of the process in updating the GNIS was in removing any local jails that were no longer holding facilities.

Submission

Data was electronically submitted to the USGS GNIS office in Denver, Colorado via their online database system. Features were then verified by GNIS personnel and any concerns/questions addressed by the WVGISTC to ensure data accuracy. In addition the updated shapfile will be added to the West Virginia State GIS Data Clearinghouse as of December 2010.

Shopping Centers:

Sources and Data Collection

Data collection for shopping centers was the most difficult in the scope of the project. A limited dataset contained a listing of 22 shopping malls and centers (FID, Name of Feature, County) which were added to the GNIS in 1981. In addition there were 12 shopping malls that had been added to the GNIS in the years since, but were not a part of any shapefile. Therefore, all features currently listed in GNIS were used to create a shapefile that was then added to as more shopping centers were identified. There are a couple of issues when updating shopping center features. First, there is no comprehensive listing or database aside from a manual search in the online yellow pages (www.yellowpages.com) for each community. The time required to conduct this particularly laborious process is simply not available. Therefore within this dataset, only major shopping centers are included. This leads to the second issue. What constitutes a shopping center? Is there certain acreage, square footage, number of stores, big box stores, internally accessible (as in malls)? The answer to many of these questions is subjective, and therefore the processor was required to make "judgment calls" as to whether or not a feature was included in the updated dataset. In general, those shopping centers included must be big enough to be visually identified on aerial imagery, could be accessed solely internally or externally or both, and were well known enough to be a major shopping center in the community. Again, many of these criteria are subjective. In order to pursue this update further, extensive fieldwork is required, which in itself may be

a futile process given that stores open and close every day and new shopping centers, particularly suburban complexes, are frequently being constructed. In addition to directory listings, visual scans of 2009 NAIP aerial imagery were conducted along interstate systems and around major cities within the state in order to locate any additional major shopping centers.

Verification and Validation

During data validation, shopping centers were selected individually and spatially validated using the highest quality aerial photography available for the area. Fortunately ortho-rectified aerial imagery via the 2009 National Agriculture Imaging Program (NAIP) was available when visually verifying each feature. In verifying shopping centers, certain features were visually identified that helped to define the criteria. Large, expansive parking lots and the presence of big box retail stores or other major structures were good indicators of the presence of a shopping center. Where discrepancies existed, phone and email interviews were conducted. If a shopping center was unable to be verified, then it was not included in this dataset.   Any collected information and notes concerning individual features were recorded in an excel spreadsheet that contained all attribute fields that were made part of the project shapefile. Given the limited sources, vague and subjected required criteria, and difficulty in field verification, it was impossible to update every shopping center in the state. Further work to create more clearly defined criteria and extensive fieldwork are required to obtain a complete listing of shopping features. However, those features included in this update represent a significant number of shopping centers in the state, regardless of the limitations presented by the project.

Reconciliation

Data reconciliation consisted of merging any additional point features with the originalshapefile (1981), removing duplicate entries, and visually verifying each point. Given that the original shapefile contained 20 features with no real attribute information, it was a relatively easy process to add new features.

Submission

Data was electronically submitted to the USGS GNIS office in Denver, Colorado via their online database system. Features were then verified by GNIS personnel and any concerns/questions addressed by the WVGISTC to ensure data accuracy. In addition the updated shapfile will be added to the West Virginia State GIS Data Clearinghouse as of December 2010.

Hospitals:

Sources and Data Collection

Data collection for hospitals involved merging 2 existing datasets, a 2009 HSIP Freedom file and a 2008 Health Care Authority file, with any additional features obtained when consulting the West Virginia Hospital Association (www.wvha.com) and the Agape Center, a chemical dependency advocacy organization (http://www.theagapecenter.com/Hospitals/West-Virginia.htm).   Unlike the 2009 HSIP

Freedom Prisons file, the 2009 HSIP Freedom Hospitals file did not contain every hospital in the state, an enormous task, considering the sheer number of facilities currently operating. Major hospitals in key cities were included and WVGISTC added to those features with those from the hospital association and Agape Center websites. It should be noted that for the most part, these sites include public facilities. Also, there were few updates that included a "closed" status. This is purely because some facilities maintained limited operability even after a new facility opened, as well as sometimes it was difficult to ascertain whether or not a feature had been closed, the function changed or if the name had been changed. In these cases, notes were made in the Microsoft Excel file, but the status was not updated.

