

2025 Beverage Calories Initiative: Detailed Methodology for Report on 2017 Progress

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SECTION 1

METHODOLOGY SUMMARIES

I. NATIONAL METHODOLOGY SUMMARY

The measurement approach used to monitor progress toward the national calorie goal consists of three features: (1) the use of sales volume data as a proxy for consumption; (2) the use of multiple data sources to corroborate shifts in beverage volumes; and (3) the measurement of underlying drivers contributing to overall shifts in beverage consumption.

Several considerations justify the use of sales data to approximate consumption. First, as long as the proportion of consumer waste and spillage (i.e., the primary difference between what is sold and consumed) does not significantly change over the measurement period, then changes in sales volumes can serve as a reliable proxy for changes in consumption. Second, using sales data enables more up-to-date reporting than would be possible using publicly-available consumption data. Third, using sales data avoids biases associated with dietary recall data.

To ensure that conclusions reflect changes that are broadly observed and not just reflective of a single data source, the verification approach relies on multiple datasets. None of the publicly available sources of beverage sales volumes are sufficiently comprehensive to measure all of the key trends relevant to this initiative. The use of multiple data sources accounts for this limitation, providing a more complete and accurate assessment of changes in beverage calories. Furthermore, the overlap across the data sources enables corroboration of findings. Three sources of data measure and corroborate estimates of per person beverage calories. They include:

- **DrinkTell:** The primary source of volume and calorie data is the Beverage Marketing Corporation's DrinkTell database ("DrinkTell"), which provides complete brand-level data for all beverages included as LRB, but does not provide information about container sizes.
- **Fact Book:** Data from the Beverage Digest Fact Book ("Fact Book") corroborate trends in several beverage categories, including carbonated soft drinks, the largest category in terms of both volumes and calories. This dataset lacks coverage of other beverage categories.
- **Scantrack:** The Nielsen Company's Scantrack ("Scantrack") dataset provides detailed stock keeping unit ("SKU")-level product information, which allows for an examination of container size changes, though it lacks coverage of important sales channels (e.g., fountain beverages).

Furthermore, calorie information was collected from DrinkTell, Scantrack, BCI Companies, and internet research and integrated into a comprehensive product-level calorie database. This database will be updated throughout the commitment period to reflect new products, product reformulations, and any other necessary revisions. Finally, to convert total calorie consumption to a per person basis, this analysis uses population data from the U.S. Census Bureau. While this analysis represents the most up-to-date information available, the findings will be updated as new data become available.

II. COMMUNITIES METHODOLOGY SUMMARY

The measurement approach designed to monitor progress toward the community calorie goal also uses beverage sales volumes as a proxy for consumption. It combines multiple datasets to estimate sales volumes to each community. Finally, to facilitate transparency, findings are reported at multiple levels of data aggregation in this document. This approach applies to the measurement of different estimates of progress, including various measures of caloric and volumetric shifts.

The primary metric used to measure progress is beverage calories per person per day. This estimate, which divides total beverage calories consumed by total population and the number of days in each year, draws on U.S. Census Bureau population data, nutrition information on calories per ounce, and estimates of beverage volumes.

The most challenging aspect of estimating per person beverage calorie consumption in the BCI Communities is determining the total beverages consumed by residents within a narrow geography. Existing estimates of beverage consumption, which are based on nationally representative dietary recall surveys, do not include large enough samples to determine consumption levels in the selected communities. As a result, this analysis uses beverage sales data to approximate consumption. Other metrics featured in this report illustrate underlying trends that contribute toward changes in calorie consumption, including changes in beverage volumes, average calories per 8-ounce serving, and average ounces per container.

Publicly available data provide reliable estimates of total beverage sales volumes at the national level. Some sources also provide regional data that account for sales through most, but not all, channels. However, to estimate total beverage volumes in specific communities requires a methodology that combines data from different sources. At this level, the most comprehensive source of sales volume data is collected by BCI Companies, which track shipments that they directly deliver to food stores, restaurants, and other locations for most of their brands. These volumes account for a majority of the estimated beverage calories consumed in each BCI Community. The remaining beverage volumes include the following:

- (1) Non-BCI Company Beverages:** These beverages are produced and marketed by companies that are not currently participating in the BCI. To estimate sales volumes of Non-BCI Company beverages, data from a sample of stores located in the BCI Communities was obtained from The Nielsen Company's Scantrack dataset. Sales volumes for Non-BCI Company beverages were then grossed up using a scaling factor based on a ratio of sales volumes for products reported by both BCI Companies and Scantrack. To the extent that the product mix of Non-BCI Company beverages is weighted more heavily towards full calorie beverages in small, non-Scantrack stores than in Scantrack stores – a point which is supported by store shelf audit data – this methodology may underestimate calories. Any bias resulting from this limitation would have the greatest impact on calorie estimates in communities where small stores are more common, including the Eastern L.A. and Bronx-Brooklyn BCI Communities.
- (2) BCI Company Beverages Delivered through Warehouses:** BCI Companies deliver some beverages to customer warehouses, which are not included in the customer-specific reports on total shipments. BCI Companies do not track the final retail destination of these products, and therefore cannot determine whether they are sold inside or outside the selected

communities. However, because these products were included in Scantrack, the same methodology used for estimating Non-BCI Company beverage sales can be used to estimate the sales volumes of BCI Company beverages delivered through warehouses.

