Topo TNM Style Template and Topo Map Vector Data Product FAQs

1. **What is the Topo TNM Style Template?**

The Topo TNM Style Template is provided by the U.S. Geological Survey (USGS) National Geospatial Technical Operations Center (NGTOC). It has been developed according to the 24,000-scale, 7.5-minute layout and cartographic design of published US Topo maps and is intended for use in any geographic location where data is available for download from The National Map (TNM). The template is provided as an Esri-specific solution (ArcGIS v10.0 map document) for the benefit of USGS earth scientists and other scientific professionals who have a requirement for symbolized and annotated topographic base map layers to support advanced Geographic Information System (GIS) analysis and mapping. Symbolized map layers, links to Web Map Services, labeling rules, grids, standard map layout, and marginalia information are included in the template. The USGS recognizes that this solution only meets the needs of end users dependent upon Esri products. Research continues into alternative formats.

Symbolized layers within the template can be linked to data downloaded from TNM and include layers from TNM vector data themes of transportation, hydrography, elevation contours, geographic names, boundaries, structures, and woodland tint. Web Map Service layers in the template include orthoimagery and shaded relief services produced by the USGS, as well as a National Wetlands Inventory (NWI) Web Map Service produced by the US Fish and Wildlife Service. An ancillary file geodatabase, provided along with the template, contains a Military Grid Reference System (MGRS) feature class and a data table created by the National Geospatial Technical Operations Center (NGTOC) containing 7.5-minute map cell names, UTM zones, and other information for use in tailoring the template to a specific 7.5-minute map.

This template may be used with any TNM data source available for download and can easily be extended with data layers supported by ArcGIS according to end user needs. For best results in symbolization and labeling, it is recommended to be used with the Topo Map Vector Data products, and at scales between 1:18,000- and 1:36,000. These products are available for download from TNM (http://viewer.nationalmap.gov/basic/).

Topo TNM Style Template Disclaimer: Initial styling of this Map Template was provided by the U.S. Geological Survey (USGS). The USGS does not endorse any products created from the template.

2. **What is the Topo Map Vector Data product?**

The Topo Map Vector Data products are one specific type of staged product available from The National Map. They are intended to work with the Topo TNM Style Template to facilitate the creation of a topographic basemap in an end user's GIS;

however, they also support a variety of GIS and cartographic applications. These products are staged at a 7.5-minute footprint to correspond with the US Topo map 7.5-minute extent. They contain feature classes from all TNM vector data themes, including Elevation Contours, Government Units (Boundaries), Woodland Tint polygons, Structures, Transportation, Hydrography, TNM Derived Names, and 7.5-minute map cells.

3. What is the TNM Derived Names feature class?

The National Map (TNM) Derived Names dataset is a feature class derived from the Geographic Names Information System (GNIS). The GNIS is the official repository of domestic geographic names data; the official vehicle for geographic names used by all departments of the Federal Government; and the source for applying geographic names to Federal electronic and printed products of all types. See http://geonames.usgs.gov for additional information. TNM Derived Names is a filtered and enriched dataset intended specifically to be used in the Topo TNM Style Template for symbolizing and labeling named features. TNM Derived Names data are provided only in conjunction with Topo Map Vector Data products and due to the filtering process does not include all GNIS names available in the standard GNIS dataset. Figures 1 and 2 demonstrate the differences in the labels when using standard GNIS names (Figure 2) compared to TNM Derived Names (Figure 1).

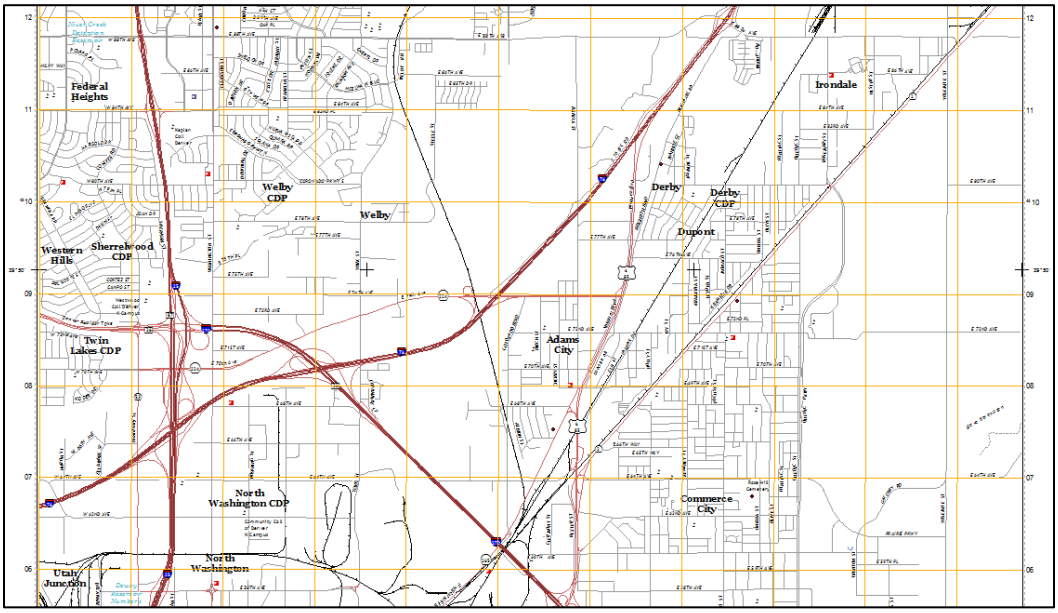

Figure 1: View of Commerce City, Colorado using the Topo TNM Style Template and Topo Map Vector Data that includes TNM Derived Names (road labels are also turned on).

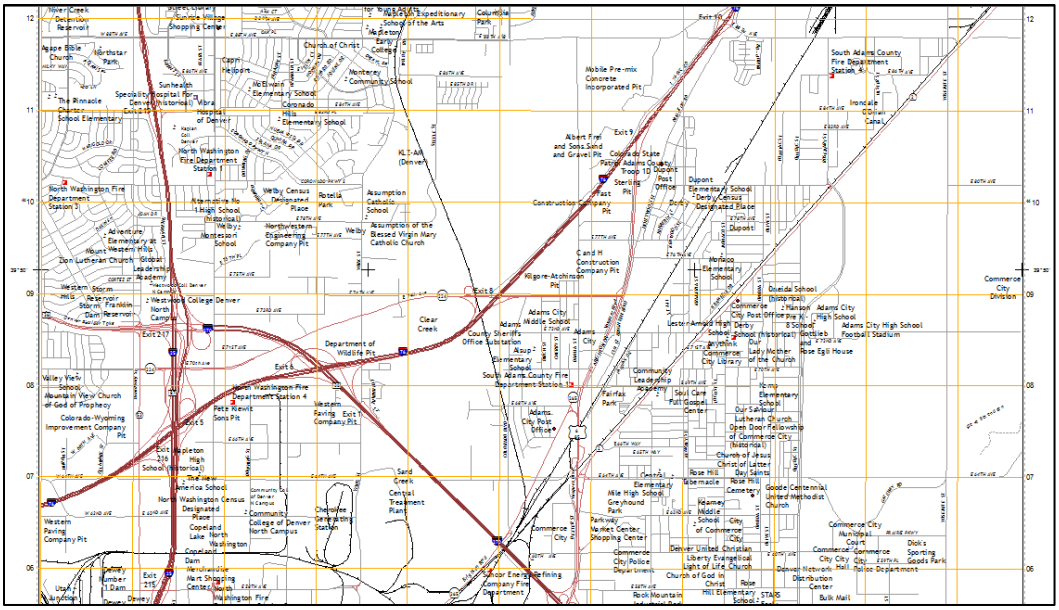

Figure 2: View of Commerce City, Colorado using the Topo TNM Style Template with unfiltered Geographic Names data (road labels are also turned on).

4. What is the intended use of the Topo TNM Style Template?

The Topo TNM Style Template is intended to depict geographic features on the surface of the earth. It has been developed by the U.S. Geological Survey (USGS) National Geospatial Technical Operations Center (NGTOC) for GIS and cartographic experts who have a requirement to analyze geospatial data and to develop custom maps based upon a template in a GIS-ready format that closely conforms to US Topo map specifications. The intended use of the template is different than that for the published US Topo maps. The template is intended for end users to create specialized, tailored maps. It is not intended to precisely duplicate the published maps.

The template may be used for tasks that may include (but are not limited to) adding or removing data layers; changing symbology; creating and editing annotation features; perform GIS analysis using base data layers and user-generated data layers; and updating or adding text information and marginalia.

