



Comments of the Center for Digital Democracy

Mobile Device Tracking, Project No. P145401

Spring Privacy Series
Federal Trade Commission

While it is important to examine the individual components of what is an increasingly pervasive and unregulated source of commercial surveillance in the “Big Data” era, such as in-store tracking of consumers, the Federal Trade Commission (FTC) must place this one use of mobile tracking in a larger context. Such tracking is but one part of a more elaborate and increasingly seamless “always-on” collection apparatus that operates across devices and user experiences. This surveillance is invisible to most consumers and connected to a range of other practices such as “hyper-local” targeting, multi-screen tracking, and data broker-driven offline and online “connected recognition” and data onboarding services.¹ Current self-regulatory approaches are ineffective and do a disservice to consumers by falsely claiming to provide privacy protection and user control. The FTC should issue a set of recommendations to govern cross-platform marketing that includes mobile devices. This is urgently required as intrusive geo-locational data-gathering practices, some of which raise concerns about the potential for new forms of “digital redlining” and other discriminatory practices, dramatically expand during the next few years.² We believe it is especially important for the FTC to examine how geo-location tracking is being used to identify people by race, ethnicity, economic class, and by their age (such as young people and seniors). The FTC should also reiterate its call for Congress to enact meaningful omnibus privacy legislation.

There are several intersecting developments that contribute to the integrated cross-platform and location-aware data tracking system now in operation.³ The rapid adoption of mobile devices and mobile data-driven marketing practices enables companies both to collect data and to reach individual consumers at any time.⁴ Mobile ad spending in the U.S. is growing dramatically, said to reach \$9.6 billion in 2013 (making up nearly 25 percent of total digital ad spending), and eMarketer predicts it will reach \$35.62 billion by 2017.⁵ Advertising and commerce e-practices on the mobile platform have matured, and are now linked to an array of related user-targeting practices involving real-time geo-location, in-store and social media marketing, and more.⁶

Increasingly, through in-store “beacon” and related check-in services, consumers are being rewarded or persuaded (including through “gamefication” techniques) to surrender their personal information.⁷ More critical is the growing role of the mobile device as a primary financial instrument, such as mobile wallets, and the linking of location-aware

apps to various credit and payment systems. The merging of geo-location targeting with mobile-related payment data (including from loyalty programs), and with social media and data-broker information, will soon create a perfect “privacy storm” that threatens the privacy, security, and, in many ways, the autonomy of consumers.⁸

The role of mobile as the leading digital device has created new opportunities—but also challenges—for marketers. To help ensure they can access mobile user information as easily as they now do on PC-based platforms, as well as blunt the growing controversies over tracking and the use of “cookies” (which is best observed in the contentious “Do-Not-Track debate), marketers are developing universal approaches for comprehensive profiling of individuals. Companies such as Google are developing an “AdID,” which, as analysts note, “could enable cross-device tracking and targeting, clean up opt-out and cookie-deletion issues and, in all likelihood, increase the targetable universe of users significantly as compared to the current third-party cookie norm.”⁹ The growing adoption of “Big Data”-related data management platforms (DMPs), either in-house or in the “cloud,” which integrate all the data and transactions of a consumer, is also contributing to the current expansion of data-gathering practices. Companies desire to collect, analyze and make actionable data on every “channel” a consumer uses.¹⁰

Advances in device-identification technologies increasingly enable the tracking of a consumer across multiple devices. As Ad Monsters recently explained about the implications of device identification, “Never before has digital tracking become so personal and never before has the argument for consumer privacy controls been so compelling.”¹¹ Device recognition on mobile devices is both helping marketers and developers scrutinize the “path that led a consumer to take an action” and giving them the ability to both target and retarget a consumer. The cross-platform tracking of users reveals that focusing solely on one platform, such as mobile, is insufficient when addressing Internet privacy. A user who does not engage at first on a mobile device can be relentlessly pursued and retargeted online elsewhere. Among the companies engaged in device ID tracking is Drawbridge, which has “developed a statistical algorithm to match users’ cookies with their devices. Using our algorithm we are able to match, within levels of confidence, the device ids belonging to a person represented by a cookie and a browser and vice versa. We run our algorithm daily to match device ids in our mobile advertising network with the desktop cookies we receive from our partners We have accumulated cookies that are matched to over 500 million devices in our current database.”¹² Others are engaged in device tracking, such as AdBrain (which “creates a single customer profile by modeling billions rich desktop, mobile and tablet data sets”); MdotM’ (whose “cross-device retargeting technology enables advertisers to reach users as they navigate from one device to another”); Kochava (which claims it can “track even the untrackable”; “[w]hen no device identifiers are provided by a publisher or a network, [it] automatically engages its fingerprinting system . . .”).¹³

In order to understand the discrete uses of mobile tracking at the retail level, we must first understand the vast data-gathering “forest” of which mobile tracking is but one arboreal species in the real-time data-driven digital targeting era.¹⁴ Individual consumers are influenced by a range of devices at various times, confronting a range of marketing

techniques. Google’s so-called “Zero Moment of Truth” is based on marketers taking advantage of the critical period when consumers’ thinking or behavior can be effectively influenced—including those times when they are on mobile devices.¹⁵ A robust field of “shopper sciences” that helps identify how to engage a consumer along the “path to purchase,” and incorporates digital marketing practices, lies at the center of today’s geo-location tracking.¹⁶ Beyond targeted search and other ads linked to purchases, consumer experiences are also shaped by communications with their friends, who are often the target of social commerce campaigns that identify and “activate” individual consumers to engage in various behaviors (such as urging friends to like a product, for example). Our social behaviors are monitored and often deliberately shaped to help create “fans” and “followers,” and to identify how social-oriented commerce affects in-store and online sales.¹⁷ Advances in measurement increasingly link exposure to digital advertising or marketing to actual offline sales.¹⁸

This comment is designed to raise some of the key concerns we believe the FTC should review as it further examines retail and related in-store tracking. It is not meant to be comprehensive, but to underscore that in order for the FTC to protect the public it will have to address the full dimensions and range of practices of the contemporary digital marketing landscape.

