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# Low-Income and Low-Supermarket-Access Census Tracts, 2010-2015

Alana Rhone, Michele Ver Ploeg, Chris Dicken,  
Ryan Williams, and Vince Breneman





## United States Department of Agriculture

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## Abstract

Limited access to supermarkets or other sources of healthy and affordable food may impede the ability of some Americans to eat a healthy diet. Income, transportation, and distance may be barriers to food access for some. This brief updates estimates of low-income and low-supermarket-access census tracts (as found in ERS' Food Access Research Atlas) using a 2015 directory of supermarkets and 2010-2014 American Community Survey data on household vehicle access and family income. The number of tracts classified as low income (LI), based on the poverty rate and median income, increased 5.41 percent from 2010 to 2015. The number of tracts that are classified as low access (LA) solely by proximity to the nearest supermarket decreased from 2010 to 2015—that is, fewer tracts had a significant number or share of people more than 0.5 or 1.0 mile (10 or 20 miles) from the nearest supermarket in urban (rural) areas. For these proximity-only measures, the increase in low-income tracts outnumbered the decrease in low-access tracts so that there was a small net increase in the number of tracts that are both low-income and low-access (LILA) in 2015. The number of low-access tracts with a significant number of vehicle-less housing units more than 0.5 mile from the nearest supermarket grew by 412 from 2010 to 2015. This increase (4 percent) largely reflects lower levels of vehicle access across all U.S. housing units relative to 2010.

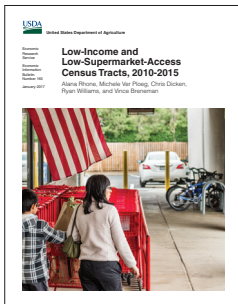
**Keywords:** supermarkets, low-income, food access, low-access, food deserts, healthy and affordable food

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# Low-Income and Low-Supermarket-Access Census Tracts, 2010-2015

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## What Is the Issue?

Limited access to supermarkets, supercenters, grocery stores, or other sources of healthy and affordable food may impede the ability of some Americans to achieve a healthy diet. The Food Access Research Atlas (FARA) is a Web-based mapping tool that allows users to investigate access to food stores at the census-tract level. The FARA is utilized by Federal, State, and local governments, community planners, public health officials, and researchers to understand food store access in communities—as well as the consequences for food shopping, diet, and dietary health—and to target interventions to improve access. Previous estimates of low-income (LI) and low-access (LA) census tracts use data that are now more than 5 years old and do not reflect recent changes in the locations of stores nor broad changes in economic conditions. This report updates estimates of food store access using more recent data.

## What Did the Study Find?

Low-income (LI) and low-access (LA) status of census tracts are measured separately, with the overlap of tracts that are both LI and LA comprising LILA tracts. Our findings first discuss these two components separately, and then jointly.

LI status is determined by poverty rates (at least 20 percent) or median family income (at or below 80 percent of the metropolitan area or State median income) in each census tract.

- The number of census tracts classified as LI increased from 29,285 in 2010 to 30,870 in 2015, or 5.41 percent

LA status of a tract is measured four ways. Three of these measures are based solely on proximity to the nearest store, demarcated by the use of different distance thresholds (0.5 and 1 mile in urban areas; 10 and 20 miles in rural areas). The fourth measure is based on the number of households without a vehicle that are more than 0.5 mile from the nearest store and the number and share of people more than 20 miles from the nearest store.

- The number of tracts that are classified as low access (LA) based solely on proximity decreased across all three measures from 2010 to 2015. These estimates show improvements in the proximity of supermarkets for the total population (regardless of income).

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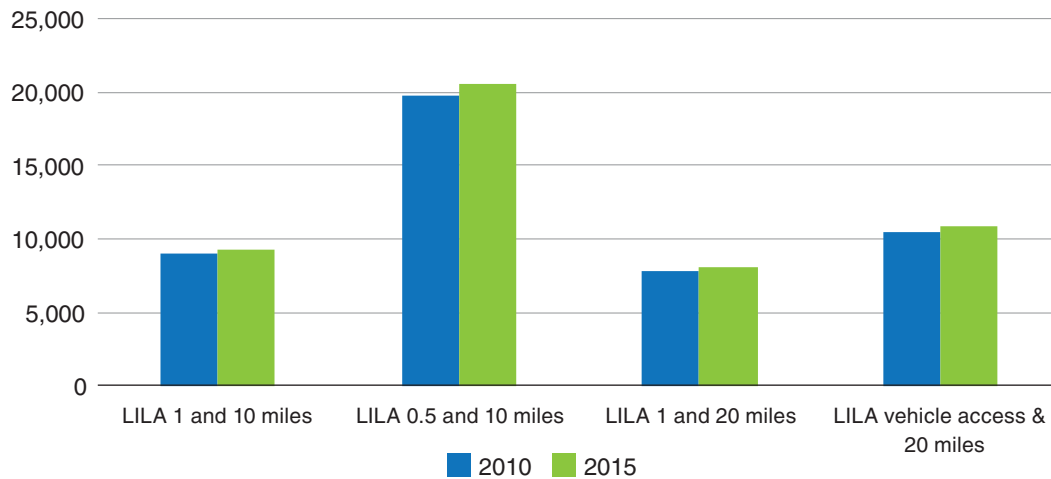
- In contrast, the fourth measure of low-access tracts increased between 2010 and 2015. This increase reflects an increase in the number of households without vehicles that are more than 0.5 mile from the nearest store.

