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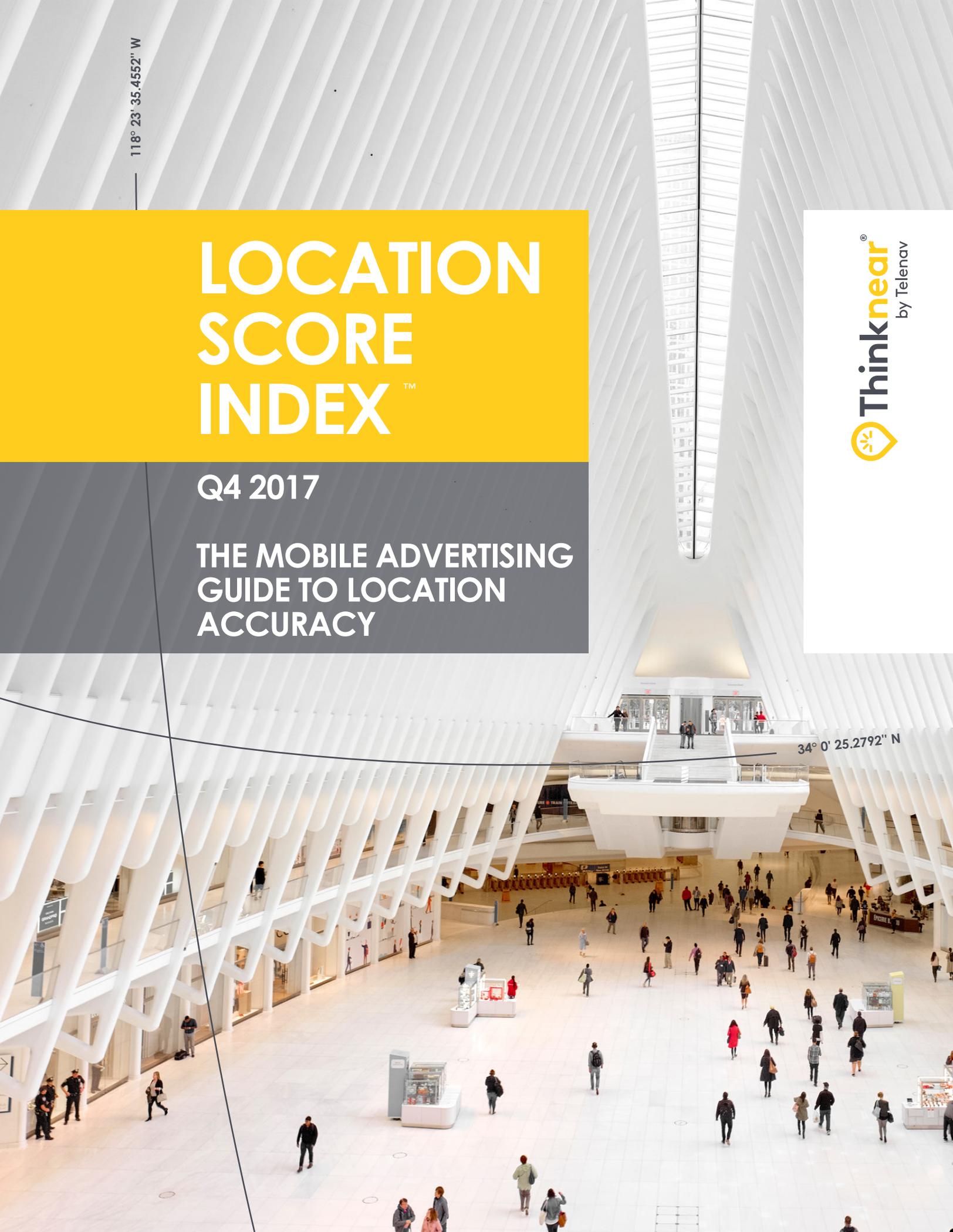
LOCATION SCORE INDEX™

Q4 2017

THE MOBILE ADVERTISING
GUIDE TO LOCATION
ACCURACY

 **Thinknear**[®]
by Telenav

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THREE YEARS TRACKING LOCATION ACCURACY

LOCATION USE CASES EVOLVE AS AVAILABILITY OF DATA CONTINUES TO SCALE

It's been three years since Thinknear launched the Location Score Index, a now annual report on the state of location data in the mobile advertising ecosystem. Since that time we've seen location data evolve from a geofencing niche to a full-fledged foundation of the mobile industry. In a recent MMA survey, 96% of marketers indicated they felt location was a critical piece of the mobile marketing landscape.