In the same manner that shopping centers were difficult to identify because of vague criteria, hospitals presented a similar problem. While a hospital is generally defined as a medical facility that can accommodate patients for a given period of time, the line becomes blurred when hospitals downgrade their status or are operated in conjunction with a doctor's office. For the purposes of this update, we included those identified as a hospital according to the West Virginia Hospital Association and the West Virginia Health Care Authority.

Verification and Validation

During data validation, hospitals were selected individually and spatially validated using the highest quality aerial photography available for the area. Fortunately ortho-rectified aerial imagery via the 2009 National Agriculture Imaging Program (NAIP) was available when visually verifying each feature.   Any collected information and notes concerning individual features were recorded in an excel spreadsheet that contained all attribute fields that were made part of the project shapefile. Only those facilities that were members of the West Virginia Hospital Association or who had submitted their information to the Agape Center were included in this update. The WVGISTC exhausted all resources available to compile the updated list of hospitals, but the likelihood of some facilities missing from the list is relatively high. Further work to create more clearly defined criteria and extensive fieldwork are required to obtain a complete listing of hospitals. However, those features included in this update represent a significant number of hospitals in the state, regardless of the limitations presented by the data availability.

Reconciliation

Data reconciliation consisted of merging any additional point features with the 2009 HSIP Freedom file, WVGISTC file and removing any duplicate features.

Submission

Data was electronically submitted to the USGS GNIS office in Denver, Colorado via their online database system. Features were then verified by GNIS personnel and any concerns/questions addressed by the WVGISTC to ensure data accuracy. In addition the updated shapfile will be added to the West Virginia State GIS Data Clearinghouse as of December 2010.

An important issue in updating hospitals by submitting them individually via the GNIS electronic database was that 42 features that were already in the GNIS and required updating could not be completed due to an internal error with the GNIS, resulting in a status of "In Processing", and preventing any changes to be made. Those hospitals that were not updated were noted accordingly in the accompanying spreadsheet. Contacts in the Denver GNIS office have been given the details of this problem and are currently searching for a resolution.

Bridges:
Sources and Data Collection

Data collection for bridges was a difficult process. While the West Virginia Department of Transportation was extremely helpful, even providing a 2009 dataset with all know bridge features in the state, it was the sheer volume of information that presented the most significant problem. The original dataset contained well over 7000 point features. Given that submitting, let alone verifying, that many features was just impossible, criteria were put into place to pare down the number of features to 498. The following process was used as criteria for reducing the volume of information in the WVDOT dataset:

- All culverts were removed
- All bridges that were not automobile bridges were removed.
- All conveyor belts and other non-traffic features were removed.
- All bridges 300 feet and above were included because it was deemed that features in this length were, for the most part, part of major highway systems.
- All bridges built before 1910 were included because bridges, regardless of size, 100 years and older are significant in their own right.
- From the remaining bridges, any that were memorial bridges or named specifically in honor of a person were included.

Verification and Validation

During data validation, bridges that were ultimately included in the dataset were selected individually and spatially validated using the highest quality aerial photography available for the area. Fortunately ortho-rectified aerial imagery via the 2009 National Agriculture Imaging Program (NAIP) was available when visually verifying each feature. Any collected information and notes concerning individual features were recorded in an excel spreadsheet that contained all attribute fields that were made part of the project shapefile. The contact from the WVDOT, Jeff Gula, indicated that not all features had been previously verified by his agency. As a result the WVGISTC ensured visual verification was conducted for each included feature.

