2025 Beverage Calories Initiative:
Communities Initiative Detailed Methodology

I. ANALYTICAL FRAMEWORK

The measurement approach designed to monitor progress toward the community calorie goal consists of three features: (1) using sales volumes of liquid refreshment beverages ("LRB") as a proxy for consumption; (2) combining multiple datasets to estimate beverage sales volumes in each community; and (3) reporting progress at multiple levels of data aggregation to facilitate transparency.

The primary metric used to measure progress is beverage calories per person per day. This metric is calculated by estimating total beverage calories and dividing by population and the number of days per year. As discussed in the national calorie goal analysis, a key constraint to estimating this metric is determining beverage volumes consumed. Existing sources of consumption data, such as the National Health and Nutrition Examination Survey ("NHANES"), are based on dietary recall surveys. The methods of these surveys carry some limitations associated with self-reporting biases.[1] For example, people often have a difficult time recalling exact quantities and types of beverages consumed. Additionally, these nationally representative surveys do not include large enough samples to estimate consumption in narrow geographies such as the BCI Communities.

For the reasons described above, this analysis uses beverage sales volumes as a proxy for beverage consumption. Sales data are highly precise, providing exact case sales for specific brands and flavors sold to stores, restaurants, and other customers located in each community. The primary difference between sales volumes and consumption is waste, both pre-consumer and consumer. BCI Companies and independent data suppliers estimate that pre-consumer waste, such as beverages that expire or are damaged prior to final sale, is small (i.e., likely a couple of percentage points), and confirm that most of it is netted out of reported sales volumes. Consumer waste is more difficult to quantify. Even if substantial, however, it would not affect estimates of the percentage change in calories consumed, as long as the share of beverage waste does not change significantly over the commitment period.

The overall estimate of calories per person per day for this analysis combines data from multiple sources. Section 2 describes both the data sources and the process for validating the data. Section 3 outlines the measurement methodology used to capture total LRB volumes and calories. Section 4 describes the different reporting levels used to monitor progress toward the community calorie goal. Finally, Section 5 summarizes limitations of the measurement approach.

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[1] Westerterp, K.R., & Goris, A.H.C. (2002). Validity of the assessment of dietary intake: Problems of misreporting. *Current Opinion in Clinical Nutrition and Metabolic Care*, 5(5), 489-493. Barrett-Connor, E. (1991). & Nutrition epidemiology: how do we know what they ate? *The American Journal of Clinical Nutrition*, 54(1), 182S-187S.

II.   DATA SOURCES & VALIDATION

Three publicly-available datasets, including Nielsen's Scantrack, Beverage Marketing Corporation's DrinkTell, and Beverage Digest's Fact Book, were used to measure progress toward the national calorie goal. At the community level, however, there are no comprehensive, publicly-available sources of LRB sales volume data. As a result, this analysis integrates BCI Company sales data and customized Nielsen Scantrack data to develop a comprehensive estimate of LRB calorie consumption.

2.1   BCI Company Customer Lists

At the community level, BCI Companies maintain the most comprehensive data on beverage sales volumes, and are able to report the volume of beverages delivered to individual retail and wholesale customers.[2] To monitor progress toward the community calorie goal, BCI Companies agreed to report brand- and flavor-level sales volume data for each community to Keybridge. As a first step in this reporting process, each BCI Company provided proprietary lists of their retail and wholesale customers, including food stores, restaurants, work places, institutional customers (e.g., hospitals and schools), and distributors in each BCI Community. These customer lists included every entity within the BCI Communities that purchased beverages from one of the BCI Companies in 2014 and 2015.

These customer lists were scrutinized and validated using several methods. First, addresses were confirmed and synced using SmartyStreets software. Locations that could not be found using this software were then confirmed using Google Streetview. These steps revealed a small number of locations that were included in the customer lists due to incorrect zip code information. Customer lists were then compared across BCI Companies to identify stores and restaurants that may have been excluded due to incorrect zip code information. These comparisons revealed a few stores in each BCI Community that were mistakenly excluded from one of the companies' lists. Due to the proprietary nature of the customer lists, this check could only be implemented for chains and large independent stores. Other customers (e.g., small, independent stores and restaurants) excluded from customer lists due to incorrect zip code information could not be identified. This limitation could result in slight underreporting of beverage volume data.