(3) BCI Company Beverages Sourced from Third Parties: Some retailers, restaurants, and other businesses purchase BCI Company beverages from third parties (e.g., independent distributors, wholesale stores, and club stores) instead of BCI Companies. These sales are therefore not included in the BCI Company sales data and must be estimated to capture a complete picture of consumer purchases in the BCI Communities. To estimate the volume of these beverages, customer lists from BCI Companies were compared to one another and with a list of all businesses provided by Hoover's, a subsidiary of Dun & Bradstreet. This comparison process identified stores and restaurants that were not purchasing beverages from a BCI Company. It was assumed that these locations obtain these beverages from third parties. To estimate the volume of third-party-sourced beverages, the number of locations not serviced directly by BCI Companies was multiplied by an estimate of average sales. The latter was calculated based on sales volumes at similarly sized stores and restaurants that are serviced by BCI Companies.

Together, these data and adjustments form a more comprehensive estimate of per person LRB calorie consumption than an estimate based on a single data source. The adjustments are designed to improve the accuracy of measuring the change in calorie consumption over time. This methodology ensures that estimated shifts in consumption are both driven by underlying sales data and that they are appropriately scaled to reflect each brand's full estimated market share. While the per person calorie estimates are reliable, there are notable uncertainties which are summarized later in this methodology. Importantly, these limitations and the biases they create should remain roughly constant over time, allowing accurate measurement of the changes in per person LRB calorie consumption.

Finally, this methodology document also presents per person calorie estimates based only on unadjusted, raw data sources. These estimates reflect data from Scantrack and BCI Companies with no adjustments to account for missing segments of the beverage market. While these data sources do not capture all LRB calorie consumption and thus are not presented in the report itself, their inclusion in the detailed methodology ensures transparency and facilitates a greater understanding of the underlying drivers of caloric change.

SECTION 2

KEY TERMS & CATEGORIES

This section briefly explains some of the key terms used throughout the report.

- **National Baseline Year:** The commitment did not specify a baseline year for setting the 2025 target level. Given that the agreement was announced toward the end of 2014, this independent evaluation uses 2014 as the baseline. Progress toward the 2025 goal will be benchmarked against the 2014 level of per person beverage calorie consumption.
- **Liquid Refreshment Beverages (“LRB”):** The BCI effort includes beverages referred to as liquid refreshment beverages (“LRB”). LRB refers to most beverages available for purchase through retail stores, fountain, vending machines, and restaurants, and covers nearly all beverages manufactured by the BCI Companies. LRB excludes alcoholic beverages, dairy products, brewed beverages, drink mixes, energy shots, lemon and lime juice, coconut milk, concentrates, flavor drops, and tap water.¹
- **Beverage Categories:** This report displays results using a set of beverage categories as defined by the Beverage Marketing Corporation. These eight categories are: carbonated soft drinks (“CSDs”), sports drinks, ready-to-drink (“RTD”) teas, RTD coffees, 100% juice and juice drinks (i.e., beverages with less than 100 percent juice), energy drinks, value-added waters (e.g., flavored waters), and water (i.e., unenhanced still and carbonated water).
- **Calorie Categories:** This report relies on the same four calorie categories provided in the DrinkTell dataset to segment brands. For an 8-ounce serving, “no-calorie” beverages have fewer than five calories, “low-calorie” beverages have between six and 40 calories, “mid-calorie” beverages have between 41 and 66 calories, and “full-calorie” beverages have 67 calories or more.²
- **BCI Companies & BCI Company Beverages:** The three beverage companies participating in the 2025 Beverage Calories Initiative (“BCI”) – The Coca Cola Company, PepsiCo, and Keurig Dr Pepper (formerly Dr Pepper Snapple Group) – are referred to collectively as BCI Companies. The beverages that they produce and market are referred to as BCI Company beverages.

¹ The inclusion of brewed beverages would make accurate measurement of progress toward the national calorie goal much more difficult given that retail outlets and consumers often add their own sugar, cream, and other caloric additives to brewed teas and coffees. Brewed teas are the only beverages that are made by the BCI Companies in substantial quantities, but not measured.

² Beverage Marketing Corporation reports sales volumes using these definitions, which align closely, but not exactly with the FDA definitions of no- and low-calorie beverages. The difference is that beverages with exactly 5 calories per ounce are counted as no-calorie beverages in the DrinkTell dataset whereas the FDA would consider them low-calorie beverages. Mid-calorie beverages are not differentiated from full-calorie beverages by the FDA. The inclusion of the category provides increased data granularity. The definition of mid-calorie used aligns with the definition used during implementation of the Alliance School Beverage Guidelines.