Even if the LA status of tracts did not change between 2010 and 2015, there would have been an increase in the number of LILA tracts because more tracts were low-income tracts due to the Great Recession's effects.

Combining LI and LA tracts results in increases in the number of LILA tracts across all four measures.

- Using the 1- and 10-mile definition, there was a net increase of 286 LILA tracts in 2015 (out of a total of 72,531 populated census tracts).
- Using the 0.5- and 10-mile definition, there was a net increase of 742 LILA tracts in 2015.
- Using the 1- and 20-mile definition, there was a net increase of 349 LILA tracts in 2015.
- Using the LILA Vehicle Access and 20-mile definition, there was a net increase of 412 new LILA tracts in 2015.

### Number of low-income and low-access (LILA) census tracts, 2010 and 2015



Source: Calculated by USDA, Economic Research Service using 2010 Decennial Census data and the 2010-2014 American Community Survey data.

## How Was the Study Conducted?

Updated estimates of LILA census tracts use a list of supermarkets, supercenters, and large grocery stores from 2015. This list is generated from two independent directories of stores—TDLinX (a proprietary source) and from stores authorized to accept Supplemental Nutrition Assistance Program (SNAP) benefits. Data on income and vehicle access are from the 2010-2014 American Community Survey. Population data are from the 2010 Decennial Census. Methods for estimating supermarket access for the U.S. population and aggregating these estimates to census tracts are similar to those used in Ver Ploeg et al. (2012) and as published in the Food Access Research Atlas (ERS, 2013). Because census tract boundaries in this report are similar to those used in the previous version of the FARA, the new 2015 estimates can be compared to 2010 estimates to understand which tracts changed low-income or low-access status or both between years. The FARA mapping tool has also been updated with the estimates of access used in this report and with contextual data on access for population subgroups by age, race, Hispanic ethnicity, income, and SNAP participation status.

# Low-Income and Low-Supermarket-Access Census Tracts, 2010-2015

## Overview

Limited access to supermarkets, supercenters, grocery stores, or other sources of healthy and affordable food may impede the ability of some Americans to achieve a healthy diet. The Food Access Research Atlas (FARA), developed by USDA's Economic Research Service, is a Web-based mapping tool that allows users to investigate access to food stores at the census-tract level using different measures (distance to store, income, and vehicle access). With the help of the FARA, policies such as the Healthy Food Financing Initiative (HFFI) identify and target communities that have limited food access by providing loans and grants to develop grocery stores and other healthy food retailers. This brief summarizes how food store access changed from 2010 to 2015, including changes in the number of stores by store type and in the number and share of low-income and low-access census tracts across four different measures of low income and low access. It then decomposes these changes into shares that can be explained by changes in tract income versus changes in store access. These updated estimates, additional data, and access measures have been added to the mapping tool and can be downloaded from the website.



## Data and Methodology

Methods for estimating supermarket access for the U.S. population are similar to those used in Ver Ploeg et al. (2012). Aggregation of these estimates to the census tract is also similar to the past version of the FARA (ERS, 2013). Further, the same 2010 census-tract boundaries are used. We have made some minor changes that are detailed in this section.

Consistent with previous reports, we use supermarkets, supercenters, and large grocery stores as proxies for the complete set of stores that sell a wide variety of healthy foods at affordable prices (USDA, 2009). Information on the location of supermarkets, supercenters, and large grocery stores is obtained from two directories—stores authorized to accept SNAP (Supplemental Nutrition Assistance Program) benefits and stores in TDLinx, a Nielsen directory. The term “supermarket” will be used throughout this brief to refer to the three store types combined, except where store types are described separately. The TDLinx store list is an annual snapshot of stores that are open on June 15 of each year. The directory of SNAP-authorized stores is extracted from the Store Tracking and Redemption System (STARS)<sup>1</sup> maintained by USDA’s Food and Nutrition Service; for this analysis, the directory includes only authorized stores that were in the system as of June 15, 2015.

As in the 2012 report, we exclude military commissaries and warehouse club stores such as Sam’s Club, Costco, and BJ’s. While many such stores offer a wide variety of foods and accept SNAP benefits, military commissaries are only accessible to a select group of individuals and club stores are only available to those who pay an annual membership fee. Drug stores, dollar stores, and convenience stores were also, again, excluded. Even though some of these store types may sell a variety of healthy foods, they vary widely in the extent of offerings. Excluding these types of food retailers from our store directory is likely to result in an overestimate of the number of people who lack access to nutritious food.