Reviewing customer lists also enabled the identification of customers that primarily serve populations living outside the BCI Communities. These customers include a small number of distributors located in the Bronx-Brooklyn, Little Rock, and Eastern L.A. BCI Communities and casinos in the Mississippi Delta BCI Community.[3] Therefore, changes in the beverage sales volumes shipped to these customers reflect changes in distribution patterns or in consumption of people living primarily outside of BCI Communities. Therefore, the BCI Companies were asked to

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[2] BCI Companies report data for brands that they own as well as for those that they distribute, which can vary by region. For example, Dr Pepper Snapple Group products are often distributed by bottling companies that are owned by or aligned with Coca-Cola or PepsiCo. In those cases, the company distributing the beverages is the one that reports the volumes shipped to customers in the selected communities.

[3] While located in BCI Communities, these distributors serve much larger geographies (e.g. a distributor in the Bronx which sells beverages throughout the New York tri-state area). Similarly, casinos in Tunica, MS – a regional gaming hub – primarily serve guests from surrounding counties and states.

exclude shipments to these customers. Nevertheless, a portion of the volumes shipped to distributors and sold in the local communities are accounted for in a process described in Section 3.2.4. Similar adjustments were not made, however, to account for beverages consumed by the local population in the Mississippi Delta casinos. This factor likely contributes a slight downward bias to the estimated levels of per person LRB calorie consumption, but not to the estimated percent change in that level.

2.2 BCI Company-Reported Beverage Volume Data

After revising customer lists, BCI Companies reported brand- and flavor-level sales volumes aggregated across all customers for each BCI Community. Packaged beverage sales volumes were reported separately from volumes sold through fountain machines. This data included complete sales volumes of all brands and flavors delivered directly by BCI Companies to retail and wholesale locations. The data did not include beverages delivered through warehouses or beverages sourced from third parties. Section 3.2.3 and Section 3.2.4 outline the process developed for estimating these volumes.

A number of consistency checks were implemented to verify company-reported beverage sales volumes for completeness and accuracy. These checks include:

- Comparing the volume shares of BCI Company beverages (excluding fountain) in the company-reported data and in the Nielsen Scantrack data;

- Comparing the volume share for companies and brands across data submissions across multiple years (if applicable);

- Comparing the volume share for BCI Companies, beverage categories, and major brands at the community and national levels; and

- Comparing the volume totals for a BCI Company's brand-level data to the sum of volumes reported for each customer.

2.3 Beverage Volume Data from Nielsen Scantrack

To supplement BCI Company-reported sales volume data, this analysis uses data from The Nielsen Company's Scantrack dataset ("Scantrack"). This dataset includes annual beverage sales volumes based on transaction-level data from a sample of stores across 52 market areas (i.e., unique groupings of counties specific to the Scantrack dataset). Retailers report total sales of beverages scanned from thousands of stores across the country. In each market area, Nielsen collects data from a representative sample of stores across multiple channels, including food, convenience, drug, dollar, and club/mass merchandiser stores. The data is tracked and reported at the stock keeping unit ("SKU") level, which enables a calculation of average container sizes.[4]

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[4] Data reported by BCI Companies is at the brand-level and does not indicate container sizes.

Nielsen provided aggregated beverage sales volumes for a set of stores located within the BCI Communities ("Scantrack stores"). The representativeness of this store sample varies by community. In all but the Bronx-Brooklyn BCI Community, the store sample accounted for 32 to 75 percent of estimated packaged beverage sales and included multiple stores in each store channel. In the Bronx-Brooklyn BCI Community, the store sample is the smallest and does not include any grocery or mass merchandiser stores. Specifically, the total beverage sales volumes of Scantrack stores account for an estimated 5 percent of estimated packaged beverage sales in this community.

In addition to these BCI Community datasets, projected market area and national datasets were obtained to enable a greater understanding of the context within which each BCI Community is located.[5] These datasets differ from the BCI Community datasets because the former include projections to estimate sales from stores that do not report data. As a result, the BCI Community and market area datasets are not comparable with one another. Market area Scantrack data are, however, comparable with national Scantrack data. These comparisons were made to identify whether the differences from national trends observed in BCI Communities were particular to those communities or shared across a broader geography.