In addressing in-store and related hyper-local targeting of consumers, the commission should incorporate the following points in its analysis:

1. Industry research on mobile devices and its impact on users privacy and consumer behavior

The commission needs to assess the significant body of industry-sponsored research that has documented the unique relationship an individual has with a mobile device. These studies, many conducted by leading companies and associations working in the mobile marketplace, provide critical insights on user expectations and behavior. Google in particular has engaged in a wide-ranging series of research, market-conduct, and case studies related to the mobile environment. For example, a 2011 Google study entitled “The Mobile Movement,” designed to “[g]ain a deep understanding of smartphone user behavior,” identified that these devices, already “embedded into daily life,” were an “always on companion” often used while “consuming other media.” Mobile has transformed “everyday shopping behavior,” Google explained, noting as well that the mobile user is influenced by a range of services and experiences, including “word of mouth,” online and mobile advertising, in-store experiences, and by other media.¹⁹

Google’s anthropological research on mobile users from October 2012, “The Meaning of Mobile,” was designed to answer the following questions: “We can’t live without apps, maps and email on the go, but what we don’t know is why. Why does the ringing of mobile phones trigger the same brain waves as love, for example? And why do we feel them vibrating even when they’re missing? What do these devices mean to us that they make us lovesick?” An anthropologist interviewed “dozens of ordinary mobile device owners [to] observe them as they interacted with their smartphones.” The study found

that “[o]ur mobile devices help us fully actualize our best self, or what we call the Quicksilver Self; they engage us to create a shared culture, the New Tribalism; and they help us make sense of the physical world around us, an act we describe as Placemaking. Understanding the deeper level at which individuals, customers, are finding meaning in mobile will enable marketers to put this powerful medium to best use.”²⁰ (Yahoo, Microsoft, the Mobile Marketing Association, the Interactive Advertising Bureau, and many others have also conducted mobile studies.) The research suggests that mobile devices are viewed as extensions of our selves, raising fundamental questions about how mobile communications affect our privacy and consumer decision-making.²¹

2. Mobile device tracking is part of a growing, integrated cross-platform user targeting and monetization system. It is the desire to reach an individual “anytime/anywhere” that contributes to growing privacy threats.

Marketers recognize that individuals are engaging across devices (or platforms), often simultaneously. Advertisers and retailers want to be able to reach the same person, regardless of whether that individual is on a mobile, gaming, personal computer, or (increasingly) a television.²² As a recent comScore “Marketing to the Multi-platform Majority” report explains, “With digital media usage occurring at scale on so many platforms, there is an overarching challenge to integrate content, advertising and measurement across disparate screens. ... In April 2013 for the first time, more than half of digital consumers in the U.S. engaged on both computers and mobile devices.”²³

Google understands how the multi-screen experience has transformed consumer behavior, including the role for mobile. It notes in its “The New Multi-Screen World Study” that “Today 90% of our media consumption occurs in front of a screen. As consumers balance their time between smartphones, tablets, PCs and televisions, they are learning to use these devices together to achieve their goals. This multi-screen behavior is quickly becoming the norm, and understanding it has become an imperative for businesses.” Google makes the following recommendations to its marketing customers:

- The prevalence of sequential usage makes it imperative that businesses enable customers to save their progress between devices. Saved shopping carts, signed-in experiences or the ability to email progress to oneself helps keep consumers engaged, regardless of device used to get to you.
- During simultaneous usage, content viewed on one device can trigger specific behavior on the other. Businesses should therefore not limit their conversion goals and calls to action to only the device where they were initially displayed.
- Most of the time when TV is watched, another screen is being used. These instances present the opportune time to convey your message and inspire action. A business's TV strategy should be closely aligned and integrated with the marketing strategies for digital devices.²⁴

Yahoo has also developed approaches to ensure that it can target users across devices with such sequential messaging.²⁵ Facebook, with its growing mobile platform, enables

its partners to engage in cross-platform targeting as well. Using “app user IDs” a retailer can “reach someone on Facebook desktop who earlier in the day browsed your mobile app and expressed interest in purchasing by adding items to their cart Thanks to custom audience targeting with app user IDs, marketers can now effectively connect their remarketing and reengagement efforts on mobile to desktop.”²⁶

Companies like comScore, Nielsen, and others have developed cross-platform “Campaign Ratings” systems to help measure the impact of media and advertising in this environment, including the mobile platform.²⁷ comScore’s “Media Metrix Multi-platform,” system, for example, “provides an unduplicated accounting of audiences across desktop computers, smartphones and tablets.”²⁸ Nielsen explains that “Advertisers already understand the emergent need in cross platform measurement [T]hey know that video is moving across platforms, and it’s only becoming more pervasive with time. In addition, advertisers recognize that achieving reach by connecting with desired audiences is only effective when messages resonate and cause desired audiences to react at the point of sale.”²⁹