Spatial analysis, string matching, and manual review methods were used to merge the SNAP and TDLinx data sets to construct a combined store directory. This combined directory encompasses all the supercenters, supermarkets, and large grocery stores from each data set, with duplicates eliminated as much as possible to avoid double counting. This matching process identified SNAP and TDLinx stores that were within a 1/3-mile radius of one another, or within the same ZIP Code. An automated string matching algorithm was used to identify exact or similar store name-address matches, which were then manually verified. Supermarkets from either the SNAP or TDLinx systems without a match in the other system were included in the final combined directory, totaling 44,243 supermarkets in the 2015 merged directory. The majority of supermarkets (37,007) were in

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<sup>1</sup>STARS superstores/supercenters are very large supermarkets, “big box” stores, superstores, and food warehouses primarily engaged in retail sale of a wide variety of grocery and other store merchandise. STARS supermarkets are establishments commonly known as supermarkets, food stores, grocery stores and food warehouses primarily engaged in retail sale of an extensive variety of grocery and other store merchandise, with 10 or more checkout lanes with registers, barcode scanners, and conveyor belts. A STARS large grocery store carries a wide selection of the four staple food categories. About 350 STARS stores were not classified as any of these three categories, but upon matching to TDLinx and further inspection through Google Maps and store websites, appeared to be full-service grocery stores with all major grocery departments and weekly sales fliers. TDLinx uses more expansive and different store classifications than STARS. TDLinx stores include those in the following subcategories: Grocery – Conventional; Grocery – Limited Selection; Grocery – Supercenter; Grocery – Natural/Gourmet; Grocery – Warehouse and Mass Merchandisers such as Target, Big Kmart, etc.

both data sources. Of the remaining stores, 3,906 were exclusive to TDLinx and 3,330 were found only in the SNAP list.<sup>2</sup>

This method of matching and review was more extensive than the previous method. Further, USDA's Food and Nutrition Service has improved the consistency of store classifications by type in the STARS directory—for example, by ensuring that stores in the same chain are classified as the same type. With these improvements, however, the inconsistency in procedures between 2010 and 2015 is a caveat in comparing store count data across years.

Data on population/characteristics are obtained from the 2010 Decennial Census. Information on income and household vehicle availability was obtained from the 2010-14 American Community Survey (ACS). Population data date to the 2010 Census because ACS data for these characteristics, though available at the census-tract level, are less precise. Population counts, occupied housing unit counts, and other population characteristics (age, race, and ethnicity) from the 2010 Census are allocated to ½-kilometer-square grids (Ver Ploeg et al., 2012).<sup>3</sup> For income and vehicle access, tract-level 2010-2014 estimates of the shares of housing units without vehicles and the share of individuals below 200 percent of poverty are multiplied by the 2010 count of housing units and population (respectively) to obtain an estimate of the number of households without vehicles and the number of people with income at or below 200 percent of poverty.<sup>4</sup> These numbers and shares are then similarly downcast to the ½-kilometer-square grid level. From here, the methods to estimate distance to the nearest supermarket for the overall population and for subgroups is the same as previously used.

Finally, to estimate whether a tract is low income, 2010-2014 ACS tract data are used directly to measure whether the tract: (1) has a poverty rate that is 20 percent or greater, (2) is at or below 80 percent of the greater of Metropolitan Statistical Area (MSA) median family income or the State's median family income, or (3) has median family income at or below 80 percent of the State's median family income if outside of an MSA (CDFI Fund, 2000). This is the same measure of low-income census tracts used for eligibility for the Department of Treasury's New Markets Tax Credit (NMTC) and that we have used in previous versions of the FARA.

The number of low-income (LI) census tracts increased from 29,285 in 2010 to 30,870 in 2015 (table 3), which may reflect lower and then stagnating incomes in the post-Recession period covered by the 2010-2014 ACS estimates (DeNavas-Walt and Proctor, 2015) and greater concentration of poor people in census tracts (Kneebone and Holmes, 2016).

To estimate if a tract is low access, the number and share of people more than 0.5 or 1 mile (urban areas) from a supermarket or 10 or 20 miles (rural) is estimated based on the location of supermarkets relative to the grids.<sup>5</sup> Urban areas are areas with more than 2,500 people, and rural areas are sparsely populated areas with fewer than 2,500 people. These estimates are aggregated at the tract

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<sup>2</sup>This is an improvement over 2010, when over 7,000 TDLinx stores and almost 4,000 STARS stores were unmatched.

<sup>3</sup>Estimates of access by age, race, ethnicity, and SNAP participation status are provided on the FARA mapping tool but are not summarized in this report.

<sup>4</sup>Access estimates by individual income are not presented here but are available on the FARA mapping tool. Access estimates by tract-level income are presented in this report. We are not able to downcast median income to the grid cells, so our definition of "low income" for individuals differs from our definition of low income for census tracts. For individual income, we use the share at or below 200 percent of poverty to get closer to the more inclusive tract-level definition of low income.

<sup>5</sup>As with previous versions of these estimates, both number and share are used to determine low-access status to accommodate tracts with (1) low populations but where a substantial portion of the tract has low access and (2) with a large number of people who are low access but with only a small share of the total tract population.

level for all grids within a tract. The same criteria for demarcating low access used in the previous FARA are applied for each of the four measures of low income and low access (LILA).<sup>6</sup>

**LILA 0.5 and 10 miles:** Low-income census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 0.5 mile from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 10 miles if in a rural area.

**LILA 1.0 and 10 miles:** Low-income census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 1.0 mile from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 10 miles if in a rural area.

**LILA 1.0 and 20 miles:** Low-income census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 1.0 mile from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 20 miles if in a rural area.

**LILA Vehicle Access and 20 miles:** Low-income census tracts where a significant number of housing units (at least 100) do not have a vehicle and are more than 0.5 mile from the nearest supermarket, supercenter or large grocery store; or low-income census tracts where a substantial number or share of people (at least 500 or 33 percent) are more than 20 miles from the nearest store.