All Scantrack datasets lack coverage of key market segments that contribute to total beverage sales volumes. Specifically, they do not include volumes sold through fountain machines, through small and independent stores, or through restaurants, bars, caterers, and full-service vending. As a result of these exclusions, national Scantrack data represent about 59 percent of LRB calories at a national level. The coverage and store sample limitations explain why the Scantrack data offer a less complete summary of total LRB sales volumes compared to BCI Company-reported sales volumes. However, Scantrack data provide a basis for estimating sales volumes of Non-BCI Company beverages and BCI Company beverages delivered through warehouses, two sources of sales volumes that BCI Companies are unable to report.

As part of the national calorie goal analysis, the Scantrack dataset was scrutinized for reporting errors. All changes made to attributes of beverages, such as corrections to calorie and container size information, were applied to the same beverages in the datasets used for the community calorie goal analysis. These adjustments are detailed in Section 2.3.1 in Appendix B of the BCI Report on 2015 Progress on the National Initiative.

2.4   Dun & Bradstreet/Hoover Store Lists

A complete list of businesses across the BCI Communities was obtained from a subsidiary of Dun & Bradstreet, Hoover's, Inc., an online database with records for just under 18 million businesses in the United States. Hoover's reports the name, address, industry, number of employees, annual revenues, and square footage, among other attributes, for each business establishment. Records were obtained for all businesses that were located in each of the BCI Communities and included in a channel that would be expected to sell beverages. These channels included all

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[5] The market areas include much larger geographies than the BCI Communities. For example, the Los Angeles market area spans a large portion of Southern California with a population of 17.7 million in 2014, whereas the Eastern L.A. BCI Community had a population of 287,000 in 2014.

convenience, gas, grocery, drug, dollar, liquor stores, mass merchandisers, and restaurants.[6] The comprehensive list of businesses in each BCI Community was used to identify locations that were not reported in the BCI Companies' customer lists and may have sourced BCI Company beverages from third parties.

2.5 Beverage Calorie Data

For the national calorie goal analysis, a comprehensive brand and flavor-level calorie library was constructed. This library was also used for the community calorie goal analysis. The library was built from multiple sources. BCI Companies provided information on calories per ounce for their different brands and flavors. Nielsen and the Beverage Marketing Corporation reported calories per ounce for the beverages included in the Scantrack and Drinktell datasets, respectively. This library also incorporated changes in calorie content due to product reformulations reported by BCI Companies. Overlap among the different sources in the calories per ounce reported for individual brands and flavors was used to validate the library, in addition to internal consistency checks and Internet research.

2.6 Population Data

Calculating population size in the BCI Communities requires two datasets from the American Community Survey ("ACS").[7] The ACS is a nationwide, continuous survey administered by the U.S. Census Bureau to collect detailed information for local areas on demographic, housing, social, and economic data. Due to sample size limitations, the Census Bureau publishes 1-, 3-, and 5-year population estimates for geographies of different sizes. For smaller geographies, such as census tracts and zip codes, only 5-year estimates are available. Population estimates for the periods 2010-2014 and 2011-2015 were summed across all zip codes included in the BCI Communities to calculate baseline population. While these data do not reflect the population estimates for the individual baseline years, the community populations should not vary dramatically from one year to the next. Therefore, these estimates should closely approximate baseline year populations in each community. Because 5-year estimates include data for multiple overlapping years, they do not provide good estimates of annual population change. Therefore, to more appropriately estimate population change, the rates of change in the 1-year estimate for the counties where the zip codes are located were applied to the baseline estimates. This analysis will use more precise population estimates from the Census Bureau in the future as they become available.

Commuter-adjusted daytime population estimates were used to understand the net flow of commuters in and out of the BCI Communities, a factor that may bias calorie consumption estimates. For the Mississippi Delta and Montgomery-Lowndes BCI Communities, daytime population estimates at the county level are available from the U.S. Census Bureau, 2006-2010

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[6] Records were downloaded for all businesses with the following NAICS (North American Industry Classification System) codes: 44511, 44512, 44521, 44522, 44531, 44611, 44711, 44719, 45291, 45299, 72241, 72251, 44523, and 44529.

[7] U.S. Census Bureau, American Community Survey 2010-14 5-year estimates, Table B01003 and US Census Bureau, American Community Survey 2014 and 2015 1-year estimates, Table B01003.