But one key question remains: has the quality and accuracy of location data improved?

The answer, predictably, is "it depends." The percentage of location-aware mobile inventory that's accurate enough for advanced targeting has remained fairly consistent over the years at roughly 30-40%. However, the sheer volume of location-aware mobile inventory has grown exponentially in recent years, which means marketers have access to virtually unlimited amounts of high-quality location-based ad inventory, if they can find it.

In this version of the Location Score Index, we discuss continued industry-wide challenges with data quality, but also highlight emerging use cases for location data. Marketers are expanding their use cases for location and new sources of data will continue to drive innovation in this space. Location is no longer a simple targeting tool for mobile ads - it's now the common thread that is helping connect the disciplines of analytics, targeting, creative, and measurement.

THIS REPORT FOCUSES ON HELPING MARKETERS UNDERSTAND:



The current state of location data quality in the mobile ecosystem



Long-term trends in location data accuracy



The evolving use cases associated with location data

METHODOLOGY

To compile this report, we sampled and analyzed data from over 7.8 billion data records and performed location accuracy tests on more than one million verified consumer locations.

LOCATION EVOLUTION

WHAT IS “LOCATION ACCURACY” AND HOW IS IT IMPACTING NEW MARKETING USE CASES?

Accuracy refers to the reliability of data with regard to a mobile user’s true location. For example, if an app shares data that a user is at a specific location, is the person really there? Accuracy is often confused with precision, which refers to the level of granularity in the data. A person could be described as being at 42nd Street and Broadway, or in Manhattan, or in the state of New York. All three statements are accurate, but they have varying degrees of precision. In mobile advertising, the degree of precision required can vary by use case, but accuracy is always necessary. Without accuracy, marketers simply don’t get what they pay for.

The role of location data is expanding beyond its original targeting use case. As the use of location data increases, the importance of accuracy and high-quality data will continue to grow.

LOCATION PLAYS A ROLE THROUGHOUT THE MARKETING LIFECYCLE



LOCATION-BASED ANALYTICS:

Location data can be used by marketers to better understand consumers before ever running a single campaign. The data derived from mobile phones helps marketers understand where their customers live, shop, and travel. This offline, real-world behavioral data is critical to better understand the customer’s journey. Once collected and analyzed, marketers can plan more effective campaigns in mobile and other channels.



LOCATION-BASED TARGETING:

Targeting remains a core use case for location data, but the industry has evolved well beyond the standard geofence. Advanced targeting techniques include the real-time application of location-based triggers driven by consumer location, and now also include the application of behavioral targeting driven by consumer location history. Consumers are creatures of habit and the places they visit can be powerful predictors of the places they’ll visit in the future and the products they’ll likely purchase.



LOCATION-BASED CREATIVE:

Creative experiences shouldn’t be designed in a silo. Adding a location-based context can have a significant impact on consumers’ responses to creative campaigns. Location can power dynamic delivery of location-relevant creative that improves consumer experiences and drives engagement. Ad creative tells the story, but location-based customization ensures the story is personalized for each consumer.



LOCATION-BASED MEASUREMENT:

Marketers have shifted their focus to mobile, but measurement remains a challenge. Location-based foot traffic measurement has become a ubiquitous tool for brick and mortar retailers, but brand advertisers can also benefit from location-based measurement tools. Location can be used to measure the effectiveness of audience targeting, the accuracy of campaign delivery, and the amount of waste associated with a campaign. Location is a powerful tool to help marketers ensure they’re reaching the audience they are paying to target.

LOCATION SCORE INDEX

43

Q4 2017 INDUSTRY SCORE

The industry Location Score Index acts as an indicator of the overall health of location data in the mobile industry over time, similar to an index such as the S&P 500. By itself, the number is an annual assessment for location accuracy, but over time it becomes a benchmark for how location data quality in the programmatic ecosystem is trending. The score is based on a 100-point, non-linear scale, meaning that it's easier for the industry score to grow from 25 to 35 than it is to grow from 75 to 85.

The index relates specifically to programmatic bid stream data in the U.S. and Canada.