The measurement variables that accompany the mobile device user are just one illustration of how surveillance methodologies are “baked” into our consumer experiences. Mobile analytics identify, track, measure, and can help make actionable a wide array of user behaviors, and the commission should address the use of such technology as it follows up on its workshop. For example, Kontagent promises marketers and developers that they can use their analytics solutions to “[t]rack user behavior across time.” Kontagent’s *kSuite DataMine* product, for example, “makes it possible to answer questions such as:

- What last three actions did users take before they uninstalled or failed to return?
- What last five behaviors did users exhibit before purchasing virtual goods?
- What are the purchase habits of my highest-value gamers or users?
- Who are my most viral users, and how can I use that information to attract more of them?³⁰

Mobile data provide marketers access to a rich vein of actionable information. For example, Verizon’s “Precision Marketing Insights” reveals how companies with mobile data have created strategies to analyze and monetize that information. As Verizon explains, “The more you know about where your audiences go and what they like in both the physical and digital worlds, the better you can tailor communications and opportunities.” Verizon offers “audience and location measurement, mobile marketing, and predictive analytics based on customers’ shopping habits, interests, travel patterns, and mobile browsing trends Gather meaningful data about customers’ shopping habits in and around your locations.” Verizon uses this information to help marketers “[t]arget mobile advertising (browser and in-app) to defined audiences using criteria such as postal addresses, ZIP codes, demographics, or interest attributes.”³¹ Verizon Precision Insights is also used to target individuals at specific locations, such as sporting events and other venues.³²

3. The tracking of consumers' behavior and interactions on mobile devices is also connected to the collection of their data on other platforms or channels for "attribution" purposes.

Consumers are unaware that their privacy is compromised so advertisers and agencies can decide how much "credit" (used for billing purposes) should be assigned to the various "marketing-driven" interactions and "brand-impressed" touchpoints that may have led to a sale or other desired behavior (reflecting that the "last click" no longer serves as a reliable measure). As eMarketer explains, "the need for more sophisticated cross-platform attribution has come to the forefront of late, thanks to the growing number of digital channels, platforms, and ad formats marketers must utilize to reach the right consumer at the right time."³³

"In the mobile arena," says Google, "attribution refers to the measurement of user events—an app install, repeat app launch, level completion, in app purchase, etc.—that are a result of marketing activity."³⁴ It notes in a discussion of mobile app attribution practices that "In the online advertising world marketing attribution already has its tried and true methods: cookies, pixel tags and appending custom parameters to the URL. Therefore, it is fairly easy to set up integrated marketing campaigns to determine which visitor came from which source"³⁵ For non-Android devices, Google recommends using "universal" attribution methods such as "unique identifier matching: matching the unique identifiers from the install to a click . . . an automated and real-time way of comparing clicks to installs. . . Attribution using unique identifiers enables 1:1 matching of click to install where identifiers can be passed app to app." It also suggests "device fingerprinting," which

works by redirecting a user through a tracking link and collects the publicly available HTTP headers about the device. This information is used to create a fingerprint about the click of the tracking link. When a user installs the mobile app, the SDK collects the same data points from within the mobile app and sends it to the platform. The platform generates the fingerprint of the install and then searches for clicks with the matching fingerprint. The last click with a matching fingerprint is then used to attributed the install. Whereas identifier matching is implemented for app to app tracking, device fingerprinting is used for web to app tracking as the publishing app in app to app cannot actually pass device identifiers.³⁶

Google's "MobileAppTracking combines these different attribution methods into a single unified solution."³⁷

Marketers and advertising companies are expanding their work to develop attribution methods, providing additional ways to track everything a consumer does. The commission should review the role that attribution plays in the data collection experience of consumers.

4. Data-driven programmatic advertising technologies (real-time bidding) creates a tracking linkage across devices, including mobile. Offline and online data are increasingly merged and used.

As CDD has explained, real-time bidding (RTB) methodologies raise crucial privacy and consumer-protection issues.³⁸ Behavioral targeting is now incorporated inside sophisticated advertising technologies, part of an array of data collected on individual users. The ability to track specific users across the digital media universe and sell access to target them in milliseconds—the principal goal of the RTB apparatus—is at the core of cross-platform tracking. Mobile devices are firmly established in this arena, with mobile-specialized RTB operators such as MoPub (now owned by Twitter), Nexage, and the operations of Google, Amazon, and others now commonplace.³⁹ MillennialMedia’s mobile RTB system, for example, enables mobile consumers to be targeted using “location, carrier, device ID, user IP address, publisher information, and more.” These parameters are part of the mobile exchange’s use of “complex, 360° user profiles” that are made operational through “real-time decisioning” applications. Consumers who have used their mobile device for transactions involving a credit card, or who have made purchases where their “history” has been analyzed, may find themselves targeted by such a mobile RTB system.⁴⁰ Accordingly, the role of programmatic buying of consumers across platforms must be included in the FTC’s privacy analysis.⁴¹

Today, consumer profiles are developed that include so-called first-, second-, and third-party data, linking our online and offline selves. This filing will not address the purposeful and disingenuous claim that such data profiles of individuals are “anonymous.” It is not the case, and the commission should reject such absurd claims. Companies say much of what they now do is “privacy compliant,” hiding behind the falsehood that cookies and all the other ways they collect and analyze data aren’t linked to an actual person. Such distortions should not be tolerated. Real people are being tracked and targeted.