- **Non-BCI Companies & Non-BCI Company Beverages:** Beverage companies that are not participating in the BCI are referred to as Non-BCI Companies. The beverages that they produce and market are referred to as Non-BCI Company beverages.
- **BCI Community:** The communities selected to participate in the Community Initiative include specific groups of neighborhoods or counties. The geographies of these communities were defined to align with specific zip codes.³ This alignment facilitates the estimation of calories per person using beverage sales volume and population data at the zip code level.
- **Community Baseline Years:** In each BCI Community, the baseline year aligns with the year prior to the launch of implementation activities, which varies across the first five communities. Implementation activities were launched in the summer of 2015 in the Eastern L.A. and Little Rock BCI Communities. As such, progress toward the community goal will be benchmarked against the level of per person LRB calorie consumption in the year prior to the launch of those activities, which was 2014. BCI Company implementation efforts were launched in the Bronx-Brooklyn BCI Community in January 2016, and in the Mississippi Delta and Montgomery-Lowndes BCI Communities in October 2016. Therefore, progress in those communities will be measured against 2015 baseline levels.
- **Bottlers:** BCI Companies work with affiliated bottling companies ("bottlers") who produce, market, and distribute their beverage products locally. The bottlers operating in some BCI Communities are owned by the BCI Companies, while others are independent. In all cases, the bottlers are working in concert with the BCI Companies to implement the Community Initiative. For simplicity, the term BCI Companies is sometimes used in a way that is inclusive of the company-affiliated local bottlers.

³ The following is a complete list of the zip codes included in each of the BCI Communities. Eastern L.A. BCI Community: 90022, 90063, 90031, 90032, 90033 (excluding census tracts 197200, 199400, 199300, 201301 and 199110 which are comprised of non-residential areas in order to align with the community boundaries). Little Rock BCI Community: 72202, 72204, 72206, 72209. Bronx-Brooklyn BCI Community: 10454, 10455, 10459, 11238, 11213, 11216, 10474. Montgomery-Lowndes BCI Community: 36013, 36040, 36064, 36104, 36105, 36106, 36107, 36108, 36109, 36110, 36111, 36112, 36113, 36115, 36116, 36117, 36752, 36043, 36047, 36052, 36032, 36785, 36069, 36036. Mississippi Delta BCI Community: 38606, 38614, 38617, 38619, 38620, 38621, 38622, 38623, 38626, 38630, 38631, 38639, 38643, 38644, 38645, 38646, 38658, 38664, 38666, 38670, 38676, 38720, 38767, 38964.

SECTION 3

DETAILED NATIONAL METHODOLOGY

I. ANALYTICAL FRAMEWORK

The measurement approach includes three features, including: (1) the use of beverage sales volume data as a proxy for consumption; (2) the use of multiple data sources to corroborate shifts in beverage volumes; and (3) the measurement of underlying factors driving changes in per person beverage calorie consumption.

1.1 Sales Volumes as a Proxy for Consumption

This analysis uses beverage sales volumes as a proxy for beverage consumption. 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, but even if substantial, 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.

In future years, consumption data collected through the Centers for Disease Control and Prevention's National Health and Nutrition Examination Survey ("NHANES") can be used as a corroborative data source for changes in national calorie consumption over time. It will not be used as a primary data source for two reasons. First, the NHANES dataset is only available with a significant lag (i.e., two to three years after collection), and its use would not allow for up-to-date progress reports. Second, NHANES data are based on dietary recall surveys. These methods are limited by biases associated with self-reporting. For example, people often have a difficult time recalling exact quantities and types of beverages consumed. Limitations around the accuracy of self-reported dietary intake are well documented.⁴

1.2 Data Corroboration

A second feature of this analysis is the use of multiple data sources to measure beverage sales and corroborate results. Each publicly available source of beverage volume data suffers from certain limitations and uncertainties. Using multiple data sources mitigates the constraints of any one source, thereby improving the completeness and accuracy of results. This report captures changes in beverage calories per person using three sources of beverage sales volume data: (1) Beverage Marketing Corporation's DrinkTell dataset ("DrinkTell") (2) The Nielsen Company's

⁴ 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.

Scantrack dataset (“Scantrack”), and (3) Beverage Digest’s Fact Book (“Fact Book”). While these data sources are robust, each has one or more limitations in terms of coverage and granularity. Once integrated, however, they present a more comprehensive picture of changes in beverage volumes. DrinkTell, the most complete data source of the three, is used as the primary source for measuring beverage calories per person nationally.

1.3 Measuring Underlying Factors

This analysis tracks some of the underlying changes contributing to the overall calorie goal. These factors include changes in (1) calories per ounce, (2) ounces per serving, and (3) servings per person. This information illustrates at a more granular level how progress toward the calorie goal is being achieved and how consumer tastes are evolving. The data collected to measure the calorie goal are also used to measure the evolution of these factors.

II. DATA SOURCES & VALIDATION

The national analysis relies on publicly available data from DrinkTell, Scantrack, the Fact Book, and the U.S. Census Bureau to estimate total LRB sales volumes, LRB calories, and container sizes.

2.1 Beverage Marketing Corporation DrinkTell Database

The Beverage Marketing Corporation’s DrinkTell database is the primary source of information used for this analysis. This data source is based primarily on confidential sales volume data provided directly by beverage companies and is supplemented with Nielsen and IRI scanner data, publicly-available earnings reports from beverage companies, and other sources. DrinkTell covers approximately 2,500 brands across all sales channels, including fountain sales.