Reconciliation

Data reconciliation consisted of removing those features not fitting with the above criteria and then merging withfeatures already a part of the GNIS database and removing any duplicate features.

Submission

Data was electronically submitted to the USGS GNIS office in Denver, Colorado via their online database system. Features were then verified by GNIS personnel and any concerns/questions addressed by the WVGISTC to ensure data accuracy. In addition the updated shapfile will be added to the West Virginia State GIS Data Clearinghouse as of December 2010.

Project Highlights

1) **Goals**: The main goal of this project is to support an ongoing activity for the state of West Virginia by continuing updates to GNIS for cultural features complementary to the existing Homeland Security Infrastructure Program (HSIP Freedom) and USGS structures and transportation update process. The focus of these cultural features updates were golf courses, prisons, bridges, hospitals, and shopping centers.

2) **Deliverables**: Each cultural feature that was verified and included in this update was submitted electronically to the USGS Denver National Geospatial Operations Center (NGTOC) via the GNIS interactive form. Previous updates were submitted via a batch process, but given the accessibility to the official database, individual entries by WVGISTC employees was a more efficient method. In conjunction with and as a companion to the submitted data, an ESRI shape file containing all of the point features was created. For a summary table of edits made to the GNIS database please see Appendix A.

3) **Challenges**: Cultural data from a variety of sources with varying quality presents several challenges in terms of long term maintenance as well as source validation and access to specific structures.
   a) Updating information about features involves site-specific challenges based upon the practicality of field work and updates at the local level. The result is that not all areas statewide will receive the same attention or frequency of updates.

   b) Comprehensive data listings are difficult to come by. While we were successful in obtaining statewide data for golf courses and prisons, similar spatial databases for shopping centers do not yet exist beyond the yellow pages and online telephone and business directory. In addition, even when provided with datasets such as a statewide listing of bridges, verification was complicated and time-consuming, given there were well over 6000 features in that dataset alone. For the purposes of this project some

serious criteria decisions were made in order to facilitate the process, primarily because a comprehensive dataset like that of the HSIP Freedom files was not available.

c) Identifying structures only through aerial imagery depends on the accuracy of feature identification. Discrepancies between data sets complicate this process further.

d) Spatial validation for many cultural features requires a large amount of field work which tends to be time consuming and costly.

e) Shopping Center features were the most difficult to update because the data sources were less comprehensive, their status may change frequently, many are known by multiple names, and new retail spaces are opened almost daily.

4) **Future Directions**: This project, and similar future federal-state-local collaborations, will help greatly in maintaining the GNIS so that it more accurately reflects the status and location of cultural features. Such activities may also stimulate more frequent and creative use of GNIS resources. Further work is needed to locate additional validated sources as well as improve the quality of other cultural features in the state.

5) **Recommendations**: Field work is an effective tool for spatial verification, and is often necessary, but it must be used judiciously to avoid exceeding time lines and project budgets. While the NAIP aerial imagery is 1-meter resolution, higher quality imagery if available in the future will always be helpful. Some recommendations to be considered:
    - Cultural features are often most accurately validated at local levels. When possible, updates should incorporate local knowledge of locations, status, and name updates, given that the source is reliable and the information can be substantiated.
    - Field work, though sometimes expensive in time and money, is a valuable tool for feature validation.
    - All cultural features which have a physical address should have the address information incorporated into the GNIS. The physical address should follow a city-style format. This makes it easier to validate geographic names. It also provides another method for geo-locating features.
    - Increasing the accuracy of the state addressing and mapping database will be helpful when updating churches with addresses.

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APPENDIX A
UPDATES SUMMARY

Feature	Additions	Historical	Total Edits	Remotely Validated (aerial imagery and geocoding)
Golf Courses	126	8	134	134
Prisons	34	11	45	45
Hospitals	69	52	121	121
Bridges	498	0	498	498
Shopping Centers	49	7	66	66
TOTAL	776	78	864	**864**

GNIS Specification and Qualifications (Fields and Definitions provided by USGS)

Certain attribute information is required by the GNIS when submitting data to the database system. These same fields were also included in the shapefile in order to facilitate a greater clarity when using the data. In updating the GNIS database for these features, fields containing bibliographic sources were required. New source additions which coincided with these updates were made to the GNIS database by official personnel in order to properly identify where the information was obtained.