Geo-location targeting is also able to take advantage of the practice of so-called data “onboarding,” which merges an individual’s residence and other offline information with online data, such as an email address. Companies such as LiveRamp perform “1-to-1 exact user matching” of such information, working with a vast number of data brokers and also merging CRM data. (Datalogix is also engaged in the merging of offline and online data so consumers can be more effectively tracked and then targeted.)⁴²

Companies such as Semcasting say they can “connect the full range of marketing touch points with the analytic, profiling, data enhancement and cross-platform onboarding requirements needed to bring offline audiences online for display or mobile advertising campaigns. . . . Now all customer and prospect data types—regardless of the platform of origin—can be linked together by our Smart Zones [and] use postal addresses, email addresses or IP addresses to generate audience lists that can be appended with more than 500 data elements—ranging from consumer affluence, home values, life stage, product ownership and social profiles to business headcount, revenue”⁴³ Mobile user information is a feature of this cross-platform and data-experience system; Semcasting’s

partnership with “Human Demand provides real-time access to more than 65 billion mobile impressions each month on smartphones and tablets.”⁴⁴

LiveRamp and Datalogix also reflect the growth of the commercial data consolidation “complex” that has emerged, with data brokers pooling their datasets, in real-time, so a consumer can be better targeted. For example, Datalogix’s partners include a “who knows who” set of companies engaged in the identification and analysis of consumers for profiling purposes, including Google, Facebook, eXelate, MediaMath, DataXU, and Criteo.⁴⁵ The merging of CRM with external information (the use of first-, second-, and third-party data) is a key feature of the mobile and broader profiling landscape, made more efficient through data management platforms (DMPs).⁴⁶ There is a growing number of companies tying together consumers’ online and geo-location information for profiling and targeting purposes.⁴⁷

5. Sophistication of geo-location tracking methodologies, such as location analytics, raises serious privacy concerns and the potential for discriminatory practices.

The growth of hyper-local targeting is spurring new forms of segmentation of individuals and their distinct communities. The country is being broken up into highly discrete areas that are mapped to identify unique characteristics—beyond actual location. The use of these so-called “tiles” raises profound concerns. For example, PlaceIQ explains that “What we do is map data from multiple sources onto a grid of tiles that cover every square foot of the US. Each tile is 100 meters by 100 meters, and we inject third-party demographic information about that area into the tile, as well as data on what’s physically located there—points of interest like parks and airports, tourist attractions, retailers, stadiums, and so forth. Then, we connect that data with where a mobile device is in real time, or where it has recently been, to build unique audience segments for brands to target.”⁴⁸

These tiles help generate a “score” on an individual that becomes part of a data profile. In a patent application, Place IQ describes the “process of profiling a user of a mobile computing device, the process including: obtaining a location history of a user, the location history being based on signals from a mobile computing device of the user; obtaining a location-attribute score of a location identified in, or inferred from, the location history; determining, with a computer, a user-attribute score based on the location-attribute score; and storing the user-attribute score in a user-profile datastore.”⁴⁹ Mobile users are largely unaware of the extent that data gathering is connected to their location and behavior. Catalina Marketing, for example, tells consumer product goods (CPG) manufacturers that “... Catalina Mobile delivers the unprecedented opportunity to engage your most important customers on-the-go and in-the-aisle. We understand and reach them at the most critical times—the point of decision. Catalina Mobile redefines the retail shopping experience by combining personalized promotions delivered in the aisle and comprehensive mobile self-checkout on a customer's smartphone.” Among the advantages promised to CPG companies are “Personalized brand engagement based on

purchase history, in-store location and real-time basket contents,” and “A truly integrated shopping experience that converges the physical store with the customer’s smartphone.”⁵⁰

The use of geo-fencing, “geobehavioral targeting,” “geo-cookies” and the role of location analytics, especially when integrated into broader data gathering, requires action by the FTC.⁵¹ As we will document for the forthcoming “Alternative Scoring Products” workshop, geo-location data are being made actionable at real-time events as well as used to make a range of critical decisions about an individual (whether they are credit worthy, seeking some product or service linked to sensitive concerns, etc.). These privacy and consumer-protection concerns extend beyond the individual to their communities and neighborhoods as well. The commission should examine the impact location-driven data gathering has on the financial health and consumer well-being of distinct communities, especially those in which its residents may suffer economically or due to other factors (such as age).

¹ Merkle, “Connected Recognition: Enabling a 360° View of the Customer,” <http://www.merkleinc.com/what-we-do/database-marketing-services/connected-recognition> (viewed 4 Feb. 2014).

² PlaceIQ, “Products,” <http://www.placeiq.com/products/>; BIA/Kelsey, “BIA/Kelsey Forecasts Overall U.S. Local Media Ad Revenues to Reach \$151.5B in 2017, Lifted by Faster Growth in Online/Digital,” 19 Nov. 2013, [http://www.biakelsey.com/Company/Press-Releases/131119-Overall-U.S.-Local-Media-Ad-Revenues-to-Reach-\\$151.5B-in-2017.asp](http://www.biakelsey.com/Company/Press-Releases/131119-Overall-U.S.-Local-Media-Ad-Revenues-to-Reach-$151.5B-in-2017.asp); “DoubleClick Ad Exchange Real-Time Bidding Protocol: Decrypting Hyperlocal Targeting Signals,” Google Developers, 10 Dec. 2013, <https://developers.google.com/ad-exchange/rtb/response-guide/decrypt-hyperlocal>; Thinknear, “Our Solutions,” <http://www.thinknear.com/solutions.html> (all viewed 4 Feb. 2014).

³ CDD first raised concerns about mobile privacy with the FTC in our 2009 Complaint (filed jointly with USPIRG). Center for Digital Democracy and the U.S. Public Interest Research Group, “Complaint and Request for Inquiry and Injunctive Relief Concerning Unfair and Deceptive Mobile Marketing Practices,” FTC filing, 13 Jan. 2009, http://www.democraticmedia.org/current_projects/privacy/analysis/mobile_marketing (viewed 4 Feb. 2014).