ACS. For The Eastern L.A., Bronx-Brooklyn, and Little Rock BCI Communities, more localized data was needed. Daytime population estimates at the census tract level were obtained through the Environmental Systems Research Institute ("Esri") ArcGIS software.[8] These estimates are calculated by Esri's Data Development Team from multiple sources of information, including the U.S. Census Bureau, the ACS, and Infogroup.[9] Individual census tracts located within zip codes were identified using 2010 ZIP Code Tabulation Areas (ZCTA) Relationship Files available through the U.S. Census Bureau's website.[10]

III. KEY CALCULATIONS

3.1 Estimating Calories Per Person Per Day

This analysis uses beverage sales volumes at the brand and flavor level. These volumes, which serve as a proxy for beverage consumption, are converted into ounces and multiplied by calories per ounce for each brand and flavor. The resulting calorie estimates are then summed to estimate total LRB calorie consumption. The total in each community is then divided by the resident population and 365 days to arrive at an estimate of daily per person LRB calorie consumption.

3.2 Estimating Total Beverage Consumption by Brand & Flavor

To form a comprehensive estimate of calorie consumption, this analysis integrates BCI Company sales data and customized Nielsen Scantrack data. Different data sources and methodologies were used to estimate beverage sales volumes grouped into four categories: (1) BCI Company beverages delivered by the BCI Companies; (2) Non-BCI Company beverages; (3) BCI Company beverages delivered through warehouses; and (4) BCI Company beverages sourced from third parties. Figure A1 illustrates the relative size of each category in terms of total LRB calories, aggregated across the five BCI Communities.

Figure A1
Sources of Total LRB Calories in BCI Communities
Share of Total LRB Calories: BCI vs. Non-BCI Company Beverages
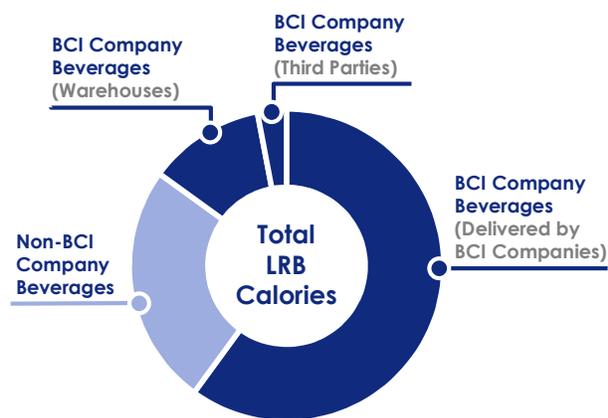
Sources: BCI Company-Reported Volumes & Nielsen Scantrack

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[8] Data were obtained from the USA 2016 Daytime Population Living Atlas Layer accessed through Esri ArcGIS Online.

[9] Esri (2016). Methodology Statement: 2016 Esri Daytime Population. Redlands, California: J10291.

[10] U.S. Census Bureau, 2006-2010 American Community Survey 5-year estimates, 2010 ZIP Code Tabulation Area (ZCTA) to Census Tract Relationship File.

3.2.1 BCI Company Beverages: Delivered by Companies

The sales volumes reported by BCI Companies include beverages sold and shipped directly to stores, restaurants, other businesses, and institutional customers (e.g., hospitals) by bottlers. As illustrated in Figure A1, these beverage account for the majority of the estimated LRB calories consumed in the five communities.

3.2.2 Non-BCI Company Beverages

Beverages produced and marketed by companies that are not participating in the BCI are referred to as Non-BCI Company beverages. Scantrack is the primary source used to estimate volumes of these beverages. As described above, Scantrack data represent only a sample of the total beverage market in each community. Therefore, estimates of Non-BCI Company beverages were scaled up to represent their full market share in each community. For this adjustment, the Non-BCI Company beverage sales volumes reported in Scantrack were multiplied by community-specific scaling factors. These factors were determined by dividing the total BCI packaged beverage sales volumes – excluding brands delivered through warehouses – by the volumes reported in Scantrack for the same brands.[11] In the Mississippi Delta BCI Community, for example, the total sales volume for the same sets of beverages were 1.34 times larger in the BCI Company-reported data than in the Scantrack data, due to the less complete coverage of Scantrack. Therefore, sales volumes for Non-BCI Company beverages reported in Scantrack were scaled up by a factor of 1.34 in order to account for sales of these beverages in stores not included in the Scantrack sample.