Because census tract boundaries have not changed since 2010, we are able to directly compare the number of census tracts that are low income, low access, and both low income/low access in 2015 compared with 2010. Table 1 shows the data source of each population characteristic used in this report, as well as the geographic level in which the estimates are drawn.

Table 1  
**Sources for demographic and economic data**

<b>Data</b>	<b>Data source</b>	<b>Source geographic level</b>
Store directory	2015 TDLinx and 2015 STARS	Latitude and longitude coordinates
Total population	Census 2010	Block
Housing units	Census 2010	Block
Vehicle access	ACS, 2010-2014	Block group
Income	ACS, 2010-2014	Block group and tract

Note: 2010 decennial census counts of the total population and number of housing units are used even though 2010-2014 ACS estimates are available for both. We use the decennial estimates instead because of high standard errors in the ACS estimates. Income and vehicle access data are not available from the decennial census so we use the most recent version of ACS data, 2010-2014. Census tract boundaries are the same for both years.

ACS = American Community Survey. STARS = Store Tracking and Redemption System.

Source: USDA, Economic Research Service.

<sup>6</sup>The low-income definition for each of these measures is the same.

## Number of Food Stores, 2010 and 2015

The total number of supercenters, supermarkets, and large grocery stores in our directory increased from 39,703 stores in 2010 to 44,243, or 11 percent, in 2015 (table 2). The extent to which this gain reflects real increases in the number of stores or changes in our matching methodology and improvements in the STARS data classifications is uncertain. However, when using only the TDLinx store directory data (before matching to the SNAP directory), which have consistently defined store classifications over time, we observe an increase of about 5,000 stores in the “supermarket” channel between 2010 and 2015 (from 35,709 to 40,913). When looking only at SNAP stores (before matching to TDLinx), we see an increase of over 7,600 stores in the 3 large store categories (from 32,690 to 40,337). So while both data sets independently show a sizable increase in the number of stores between 2010 and 2015, the increase in SNAP stores is larger, which could be due to an increase in SNAP-authorized stores or to changes in how SNAP stores were classified.

Even though the number of supercenters and large grocery stores increased, the number of supermarkets saw a small decline (fig. 1). The observed increase in supercenters and large grocery stores and decrease in supermarkets may be due to retailer competition across price, quality, and convenience. Supermarkets still outnumbered other types of large food stores and made up a majority of stores across all census tracts in 2015, accounting for over three-quarters of the total number of stores. Supercenters, the second-most common store type, nearly doubled across all census tracts from 2010 to 2015. The growth in supercenters likely reflects consumer preferences to shop at stores where they can economize on food spending and purchase a wide variety of nonfood items in addition to groceries.

Table 2

**Number of stores by store type and by census tract income, 2010 and 2015**

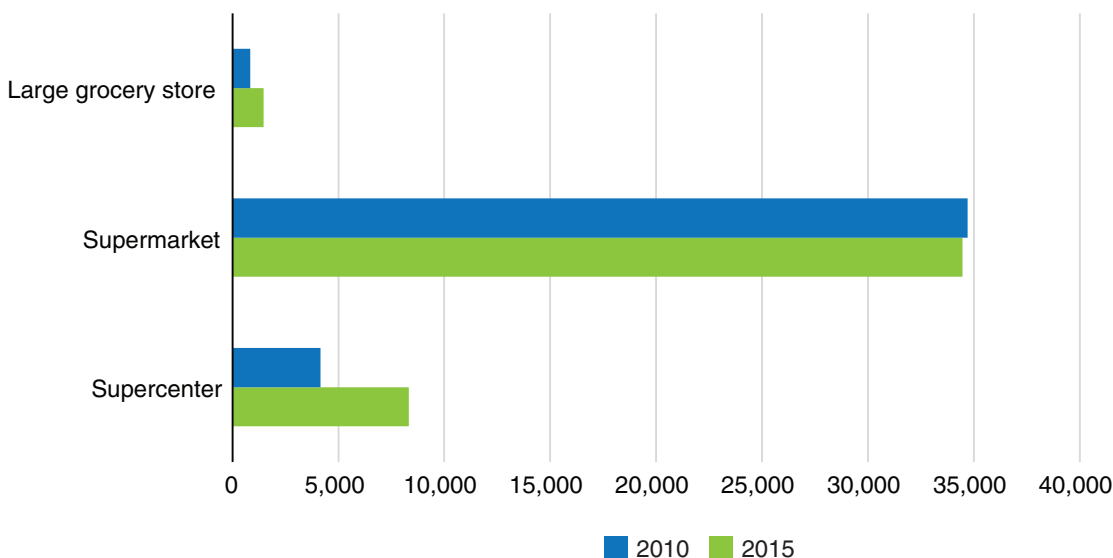
	All census tracts				Low-income census tracts				Moderate/high-income census tracts			
	2010		2015		2010		2015		2010		2015	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Store type:												
Supercenter	4,165	10.5	8,323	18.8	1,678	9.9	3,443	17.4	2,487	10.9	4,880	19.9
Supermarket	34,704	87.4	34,458	77.9	14,728	87.2	15,390	78.0	19,976	87.6	19,068	77.8
Large grocery store	834	2.1	1,462	3.3	491	2.9	908	4.6	343	1.5	554	2.3
<b>Total</b>	<b>39,703</b>	<b>100.0</b>	<b>44,243</b>	<b>100.0</b>	<b>16,897</b>	<b>100.0</b>	<b>19,741</b>	<b>100.0</b>	<b>22,806</b>	<b>100.0</b>	<b>24,502</b>	<b>100.0</b>