⁴ For an example of the maturing role of mobile devices used for advertising and marketing, see, generally, Vivaki’s “The Pool” Research. “Marketers and Publishers Unite to Unlock the Secrets of Tablet Advertising,” 3 Apr. 2013, <http://www.prnewswire.com/news-releases/marketers-and-publishers-unite-to-unlock-the-secrets-of-tablet-advertising-201250311.html> (viewed 4 Feb. 2014).

⁵ Illustrating the number of ways users can be tracked and also encouraged to enable data collection, mobile ad spending is focused on such categories as search, display (including rich media adopted for the mobile platform), lead generation, email, and SMS. Alison McCarthy, “US Ad Spending: 2013 Year-End Forecast and Comparative US Ad Spending: 2013 Year-End Forecast and Comparative Estimates,” eMarketer, 20 Dec. 2013 (personal copy).

⁶ We are not addressing here the array of mobile-connected applications and techniques (from special “mobile stars” ad formats to mobile discount coupons linking point of presence or interest with point of purchase) that also play a key role in consumer behavior and privacy. Interactive Advertising Bureau, “Mobile Rising Stars Ad Units,” <http://www.iab.net/risingstarsmobile>;

Interactive Advertising Bureau, “Mobile Rich Media Ad Interface Definitions (MRAID),” <http://www.iab.net/mraid>; Steve Hemsley, “Now It’s Time for Mobile RTB Ads,” <http://www.marketingweek.co.uk/analysis/digital-strategy/now-its-time-for-mobile-rtb-ads/4002629.article>; Nexage, “BlueKai and Nexage Team Up to Power Data-driven Targeting in Mobile,” 18 Sept. 2013, <http://www.nexage.com/resources/press-releases/bluekai-and-nexage-team-up-to-power-data-driven-targeting-in-mobile>. The commission should also review the myriad of research designed to analyze how mobile influences consumer behavior. For example, comScore “has conducted more than one hundred mobile brand lift studies,” including measures addressing so-called “lift” (“aided awareness, favorability, likelihood to recommend and purchase intent”). comScore, “Marketing to the Multi-Platform Majority,” 17 Oct. 2013, http://www.comscore.com/Insights/Presentations_and_Whitepapers/2013/Marketing_to_the_MultiPlatform_Majority. Also note the use of specialized mobile marketing practices designed to drive engagement, interaction, and foster data collection, such as “Click-to-Call.” Google, “The Role of Click to Call in the Path to Purchase,” Think Insights, Sept. 2013, <http://www.thinkwithgoogle.com/research-studies/click-to-call.html> (all viewed 4 Feb. 2014).

⁷ Jason Burby, “Bridging Digital & Physical—The Potential of Leveraging Beacons,” ClickZ, 21 Jan. 2014, <http://www.clickz.com/clickz/column/2323755/bridging-digital-physical-the-potential-of-leveraging-beacons> (viewed 4 Feb. 2014).

⁸ PayPal, “Connection Made,” <https://www.paypal.com/webapps/mpp/beacon>; TimePlay, “Marketing Magazine Covers TimePlay and Gamification,” 15 Jan. 2014, <http://timeplay.com/marketing-magazine-covers-timeplay-and-gamification/>; Cardlytics, “How it Works,” <http://cardlytics.com/advertisers-2/how-it-works/>; Roger Cheng, “How MasterCard Plans to Transform Mobile Purchases,” C|Net, 24 Feb. 2013, http://reviews.cnet.com/8301-13970_7-57570783-78/how-mastercard-plans-to-transform-mobile-purchases/; PayPal, “Paying With Your Phone has Never Been So Easy—Or Looked So Good,” 5 Sept. 2013, <https://www.paypal-forward.com/mobile/paying-with-your-phone-has-never-been-so-easy-or-looked-so-good/>; Karen Webster, “PayPal Puts Another Nail In NFC With Beacon Launch,” Pymnts, 10 Sept. 2013, <http://www.pymnts.com/briefing-room/mobile/playmakers/2013/PayPal-Puts-Another-Nail-In-NFC-With-Beacon-Launch/> (all viewed 4 Feb. 2014).

⁹ “What The Google AdID Means For Ad Tech,” Ad Exchanger, 19 Sept. 2013, <http://www.adexchanger.com/data-driven-thinking/what-the-google-adid-means-for-ad-tech/>. Apple’s own “Identifier for Advertising” (IFA) appears to offer greater privacy for consumers, but should be evaluated under real-world conditions. “ASIdentifierManager Class Reference,” https://developer.apple.com/library/ios/documentation/AdSupport/Reference/ASIdentifierManager_Ref/ASIdentifierManager.html#apple_ref/doc/uid/TP40012654 (both viewed 4 Feb. 2014).

¹⁰ Kate Kaye, “New Forrester Study Singles Out Top Data Management Platforms,” *Ad Age*, 21 Aug. 2013, <http://adage.com/article/datadriven-marketing/marketers-dmps/243746/>; Susan Bidell, “Boosting First-Party Data Effectiveness With DMPs,” <http://www.forrester.com/Boosting+FirstParty+Data+Effectiveness+With+DMPs/fulltext/-/E-RES108301>; Acxiom, “Multichannel Marketing Solutions,” <http://www.acxiomdigital.com/services/multichannel-marketing.asp>. As one official at ad giant WPP explained, “We’re all moving to some point in the future where we can all monitor exposure at an individual or household level and that will all get fed into a data management platform.” Quoted in David Kaplan, “Mindshare Data Chief Ivins Wants to Tear Down Walls Around First Party Analytics,” Ad Exchanger, 16 Sept. 2013, <http://www.adexchanger.com/data-exchanges/mindshare-data-chief-ivins-wants-to-tear-down-walls-around-first-party-analytics/#more-82083> (all viewed 4 Feb. 2014).