One exception to this approach was implemented for the Bronx-Brooklyn BCI Community. Due to the small and biased sample of Scantrack stores within this community, market area sales volume estimates were used to estimate Non-BCI Company beverage volumes, instead of sales volumes from stores located in the community. This alternative methodology provides a more probable calorie consumption estimate, but it also represents a key limitation in estimating Non-BCI Company beverage volumes in this community.

Several assumptions are implicit in the use of this adjustment methodology. First, the estimate of Non-BCI Company beverage sales volumes is scaled up to represent the size of the market for packaged beverages only. It was not scaled to account for sales through the fountain channel. As a result, the analysis assumes that Non-BCI Company beverages are not sold in the fountain channel. While some fountain accounts in these communities may feature Non-BCI Company beverages, their overall contributions are unlikely to be substantial. Data reported in the Beverage Digest's Fact Book validate this assumption. The Fact Book identifies the brands offered in the top 100+ fountain accounts in the nation, all of which are BCI Company brands.

A second assumption is that stores in the Scantrack sample sell the same proportions of Non-BCI Company beverages as stores that are not included in the sample. While it is not possible to fully validate this assumption with the available data, shelf audits that were conducted to measure

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[11] Since BCI Company-reported data included either no data or incomplete data for warehouse direct brands, these brands were not included in the calculation of the scaling ratio.

in-store merchandising efforts partially support this assumption.[12] The data showed that Non-BCI Company beverages represent a similar percentage of shelf space in Scantrack and non-Scantrack stores. The data, however, also suggest that the mix of Non-BCI Company beverages in non-Scantrack stores may be more caloric than in Scantrack stores. On average, the product facings on non-Scantrack store shelves had 16 percent more calories per ounce than facings in Scantrack stores. While facings do not perfectly reflect sales, the difference suggests that this assumption may somewhat underestimate the calories from Non-BCI Company beverages.

3.2.3   BCI Company Beverages: Delivered through Warehouses

While BCI Companies deliver most beverages directly to their final retail and wholesale locations, some beverages are delivered through warehouses. For example, refrigerated juices may be delivered to a Kroger warehouse and then delivered to individual Kroger stores on a Kroger truck. BCI Companies do not generally track the final retail destination of these beverages, and therefore cannot determine whether the beverages are sold inside or outside the BCI Communities. Therefore, the sales volumes of these beverages are not included in the data that the BCI Companies report.[13] These beverages are, however, included in Scantrack. The same methodology that was used to estimate Non-BCI Company beverage volumes was used to estimate the sales volumes of BCI Company beverages delivered through warehouses, with only slight revisions.[14]

3.2.4   BCI Company Beverages: Sourced from Third Parties

In the BCI Communities, some small and independent food stores and restaurants purchase BCI Company beverages from third-party sources other than BCI Companies. When this happens, the sales volumes for BCI Company beverages are not included in the BCI Company sales data unless the independent source is located within the BCI Community and purchasing those beverages directly from BCI Companies. The prevalence of purchases of BCI Company beverages from third parties varies by BCI Community. Specifically:

- In the Bronx-Brooklyn BCI Community, the practice of sourcing beverages from third parties is more common than in other markets. An estimated 14 percent of BCI Company beverages are sourced from third parties in this community.

- In the Eastern L.A. and Little Rock BCI Communities, third-party sourcing of beverages is less common. Beverages from these third-party sources are estimated to represent 6 and 3 percent of the BCI Company beverage volumes, respectively.

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[12] Shelf audits were conducted at approximately 30 stores in each of the BCI Communities in order to assess the amount of shelf, cooler, and display space occupied by different types of beverages. More information about these audits will be provided in a future report that features this data.

[13] BCI Companies reported incomplete volume data for some products that are primarily delivered through warehouses, but occasionally delivered directly to customers. This data was not used because it was unclear what share of the total volumes these data represented.

[14] The only difference was that the calculation of the scaling ratios used only the volumes reported by the BCI Companies rather than total volumes. Also, BCI Companies were able to report fountain volumes for all of their brands.

- In the Mississippi Delta and Montgomery-Lowndes BCI Communities, the amount of BCI Company beverages sourced from third parties is inconsequential. The reasons for this include the following: First, independent distributors generally play a smaller role in these communities. Second, the communities are geographically larger, which means that distributors located there likely distribute most of their beverages within the community. For this reason, their volumes were not excluded in company-reported data for these communities.[15] Third, small retailers who purchase the beverages from larger retailers are likely to do so from mass merchandisers located inside the selected communities. These volumes are included in BCI Company-reported data.