Source: Store data for both 2010 and 2015 are combined from TDLinx and Supplemental Nutrition Assistance Program (SNAP)-authorized lists of stores. Census tracts are defined based on a census tract’s poverty rate or median family income. Income data for 2010 are from the 2006-2010 American Community Survey (ACS). Income data for 2015 are from the 2010-2014 ACS. 2010 store count numbers overall and by store type do not match those reported in Ver Ploeg et al. (2012) because our revised matching and classification methods allowed us to retroactively reclassify stores in the 2010 list to be consistent with our 2015 classification method in order to make the comparison here.

Source: USDA, Economic Research Service.

The total number of stores in low-income census tracts increased from 16,897 stores in 2010 to 19,741 stores in 2015, or 17 percent. This reflects both a rise in the number of stores in low-income areas since 2010 and a greater number of low-income tracts in 2015.<sup>7</sup> Furthermore, the number of food stores in each store type grew in low-income tracts. In low-income census tracts, the greatest absolute increase in the number of stores was for supercenters, which gained 1,765 stores from 2010 to 2015. The total number of food stores in moderate/high-income census tracts grew by 1,696, or 7 percent, from 2010 to 2015. In moderate/high-income census tracts, the only decrease between 2010 and 2015 was in the number of supermarkets, which accounts for the observed decrease (4.5 percent) in the supermarket type across all census tracts.

Figure 1  
**Number of stores by store type in all census tracts, 2010 and 2015**



Source: USDA, Economic Research Service. Store data for both 2010 and 2015 are combined from TDLinx and Supplemental Nutrition Assistance Program (SNAP)-authorized lists of stores.

<sup>7</sup>We compared 2015 store counts to 2010 store counts, while holding 2010 low-income census tract designations constant, and vice versa using constant 2015 tract income status. We found a sizable increase in the 2015 store numbers in both low income and moderate/high income 2010 tracts, and vice versa using constant 2015 income status. We observed similar patterns of changes for both TDLinx stores and STARS stores when analyzed separately.

## Changes in Distance and Other Indicators of Food Access, 2010 and 2015

The number of census tracts classified as low-income increased from 29,285 in 2010 to 30,870 in 2015, or 5.41 percent (table 3). The number of low-access (LA) census tracts decreased from 2010 to 2015 for each measure of low access, except the “LILA Vehicle/20 miles” measure. A smaller share of tracts were low access using the 1- and 10-mile demarcations, 38 percent in 2015 compared with 39.4 percent in 2010 (table 3). Similar decreases occurred in the share of tracts that were low access using the 0.5- and 10-mile definitions and the 1- and 20-mile definition. These estimates show improvements in the proximity of supermarkets to the total population (regardless of income).

Vehicle availability is an important measure of how readily a household can access a supermarket. When vehicle availability and proximity to a supermarket are considered together (LILA Vehicle Access and 20 Miles), estimates show a slight increase in the share of tracts that are low access, from 22.3 percent in 2010 to 22.9 percent in 2015 (table 3). The American Community Survey shows that the share of housing units without vehicles increased from 8.8 percent of all housing units in 2010 to 9.2 percent in 2015 (not reported). Not all of these households are far from a supermarket, but the share of housing units without a vehicle that were more than 0.5 mile from a store also increased from 4.1 percent of all housing units in 2010 to 4.2 percent in 2015.

Table 3

**Low-income and low-access (LILA) census tracts across four measures of low access, 2010 and 2015**

Access measure	LILA 1 and 10		LILA 0.5 and 10		LILA 1 and 20		LILA vehicle access & 20 miles	
	2010	2015	2010	2015	2010	2015	2010	2015
<b>Low-Income (LI)</b>								
Number	29,285	30,870	29,285	30,870	29,285	30,870	29,285	30,870
%	40.4	42.6	40.4	42.6	40.4	42.6	40.4	42.6
<b>Low Access (LA)</b>								
Number	28,541	27,527	50,618	49,725	25,645	24,710	16,142	16,638
%	39.4	38.0	69.8	68.6	35.4	34.1	22.3	22.9
<b>Low-Income &amp; Low Access (LILA)</b>								
Number	8,959	9,245	19,814	20,556	7,756	8,105	10,457	10,869
%	12.4	12.7	27.3	28.3	10.7	11.2	14.4	15.0

Total tract count:  
72,531 populated tracts

Note: LILA at 1 and 10 miles = Low-income census tracts where a significant number or share of the population is more than 1 mile (urban areas) or more than 10 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA at 0.5 and 10 miles = Low-income census tracts where a significant number or share of the population is more than 0.5 mile (urban areas) or more than 10 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA at 1 and 20 miles = Low-income census tracts where a significant number or share of the population is more than 1 mile (urban areas) or more than 20 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA using vehicle access and 20 = Low-income census tracts where a significant number of households do not have a vehicle and are more than 0.5 mile from the nearest supermarket; or a significant number or share of the population are more than 20 miles from the nearest supermarket, regardless of vehicle availability.