VOLUME OF AD INVENTORY BY LEVEL OF PRECISION

30% HYPER LOCAL

Location data was accurate to within 100 meters of the user's true real-time location. (size of a football field)

5% LOCAL

Location data was accurate between 100 and 1,000 meters of the user's true real-time location. (Approx. 0.6 miles)

31% REGIONAL

Location data was accurate between 1,000 and 10,000 meters of the user's true real-time location. (Approx. 6 miles)

21% MULTI-REGIONAL

Location data was accurate between 10,000 and 100,000 meters of the user's true real-time location. (Approx. 60 miles)

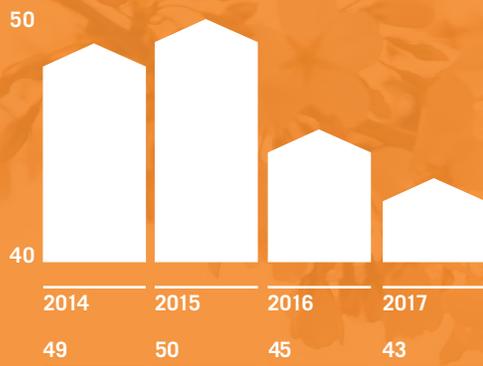
13% NATIONAL

Location data was not accurate to within 100,000 meters of the user's true real-time location. (Greater than 60 miles)

INTERPRETING THE RESULTS

THE LOCATION SCORE INDEX OVER TIME

INDUSTRY LOCATION SCORE INDEX BY YEAR

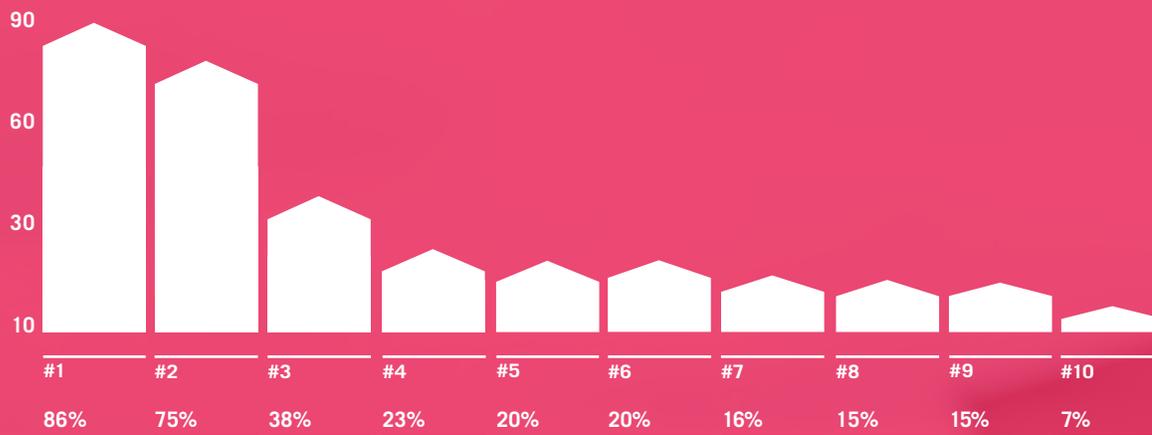


The current benchmark for the Location Score Index is the lowest it has been since we began measuring the industry in 2014. However, the index by itself does not paint the full picture on industry activity. It's important for marketers to understand two key trends:

First, the overall quality of location data has not changed dramatically. The Index has ranged from a score of 43-50 and the percentage of bid stream inventory that is accurate to within 100 meters of a user's true location has ranged from 30-37% in the past four years.

Second, the volume of highly accurate location data has increased substantially. While accurate inventory as a percentage of total programmatic inventory hasn't changed significantly, the sheer volume of inventory has grown at an estimated 60-80% annually over the past few years. The impact is that marketers have an abundance of highly accurate location data to work with as long as they have the tools to sort the good from the bad.

% OF DATA ACCURATE TO WITHIN 100 METERS OF THE USER'S TRUE LOCATION, BY EXCHANGE



According to eMarketer, 80% of digital display advertising will be purchased programmatically in 2017. But who that inventory is purchased from can have a large impact on the accuracy of the location data. We looked at 10 of the top programmatic mobile exchanges in the U.S. to assess the quality of location data attached to their ad requests. This data is typically used by buyers to employ tactics such as real-time geofencing, geo-conquesting, or geo-retargeting. Most exchanges rely on mobile SDKs to pull location data from the phone's operating system when an ad request is made. It's evident from the data that the level of focus on the issue of location accuracy varies considerably by exchange.

LOCATION DATA EVOLVED

Accurate location data is playing a bigger role than ever in digital marketing. High-quality data is improving planning strategies, competitive assessments, and marketers' understanding of the consumer experience. The case studies below highlight various ways location data can be used by marketers. The use of location data has evolved greatly and it will continue to influence many aspects of the marketing cycle.