Calculating the sales volumes of BCI Company beverages sourced from third parties required three underlying estimates: (1) an estimate of the number of stores not included in the BCI Company lists but likely selling BCI Company beverages; (2) an estimate of the average beverage sales volumes in these stores, and (3) an estimate of the product mix of these beverages. Calories from BCI Company beverages sourced from third parties were then calculated by multiplying these factors.

(1) Step 1: Identifying Locations that Receive Beverages Sourced from Third Parties

Comparing the BCI Company customer lists and the Hoover's list enabled an estimate of the number of stores likely procuring BCI Company beverages through independent sources. Stores included in all three of the BCI Company lists were assumed to source no beverages from third parties. Stores included only in the Hoover's list were assumed to source beverages of all three BCI Companies from third parties. Finally, stores included in one or two of the companies' customer lists were assumed to source only the other companies' beverages from third parties. Unlike stores which typically sell the beverages made by many companies, restaurants usually have exclusive relationships with beverage companies. Restaurants included in the Hoover's list and missing from all BCI Company lists were assumed to receive beverages from third parties.

The final output of this process was a list of stores and restaurants that were assumed to source BCI Company beverages from third parties. To verify the locations, Hoover's-only stores were investigated through Google Streetview and online research to verify that they were both in the BCI Community and still in business. To verify the assumption that these stores sell BCI Company beverages, more than 30 stores and restaurants in the Little Rock and Eastern L.A. BCI Communities were visited to confirm the types of beverages sold. All of them sold BCI Company beverages and all but one obtained them from a third party.

(2) Step 2: Estimating Average Volumes of BCI Company Beverages Sourced from Third Parties

The next step was to estimate the average sales volumes of BCI Company beverages sold by stores and restaurants that source beverages from third parties. The stores identified in the Hoover's list included the number of employees, annual revenues, and square footage of each business. Using this information, the median value for each characteristic was calculated for each location identified in Step 1. Next, a set of comparison stores was selected from each of

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[15] There were no distributors in the Mississippi Delta BCI Community. Two distributors located in the Montgomery-Lowndes BCI Community confirmed that the products delivered to them are primarily distributed within the community.

the BCI Company lists that were similar to the locations identified in the Hoover's list. For these comparison stores, each BCI Company calculated median beverage sales. These numbers were added across the three BCI Companies to estimate the total sales to a store that procures beverages from third parties.

The BCI Companies also agreed that average sales are likely to be lower in stores where they do not directly supply and market beverages. To account for this, each company was asked to estimate the impact that this would have on overall sales. The average of these estimates – 30 percent – was then applied to the overall per store sales estimates. This factor will be held constant over the measurement period. Stores included in one or two of the BCI Company customer lists were assumed to source the beverages made by the other companies from third parties. The volume of third-party sourced beverages was scaled down to reflect the average market share of the companies that did not directly provide beverages to them.

For restaurants, BCI Companies were asked to estimate average sales volumes of packaged beverages to a comparison sample of restaurants for where they have exclusive contracts. Rather than summing these estimates, the number was averaged, reflecting the likelihood that restaurants would only receive beverages from one company. The 30 percent reduction applied to beverage volume estimates for retail outlets was not applied to restaurants. Company marketing efforts were considered to be less influential in determining beverages purchased relative to other factors, like the number of meals served.

(3)   Step 3: Estimating the Average Product Mix of Beverages Sourced from Third Parties

Product mix was the third piece of information needed to calculate beverage calories sourced from third parties. It was assumed that the average product mix of BCI Company beverages in stores with independently-procured beverages was the same as the non-fountain product mix in stores that received beverages directly from BCI Companies. Going forward, this mix will be updated each year based on the new beverage volumes reported by BCI Companies.