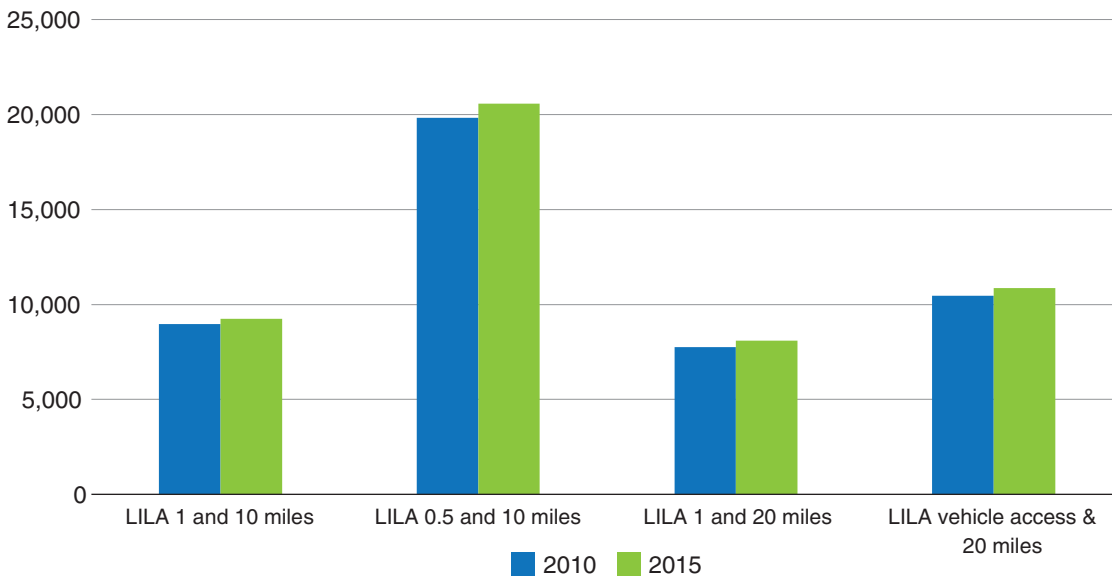
Source: Calculated by USDA, Economic Research Service using 2010 Decennial Census data and the 2010-2014 American Community Survey data.

When the low-income and low-access estimates are combined, results show small increases in the number of LILA census tracts across all four measures (fig. 2). For the three proximity-only measures (1/10, 0.5/10, and 1/20 miles), the increase in the number of LILA tracts may be attributed to more low-income tracts rather than to the low-access status. The increase in the number of “LILA Vehicle Access/20 Miles” census tracts is due to both an increase in the number of low-income census tracts and an increase in the number of housing units without a vehicle more than 0.5 mile from a supermarket.

Table 3 also illustrates variation across the four proximity measures in the degree to which low-access census tracts are also low-income. For the “LILA Vehicle/20 Miles” category in 2015, 65 percent of the low-access tracts are also low-income (10,869/16,638). The overlap for the other three measures is between 33 and 41 percent. This is not surprising given the correlation between income and vehicle ownership.

Figure 2

**Number of low-income and low-access (LILA) census tracts, 2010 and 2015**



Source: Calculated by USDA, Economic Research Service using 2010 Decennial Census data and the 2010-2014 American Community Survey data.

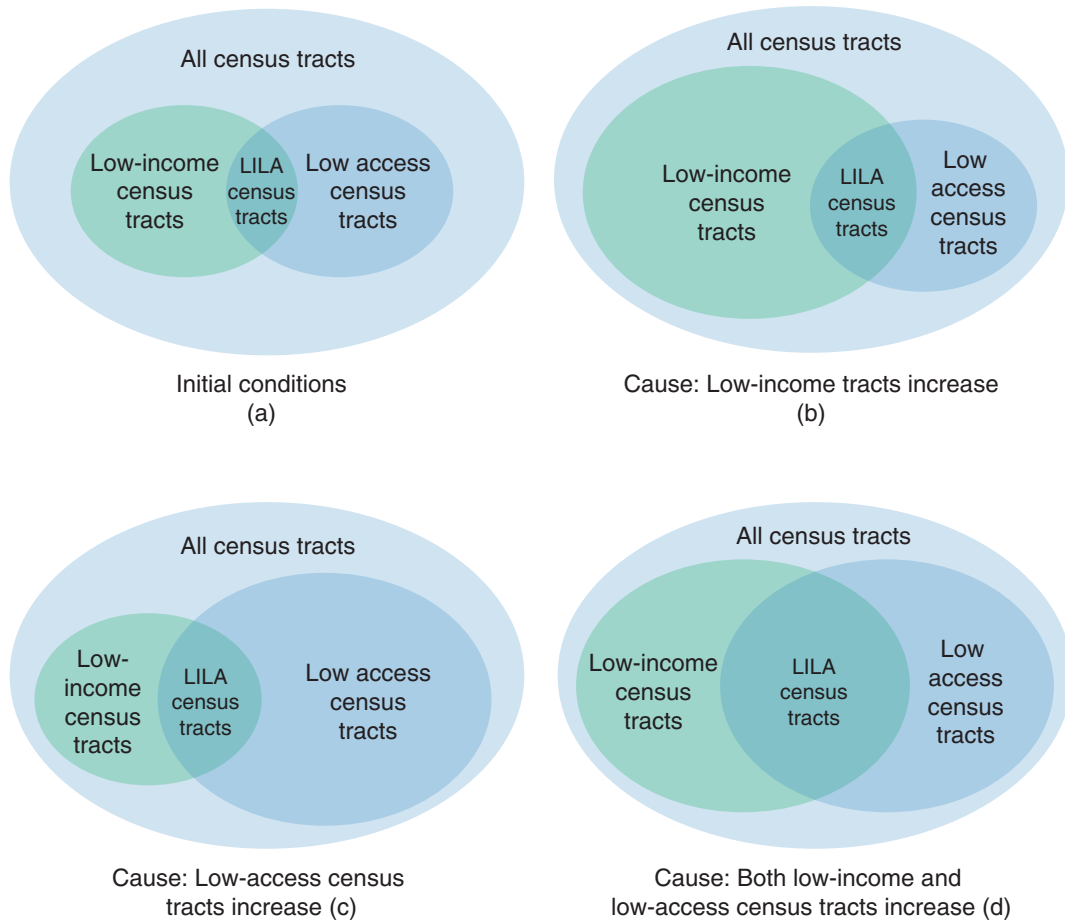
# Changes in Low-Income, Low-Access Tracts Between 2010 and 2015