5. How does the Topo TNM Style Template differ from the published US Topo maps?

The Topo TNM Style Template is designed to be used with base data that is available for download via The National Map (TNM) (http://viewer.nationalmap.gov/basic/). Thus, there will be a number of differences between the Topo TNM Style Template used with the downloadable Topo Map Vector Data products and the original published US Topo maps as follows.

a. US Topo maps have not yet been produced to cover all of Alaska. Data for US Topo map production is staged and/or maintained ahead of the US Topo map production schedule and thus, the content of the Topo Map Vector Data products in Alaska where US Topo maps have not yet been produced will not include contour features. As an alternative, there is a web map service available from The National Map that does cover all of Alaska. This service is available under the "Theme Overlays" section at https://viewer.nationalmap.gov/services/. It includes older contours produced at a 50 foot contour interval as well as the newer contours produced to support the US Topo maps where available.
b. The publication date of the vector feature data and the raster imagery and shaded relief used in the published US Topo maps will likely be different from that of the data and web map service links published along with the Topo Map Vector Data products and Topo TNM Style Template. The difference in source data vintage may result in differences in content, cartographic representation, and labeling. Figures 3 and 4 demonstrate the difference between railroad data available for the US Topo map published in 2013 compared to the more current railroad data available in 2016.
c. Roads
    i. US Topo maps (through September 2015) were published using commercial road data (Figure 3) and U.S. Forest Service (USFS) road data. Beginning in October 2015, Census TIGER road data (Figure 4) is used for the published US Topo maps in combination with the USFS roads. The difference in source data results in variations from the published maps in content, symbology, and in labeling (see details on symbology and labeling in paragraph "e" below). Figures 3 and 4 demonstrate the differences in road symbology that result from the different road data sources.

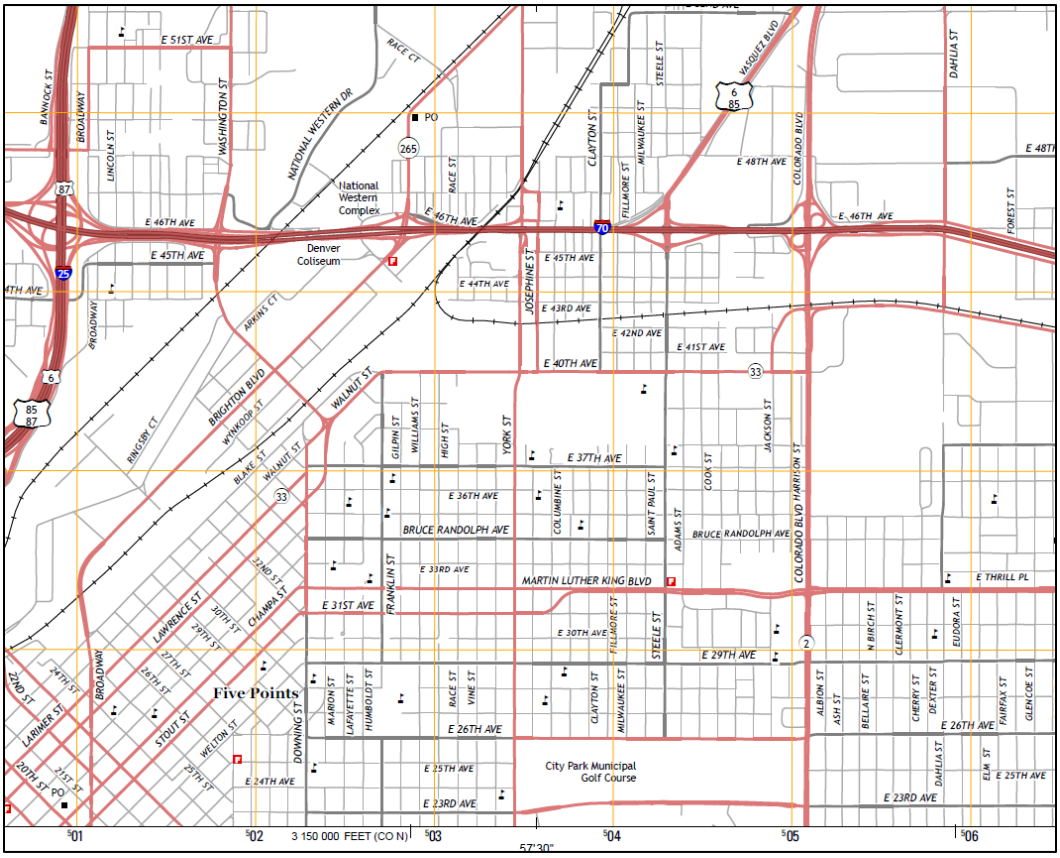

Figure 3: View of Commerce City, Colorado US Topo Map Transportation (Road and Railroad) Layers published in August, 2013.

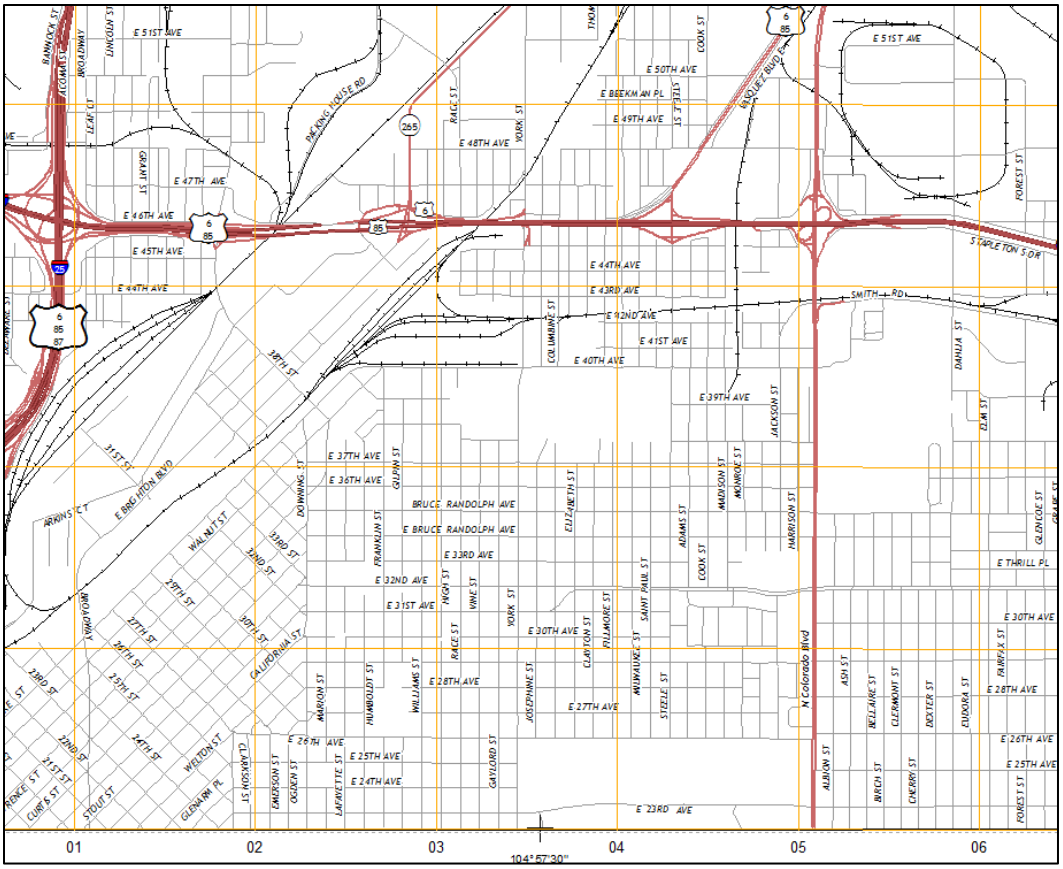

Figure 4: View of Commerce City, Colorado using the Topo TNM Style Template and Topo Map Vector Data Transportation (Road and Railroad) Layers available in May, 2016.

ii. Published US Topo maps use road data provided by the USFS, for USFS designated areas. In addition to the linear USFS road features, point features are used for generating USFS road shields. The USFS point feature class used to generate USFS road shields will not be made available for download. Figure 5 demonstrates the vertical and horizontal road shields produced from the USFS point feature class for the most recently published US Topo map for Langlade, Wisconsin. Note that while the shield data is not available for download, road labels can still be represented as full road names (no shields) using the template (Figure 6).