The BCI Companies suggested that the approach, outlined above, for estimating product mix in stores with third-party sourced beverages may underestimate calories. Companies indicated that these stores tend to offer more full-calorie beverages. Based on this input, an alternative approach was tested. Shifting the product mix to include a greater proportion of full-calorie beverages did not have a significant impact on the overall calorie estimates. Therefore, the approach discussed above was chosen for simplicity and transparency.[16]

3.3   Estimation of Additional Metrics

Other metrics were calculated to demonstrate potential underlying drivers of changes in per person LRB calorie consumption. Two of these metrics – calories per ounce and volumes per

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[16] For this alternative approach, BCI Companies reported customized estimates of the product mix that they would expect in retail stores and restaurants that source beverages from third parties. Based on this estimated product mix, the average calories per 8 ounces was higher, reflecting an assumption by companies that the mix of beverages sold in these stores would be more skewed toward full-calorie beverages. The difference in average calories per 8 ounces between the two approaches was not large enough to notably affect per person LRB calorie consumption estimates.

person – were calculated as part of the process of estimating calories per person. Additionally, changes in average container sizes, calculated using Scantrack data, is another important driver that could contribute toward future calorie reductions. The average container size analysis focuses on beverage containers less than or equal to one liter in size.[17] For this calculation, the total number of ounces sold in these containers was summed and divided by the total number of containers for each beverage category.

IV. CORROBORATING ESTIMATES

Multiple estimates of the community calorie goal metrics are reported to provide transparency. As discussed in Section 3, the primary estimate of calories per person per day is based on BCI Company-reported brand and flavor level sales volumes; custom data provided by Nielsen Scantrack; and various data adjustments. This estimate is referred to as the "total LRB estimate", given that it attempts to capture beverage volumes from all sources in the BCI Communities. Two additional estimates of beverage calories per person per day are provided based on the unadjusted BCI Company-reported data and Scantrack data. These two estimates do not capture key segments of LRB sales volumes, but their inclusion ensures transparency and helps to illustrate some of the underlying drivers of caloric change. To summarize, these three measures of calories consumed per person per day differ in the following ways:

- **Total LRB Estimate:** This estimate includes the data and adjustments described in Section 2 and Section 3. It is the most comprehensive estimate, as it attempts to account for every source of beverage calories in a given community. This estimate serves as the primary measure of progress toward the community calorie goal.

- **Estimate Based on BCI Company-Reported Data:** This estimate aggregates the raw data reported by BCI Companies. Unlike the total LRB estimate, this data is not adjusted to account for BCI Company beverages delivered through warehouses or third parties. It also does not include Non-BCI Company beverages.

- **Estimate Based on Scantrack Data:** This estimate includes all beverage sales volumes reported in Scantrack. This dataset reflects sales volumes of all beverages sold in a set of stores located in the BCI Communities for two consecutive years, including BCI and Non-BCI Company beverages, as well as directly-delivered and warehouse-delivered beverages. The data are not, however, scaled to reflect the full size of the market. Also, they do not include beverages sold through several key channels, including all fountain beverages.

Each estimate has strengths and limitations. On balance, the total LRB estimate aligns most closely with the community calorie goal.

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[17] The analysis excludes products in containers larger than one liter, given that they are nearly always considered multi-serve beverages. While many beverage products that are less than or equal to one liter are also considered multi-serve beverages, some consumers treat them as a single portion and thus the calculation includes them. Also, products in the one-liter size range are relatively uncommon, and so their inclusion does not significantly impact the results.

V. LIMITATIONS

Unlike the estimation of calorie consumption at the national level, data limitations create notable uncertainties around estimating per person LRB calorie consumption in the BCI Communities. These uncertainties are driven in large part by the small size of the BCI Communities and the movement of people and beverage products across borders. This section highlights the most significant uncertainties underlying the total LRB estimate, including:

- **Population Estimates:** As discussed, the samples used to estimate population for the BCI Communities are too small to provide accurate measures of population change. This source of uncertainty should decline significantly over time as population trends become clearer with the availability of additional years of data and revisions enabled by the 2020 Census.

- **Commuting & Shopping Patterns:** There is uncertainty created by commuting and shopping patterns that inhibits the linking of beverage sales in a specific geography to the consumers residing in that same area. In different communities, these flows of people may result in upward (likely in the Montgomery-Lowndes BCI Community) or downward (likely in the Eastern L.A. and Bronx-Brooklyn BCI Communities) biases of different magnitudes.[18] Nevertheless, these biases should not change significantly over time and therefore should not affect estimates of the percent change in per person LRB calorie consumption. Biases that could affect estimates of change could result from the opening or closing of major shopping centers near the boundaries of BCI Communities during the commitment period. Controlling for such an occurrence may require adjustments to the methodology that will be communicated in future reports.