Although comprehensive in terms of its coverage of LRB, the DrinkTell dataset reports volumes at the brand level instead of the more granular SKU level. As a result, it is not possible to track changes in container sizes. Additionally, though sales were estimated at a sub-brand level (e.g., Lipton Iced Teas with 0-5 calories per 8 ounces) for the purposes of the BCI analysis, the most granular sales volume data in the DrinkTell dataset for most products is at the brand level (e.g., Lipton Iced Tea). This limitation required BMC to make reasonable assumptions about the distribution of sales across product lines within a brand. These assumptions may decrease the precision of estimates made using DrinkTell data. However, the assumptions do not appear to create any biases. These assumptions will remain consistent throughout the commitment period, and if new data suggest that the assumptions should be changed, they will be changed for all years in the same way to ensure consistency. One known shortcoming of this data is that the DrinkTell data may not reflect changes in the share of sales among product lines of the same brand. Over time, Scantrack data, which captures sales at the SKU level, will be used to identify such shifts and to estimate if they have a material effect on the findings. Another limitation of the dataset is that brands with small

sales volumes are reported collectively as “other brands” within each beverage and calorie category (e.g., “other no-calorie CSDs”).⁵

2.2 Nielsen Scantrack Dataset

The analysis uses the Nielsen Company's Scantrack data to corroborate beverage volume and calorie estimates. This dataset reports total beverage sales volumes based on transactions from a sample of stores. Hundreds of retailers report sales volume data on products scanned from thousands of stores across the country. Based on this sample, Nielsen scales up the data to approximate all beverages sold in most food, convenience, drug, dollar, and mass merchandiser stores. A key feature of the Scantrack dataset is that it reports beverage volumes by SKU. This level of granularity enables tracking of detailed information on calories per ounce, container size (i.e., fluid ounces per bottle, can, etc.), and the number of containers per unit (i.e., individual bottle, 6-pack, 24-pack, etc.).

The Scantrack dataset is limited in its coverage of important market segments. Most importantly for the purpose of this report, Scantrack does not include fountain sales volumes, which represent a large segment of many beverage categories, especially CSDs. This dataset includes limited coverage of beverage volumes sold through small and independent grocery stores (i.e., stores with less than \$2 million in annual sales) and small and independent drug stores (i.e., stores with less \$1 million in annual sales). Finally, the dataset does not capture other beverage volumes sold through restaurants and bars, caterers, and full-service vending. As a result of these exclusions, Scantrack includes just under 60 percent of the LRB calories captured by DrinkTell. Comparisons of total volumes across the two datasets may not be instructive for a given year, because the coverage differences in the datasets mean that the expected level for any given year should not align, and therefore cannot corroborate each other. However, the Scantrack dataset will be helpful for corroborating major changes in the LRB product mix and calories as reported by DrinkTell over multiple years. Additionally, the coverage limitations of Scantrack can be exploited to observe differences between changes observed in market segments covered by Scantrack and those that are not covered.

2.3 Beverage Digest Fact Book

This analysis also integrates data from Beverage Digest's Fact Book. This annual publication provides all-channel, brand-level volume estimates. These data are compiled annually by Beverage Digest from various sources using a proprietary methodology. With comprehensive coverage for several beverage categories, including CSDs, the Fact Book can corroborate brand- and category-level volume estimates reported by DrinkTell. The Fact Book, however, does not include several categories important for monitoring this commitment, including refrigerated and multi-serve shelf stable 100% juices and juice drinks, some refrigerated teas, bulk bottled water,

⁵ Changes to previous estimates are primarily the result of updates to the brand-level sales volume estimates provided by DrinkTell due to volume re-statements from their data sources. In order to present the most accurate calculations each year, previous calculations are refreshed so that all estimates in this report reflect the most up-to-date data on beverage volumes and calories.

and RTD coffees. As a result of these exclusions, the calorie totals reported in the Fact Book are about 89 percent of the totals estimated from the DrinkTell dataset.

2.4 Data on Beverage Calories

Estimating total LRB calories required the development of a comprehensive calorie database to integrate data from four sources. The DrinkTell and Scantrack datasets reported calorie information for most products along with the beverage volume estimates. To supplement and corroborate this information, BCI Companies reported information for their individual products. Finally, to fill remaining gaps in the data, particularly for individual beverage products with large volumes, internet research provided missing calorie information.

2.5 Data on the U.S. Population Size

The calculation of calories per person uses population data from the U.S. Census Bureau. The Census Bureau integrates data on births, deaths, and migrations to produce a time series of population estimates from the most recent decennial census. This annually-updated series provides estimates for the most recent year and updated estimates for previous years.⁶ As newer population estimates become available, future reports will incorporate those revisions which may affect both the 2014 baseline per person estimate and the 2025 target.

III. ADJUSTMENTS

Integrating data from multiple sources enabled the identification and correction of inconsistencies and gaps in the data. Although the LRB volume estimates required no changes, this section outlines adjustments to the calorie and package size information provided by DrinkTell and Scantrack.