The number of LILA census tracts increased between 2010 and 2015. Given the definition of LILA, which relies on both income and access criteria, there are a variety of ways that the number and proportion of LILA census tracts could change over time. Figure 3 presents a series of Venn diagrams illustrating a starting point (diagram “a”) as well as three possible scenarios under which the number of census tracts classified as LILA increases. This section aims to identify how each of these potential causes—an increase in the number of low-income census tracts, an increase in the number of low-access census tracts, or an increase in both—contributes to the increase in LILA tracts observed between 2010 and 2015 (tables 3 and 4).

Table 4 compares 2010-15 changes in LILA status for four low-access measures (LILA 1 and 10, etc.), with one of four outcomes for each: (1) LILA in both years, (2) LILA in 2010 but not in 2015, (3) not LILA in 2010 but LILA in 2015, and (4) not LILA in either 2010 or 2015. For tracts where LILA status changed, we indicate whether it was a change in low-income status, low-access status, or both.

Figure 3

## Possible scenarios for an increase in low-income, low-access (LILA) census tracts



Source: USDA, Economic Research Service.



Table 4

**Decomposition of changes in low-income, low-access (LILA) tracts for four low-access measures, 2010 and 2015**

	LILA 1 and 10		LILA 0.5 and 10		LILA 1 and 20		LILA Vehicle Access and 20	
	Number	%	Number	%	Number	%	Number	%
<b>LILA in both 2010 &amp; 2015</b>	6,359	8.8	16,155	22.3	5,607	7.7	7,054	9.7
LILA in 2010 but not in 2015:								
Not low income in 2015, but low access 2015	1,218	1.7	2,358	3.3	906	1.2	586	0.8
Not low access in 2015, but low income 2015	1,179	1.6	1,164	1.6	1,079	1.5	2,494	3.4
Not low access nor low income 2015	203	0.3	137	0.2	164	0.2	323	0.4
<b>Tracts no longer LILA</b>	2,600	3.6	3,659	5.0	2,149	3.0	3,403	4.7
LILA in 2015 but not in 2010:								
Not low income in 2010, but low access in 2010	1,733	2.4	3,592	5.0	1,476	2.0	782	1.1
Not low access in 2010, but low income in 2010	953	1.3	697	1.0	860	1.2	2,425	3.3
Not low access nor low income 2010	200	0.3	112	0.2	162	0.2	608	0.8
<b>New LILA tracts</b>	2,886	4.0	4,401	6.1	2,498	3.4	3,815	5.3
Net change in LILA tracts	286	0.4	742	1.0	349	0.5	412	0.6
<b>Not LILA in 2010 or 2015</b>	60,686	83.7	48,316	66.6	62,277	85.9	58,259	80.3

**Total tract count: 72,531 populated tracts**

Source: Calculated by USDA, Economic Research Service using 2010 Decennial Census data and the 2010-2014 American Community Survey data.

The majority of the 72,531 populated tracts<sup>8</sup> did not change their status—that is, they were either still LILA in 2015 or were not previously LILA in 2010. This holds for each of the 4 measures of low access, with between 64,000 and 68,000 tracts that do not change LILA status. Even though tracts that are not LILA make up the majority of all tracts, tracts that are LILA in both years account for 22.3 percent of all tracts using the 0.5- and 10-mile demarcations and 8-10 percent of tracts using the other three measures (table 4).

Estimates of new LILA tracts for the four low-access measures reflect the general increase in low-income tracts since 2010, consistent with table 3.

By 2015, there was a net increase of 286 new LILA tracts using the 1- and 10-mile definition—2,600 tracts that were LILA in 2010 but were no longer LILA in 2015 and 2,886 tracts that became LILA between 2010 and 2015 (table 4). Of those that became LILA tracts, 1,733 were already low access in 2010 but then also became low income by 2015. Far fewer tracts, 953, were already low-income tracts in 2010 but became low access by 2015. Only 200 tracts under these distance parameters had both their LI and LA status worsen in 2015. For tracts that were LILA in 2010 but not in 2015, 1,218 saw their incomes improve, 1,179 saw their access improve, and 203 saw both access and income improve.