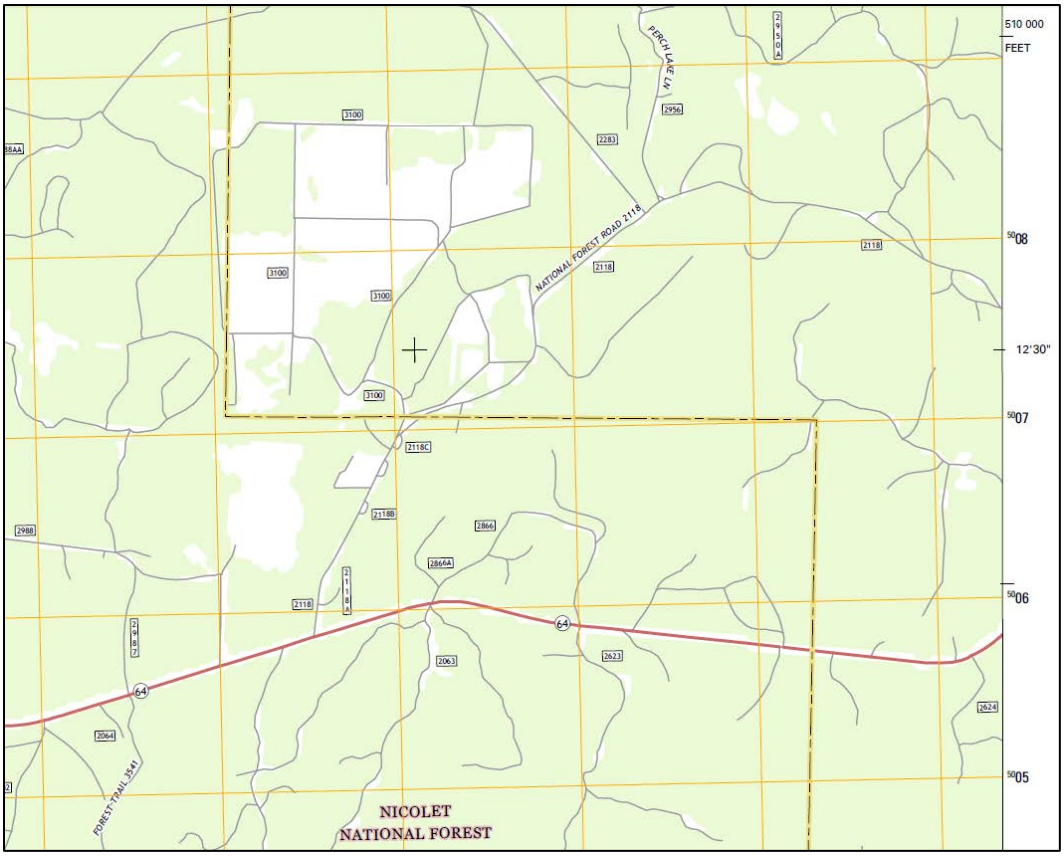

Figure 5: View of Langlade, Wisconsin US Topo Map published in November, 2015.

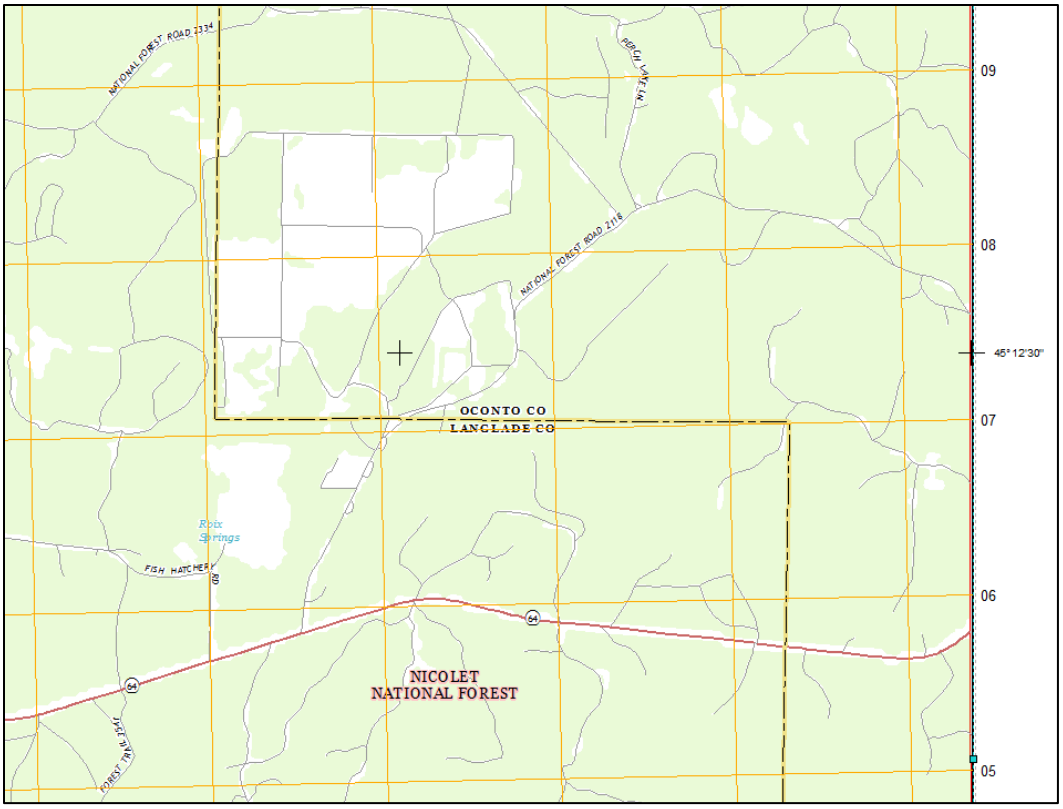

Figure 6: View of Langlade, Wisconsin using the Topo TNM Style Template and Topo Map Vector Data available in May, 2016.

iii. It is important to note that USFS roads and the Census TIGER roads have not yet been fully integrated in all of the Topo Map Vector Data products. The intent is to complete this integration in conjunction with the 2016 through 2018 US Topo map production cycles. Once complete, that data integration process will provide Topo Map Vector Data products that contain USFS roads that cover USFS designated areas, and Census TIGER roads that cover all other areas of the country. Census roads are to be omitted in USFS Forests and Grasslands. In addition, edge-matching between the two road data sets at the USFS boundaries is done for the US Topo published maps. See Figure 7 for an example of a 7.5-min cell that contains integrated USFS and Census road data.

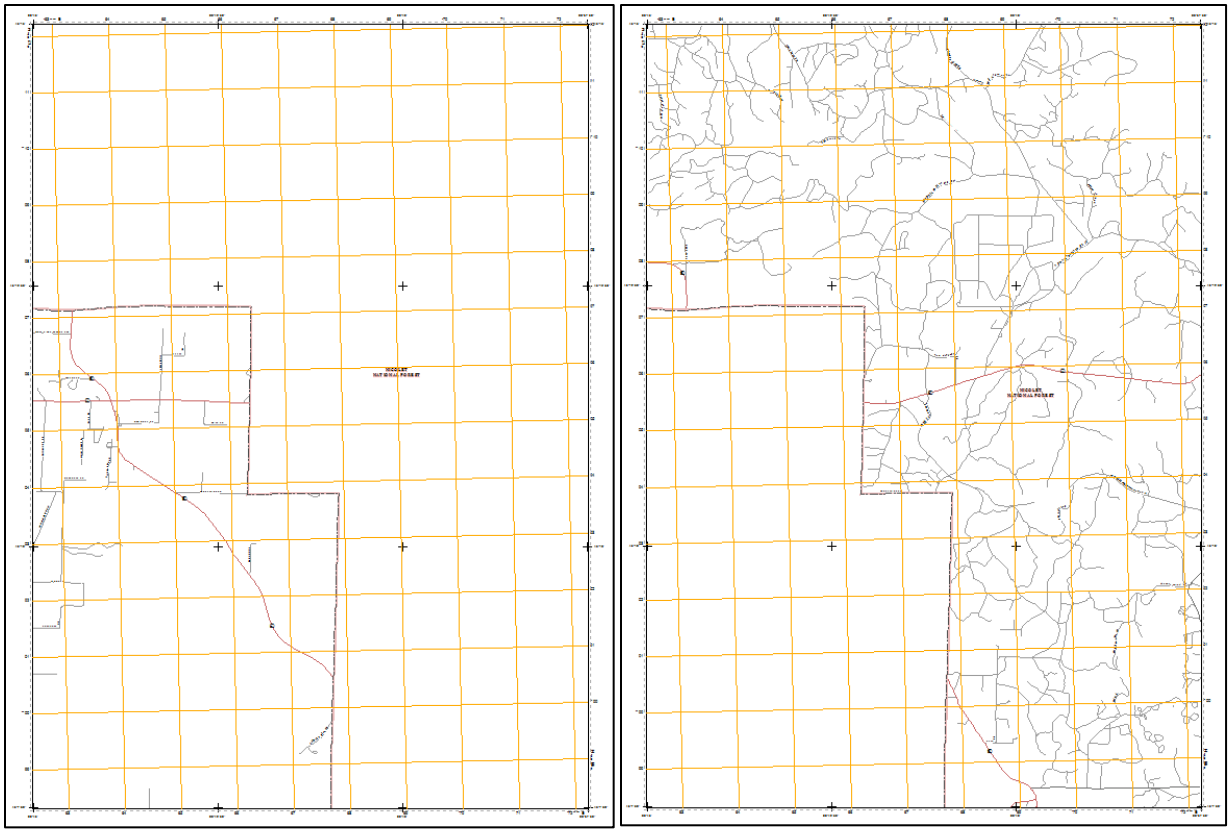

Figure 7: View of Langlade, Wisconsin using the Topo TNM Style Template and Topo Map Vector Data with Integrated Transportation Layers (Census roads in left panel / USFS roads in right panel) available in May, 2016.