3.1 Adjustments to Calorie Database

Constructing the calorie database required a two-step process. The first step was to create a crosswalk between the brand-level calorie data from DrinkTell and the SKU-level calorie data from Scantrack.⁷ By assigning each SKU to a specific brand, calorie estimates were compared across datasets. Additionally, within Scantrack, a comparison between the calorie counts for individual SKUs and the weighted average among all SKUs of the same brand revealed inconsistencies in calorie information. Keyword searches were used throughout the dataset in categories such as CSDs and energy drinks to ensure that all products with descriptions that suggested they might be reduced-calorie (e.g., diet, zero, sugar-free) products, were classified as such.

⁶ The data come from the table NST-EST2016-01, which provides Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2016

⁷ This analysis assumes that the smaller brands, which DrinkTell combines into "other brands" categories, have the same number of calories per ounce as the weighted average of calories per ounce among the brands within the same beverage and calorie categories. For example, the analysis assumes that the beverages lumped together as "other full-calorie CSDs" have the same calories per ounce as average of the full-calorie CSD brands that are listed individually.

The next step drew upon additional information from BCI Companies and/or internet research to resolve discrepancies. For the data used in the 2017 BCI report, this process resulted in revisions to seven out of the 326 non-juice brands in the DrinkTell dataset (see below for adjustments to juices) and 13,532 out of 54,992 SKUs in the Scantrack dataset.⁸ Most of these adjustments were carried over from changes made to products in previous Scantrack datasets. All new changes were applied to the 2014, 2015, 2016, and 2017 data so that all products were assumed to have the same number of calories per ounce throughout the measurement period, with the exception of a small number of products that experienced a caloric change due to independently-confirmed reformulations. Over the period of the commitment, this calorie library will be updated as newer information becomes available. The adjustments made to beverages in this database were applied to both the DrinkTell and Scantrack datasets.

3.2 Adjustments to Container Size Data

A systematic review of the Scantrack container size data revealed inconsistencies that required revision. The multiple data fields available in the Scantrack dataset allowed problems to be identified and corrected. For example, if data showed that an individual product was both a 6 pack (as indicated in the product description) and a single unit (as indicated in the unit information), then the product was flagged for further investigation. Review of additional data fields, such as the average price of the SKU, helped to determine which container size information was correct. This level of scrutiny often revealed patterns that helped to correct systematic inconsistencies in the database (e.g., all 6-packs from a particular manufacturer were incorrectly listed as single units). In total, 291 out of 54,992 SKUs were corrected. This review process included, but was not limited to, the top 5,000 products in terms of both volume and calories⁹, which represented 97.2 percent of volumes and 97.4 percent of calories in the dataset in 2017.

3.3 Separate Analysis of 100% Juice and Juice Drinks

In 2016, the national methodology was changed to allow the separate examination of the 100% juice and juice drink categories. The change, which will be used each year moving forward, also provides more precise calorie estimates by accounting for flavor-level differences in calories per 8 ounces within brands.¹⁰ Both Scantrack and proprietary BCI company data were used to help reapportion brand-level totals from DrinkTell to the flavor level. To do this, Scantrack data (covering the most retail channel packaged beverages) were used to estimate the flavor level volumes for all 100% juices and juice drinks that were sold as packaged beverages. For 100% juices and juice drinks that were served through fountain machines – the largest segment of the market not covered by Scantrack – company data were used to estimate the breakdown the brand-

⁸ This figure only includes calorie values that were adjusted by 1 calorie per 8 ounces or more.

⁹ The process for cross-checking and validating Scantrack data was revised and expanded in 2015. The number of products, represented by individual SKUs, which were validated for pack size, multipack number, calories per 8-ounces, and product category, was expanded from the top 1,000 products in terms of sales to the top 5,000 products.

¹⁰ For most beverage types, the brand-level data provided in DrinkTell is sufficient to accurately estimate calories. For 100% juices and juice drinks, however, there are large discrepancies between the calories per ounce of different flavors within a brand. This is why a more detailed analysis was conducted for juices and juice drinks and not other categories. In the future, it may become important to perform similar analyses for other categories, particularly if there is significant sales growth of new flavors with much different calorie profiles from other flavors within the same brand.

level volumes not included in Scantrack to the flavor level. Flavor level volumes were then multiplied by the corresponding calorie per 8-ounce value in order to calculate total calories.

IV. KEY CALCULATIONS

Calculating per person beverage calorie consumption first required converting all sales volume data into ounces and then multiplying those values by average calories per ounce for each brand or SKU. Next, these calorie estimates were summed across all products to calculate total LRB calories. Third, the total LRB calorie estimate was divided by the national population estimate for each year. Fourth, this amount was divided by the number of days in each year to obtain a daily per person estimate of beverage calories consumed.

These calculations were performed across the different datasets. Where differences existed, the next step was to confirm that this variation could be explained by the known differences in data coverage. For further validation of findings, each BCI Company reviewed a data summary similar to those included in the appendices to the main report, but including only data for their own brands. By confirming that the data were consistent with their internal data, this additional review further validated data for brands representing 78 percent of all LRB calories.

