

# Connecting People Place & Opportunity

Analysis for Spring 2021 Workshops

May 2021

## HOUSING AND JOB HEAT MAPS

The final products are separate raster layer files that convey concentration of housing units and jobs. These were derived from point layers that each had a population field (total units for each point in the housing layer, and total jobs for each point in the jobs layer) that was used as a multiplier for each point. A GIS software tool used the point layers to create raster layers, or “heat maps”, that convey density. Parameters for both the tool itself, and symbology of the final layers, were chosen to balance detail and generalization at a regional scale.

### Data Inputs:

- Housing Units
  - GIS parcel layer (Source: Lancaster County GIS Division / Data Year: 2020)
  - Tabular data for total housing units associated with each parcel (Source: Lancaster County Property Assessment Office / Data Year: 2020)
- Jobs
  - GIS layer of census block points (Source: US Census Bureau / Data Year: 2018)

### Process:

- Housing Units
  1. Exported tabular parcel assessment data to a File Geodatabase Feature Class
  2. Used the **Dissolve** GIS tool to remove duplicate features that result from non-contiguous parcels (this must be done to make sure that there is no double, triple, etc. counting of units).
    - Input: 2020 GIS Parcel Layer from Rose’s Growth Tracking work
    - Output: Dissolved 2020 Parcel Layer
    - Dissolve Field: ParentID
    - Statistics Field(s): None
    - Create Multipart Features: Yes
  3. Joined the tabular Assessment Office data from Rose’s Growth Tracking Work to the Dissolved 2020 Parcel Layer
  4. Used the **Feature To Point** GIS tool to create a point feature class whose points are in the centroids of their associated parcels and retain the parcel attributes.
    - Input: Dissolved 2020 Parcel Layer
    - Output: 2020 GIS Parcel Point Layer
    - Inside: Yes
  5. Ran **Kernel Density** GIS tool. The following parameters were chosen after iterative testing to achieve an output raster that is optimized to show detail at a regional scale:
    - Input: 2020 GIS Parcel Point Layer
    - Output: Units\_50cell\_1500rad\_sqmi
    - Population Field: TotUnit (total housing units)
    - Output Cell Size: 50
    - Search Radius: 1500
    - Area Units: Square Miles
    - Output Values: Densities
    - Method: Planar
  6. Examined output raster (heat map) to determine a minimum cell value that should be shown in the final map. This needs to be done because there are enough points all over the county to give the output cells some value above zero, resulting in most of the county being covered in the low end of the color ramp. The minimum value chosen was 100.

7. Used **Raster Calculator** GIS tool to assign the cells greater than or equal to 100, a 1, and the rest a 0.
    - Map Algebra Expression: "Units\_50cell\_1500rad\_sqmi" >= 100
    - Output: Units\_50cell\_1500rad\_sqmi\_min100
  8. Used **Raster Calculator** GIS tool to generate a raster whose cells retain their values if they were greater than or equal to the minimum chosen above, and assign the rest a 0.
    - Map Algebra Expression: "Units\_50cell\_1500rad\_sqmi" x "Units\_50cell\_1500rad\_sqmi\_min100"
    - Output: Units\_50cell\_1500rad\_sqmi\_min100\_calc
  9. Chose the following symbology parameters to optimize detail at a regional scale:
    - Show: Stretched
    - Check the "Display Background Value" box, set the value to 0, and assign no color
    - "Display NoData as" no color
    - Stretch Type: Standard Deviations, n: 4
- Jobs
    1. Ran **Kernel Density** GIS tool. The following parameters were chosen after iterative testing to achieve an output raster that is optimized to show detail at a regional scale:
      - Input: GIS layer of census block points
      - Output: Jobs\_50cell\_3500rad\_sqmi
      - Population Field: c000 (total jobs)
      - Output Cell Size: 50
      - Search Radius: 3500
      - Area Units: Square Miles
      - Output Values: Densities
      - Method: Planar
    2. Examined output raster (heat map) to determine a minimum cell value that should be shown in the final map. This needs to be done because there are enough points all over the county to give the output cells some value above zero, resulting in most of the county being covered in the low end of the color ramp. The minimum value chosen was 100.
    3. Used **Raster Calculator** GIS tool to assign the cells greater than or equal to 100, a 1, and the rest a 0.
      - Map Algebra Expression: "Jobs\_50cell\_3500rad\_sqmi" >= 100
      - Output: Jobs\_50cell\_3500rad\_sqmi\_min100
    4. Used **Raster Calculator** GIS tool to generate a raster whose cells retain their values if they were greater than or equal to the minimum chosen above, and assign the rest a 0.
      - Map Algebra Expression: "Jobs\_50cell\_3500rad\_sqmi" x "Jobs\_50cell\_3500rad\_sqmi\_min100"
      - Output: Jobs\_50cell\_3500rad\_sqmi\_min100\_calc
    5. Chose the following symbology parameters to optimize detail at a regional scale:
      - Show: Stretched
      - Check the "Display Background Value" box, set the value to 0, and assign no color
      - "Display NoData as" no color
      - Stretch Type: Standard Deviations, n: 7

## DESTINATION POINTS

The final product is a set of points that represent destinations of different kinds that are within the defined focus areas of each Planning Area. The destinations shown on the final maps are mostly major employers, shopping centers, business parks. The full set of categories from the visual scan of the county include:

- Business/Shopping Center or Major Employer
- Higher Education/VOTEC
- School Campus
- Entertainment/Attraction
- Airport
- Park

- Church Campus
- City/Borough Center
- Village
- Hospital/Medical Campus
- Business Corridor

The destinations were chosen based on their regional significance, and context within the region. For example, one destination might be included because it has a large number of employees and a large land use footprint. Conversely, another destination with low numbers in the previous metrics might still be chosen because it is located away from any significant development, and serves as the only destination within a large area. The choices were made by referring to land use patterns exhibited in aerial imagery, Google street view, total employees from raw Claritas business data, highlighted parcels based on certain land use codes, and local knowledge of the County.

**Data Inputs:**

The following were used for reference only in an effort to produce a new point layer of destinations:

- GIS Parcel Layer
- Raw Claritas Business Data
- 2018 Aerial Imagery