For the two other proximity-only-based, low-access measures (LILA 0.5/10 and LILA 1/20), low-access tracts decreased and low-income tracts increased between 2010 and 2015 (table 4).

<sup>8</sup>A small number of census tracts have no people living in them. We exclude these throughout.

However, the Vehicle Access/20 mile LILA measure shows that change in *access* explains the majority of change in LILA status for census tracts that became LILA tracts. Of the 3,815 tracts that became LILA using the Vehicle Access and 20-mile measure in 2015, 2,425 were low income but not low access in 2010 and then became low access by 2015. This compares with 782 tracts that were low access but not low income in 2010 but became low income also by 2015. Of the 3,403 tracts that were LILA by this measure in 2010 but not in 2015, the majority (2,494) changed status because access rather than income improved. Of the four low-access measures, the LILA Vehicle Access/20 Mile measure is the one that shows substantial change in the access portion of the low-income and low-access measure. This is likely due to an increase in the number of housing units without vehicles that are more than 0.5 mile from a store.

## Individuals and Households in Low-Income and Low-Access Census Tracts

Some individuals living in a census tract designated as LILA may have no difficulty accessing healthy and affordable food, despite living in a tract where many residents are low income and live relatively far from a supermarket. The same goes for vehicle access. Two neighbors who are equidistant from a supermarket or other source of healthy food may have dissimilar access if one regularly uses a car and the other does not.

Table 5 illustrates these distinctions by summing the total number of people and housing units in LILA census tracts (column 1) and also the number of people/units that are low access only (for each of the low-access measures, for example, more than 1 mile from a supermarket) (column 3). For the 3 proximity-only measures (1/10, 0.5/10, and 1/20 miles), about half of the population that resides in LILA tracts (column 1) had limited access to a supermarket or grocery store (column 3) in 2015. An estimated 19 million of the 39.4 million individuals in LILA census tracts, or 6.2 percent of the U.S. population, had limited access to a supermarket or grocery store using the 1- and 10-mile definition. An estimated 54.4 million of the 83.5 million individuals in LILA census tracts, or 17.7 percent of the U.S. population, had limited access to a supermarket or grocery store at 0.5 and 10 miles. An estimated 17.3 million of the 35.2 million individuals in LILA tracts, or 5.6 percent of the U.S. population, had limited access to a supermarket or grocery store at 1 and 20 miles.

Of the 18.2 million housing units in LILA Vehicle Access/20 Mile census tracts, an estimated 2.1 million—or 1.8 percent of all housing units—are far from a supermarket and do not have a vehicle (vehicle access is measured on the household level). An estimated 335,000 individuals are more than 20 miles from a supermarket.

For the three proximity-only measures, it is important to note that not all people who are low access (for example, more than 1 mile from a supermarket) are poor or without a vehicle. Many of these people likely own cars or have the means to afford alternatives, such as grocery delivery, to overcome distance barriers, at least in areas where such services are offered.

Table 5

**Population and housing units and shares in low-income/low-access (LILA) tracts and in tracts that are low access but not low income in 2015, across four measures of low access**

	# of people/ HU in tract	% of total U.S. population/HU	# LA population/ HU in tract	% of total U.S. population/HU
Low-income and low-access census tract				
LILA 1 and 10	39,416,557	12.8	19,073,154	6.2
LILA 0.5 and 10	83,594,154	27.1	54,493,903	17.7
LILA 1 and 20	35,293,644	11.4	17,369,180	5.6
LILA Vehicle Access and 20				
Housing units <sup>1</sup>	18,212,287	15.6	2,106,505	1.8
Population <sup>2</sup>	47,406,759	15.4	335,446	0.1
Total U.S. population	308,745,538			
Total U.S. housing units	116,716,292			

<sup>1</sup>Column 1 is the number of housing units (HUs) in LILA (low-income, low-access) Vehicle and 20 Miles tracts; column 3 is the number of HU without a vehicle and >0.5 mile from a store.

<sup>2</sup>Column 1 is the number of people in LILA tracts using the Vehicle Access and 20 Miles measure; column 3 is the number of people more than 20 miles from a supermarket in LILA Vehicle and 20 Miles tracts.

Source: Calculated by USDA, Economic Research Service using 2010 Decennial Census data and the 2010-2014 American Community Survey data.

## Conclusions

Some Americans and some neighborhoods have limited access to stores that offer a wide variety of healthy food items, such as supermarkets, supercenters, and grocery stores. Access-related challenges like low income and vehicle availability may make it harder for them to have a healthy diet and lifestyle. In this brief, we update previous estimates of low-income areas, low-access areas, household vehicle access, and family income along with data on the location of supermarkets, supercenters and large grocery stores.

The total number of grocery stores grew from 2010 to 2015 in both low-income and moderate/higher income census tracts. This growth occurred in both of our store directories, but because of modifications in SNAP store classifications and in our methods for matching and reviewing stores across the two data sets, some of the changes over time may be due to changes in our methods.

Across three proximity-only measures, supermarket access has improved between the 2 years though income has not, resulting in an increase in LILA census tracts observed between 2010 and 2015. In contrast, the vehicle access measure shows a greater share of census tracts with poor access, reflecting a decrease in vehicle availability for households and an increase in the number of households without vehicles that are more than 0.5 mile from the nearest store. These findings suggest that income and resource constraints may be greater barriers to accessing healthy food retailers than proximity.

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