CASE STUDY 1: ACCURATE DATA DRIVES STRATEGY IN THE AUTOMOTIVE INDUSTRY

We looked at the competitive dynamics of one of the top three automotive brands in the U.S. to better understand the impact of location data in specific markets.

DATA:

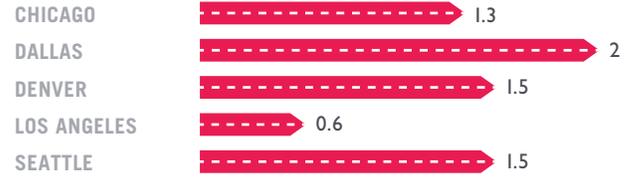
On average 60% of dealerships have 3+ competitors within 5 miles. The data varies significantly by market. Among a sample set of metro areas, Los Angeles takes the crown as the most competitive town for dealerships.

IMPLICATIONS:

Marketers shouldn't apply a one-size-fits-all model to media plans covering multiple markets. Location data can ensure a more efficient strategy for each market.



AVERAGE DISTANCE FROM AN AUTO DEALER TO THE NEAREST COMPETITOR



AVERAGE NUMBER OF COMPETITORS WITHIN A MILE

CHICAGO	3.1
DALLAS	2.3
DENVER	1.5
LOS ANGELES	6.2
SEATTLE	4.6

CASE STUDY 2: LOCATION DATA INFORMS VARIATIONS IN CONSUMER BEHAVIOR FOR BIG-BOX RETAILERS

Over 90% of transactions occur in physical stores but the addressable target market for those stores varies in size depending on the population profile of the market. We looked at the distance consumers are willing to travel to reach big-box retail stores in urban, suburban and rural markets.

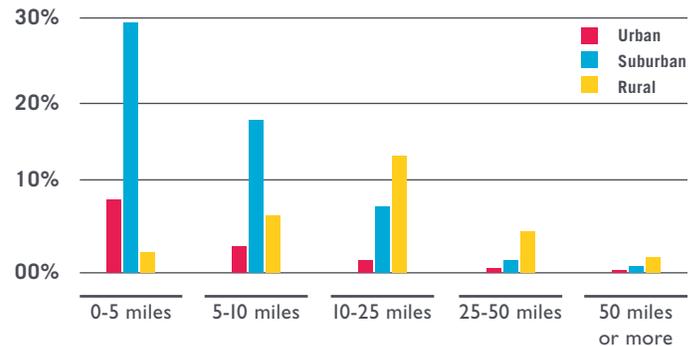
DATA:

In urban and suburban markets, most shoppers travel less than five miles to reach a store. However, in rural markets, nearly 50% of shoppers travel 10-25 miles. The rural segment can't be ignored - it makes up almost 30% of all visits to big-box retailers.

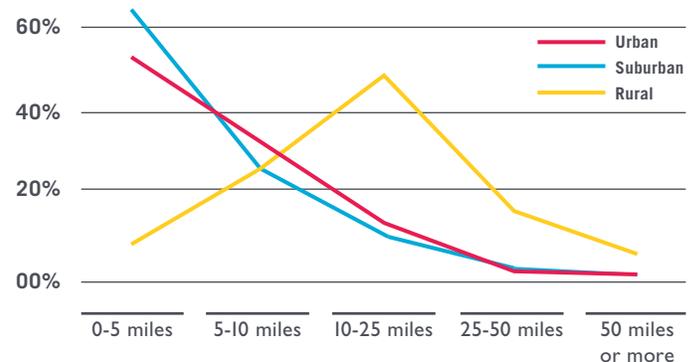
IMPLICATIONS:

Marketers need to understand consumer behavior on a market-by-market basis to more effectively plan campaigns. Location data helps brands understand the local dynamics of real-world consumer behavior.