Until the integration cycle is complete, some of the Topo Map Vector Data products that have been produced initially will not have integrated roads, because the first round production schedule for the Topo Map Vector Data products does not directly coincide with the published US Topo map production schedule. For the Topo Map Vector Data products that coincide with US Topo maps produced in Fiscal Year (FY) 2016 (October 2015 – September 2016) (see Figure 9) the roads will be integrated. For all other states, road data will be duplicative in the USFS Forests and Grasslands; i.e., Census roads and USFS roads will both be included for those areas. Note the duplicate roads (blue arrow) with Pike National Forest, Colorado in see Figure 8 (depicted at 1:24,000-scale).

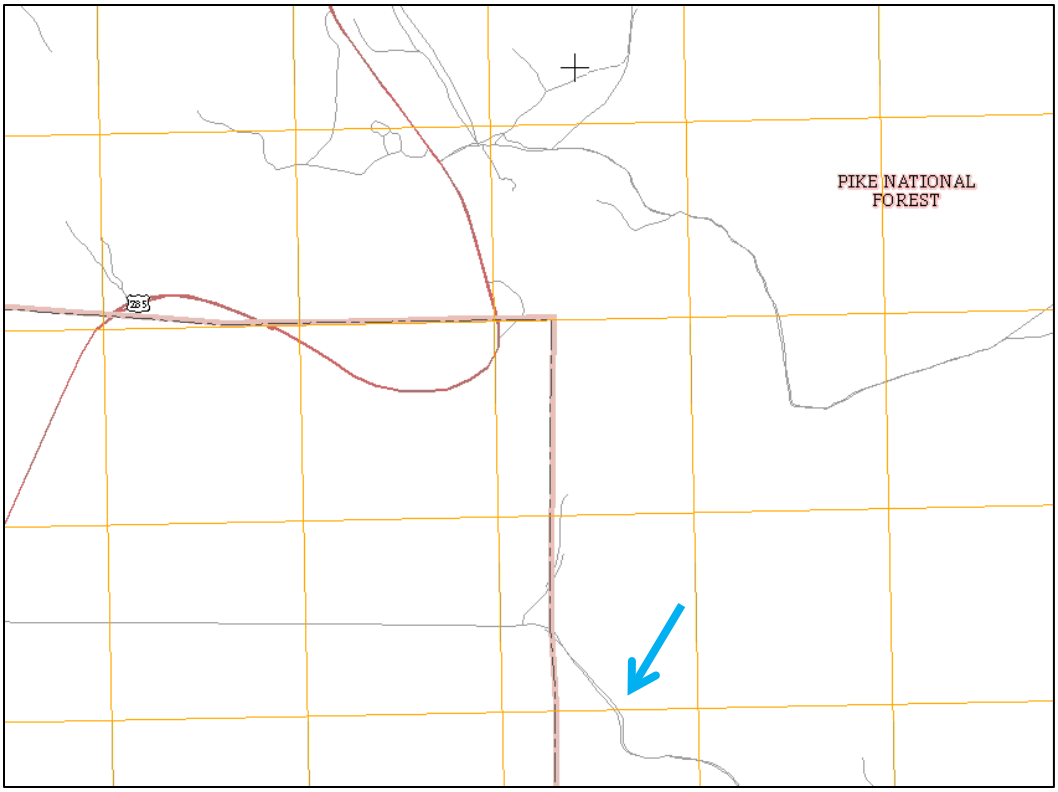

Figure 8: View of Pike National Forest in Colorado using the Topo TNM Style Template and Topo Map Vector Data with Overlapping Transportation Layers (Census and USFS) available in May, 2016.

This issue will be resolved through the course of Fiscal Years 2017 and 2018, following the US Topo map production cycle. For example, Topo Map Vector Data products produced in the states designated in red in Figure 9 currently contain integrated USFS and Census road data. All other Topo Map Vector Data products produced in 2016 will contain road data that overlaps in the USFS areas. In FY2017, the Topo Map Vector Data Products noted in blue will be updated and will be delivered with integrated road data. In FY2018, the Topo Map Vector Data products noted in yellow will be updated and will be delivered with integrated road data. Note that the Topo Map Vector Data products may be updated more frequently due to data maintenance in other TNM data themes. However, the road integration updates are specifically tied to the US Topo map production schedule.

In the interim, a recommended solution is to use the USFS Boundary data included in the Topo Map Vector Data products to clip out the Census roads that exist within USFS Forest and Grassland areas.

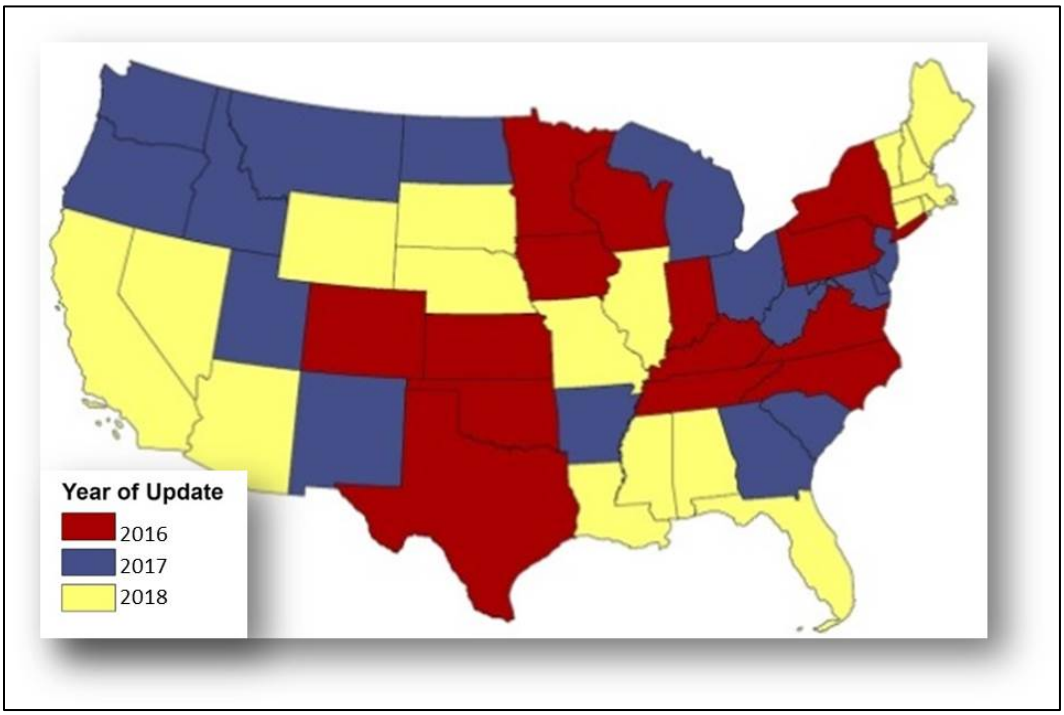

Figure 9: US Topo Fiscal Year (1 October – 30 September) Production Schedule (CONUS).

iv. Note that in Alaska, roads are provided exclusively from the Alaska Department of Transportation and are used both in publication of the US Topo maps and the Topo Map Vector Data products.

d. Alaska pipeline data is represented on published maps in Alaska, but is not currently available for download from TNM.

e. The shaded relief and orthoimagery layers included with the published maps will differ somewhat from the Web Map Services provided along with the Template. The source elevation data and imagery may differ from that produced in the maps and/or the publication date may differ. The shaded relief in the Web Map Service has also been processed with a different color ramp than that used in the published maps. Figures 10 and 11 demonstrate the differences in the shaded relief and imagery for the published US Topo map compared to the web map services used in the template.

