

The Orf467 National aTaxi Equal Area {0.5, 0.5} Pixel Grid

The *Orf467 National aTaxi Equal Area Pixel Grid* is a simple method by which to automatically locate aTaxi Stands throughout the nation and serve as a convenient pointer to tag, store and find (through sorting) all trip ends that are closest to, and thus would likely be served by the aTaxi Stand that is located at/near the center of the pixel. The size of these pixels, being 0.5 miles on a side implies that “all” trips ends are essentially within an “easy” walk (< ~ 5 minutes) of an aTaxi Stand.

The center of the Orf467 National equal Area grid is at 37° N Latitude, -97.5° W Longitude. This places it near the geographic center of the continental US along the time meridian that is roughly the boundary between the Central and Mountain time Zones.

Along a Meridian, each degree of latitude traverses approximately 69.174 miles

Along a Parallel (at a Latitude), each degree of longitude traverses approximately $69.174 * \cos(\text{Latitude})$

At the origin (and everywhere) the Y-height of a pixel is 0.00722814 degrees Latitude

At the origin (and all along the 37° N Latitude parallel) the X-width of a pixel is 0.00944344 degrees Latitude

The {i,j} pixel {xPixel, yPixel} includes all {Lon, Lat} points within

$$\begin{aligned} \{-97.5 + 0.00722814*(i)/\cos(37 + j) \leq \text{Longitude} < \{-97.5 + 0.00722814*(i + 1)/\cos(37 + j)\} \\ \{37.0 + 0.00722814*(j) \leq \text{Latitude} < \{37.0 + 0.00722814*(j + 1)\} \end{aligned}$$

Pixelization of { Longitude, Latitude} -> {i,j} :

$$\mathbf{xPixel = i = \text{floor} \{138.348 * (\text{longitude} + 97.5) * \cos(\text{latitude})\}}$$

$$\mathbf{yPixel = j = \text{floor} \{ 138.348 * (\text{latitude} - 37.0)\}}$$

Pixel {i,j} is centered @: Latitude = $37.0 + 0.00722814*(j + .5)$

Longitude = $-97.5 + 0.00722814*(i + .5)/\cos(\text{Latitude})$

See: [EqualArea{0.5,0.5} Pixel LonLat Conversion&Distances.xlsx](#)