¹¹ Gavin Dunaway, “ID Is Key: Unlocking Mobile Tracking & Cross-Device Measurement, Part I,” AdMonsters, 2 Aug. 2013, <http://www.admonsters.com/blog/id-key-unlocking-mobile-tracking-cross-device-measurement-part-i/>; Gavin Dunaway, “ID Is Key: Unlocking Mobile Tracking & Cross-Device Measurement, Part 2,” AdMonsters, 3 Aug. 2013, <http://www.admonsters.com/blog/id-key-unlocking-mobile-tracking-cross-device-measurement-part-2> (both viewed 5 Feb. 2014).

¹² Tin Kyaw, “The Pairing Algorithm: A High-Level Overview of Our Special Sauce,” Drawbridge Blog, 1 Mar. 2013, <http://blog.drawbrid.ge/?cat=11>. See also Jeff Chester, “Head in the Digital Sand: How the Obama Administration’s NTIA-led Multistakeholder Effort Doesn’t Deliver its Promised Privacy Bill of Rights,” Center for Digital Democracy, Aug. 2013, <http://www.centerfordigitaldemocracy.org/sites/default/files/CDDPrivacyObamaAdmReportAugust2013.pdf> (both viewed 5 Feb. 2014).

¹³ “As Budget Continues to Shift to Mobile, Adbrain CEO & Co-Founder Gareth Davies Outlines Their New Pure Play Tech Solution For Buyers,” ExchangeWire, 8 Aug. 2013, <http://www.exchangewire.com/blog/2013/08/08/as-budget-continues-to-shift-to-mobile-adbrain-ceo-co-founder-gareth-davies-outlines-their-new-pure-play-tech-solution-for-buyers/>; MdotM, “Retargeting,” <http://www.mdotm.com/advertisers2/retargeting/>; Kochava, <https://kochava.com/> (all viewed 5 Feb. 2014).

¹⁴ These techniques are part of the digital marketing “ecosystem,” of which data collection is a key—but not isolated—feature. They include the use of influencers, immersive techniques relying on neuroscience, interactive story telling, etc. For an overview Coca-Cola’s approach to twenty-first-century marketing, see Coca-Cola, “Coca-Cola Content 2020 Initiative Strategy Video—Parts I & II,” 7 July 2012, YouTube, <http://www.youtube.com/watch?v=G1P3r2EsAos>. For a glimpse into how neuromarketing plays a role generally, as well as with mobile devices, see NeuroStrata, “Admap Feature: Neuroscience in Practice. The Definitive Guide for Marketers,” 3 Mar. 2013, http://neurostrata.com/?page_id=446; True Impact, “The Science Behind Mobile Design,” <http://www.trueimpact.ca/the-science-behind-mobile-design/> (all viewed 5 Feb. 2014).

¹⁵ Jim Lecinski, “Marketers: Winning the Mobile Consumer Is All About The ‘Zero Moment of Truth,’” *Ad Age*, 22 Dec. 2011, <http://adage.com/article/digitalnext/marketers-winning-mobile-consumer-moment-truth/231716/>; Google, “Zero Moment of Truth (ZMOT),” Think Insights, <http://www.thinkwithgoogle.com/collections/zero-moment-truth.html> (both viewed 4 Feb. 2014).

¹⁶ Shopper Sciences, “Our Approach.” <http://www.shoppersciences.com/>; Google, “The Customer Journey to Online Purchase,” Think Insights, <http://www.thinkwithgoogle.com/tools/customer-journey-to-online-purchase.html>; Path to Purchase Institute, <http://p2pi.org/> (all viewed 4 Feb. 2014).

¹⁷ Source Metrics, “Source Metrics In-Store,” YouTube, 13 Nov. 2013, http://www.youtube.com/watch?v=Z__3A5sFYVc; Source Metrics, <http://sourcemetriks.com/> (both viewed 4 Feb. 2014).

¹⁸ See, for example, Catalina, “Catalina Brings Deeper Insight and More Efficiency to Online Advertising with the Introduction of Catalina Buyervision,” 21 May 2012, <http://www.catalinamarketing.com/news-events/press-releases/details.php?id=285>; Datalogix, “Retail: Anytime Access to the Right Customers Across All Channels,” <http://www.datalogix.com/industries/retail/> (both viewed 5 Feb. 2014).

¹⁹ Chester, “Head in the Digital Sand.”