Furthermore, Scantrack data was used to measure changes in container sizes across beverage categories. The average container size analysis focuses on beverage containers of less than or equal to one liter in size.¹¹ For this calculation, the total number of ounces sold for each beverage category was summed and divided by the total number of containers sold in that category. To calculate the distribution of products across different container size groupings, the number of containers in each grouping was summed and divided by the total number of containers.¹²

¹¹ 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 so 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.

¹² The distributional analysis splits beverages into 6 categories: (1) less than 12 ounces, (2) equal to 12 ounces, (3) between 12 and 20 ounces, (4) equal to 20 ounces, (5) greater than 20 ounces and less than or equal to 1 liter, and (6) greater than 1 liter. The 12- and 20-ounce categories serve as cutoffs because they are the most common pack sizes for CSDs, the largest beverage category in terms of calories.

SECTION 4

DETAILED COMMUNITIES 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.¹³ 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.

¹³ 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.

Key Dates for BCI National & Community Initiatives

| Community | Selection Announced | Implementation Initiated | Baseline Year |
|----------------------------------|---------------------|--------------------------|---------------|
| National Initiative | September 2014 | January 2015 | 2014 |
| Little Rock BCI Community | September 2014 | May 2015 | 2014 |
| Eastern L.A. BCI Community | September 2014 | May 2015 | 2014 |
| Bronx-Brooklyn BCI Community | May 2015 | January 2016 | 2015 |
| Montgomery-Lowndes BCI Community | April 2016 | October 2016 | 2015 |
| Mississippi Delta BCI Community | April 2016 | October 2016 | 2015 |

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.¹⁴ 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 2014-2017.

These customer lists were scrutinized and validated using several methods. First, addresses were confirmed and synced using SmartyStreets and Esri ArcGIS 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

¹⁴ BCI Companies report data for brands that they own as well as for those that they distribute, which can vary by region. For example, Keurig Dr Pepper (formerly 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.

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.¹⁵ 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 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 percentage change in that level.¹⁶

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.¹⁷ 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.

¹⁵ 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.

¹⁶ For the 2017 estimates, retroactive changes were made to 2014, 2015, and 2016 BCI Company customer lists, based on updated classification of customers inside vs. outside the BCI community or as large wholesalers/distributors not primarily serving the BCI Community.

¹⁷ For the 2017 estimates, underlying volume and calorie data were retroactively updated due to BCI Company volume re-states, which are based on better available information or prior reporting errors. Additionally, a small number of beverages had brand ownership reassigned (e.g., BCI Company vs. Non-BCI Company) based on updated information about brand recognition in each of the communities. For a small number of brands, BCI Companies do not own, distribute, or market the brand nationally, but are responsible for distributing the brand in one or more BCI Communities. This is mostly due to the highly local nature of bottling and distributing relationships. This is significant in the communities methodology because BCI Company data is assumed to account for BCI Company beverages fully, while data from Non-BCI Company beverages is scaled up from Scantrack data. Last, the assigned calories per 8 ounces was updated for a small number of beverages.

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 SKU level, which enables a calculation of average container sizes.¹⁸

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.¹⁹ 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

¹⁸ Data reported by BCI Companies is at the brand-level and does not indicate container sizes.

¹⁹ 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 an estimated population of 17.7 million in 2014, whereas the Eastern L.A. BCI Community had an estimated population of 287,000 in 2014.

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 the Detailed National Methodology, section 3.

In order to capture meaningful estimates of year-to-year change using Scantrack data, the list of stores whose data are included in the communities datasets are filtered to include only the sales from stores for which Nielsen has 24 months of data. This effectively means that data are provided in discrete 2-year sets that reflect "same-store sales" for that two-year period. If this filter was not included, the data could reflect increases or decreases in calories per person which only reflect data coverage, not true changes in consumption.

Due to this filter, each 2-year dataset is internally consistent to measure 1-year changes, but different two-year datasets cannot accurately be compared to each other, due to the differences in which stores are included. For example, volume totals for 2014 and 2016 cannot be meaningfully compared without adjustments because they are based on the sales reported from somewhat different sets of stores, one set that reported sales throughout 2014-15 and one who reported sales throughout 2015-16. To remedy this limitation, an additional adjustment was made beginning in 2016. This adjustment exploits the 1-year overlap between each consecutive dataset (e.g., both the 2014-15 and 2015-16 dataset include 2015). Essentially, the previous dataset is scaled up or down such that the total volume for the overlapping year matches in both datasets. With this adjustment, both of the 1-year changes from the separate datasets (i.e., 2014 to 2015 and 2015 to 2016) are maintained. Also, the two datasets are aligned so that the 2-year change (i.e., 2014 to 2016) reflects the combined 1-year changes and not changes in volumes that are due to shifts in which stores were able to report data for the full period.

In practice, this adjustment is made by finding the ratio between total estimated non-water volume for 1) Non-BCI Company beverages and 2) BCI Company beverages delivered through warehouses in each dataset for each community. These ratios are incorporated into the ratios used to scale up the raw Scantrack data for each of these categories.

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 convenience, gas, grocery, drug, dollar, liquor stores, mass merchandisers, and restaurants.²⁰ 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").²¹ 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

²⁰ 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.