PERCENTAGE OF TOTAL VISITS BY DISTANCE TO STORE AND POPULATION DENSITY



PERCENTAGE OF VISITORS BY DISTANCE TO STORE AND POPULATION DENSITY

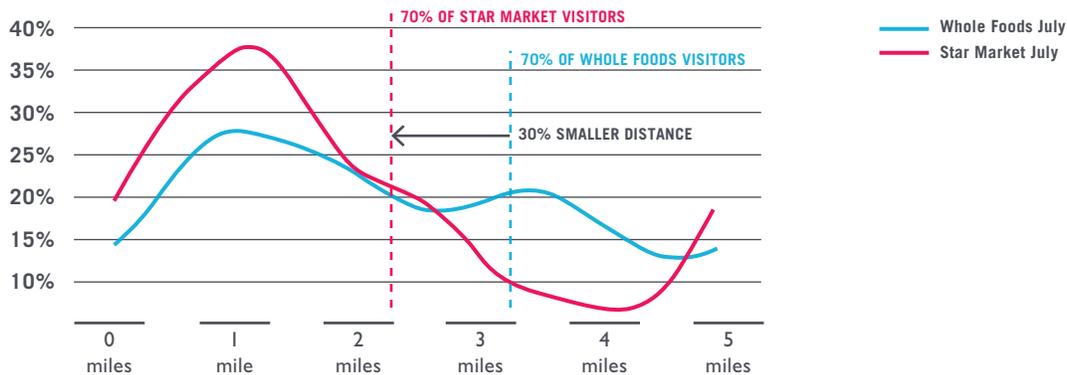


CASE STUDY 3: GROCERY VISITATION PATTERNS VARY BY AUDIENCE

Following the acquisition of Whole Foods by Amazon, the retailer has received an increased level of interest from the press and marketers. To better understand the grocery segment and the impacts of the acquisition, we looked at Whole Foods locations in select markets and compared the visitor data with Star Market, a regional competitor. On average, we

found that a radius of 2.3 miles captured the home addresses of 70% of Star Market visitors while Whole Foods needed a radius of 3.3 miles to capture 70% of its visitors. On the surface, this indicates that Whole Foods was not capturing as many consumers who lived nearby, an indication that prices may have been keeping certain audiences away.

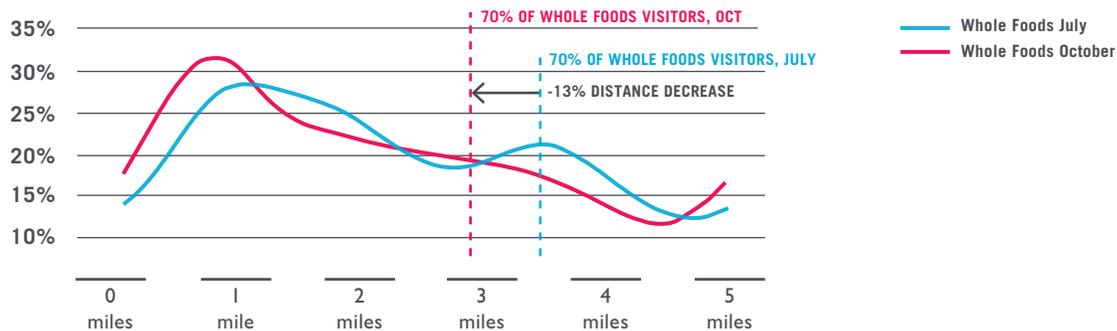
PERCENTAGE OF TOTAL VISITS BY DISTANCE TRAVELED



To analyze behavioral changes of Whole Foods before and after the acquisition, we looked at data for Whole Foods in both July and October. Following the Amazon price drops, we saw a greater percentage of visitors coming from neighborhoods closer to Whole Foods stores. Before the

acquisition, 70% of Whole Foods visitors were coming from within a radius of 3.3 miles. After the acquisition, that radius shrank to 2.9 miles. This implies that people who lived near a Whole Foods, but who did not shop there, were now changing behaviors and beginning to shop at Whole Foods.

PERCENTAGE OF TOTAL VISITS BY DISTANCE TRAVELED,
WHOLE FOODS PRE AND POST ACQUISITION



IMPLICATIONS:

The data indicates that post-acquisition, Whole Foods is attracting audience segments it wasn't previously reaching. Nearby consumers in the sample set who previously did not shop at Whole

Foods now appear to be visiting the retailer. More research is needed, but the example highlights the importance of location data when measuring the consumer impact on marketing decisions.

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BOSTON
CHICAGO
DALLAS
DETROIT
LOS ANGELES
NEW YORK
SAN FRANCISCO

ABOUT THINKNEAR

Thinknear is a leading location technology company and full-service mobile advertising platform focused on using real-world data to connect leading brands with mobile consumers. Thinknear's platform delivers the accuracy, scale and technology required to effectively leverage mobile location data to power better consumer experiences. Thinknear is a division of Telenav (NASDAQ:TNAV), a leader in location-based software solutions. To learn more, please visit www.thinknear.com and follow @thinknear on Twitter and Instagram.

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INDUSTRY REPORTS



CASE STUDIES



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