

# Transportation Cost Model (TCM)

**Prepared by the University of Florida and  
The Central Florida Regional Planning Council  
For the Florida Heartland Consisting of DeSoto, Glades,  
Hendry, Highlands and Okeechobee Counties**



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*“The work that provided the basis for this publication was supported by funding under an award with the U.U. Department of Housing and Urban Development. The substance and findings of the work are dedicated to the public. The author and publisher are solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the Government.”*

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## **Transportation Cost Model (TCM)**

For many people the combined expenses of transportation and housing are often the largest drain on their household budget. Saving money by reducing transportation costs is one way that lower-income households can help to alleviate this type of financial pressure. A transportation cost (or driving cost) suitability layer was created to quantify these location-based expenses. Essentially, the driving cost suitability layer estimates the cost of transportation at any given location using variables like household size and distance to employment, and goods and services that are necessary for residential life. For use in modeling, the layer assigns preference to locations with lower driving costs by assigning the highest suitability to locations with a monthly driving cost for an average-sized household that is equal or below the mean for residential locations. The driving cost suitability layer was used in the Housing Suitability Model and the Affordable Parcel Inventory.

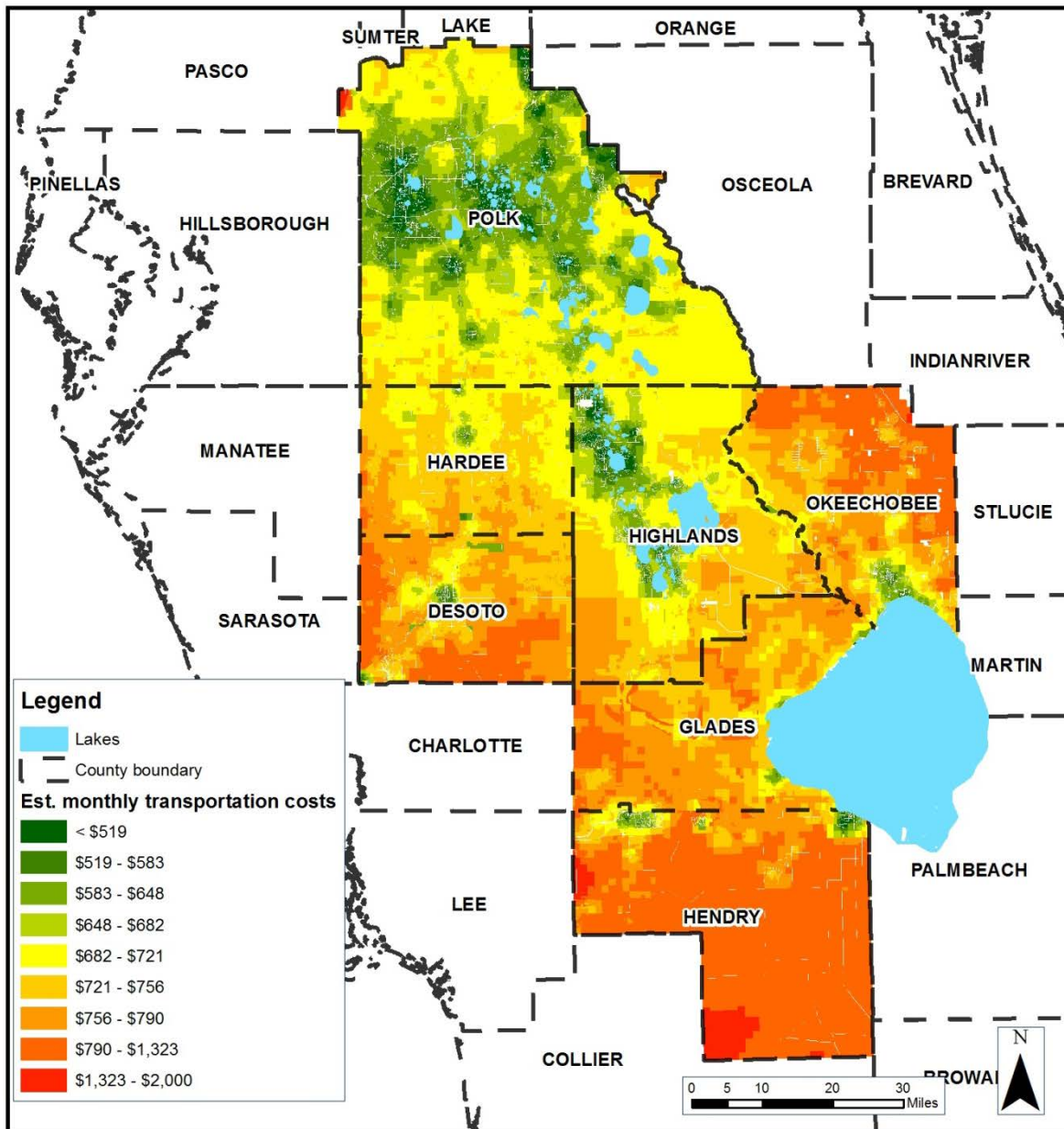
To create the driving cost suitability layer, it was first necessary to create a spatial layer for the region containing estimated monthly driving costs for all locations. The 2009 National Household Travel Survey (NHTS), with the Florida Add-on dataset (over sample), has typically been used by the University of Florida Shimberg Center for Housing Studies to create such a spatial layer. However, data for the Florida Heartland counties (DeSoto, Glades, Hardee, Hendry, Highlands, Okeechobee, and Polk Counties) was not included in the 2009 survey, so an alternative method was developed for the region based on previous travel cost modeling undertaken at the Center. Using an ordinary-least-squares (OLS) global regression model that was previously tested in Orange County where it was shown to have good predictive results, the model's equation was applied to population and land use variables in the Heartland region to estimate driving cost. The independent variables used to estimate the driving cost included population and employment densities; an indicator of land use mix; indicators of road connectivity and four-way intersections; and an indicator of the accessibility of locations to major destinations created using a gravity-model.

Using driving cost data for Orange County estimated from the 2009 NHTS and the predicted effects on driving cost of the independent variables described above, driving cost estimates were created for the Heartland Region based on the region's unique population, employment and land use characteristics. Within a GIS environment, driving cost values were predicted at 50,000 random points across the region. A continuous spatial layer was then created from the random points by using an inverse-distance-weighting function to estimate values between the random point locations. The data was then summarized using property parcel boundaries, so that an average monthly driving cost, in dollars, was estimated for all parcels in the region.

Once the driving cost data was created, a suitability layer was made by using the average driving cost value at all residential parcels as the measure for determining

suitability. Locations with the most suitable driving cost had average or lower driving costs, and locations with higher driving costs were assigned decreasing lower suitability values as the costs increased. See Map 1 – Estimated Driving Cost and Map 2 – Driving Cost Suitability, for a regional, graphical view of the dataset. The maps derive from the same information, but the first displays estimated monthly driving cost in dollars, and the second displays estimated parcel suitability based on the same driving costs.

**Map 1 – Estimated Driving Cost**



## Map 2 - Driving Cost Suitability