²¹ 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.

the zip codes are located were applied to the baseline estimates, where available.²² 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 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.²³ 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.²⁴ 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.²⁵

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 the number of days in each year to arrive at an estimate of daily per person LRB calorie consumption.

²² In the Mississippi Delta and Montgomery-Lowndes BCI communities, the counties which make up the communities are too small for the Census Bureau to publish 1-year estimates. For the Mississippi Delta BCI Community, 5-year county-level estimates of change were applied to the 5-year zip code level baseline estimate. In the Montgomery-Lowndes BCI Community, the 1-year estimate of change was used for Montgomery County, representing the vast majority of the community, and the 5-year estimate of change was used for Lowndes county.

²³ Data were obtained from the USA 2016 Daytime Population Living Atlas Layer accessed through Esri ArcGIS Online.

²⁴ Esri (2016). Methodology Statement: 2016 Esri Daytime Population. Redlands, California: J10291.

²⁵ U.S. Census Bureau, 2006-2010 American Community Survey 5-year estimates, 2010 ZIP Code Tabulation Area (ZCTA) to Census Tract Relationship File.

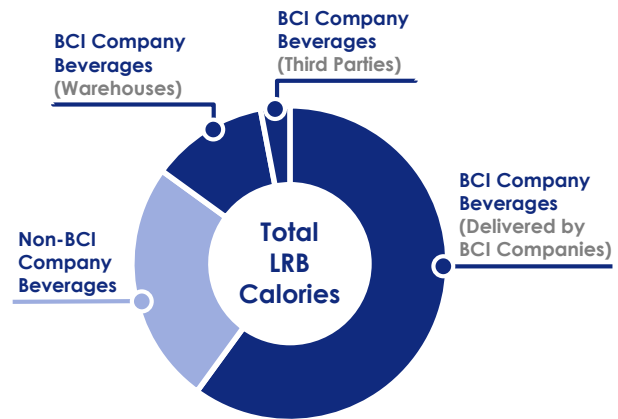
3.2 Estimating Total Beverage Consumption by Brand & Flavor

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

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 beverages 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.²⁶ For example, in the Mississippi Delta BCI Community for example, the total sales volume for the same sets of beverages were 2.09 times larger in the BCI Company-reported data than in the Scantrack data in 2015 due to the less complete coverage of Scantrack. Therefore, sales volumes for Non-BCI Company beverages reported in

²⁶ 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.

Scantrack were scaled up by a factor of 2.09 in order to account for sales of these beverages in stores not included in the Scantrack sample.²⁷

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, 2015 shelf audits that were conducted to measure in-store merchandising efforts partially support this assumption.²⁸ 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.²⁹ These beverages are, however, included in Scantrack. The same methodology that was used to estimate Non-BCI Company beverage volumes was used to

²⁷ In the 2015 report on progress, an exception to this approach was implemented for the Bronx-Brooklyn BCI Community. Due to the small and biased sample of Scantrack stores in the 2014-15 dataset 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 provided a more probable calorie consumption estimate in 2014 and 2015, but it also represented a key limitation in estimating Non-BCI Company beverage volumes in this community. In 2016, the sample of stores within the BCI Community who reported sales through Scantrack improved and so the methodology was adjusted to be consistent with the methodology used in the other BCI Communities.

²⁸ Shelf audits were conducted at approximately 30 stores in each of the first three BCI Communities in order to assess the amount of shelf, cooler, and display space occupied by different types of beverages.

²⁹ 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.

estimate the sales volumes of BCI Company beverages delivered through warehouses, with only slight revisions.³⁰

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 purchases 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. In each year from 2015-2017, an estimated 10 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. In each year from 2014-2017, beverages from these third-party sources are estimated to represent 5 and 2 percent of the BCI Company beverage volumes, respectively.
- 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.³¹ 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

³⁰The 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.

³¹ 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.

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 in 2016 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 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. This process was completed at baseline and will be replicated every few years.

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 was determined at baseline and 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.³²

3.3 Estimating 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 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.³³ 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. CORROBORATION & ADDITIONAL MEASURES OF BEVERAGE CALORIE CONSUMPTION

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 Scantrack data and unadjusted BCI Company-reported 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:

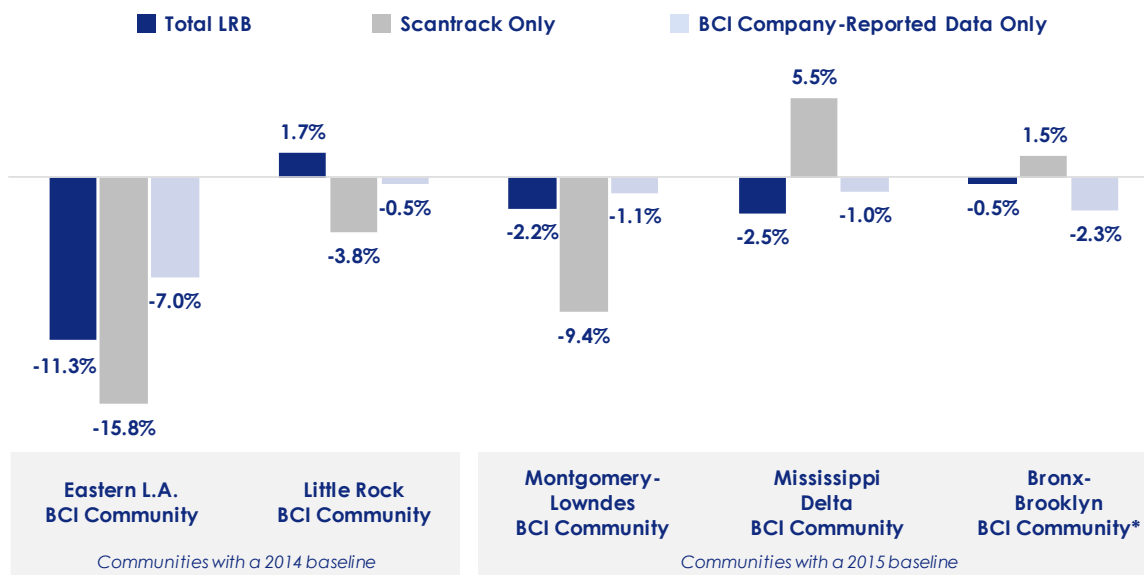
³² For this alternative approach, BCI Companies reported customized estimates of the product mix that they would expect in retail stores and restaurants that source beverages from third parties. Based on this estimated product mix, the average calories per 8 ounces was higher, reflecting an assumption 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.

³³ 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.

- **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 Scantrack Data:** This estimate includes all beverage sales volumes reported in Scantrack. This dataset reflects changes in sales volumes of all beverages sold in sets of stores located in the BCI Communities that reported their complete beverage sales data to Nielsen for two consecutive years. This dataset includes 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. These estimates differ from the Total LRB estimates for three reasons: (1) Scantrack data cover only certain channels, excluding fountain, vending, and many small stores, among others; (2) Scantrack is based on a sample rather than the complete set of stores within the measured channels; and (3) Scantrack data reflects same store sales which means that it will not capture changes in LRB consumption resulting from changes in the total number of stores in a given community.
- **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. Differences between these estimates, the total LRB estimates, and the Scantrack estimates can be explained by the BCI Company data's exclusion of: (1) Non-BCI Company beverages, (2) BCI Company beverages that are delivered to warehouses, and (3) BCI Company beverages that are sourced from third parties.

Each estimate has strengths and limitations. Figure A2 illustrates the change in calories per person per day for each of the three estimates across the BCI Communities. On balance, the total LRB estimate aligns most closely with the community calorie goal.

Figure A2
Change in Calories Per Person Per Day, Additional Measures
Percent Change from Baseline to 2017 by BCI Community



Sources: Keybridge estimates, BCI Company-Reported Volumes & Nielsen Scantrack, 2017

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.³⁴

³⁴The 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

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 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 calories per person.

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, 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.

These beverages account for an estimated 5 and 2 percent, respectively, of total calories in the Eastern L.A. and Little Rock BCI communities at baseline. 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.

- **Bronx-Brooklyn BCI Community Limitations:** Estimates of per person LRB calorie consumption in the Bronx-Brooklyn BCI Community are more uncertain than estimates in other markets. The baseline per person calorie estimate in this community was lower than the national average in 2015 and below estimates for all other BCI Communities. The biggest driver of this low LRB calorie consumption estimate is the low estimate of per person LRB volumes. Three factors influence these lower-than-average estimates, including: (1) higher daily population flows out of the community; (2) data coverage gaps; and (3) beverage consumption patterns that are truly different from the other BCI Communities.

First, commuting patterns likely contribute to the low per person LRB volume estimate. Daytime populations for the Bronx-Brooklyn BCI Community were 12 percent smaller than official estimates of the resident population at baseline.³⁵ As a result, consumption estimates, which are based on the higher nighttime population, may be biased downward.

Second, data coverage limitations may also contribute to the low per person LRB volume estimate. The store sample in the Scantrack dataset is smaller and less representative in the Bronx-Brooklyn BCI Community than in other communities. Additionally, the data reported by BCI Companies is less complete because a larger share of beverages is sourced from third parties. While the estimation methodology attempted to account for these data coverage gaps, they create significant uncertainties in estimating calorie consumption levels and may contribute to downward biases.

Third, the estimates could reflect true differences in consumption patterns. Gaps in both the company-reported and Scantrack datasets make it difficult to assess the degree to which this is the case, but data for the broader New York market area suggest regional differences in beverage consumption patterns may play a role. Scantrack data for the New York market area showed that average LRB calories per 8 ounces was 34.1 in 2015, well below the national average of 45.9. While this data is likely not representative of the Bronx-Brooklyn BCI Community, those broader market consumption patterns likely influence consumption in the BCI Community.

Overall, the level of uncertainty in estimating consumption patterns in the Bronx-Brooklyn BCI Community is significantly higher than in the other BCI Communities. Additional analysis and scrutiny will be required in future years to ensure that biases in estimating the level of LRB calorie consumption remain constant and do not bias the measurement of changes over the commitment period.

³⁵ Source: Census tract estimates from U.S. Census Bureau 2010 Zip Code Tabulation Areas Relationship to Census Tracts & Esri 2016 Daytime and Nighttime Population Estimates.

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.