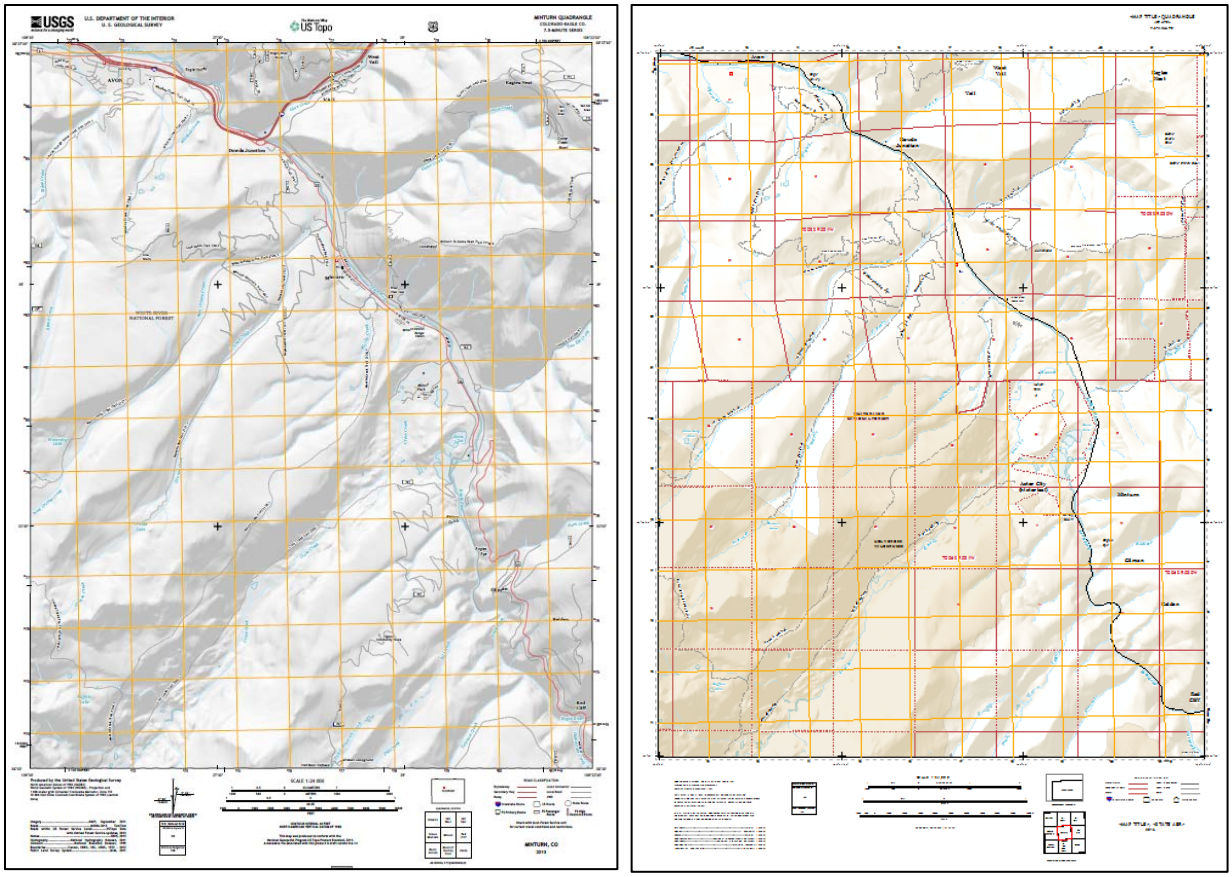

Figure 10: View of shaded relief layer for Minturn, Colorado US Topo Map published in August, 2013 (left panel), and using the Topo TNM Style Template web map services (right panel).

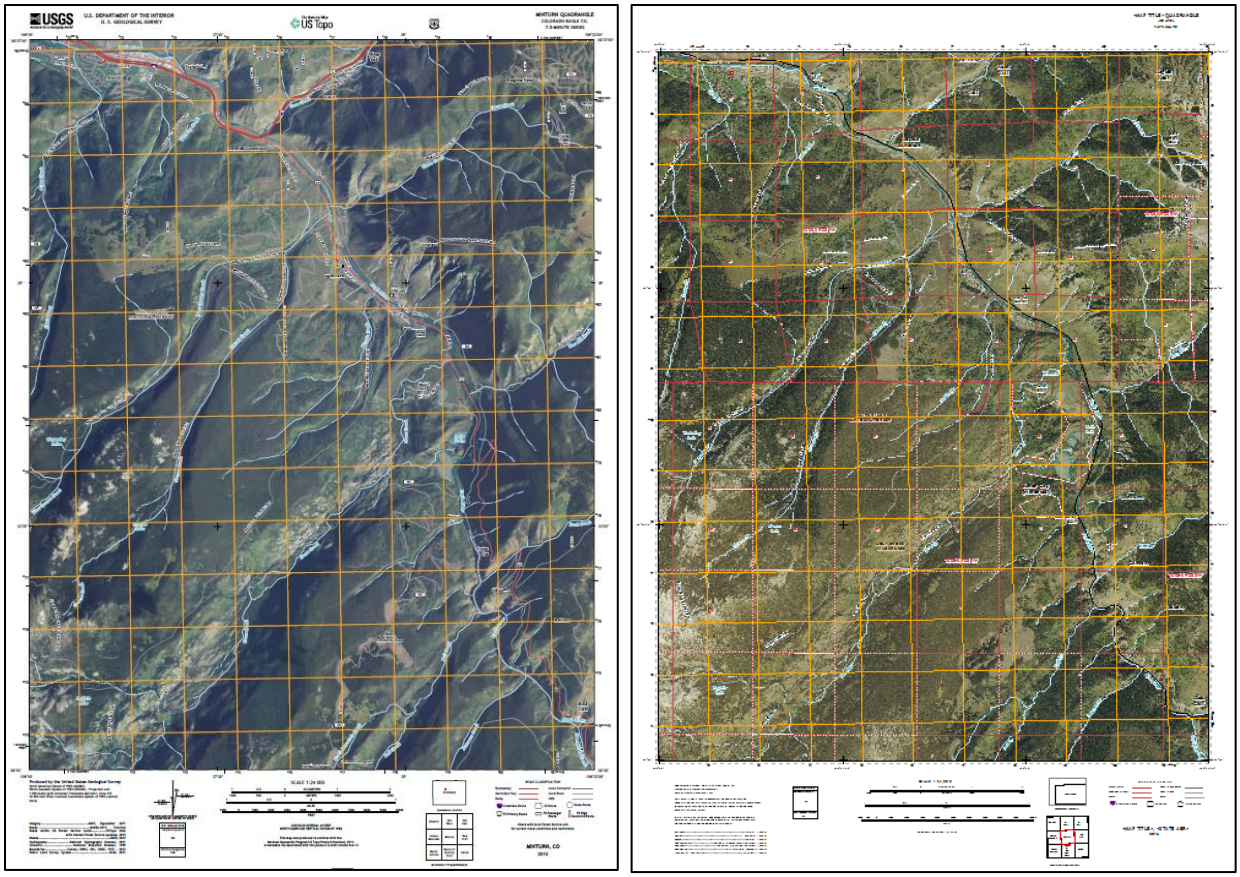

Figure 11: View of imagery layer for Minturn, Colorado US Topo Map published in August, 2013 (left panel), and using the Topo TNM Style Template web map services (right panel).

f. Symbology and Labeling: This template is set up with feature symbology and label rules that emulate the published US Topo maps. The template will not provide an exact duplication of the published map for several reasons described below.

   i. The symbology could be different between the published US Topo map and the Template for the following reasons.

      1. The symbology used in the Topo TNM Style Template may have been updated since the publication of many of the US Topo maps. Figures 12 and 13 demonstrate the differences in road symbology between the US Topo map published in February 2013 compared to the current road symbology. US Topo maps underwent a holistic redesign in March of 2013. Road symbology in particular was changed significantly as noted by the blue arrows that indicate local roads and secondary highway examples.

