When introducing the TAZ shapefile updates to the independent subarea models, this file can serve as a starting point, but typically would need a bit more info to catch it up to what the subarea model needs.  Since F&P will be doing this for Cache, Horrocks for DMPO, and UDOT for Summit/Wasatch (not sure who is updating Iron), I'll mention a few things here to consider as you get started:

* Create subarea TAZ shapefile
  + To use the USTM TAZ shapefile to get consistent, updated geometry for the subarea model, delete all zones that are not part of the subarea.  I believe all the subarea models are set up to use 'TAZ.shp' as the default name.
  + Copy the SA\_TAZID into the TAZID field and delete SA\_TAZID.  All other fields should be OK without editing (e.g. ACRES, DEVACRES, X, Y, ADJ\_XY, and county, city and district field names were made consistent across all model spaces a few years ago so there would be less downstream data management).
  + Add required fields from the previous TAZ shapefile to the updated TAZ shapefile and populate/transfer attributes to the new shapefile.
  + Document changes made to the TAZ shapefile in a text or word document and save in same location as the TAZ shapefile.
* Update Highway Network
  + Node File:
    - TAZ Centroids in the Master Highway Network will need to be updated to match the new TAZ structure and numbering scheme.  Split zones will need new Centroids created.  Parent zones to the split zones and perhaps zones with significant realignment would need adjustments to the Centroid location.
    - Because TAZ were renumbered using a different pattern in the new TAZ shapefile, all Centroid node numbers (N field) will need to be updated as well.  Location of most of these should still be OK.
  + Link File:
    - Centroid Connectors will need to be created or adjusted for all new zones.  Zones with significant boundary realignment may also need to have adjustments made to the Centroid Connectors.
    - Update all Centroid Connectors A & B fields with the new Centroid node number.
  + Update the node X & Y coordinates and link DISTANCE fields if making changes in GIS.  If edits to the network were made in Cube, these should have been calculated automatically.
  + Update/export the Link & Node shapefiles as true shape in the GIS folder.
* Review other TAZ specific inputs and update if necessary.  Here's a list of what would need to be looked at/updated, thought I may have missed one or two:
  + Update the GeneralParameters.block file with new TAZ numbers in the appropriate spots.
  + 'Lookup - BYTAZAgePct - AllCo.csv' file located in the '1\_Inputs\0\_GlobalData\1\_HHDisag\_AutoOwn' folder.  Source for this file should be available in the same location.  (Note, this file will be updated when the Census 2020 SF1 data comes available, but we will use this file until then.)
  + College base year student location input file
  + SE files (this is being done through a separate effort)
  + Update any Transit line files that may have been affected by a link split to accomodate a new Centroid Connector or by a line that ran all the way up to a Centroid (rare, but could happen).
  + Recreation model input files
  + Update External Node input file to reflect new external nodes
    - Because the Segment shapefile has been updated with 2019 data and factors, this would be a good time to refresh the external forecasts as well.
  + National Truck model input files
    - There are several of these, but I can't recall them off the top of my head.

Note if working with Cache or Dixie TAZ and Highway Networks:

* Cache and Dixie TAZ and highway networks use State Plane (feet) projection.  All other Utah models use UTM NAD 83 Zone 12N (meters).
* This may be a good time to convert these models to UTM.  To convert to UTM, one would follow these steps:
  + The new TAZ shapefile is already in UTM and the XY coordinates represent that projection.
  + The previous version's Highway Network Link & Node shapefiles will need to be brought into GIS using the State Plan (feet) projection and reprojected to the UTM.  Once reprojected, recalculate the Node X & Y fields.  Then rebuild the Highway Network using the available scripts in the model's '1\_Inputs\3\_Highway' folder.
* If remaining in State Plane:
  + Project the new TAZ shapefile to State Plane and recalculate the TAZ central point X & Y coordinates.
  + Highway Network already in State Plane.
* I'd recommend updating Cache and Dixie to UTM.  It seems like is more work initially (though really not much) and will save extra processing downstream.
* Please let me know if these are converted to UTM so we can update the USTM Data Import model as well.

**External Zones**

**External TAZ numbering**: most of the travel models have external TAZ nodes at the end of the internal TAZ range.  The new TAZ structure has more zones and there is a good chance that the new TAZ numbering overlaps with the current external TAZ numbers.  The externals would most likely need to be shifted to an appropriate number to accomodate the new TAZ range.

**External Node Location:** The location of most of the external nodes should be OK, but it's good to double check to see if any might need to be adjusted.  I would recommend having the USTM network and road centerline shapefile handy when checking location of the external nodes.  Since these externals are automatically connected to the USTM highway network in the USTM snapping routine, it's best if the externals are located within 1/2 mile of the USTM stub node and that it lies just off to the side of the road centerline (not on it).

Because we shifted the boundary between the WF and USTM model spaces, there will be new external locations in this area.  WFRC/MAG have already created the external locations and numbering on the WF model side.  The USTM network will need to be trimmed back and stub nodes created to accommodate the new WF nodes.  I also recommend relooking at the Dixie externals on the frontage road adjacent to the I-15 north external station.  With USTM's more refined highway network, the frontage road could be added to the Dixie network and the external station moved to the county border.

We will also like to revisit the externals for USTM.  There are a few locations where we will add external nodes to Utah.  We set up the StreetLight data so it could provide the traffic data to support the forecasts at these new locations.  If memory serves there is a new USTM external connected to Cache and to Washington counties.  The Cache and Dixie models would want to understand these new connections and make a plan to include them into their model networks.

**External Forecasts:** Once the highway network external node locations and numbering have been updated, the forecast spreadsheet and export table will need to be updated to reflect these changes.  Also, the external forecasts should be refreshed using a history that includes the 2018 and 2019 AADT data from the traffic count segment shapefile.

**TAZ Age Percent**

**Updating the File:** In order to make the models run correctly, the base year TAZ age percent file will need to be updated with the new TAZ numbering. The level of effort to put into this now all depends on when the Census releases Summary File 1 (SF1) which will have the population by age at the block level (population by age at the block level is not part of the redistricting file recently released).  If SF1 will be released by end of year or early Q1 2022, then a small effort to update the data file so it works with the new TAZ structure is appropriate.  However, if SF1 will be delayed beyond the end of Q1, then we will want to put a little more effort into refreshing the data using a combination of the 2010 Census and ACS data.

**Noise in Census Block Data:** We should be OK in this exercise with regards to the Census adding noise to the block data.  In calculating TAZ base year age percentages, we already override the TAZ data with data for zones that have a low population with data from a larger geography (e.g. districts or county average).