- **Excluded Beverage Sales Volumes:** Some beverages are not reported in any dataset. Examples include Non-BCI Company beverages sold in fountain machines and beverages consumed by the local population at casinos that primarily serve people from outside of the community. Such volumes are difficult to estimate with any degree of confidence and they are therefore excluded. These exclusions could result in small downward biases, but they

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[18] The Montgomery-Lowndes BCI Community has a daytime population that is 15 percent larger than its official population due to people commuting in from other counties. Some of the beverage consumption estimated for this community is attributable to these commuters. This volume is likely to be larger than the beverage volumes consumed by the smaller number of people commuting out of the community. This creates an upward bias. In contrast, daytime populations in the Eastern L.A. and Bronx-Brooklyn BCI Communities are 10 and 12 percent smaller than official estimates of resident population. Beverage purchases by local residents outside of the community boundaries, which are excluded from the analysis, and are likely to be larger than beverage volumes purchased by the smaller number of people commuting into the community. This creates a downward bias. Similar estimates were tabulated for the Mississippi Delta and Little Rock BCI Communities, but the estimated scale and direction of the net flow of commuters was less certain. In the Mississippi Delta BCI Community, a net inflow of commuters appeared to be driven by people going to casinos in Tunica, locations that were specifically excluded from this analysis. In the Little Rock BCI Community, a majority of the net inflow of people was driven by two census tracts. One includes the airport and the other includes a major shopping center that falls both inside and outside of the BCI Community. These factors made it impossible to provide reliable estimates of the net flow of commuters.

Sources: County-level estimates used for Montgomery-Lowndes and Mississippi Delta are from the U.S. Census Bureau, American Community Survey 2006-10, Commuter-Adjusted Daytime Population: States, Counties, Puerto Rico, Municipios (Table 1). Census tract estimates used for the other communities are from U.S. Census Bureau 2010 Zip Code Tabulation Areas Relationship to Census Tracts & Esri 2016 Daytime and Nighttime Population Estimates.

enable a more accurate assessment of the percent change of per person LRB calorie consumption.

- **Non-Scantrack Stores:** BCI Companies are able to report the volumes for most of their own beverages sold in non-Scantrack stores. However, no data source provides the sales volumes of Non-BCI Company beverages and BCI Company beverages delivered through warehouses in non-Scantrack stores. Therefore, these volumes are estimated. In all communities except for the Bronx-Brooklyn BCI Community, the samples of stores reporting data in Scantrack represent a significant share of the beverage market, providing a good basis for estimating sales volumes across all stores. Nevertheless, the assumption used – that market shares and product mix for these beverages are the same in the Scantrack sample stores as they are in the remaining outlets – could create an upward or downward bias. However, it is unlikely to bias estimates of change.

- **BCI Company Beverages Sourced from Third Parties:** Excluding these beverages from the total LRB estimate could introduce bias in future years if BCI Companies begin selling beverages to stores and restaurants that previously procured beverages from third parties. Therefore, calories from these beverages were included in total LRB estimates. While estimates of their size and composition are more uncertain than other estimated volumes included in this analysis, sensitivity checks around these estimates show that significant changes in assumptions have minimal effects on estimates of changes in the Eastern L.A. and Little Rock BCI Communities. These beverages account for an estimated 4 and 2 percent, respectively, of total calories in those communities. In the Bronx-Brooklyn BCI Community, a larger proportion of BCI Company beverages are sourced from third parties. As a result, these underlying assumptions may have a notable impact on the estimates of caloric change. In future years, sensitivity analyses will continue to be conducted to ensure that sources of uncertainty are assessed and communicated if significant.

These limitations create uncertainty, but over time they will become less of a constraint in terms of measuring progress toward the community calorie goal. First, while these uncertainties may bias the estimated levels of LRB calorie consumption per person, the use of a consistent methodology should ensure that these biases do not change over the measurement period. As a result, they should not bias the estimated percent change in LRB calories per person, which is the primary goal of this measurement effort. Second, uncertainty should decline with time. Additional data collected over the course of the next decade should help to more clearly define trends in local beverage volume and population data. Also, if the 20 percent calorie reduction goals are to be met, then the measured changes in beverage calorie consumption should greatly exceed the relative uncertainty of those estimates.