-
- ²⁰ Jesse Haines and Abigail Posner, “The Meaning of Mobile,” Think with Google, Oct. 2012, http://ssl.gstatic.com/think/docs/the-meaning-of-mobile_research-studies.pdf (viewed 4 Feb. 2014).
- ²¹ We also urge the commission to incorporate into its work an analysis on the impact of mobile device and application interface design on privacy considerations.
- ²² Programmatic buying is being applied to TV, which will eventually have similar data tracking and targeting capabilities now seen online. For example, see: <http://www.audienceexpress.com/the-platform/>
- ²³ comScore, “Marketing to the Multi-Platform Majority.”
- ²⁴ Google, “The New Multi-Screen World Study,” Think Insights, Aug. 2012, <http://www.thinkwithgoogle.com/research-studies/the-new-multi-screen-world-study.html>. See also Google, “The Customer Journey to Online Purchase,” Think Insights, <http://www.thinkwithgoogle.com/tools/customer-journey-to-online-purchase.html> (both viewed 5 Feb. 2014).
- ²⁵ Steve Schuler, “How to Reach Consumers Across Devices with Sequential Messages,” Yahoo Advertising, 16 Sept. 2013, <http://hispanicad.com/agency/digital/how-reach-consumers-across-devices-sequential-messages>; “Marketing for Cross-screen Sequencing,” ANA Magazine, Issue 8, 2012, p. 7, http://www.ana-thoughtleadership.net/ana-thoughtleadership/2013_issue_8#pg7 (both viewed 5 Feb. 2014).
- ²⁶ Cheryl Morris, “Mobile Marketers: Supercharge Targeting with Facebook’s New Custom Audience Solution—App User IDs,” Nanigans, 21 May 2013, <http://www.nanigans.com/2013/05/21/mobile-ad-targeting-facebook-custom-audiences-app-user-ids/>; “Custom Audiences for Mobile Apps,” Facebook Developers, <https://developers.facebook.com/docs/ads-for-apps/custom-audiences-for-mobile-apps/> (both viewed 5 Feb. 2014).
- ²⁷ Nielsen, “Any Way You Watch It: Nielsen to Incorporate Mobile Viewing into TV Ratings and Dynamic Digital Ratings,” 28 Oct. 2013, <http://www.nielsen.com/us/en/newswire/2013/any-way-you-watch-it-nielsen-to-incorporate-mobile-viewing.html> (viewed 4 Feb. 2014).
- ²⁸ comScore, “Marketing to the Multi-Platform Majority.”
- ²⁹ Nielsen, “Unleashing Cross-Platform: The Tip of the Spear,” 13 Nov. 2013, <http://www.nielsen.com/us/en/newswire/2013/unleashing-cross-platform-the-tip-of-the-spear.html>. See also Becky Chappell, “Making Mobile Work Across the Advertising Industry,” DoubleClick Advertiser Blog, 1 Nov. 2013, <http://doubleclickadvertisers.blogspot.com/2013/11/making-mobile-work-across-advertising.html>. For an example of a mobile targeting company’s discussion of cross-platform realities, see Millennial Media, “Millennial Media’s Mobile Audience Solutions,” <http://www.millennialmedia.com/advertise/targeting/> (all viewed 4 Feb. 2014)
- ³⁰ Kontagent, “Kontagent’s New kSuite DataMine Changes Social/Mobile Analytics Game for App Developers,” 4 Apr. 2012, <http://www.kontagent.com/company/press-releases/kontagents-new-ksuite-datamine-changes-social-mobile-analytics-game-for-app-developers/#sthash.6uLqg81b.dpuf> (viewed 4 Feb. 2014).
- ³¹ Sue Marek, “Verizon’s Hillier Discusses Data Privacy and the Future of Mobile Marketing,” FierceMobileIT, 5 Oct. 2012, <http://www.fiercemobileit.com/story/verizons-hillier-discusses-data-privacy-and-future-mobile-marketing/2012-10-05#ixzz2sHoEXWJE>; Verizon, “Precision

Market Insights,” <http://business.verizonwireless.com/content/b2b/en/precision/precision-market-insights.html>; Verizon, “Retail Solutions,” <http://www.verizonenterprise.com/industry/retail/precision-market-insights/> (all viewed 4 Feb. 2014).

³² Armed with this technology, says Verizon, companies “have information about how customers are using their mobile phones. Whether it's making a call or using an application or browsing the web ... when it comes to things like measurement of behavior, we think that by virtue of having 70 million devices that are providing us with these insights, we have much more precision from our analytics than the other things out there that are panel based or subject to bias.” Kate Kaye, “Verizon Uses Phone Data to Connect Consumer Dots for NBA Teams, Sponsors,” *Ad Age*, 8 Nov. 2013, <http://adage.com/article/dataworks/verizon-phone-data-connect-dots-nba-sponsors/245178/>; Verizon, “Unprecedented Insights, in Your Neighborhood,” http://business.verizonwireless.com/content/dam/b2b/precision/Precision_Phoenix_Market_Infographic.pdf (both viewed 5 Feb. 2014).

³³ Alison McCarthy, “US Ad Spending: 2013 Year-End Forecast and Comparative Estimates,” eMarketer, Dec. 2013, personal copy.

³⁴ The FTC should review the impact of “multi-channel funnels” and other approaches used to track the actions of individuals on devices and across platforms. See, for example, Bill Kee, “Data-driven Attribution: Better Investment Decisions, Better Marketing Outcomes,” Google Analytics Blog, 20 Aug. 2013, <http://analytics.blogspot.com/2013/08/data-driven-attribution-better.html> (viewed 4 Feb. 2014).

³⁵ While mobile devices prove a challenge, Google “makes life for the [Android] mobile app advertiser easier by using a referrer URL parameter in download links to Google Play. The Google Analytics SDK for Android uses this parameter to automatically populate campaign information in Google Analytics for your application. This enables the source of the application install to be recorded and associated with future pageviews and events, which can be useful for gauging the effectiveness of a particular advertisement for your app. In addition, for any campaign run through Google Play, you can take advantage of Google’s Campaign Tracking URL Builder that generates a tracking URL (based of your own app info) that refers users to the your specific app and the subsequent referral information is later available in your Google Analytics report.” Grace Fletcher, “An Introduction to Mobile App Attribution,” Mobile App Tracking, 26 Sept. 2013, <http://support.mobileapptracking.com/entries/22260809-An-Introduction-to-Mobile-App-Attribution> (viewed 4 Feb. 2014).