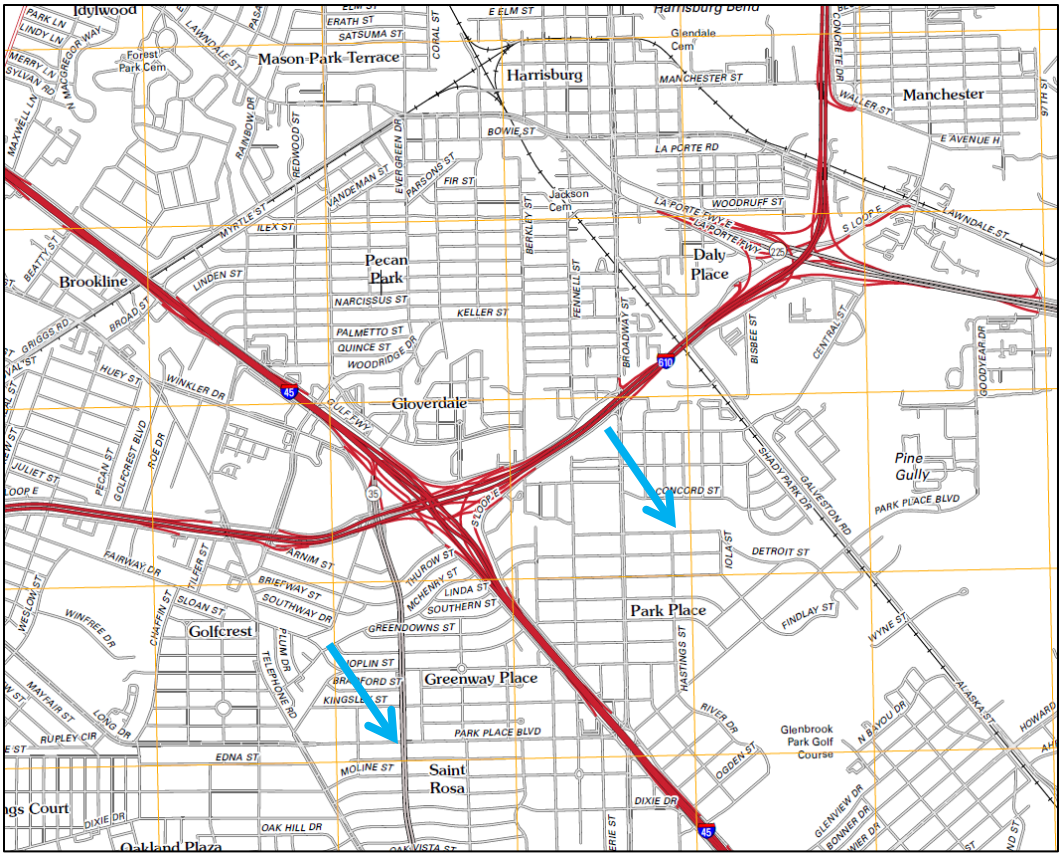

Figure 12: View of Park Place, Texas US Topo Map as published in February, 2013.

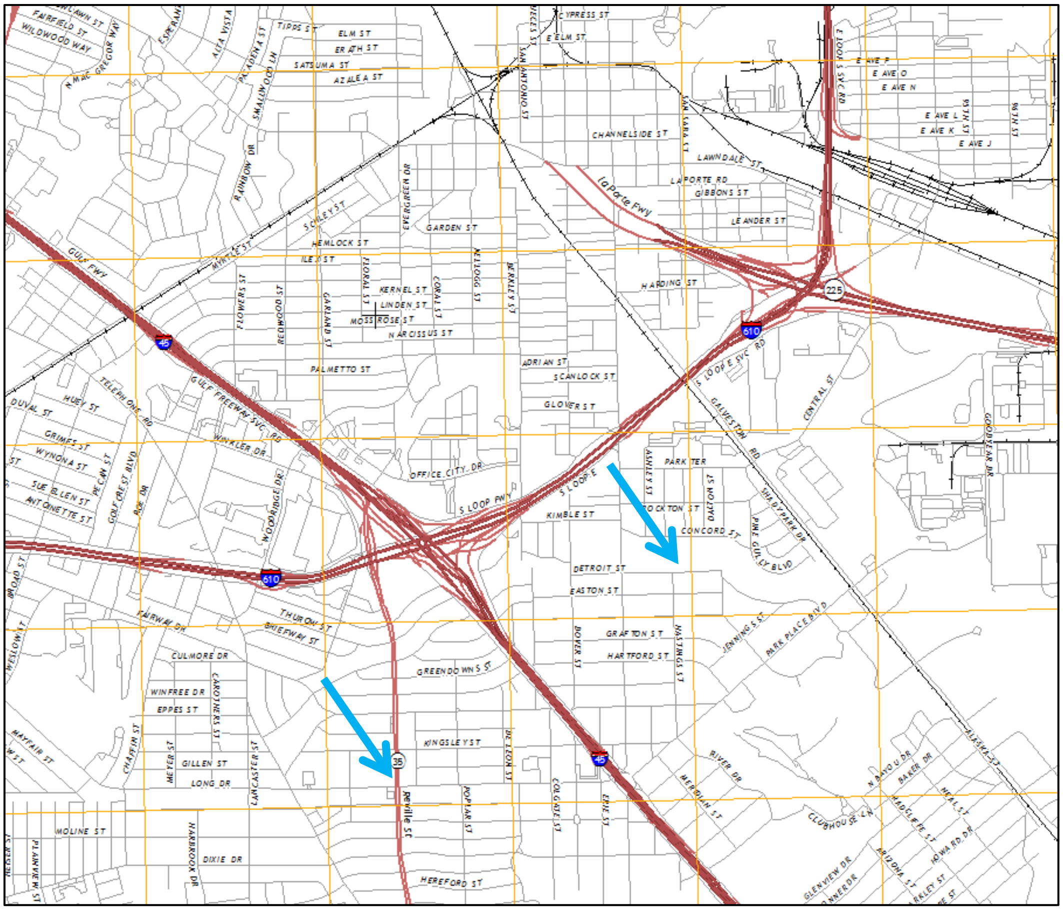

Figure 13: View of Park Place, Texas using the Topo TNM Style Template and Topo Map Vector Data available in May, 2016.

2. Due to content additions / changes in the US Topo maps over the past several years, there may be data layers represented in the Topo TNM Style Template that may not have been included in an older published US Topo map. Figures 14 and 15 demonstrate both symbology and content differences in the Nashville West, Tennessee US Topo maps published in May 2010 and in April 2016. The Topo Map Vector Data will provide the most robust content available as of the date of download and the template will include symbolized layers for the most current US Topo map content. Blue arrows in Figure 15 point to new structure and railroad content, for example.

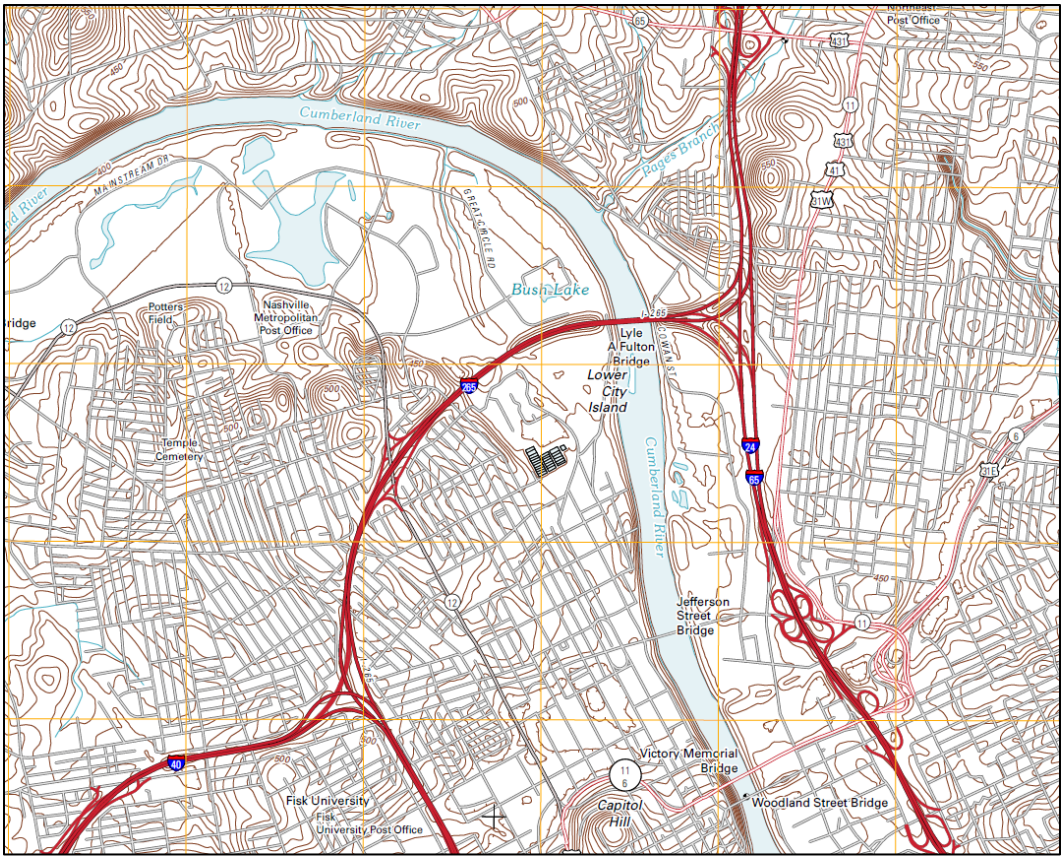

Figure 14: View of Nashville West, Tennessee US Topo Map published in May 2010.

