TRF Limited Supermarket Access (LSA) Analysis

Details:	TRF Limited Supermarket Access Analysis
Topics:	Food access, food security
Source:	The Reinvestment Fund (TRF)
Years Available:	2014
Geographies:	Block groups and Limited Supermarket Access (LSA) clusters of block groups
Free or Subscriber-only:	custom
For more information:	http://www.trfund.com/financing-development/food/http://www.trfund.com/TRF-food-access.html

Description:
With support from the William Penn Foundation and the JPMorgan Chase Foundation, TRF's Limited Supermarket Access (LSA) analysis is specifically designed to: (1) Establish a valid and reliable method for measuring areas with inadequate access within the United States; (2) Locate geographic areas with the strongest need for additional supermarket development and quantify the demand for the area; (3) Allow for LSA areas to be prioritized based on the degree to which they lack access, have grocery demand and experience retail leakage; and (4) Provide a mapping tool to allow a diverse range of clients, including policymakers, government agencies, lending institutions, communities and policy research organizations, to analyze LSA areas within their geographies and craft strategies based upon the conditions in their community. Click here to read an overview of LSAs and how to use PolicyMap to identify and learn more about LSAs.

Identifying LSAs
TRF's methodology is designed to identify areas where residents travel longer distances to reach supermarkets when compared to the average distance traveled by residents of non-low/moderate income areas. Comparative areas are grouped based on similar values for population density and car ownership rates. Our data sources include 2010 US Census for population, households, and residential land area, 2008-2012 US Census ACS for household income and car ownership rates; 2010 Bureau of Labor Statistics Consumer Expenditure Survey for demand for food at home; and 2013 Nielsen Trade Dimensions for supermarket locations. Supermarkets include the following store types: supermarkets, supercenters, wholesale club, limited assortment, military commissary, and natural food stores. Superettes and dollar stores are excluded because they are less likely to provide a wide range of fresh groceries.

This methodology's key assumption is that block groups with a median household income greater than 120% of their respective metro area household medians (or non-metro state medians for non-metro areas) are adequately served by supermarkets and thus travel an appropriate distance to access food. Thus, higher-income block groups establish the benchmark to which all block groups are compared. This assumption is based on existing research that indicates an intense level of competition in the supermarket industry in higher-income communities, leading competitors to optimally locate in areas to adequately serve their customers.

Step I. TRF categorizes all block groups in the continental US into classifications using census data for population density and car ownership rates. This process resulted in 13 categories ranging from: Density 1 (lowest density – high car ownership) to Density 8 (highest density – low car ownership). TRF determined the residential population density by calculating the count of people and dividing it by the square mileage of non-water areas, minus the area of any non-residential census blocks. *Note: Block groups with fewer than 200 people and/or less than 100 households were excluded because a significant portion of the land area contains non-residential uses (e.g. park land, industrial, commercial, or institutional areas).*
Step II. TRF uses census block groups as the geographic unit of analysis. TRF calculates the distance traveled from the population center of every census block group (weighted by block centroid population) to the nearest full-service store. For each census block group, a population-weighted distance is established based on road distance traveled for each of the member blocks.

Step III. TRF calculates benchmark distances based on our key assumption noted above. Each benchmark represents the average block group distance (calculated in Step II) of all non-low/moderate income (LMI) block groups and their nearest supermarket, within each category created in Step I. The benchmark distance represents a "comparatively acceptable" distance for households to travel to a supermarket.

Step IV. TRF calculates an LSA score for each block group which represents the percent that the block group's actual distance needs to be reduced in order to equal the reference group distance. These are the block groups' LSA Scores – higher scores equate to lower access. TRF compares the distance from each block group's population-weighted centroid to its nearest supermarket to that of its respective benchmark within the same category created in Step I. TRF assigns an LSA Score to all block groups having a longer distance than their benchmark distance to a store. All block groups with distances at or less than their reference distance have negative LSA Scores. All of these negative values were coded as "0". Therefore an access score of "0" is defined as block groups with distances at or below their reference group difference.