Column headings (these generally match the field entries in the web forms):

feature_id the current GNIS ID, if it exists

class feature class (lower case), a separate document listing the possible feature types is also available

name feature name (as shown, no abbreviations allowed) If you are making a name historical, append (historical) to the end of the name. For example, if Smith School is no longer a school, edit the name to now read, Smith School (historical) and add the *Historical* designation in the designation field. The name does not become a variant and we don't change the bibliographic citation. The next four fields (originator, ref_type, ref_code, and ref_detail) all relate to the **bibliographic citation** (or biblio code). For example, the biblio code US-text-147 2007/www.xyz.com breaks down like this: originator = US; ref_type = text; ref_code = 147; ref_detail = 2007/www.xyz.com. The ref_detail won't necessarily be populated for every biblio code. You need biblio codes when you are entering a new name or changing an existing name. If you're changing coordinates, you won't need to populate the fields. Please don't use wiki-type sources as these are not reviewed.

originator	two-digit code, in caps (usually the state [WV] or [US] if it's national.
ref_type	type: map (M), text (T), dataset (D), web (W), interview (I). It is possible to add new codes if necessary.
ref_code	the number of the reference: if you're using a web citation, such as a listing from the Department of Education, use 147
ref_detail	might be the year of the map's publication or when you accessed a web site
county_sequence	sequence number of the county; primary counties are sequence 1
county_name	name of the county in which the primary point falls, other counties are listed in order of areal extent. If you have a feature that spans more than one county, or if you need to add an additional county, copy or change the set of fields and append the sequence number, i.e., county_sequence2, county_name2. Place them behind the county_name.
state_alpha	the postal abbreviation for the state
state_num	the FIPS code for the state, this will be calculated from the postal abbreviation, but you can enter it if you know it.
point_sequence	the sequence number of the feature; primary points are sequence 1. If you have more than one set of points you need to add, copy the sequence field name and append the sequence number, i.e., point_sequence3 and place it behind the point_sequence field. This field is theoretically tied to the latitude and longitude coordinates. The point sequence is used to denote which set of coordinates come first. In the event that you are adding only point features, this field will be largely irrelevant and you can simply put a 1 for all features. However, in the event that you are updating polygon or line features (such as lakes and streams), boundary lines can be crossed and multiple spatial coordinates will be necessary.
lat_dec	You can enter DMS values or decimal degree values. If you enter one type you don't need to enter the other.
lon_dec	
lat_dms	
lat_dms	
designation	There are many types of designations. You will probably use historical or the administering agency if you enter a park.
history	free text field to discuss the history of the feature. Personal information relating to individuals or families is omitted in accordance with GNIS policy.
description	free text field to enter elevation or location information beyond just the coordinates, for example. If the feature has an address, it should be added here unless there are other designated GNIS fields for addresses.

The next five fields apply to variant names. The fields are similar to the official name fields. If you have more than one variant name, copy the five fields next to the block of the first set of variant_name fields and add a number to indicate that this is a second variant name, example: variant_name3, var_originator3, etc.

var_name1
var_originator1

var_ref_type1
var_ref_code1
var_ref_detail1
var_name2
var_originator2
var_ref_type2
var_ref_code2
var_ref_detail2

The feature_id will be assigned during the load process for new records and the cell_id (Cell Name) will be calculated from the coordinates as will the Elevation. If you enter coordinates as DMS, the lat/lon values need to be filled out completely. For example, write out 08 05 32 N for latitude rather than 8 5 32N and 098 52 09 W for longitude rather than 98 52 9 W. While you're working you can reduce the width of the columns as you wish, but please don't rearrange the columns.