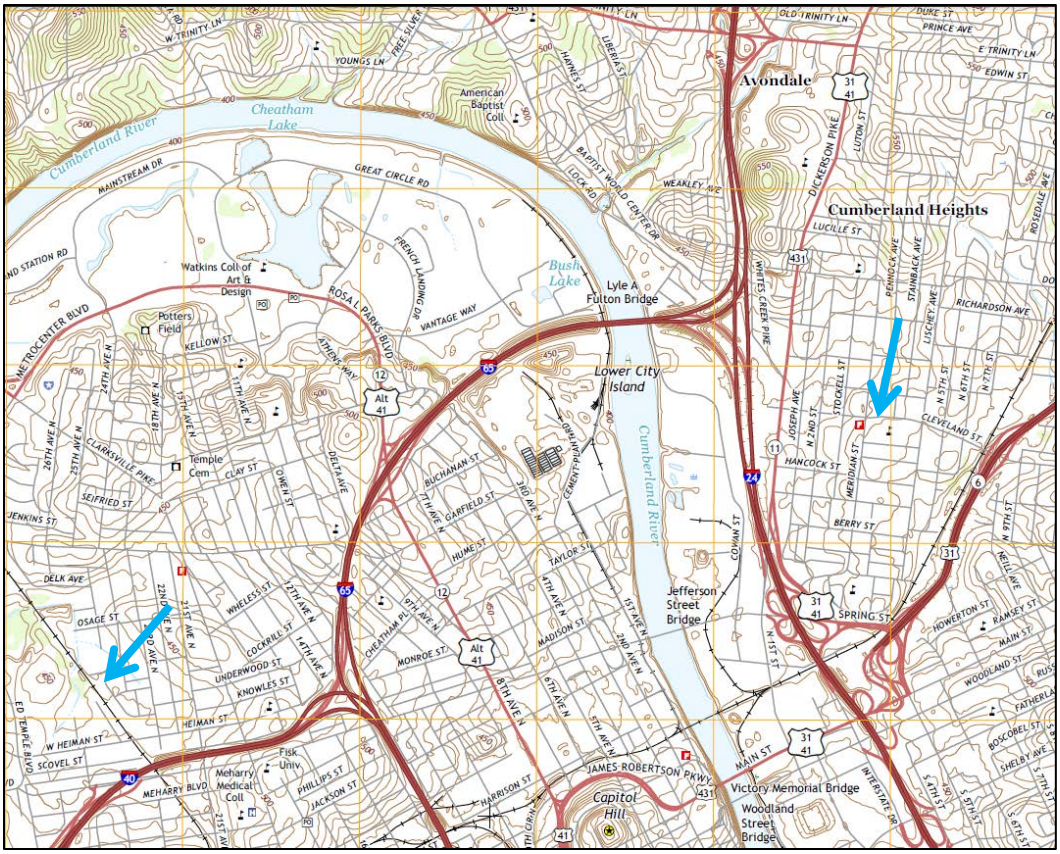

Figure 15: View of Nashville West, Tennessee US Topo Map published in April 2016.

ii. Labeling results will vary from the published map for the following reasons.

1. Labels may be abbreviated, replaced, added, or removed during the production process to produce a more refined map. The Template uses the Esri Maplex label engine to produce dynamic labels that will be different from the published US Topo maps. Figures 16 and 17 demonstrate the differences between the labels in a published US Topo map as compared to the automated labeling used in the template. Note the blue arrow in Figures 16 and 17 that indicate a difference in the placement of the "Highlands" label. In Figure 17 the label overprints the Fire Station symbol. In the published US Topo map in Figure 16, the label was adjusted to remove the overprint.

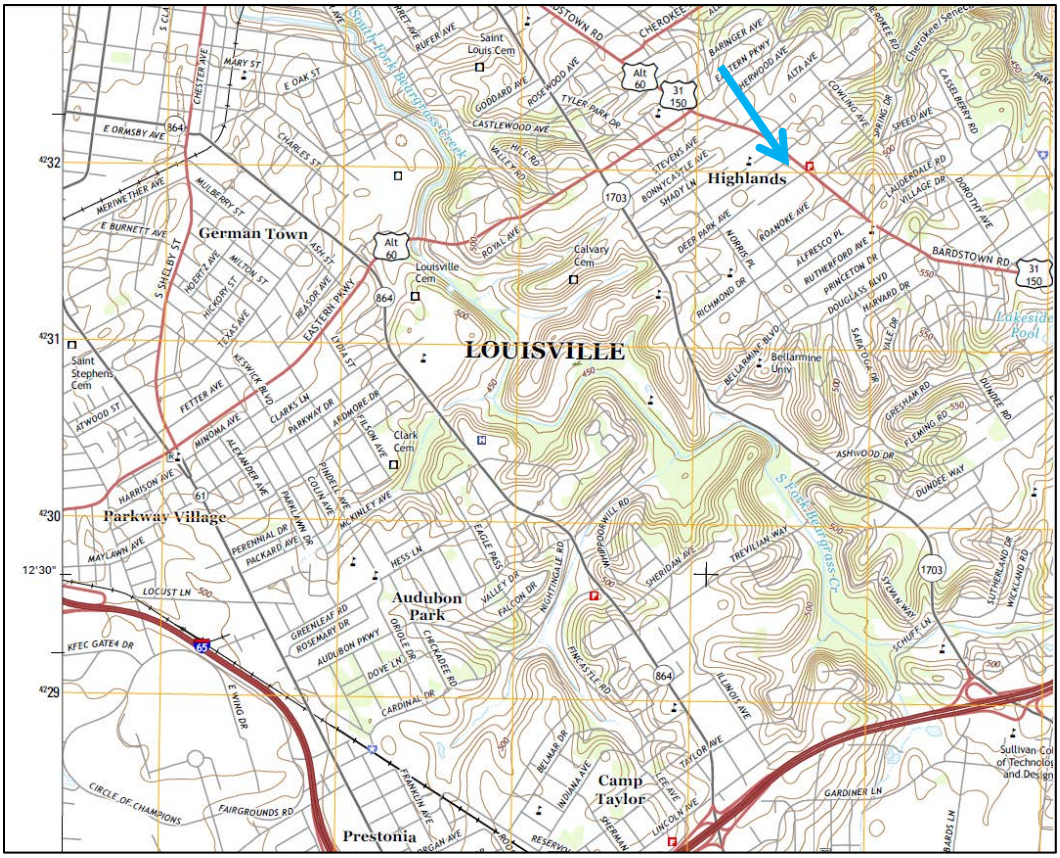

Figure 16: View of Louisville East, Kentucky US Topo Map published in March, 2016.