Step V. TRF used spatial connectivity methods to identify which block groups with positive LSA scores are spatially clustered with neighboring block groups also exhibiting high LSA scores. Only those block groups with LSA scores greater than 45 were subjected to this spatial connectivity analysis. Block groups with contiguous spatial connectivity of high LSA scores are referred to as LSA areas. They represent areas with the strongest need for increased access to supermarkets. We used 45 as our minimum threshold because it was roughly equal to the average LSA score for all LSA block groups in our 2011 analysis, thus providing a benchmark of some sort.

Step VI. TRF created retail grocery leakage estimates as a way to determine the magnitude of each LSA area's access problem and its potential remedy – leakage represents grocery sales occurring outside of the LSA area boundaries. Using household income ranges (2008-2012 US Census ACS) and their respective percentages of income spent on "food at home" (2010 Consumer Expenditure Survey), TRF also estimates the total sales of all food items from all stores (including existing superettes, dollar stores, and in some cases supermarkets) within each block group's reference distance. Dollars are distributed equally to all households within the reference distance. The total grocery sales figure is subtracted from demand, resulting in an estimate for retail grocery leakage. Because the access problem is better understood in terms of square feet, TRF converted dollars leaked to square feet using nationwide weighted averages for sales per square foot among full-service grocers.

Details for TRF Supermarket Study of LSA

For a detailed account of the methodology used in this study, please see the descriptive sections above.

Indicator	**Description**
Limited Supermarket Access (LSA) Name	The LSA area name includes the county, state, and a number identified with the LSA area, due to the fact that many counties have multiple LSA areas.
Population Weighted LSA Score	LSA scores indicate the degree to which LSA area residents (in block groups) are underserved by supermarkets. Block groups with a positive score must travel longer distances to access a full-service supermarket compared to established benchmark distances. The score's value represents the percent by which a block groups' distance needs to be lowered in order to have a distance equal to its reference group. LSA scores can range from 0 to 100, with 0 representing areas equal to or less than their benchmark distance and 100 being the maximum. Because LSA areas are made up of block groups with varying population sizes, TRF calculated an LSA score that is weighted by population. TRF did not include block groups with fewer than 200 people or 100 households in this analysis.
# Block Groups in LSA Area	Number of census block groups in LSA area, as of 2014.
Est. Grocery Retail	To compute leakage, TRF calculates Grocery Retail Demand for an area and then deducts

Leakage Amount	the sales captured by existing local stores, with the difference representing the amount “leaked” or lost to stores in another area. The leakage estimate is an indicator of need, in addition to LSA scores, for a geographic area; it is expressed in both dollars and square feet. Calculation rounded to the nearest $1,000.
Est. Grocery Retail Leakage Rate	The grocery retail leakage rate is the percentage of total grocery demand for a given Limited Supermarket Access (LSA) Area being "leaked" or lost from the LSA. The leakage rate is calculated by dividing leakage amount by grocery retail demand within the LSA member block groups.
Est. Total Grocery Retail Demand	Estimated grocery retail demand is the dollar amount of grocery demand within a Limited Supermarket Access (LSA) Area. Grocery retail demand is calculated using income (2008-2012 Census ACS) and percent of income spent on food prepared at home (Bureau of Labor Statistics), weighted by number of households. This figure is expressed in both dollars and square feet. Calculation rounded to the nearest $1,000 for demand in dollars and the nearest 100 for demand in square feet.
Est. # Grocery Retail Sq Ft Leaked	TRF estimates grocery retail expenditures for an area and then deducts the sales captured by existing stores. The difference represents the amount 'leaked' or lost from the area. This calculation is then converted into square feet, based upon a nationwide average for food sales per square foot. Leakage figures estimate the size of an area’s access problem. Leakage figures are rounded to the nearest 100 square feet.
Limited Service Stores in LSA Area	The number of limited-service stores located within the defined LSA area, based on the July 2013 Trade Dimensions database. Note that it is theoretically possible for a full-service store to be included in this count, though such an event is extremely rare.
Population	Count of population in 2010 census block groups.