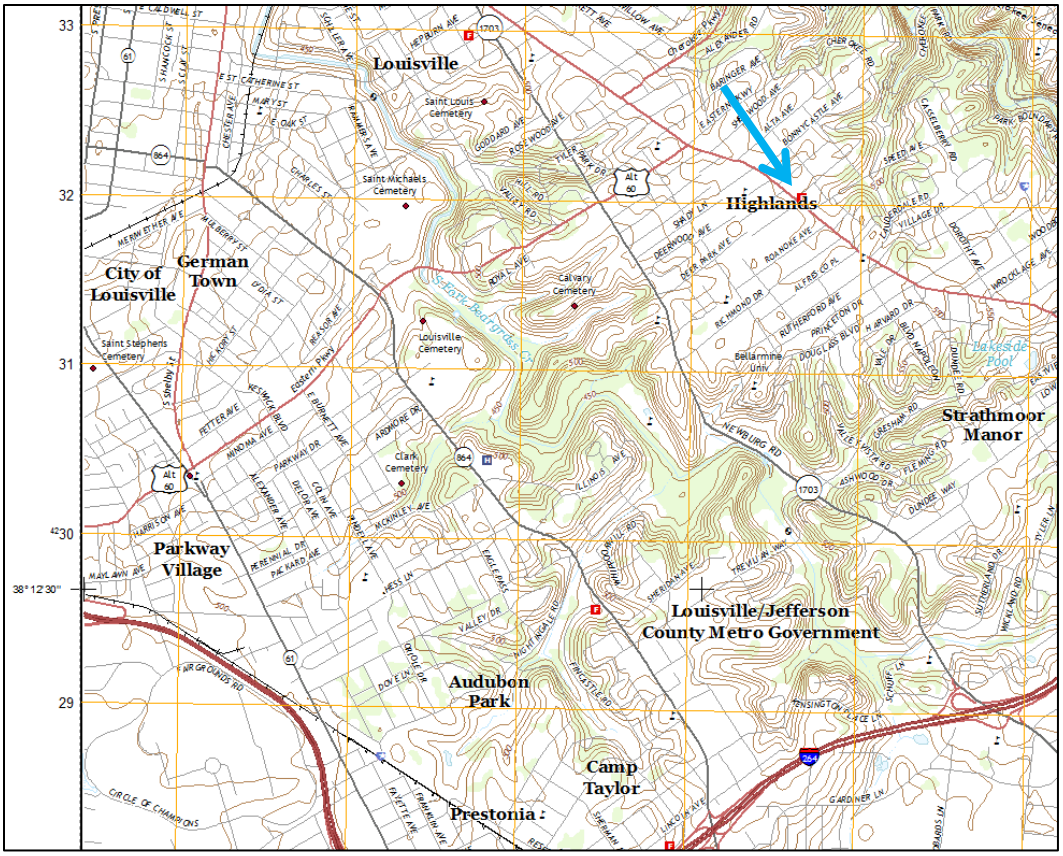

Figure 17: View of Louisville East, Kentucky using the Topo TNM Style Template and Topo Map Vector Data available in May, 2016.

2. The label rules used in the Topo TNM Style Template may have been updated since the publication of one or more of the US Topo maps.
3. Due to content additions / changes in the US Topo maps over the past several years, there may be data layers represented and labeled in the Topo TNM Style Template that may not have been included and labeled in an older published US Topo map.
4. As noted previously, USFS road shield point data are not available for download. The use of the template and downloaded data will thus not include the standard USFS road shield styles.

g. Grids and grid labels included in the Topo TNM Style Template are dynamic. The grid lines, ticks and labels will change as the user pans and/or zooms in the data frame. Published US Topo maps are generated with grid line, tick and annotation features that are edited prior to publication of the maps. As with interior labels, it is possible for the GIS user to export grids and labels to editable features if

desired. Figures 18 and 19 demonstrate the differences in the grid labels used in the published US Topo maps and the template.

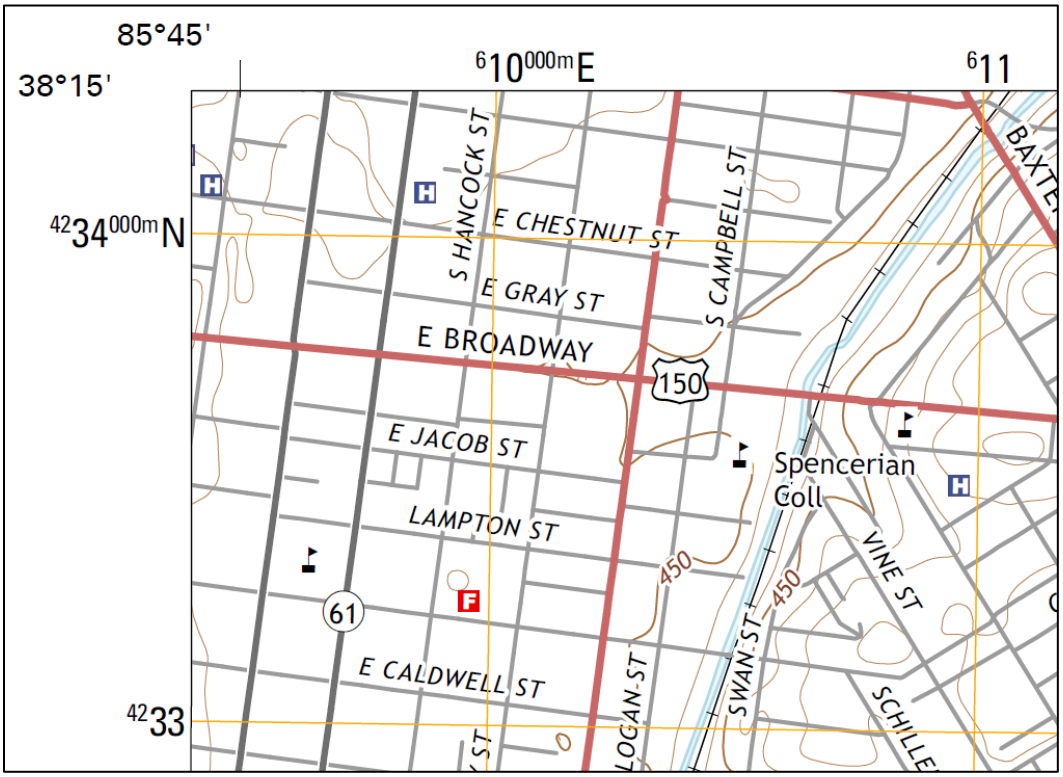

Figure 18: View of Louisville East, Kentucky US Topo Map published in March, 2016.

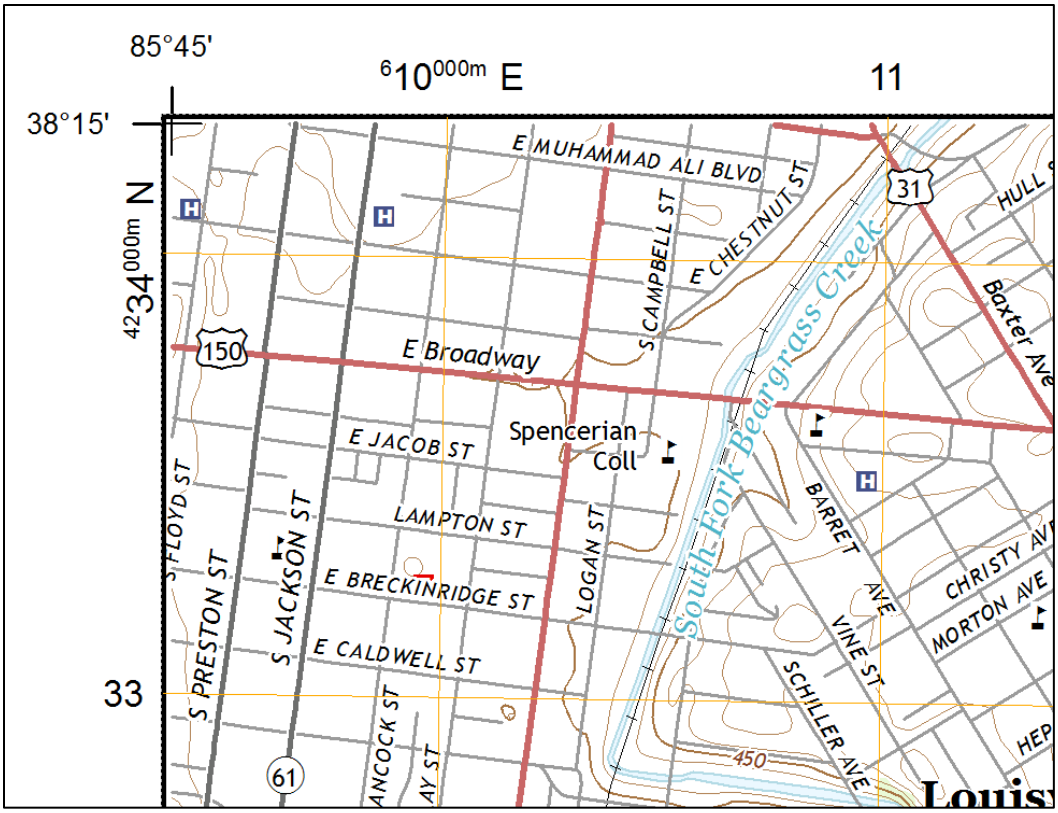

Figure 19: View of Louisville East, Kentucky using the Topo TNM Style Template and Topo Map Vector Data available in May, 2016.