³⁶ Fletcher, “An Introduction to Mobile App Attribution.” In its recent S-1 filing with the SEC, the Rubicon Project explains the growth of universal tracking systems in relationship to cookie-based approaches:

Google and Microsoft have announced intentions to discontinue the use and deployment of cookies, and to develop alternative methods and mechanisms for tracking web users. There are also reports that other prominent web sellers, such as Amazon, Facebook, and Apple, are also developing alternative web tracking technologies to displace the use of cookies. These alternative mechanisms have not been described in technical detail, and have not been announced with any specific stated time line. It is possible that these companies may rely on proprietary algorithms or statistical methods to track web users without the deployment of cookies, or may utilize log-in credentials entered by users into other web properties owned by these companies, such as their digital email services, to track web usage without deploying third party cookies. Alternatively, such companies may build alternative and potentially proprietary user tracking methods into their widely-

used web browsers [S]uch proprietary web tracking standards are owned by sellers or browser operators that have access to user information by virtue of their popular consumer-oriented websites or browsers and have the technology designed for use in conjunction with the types of user information collected from their websites

The Rubicon Project, "Form S-1 Registration Statement," Securities and Exchange Commission, 4 Feb. 2014,

<http://www.sec.gov/Archives/edgar/data/1595974/000119312514034389/d652651ds1.htm> (viewed 5 Feb. 2014).

³⁷ Fletcher, "An Introduction to Mobile App Attribution." See also Vijaye Raji, "Drive Installs and Discovery with Mobile App Install Ads," Facebook Developers, 17 Oct. 2012, <https://developers.facebook.com/blog/post/2012/10/17/drive-installs-and-discovery-with-mobile-app-install-ads/>; "Measurement for Mobile App Ads," Facebook Developers, <https://developers.facebook.com/docs/ads-for-apps/measurement/> (all viewed 4 Feb. 2014).

³⁸ [<http://www.pcworld.com/article/193789/article.html>]; http://www.nytimes.com/2012/11/18/technology/your-online-attention-bought-in-an-instant-by-advertisers.html?pagewanted=all&_r=0]

³⁹ Kevin Weil, "Driving Mobile Advertising Forward: Welcoming MoPub to the Flock," Twitter Blog, 9 Sept. 2013, <https://blog.twitter.com/2013/driving-mobile-advertising-forward-welcoming-mopub-to-the-flock>; Nexage, "Nexage Reaches Major Milestone with More than 50 Percent of Spend Now through RTB," 17 July 2013, <http://www.nexage.com/resources/press-releases/nexage-more-than-50-percent-of-spend-now-through-real-time-bidding>; Kelly Liyakasa, "Ads Across Amazon: O&O Sites Vary in RTB and Data Readiness," Ad Exchanger, 5 Dec. 2013, <http://www.adexchanger.com/e-commerce-2/sizing-amazons-scope-the-owned-and-operated-opportunity/>; DoubleClick, "Solutions for Publishers: Sell Across All Screens," <http://www.google.com/doubleclick/publishers/solutions/mobile.html>; (all viewed 4 Feb. 2014).

⁴⁰ Millennial Media, "The Millennial Media Exchange," <http://www.millennialmedia.com/data-technology/mmx/>; Millennial Media, "Creating Mobile Success for the World's Top Brands," <http://www.millennialmedia.com/data-technology/for-advertisers/>; Millennial Media, "Patents," <http://www.millennialmedia.com/data-technology/patents/>. See also Smaato, <http://www.smaato.com/> (all viewed 5 Feb. 2014).

⁴¹ Such tracking enables marketers, such as WPP's Xaxis, to "reach an audience across all different publishers with one frequency cap," revealing how intrusive current practices already are. "Programmatic Ads Provide for Audience Precision and Ad Guarantees," eMarketer, 17 Jan. 2014, <http://www.emarketer.com/Article/Programmatic-Ads-Provide-Audience-Precision-Ad-Guarantees/1010539> (viewed 4 Feb. 2014).

⁴² Jeremy Litz, "Data Onboarding System Overview," LiveBlog, 3 Oct. 2012, <http://blog.liveramp.com/2012/10/03/data-onboarding-system-overview/>; Fahim Zaman, "New LiveRamp Connect Allows Brands to Integrate Data into 70+ Marketing Platforms," LiveBlog, 21 Jan. 2014, <http://blog.liveramp.com/2014/01/21/new-liveramp-connect-allows-brands-to-integrate-data-into-70-marketing-platforms/>; Datalogix, "DLX OnRamp," <http://www.datalogix.com/dlx-onramp/>; Datalogix, "Digital Media," <http://www.datalogix.com/digital-media/>; Datalogix, "Audiences," <http://www.datalogix.com/audiences/mobile/>; Semcasting, "DataPoint Media Partners with Semcasting for Enhanced Targeting Capabilities for Premium Publishers," 12 Dec. 2013, <http://semcasting.com/about-us/news-and-events/146-datapoint-media-partners-with-semcasting-for-enhanced-targeting-capabilities-for-premium-publishers.html> (all viewed 5 Feb. 2014).

⁴³ Semcasting, “New Semcasting Marketing Appliance Fuses Offline and Online Data for 100% Reach and Enhanced Accuracy Without Tracking or Cookies,” 7 Oct. 2013, <http://semcasting.com/about-us/news-and-events/142-new-semcasting-marketing-appliance-fuses-offline-and-online-data-.html> (viewed 5 Feb. 2014).

⁴⁴ Semcasting, “Human Demand Partners with Semcasting to Enhance Audience Targeting,” 31 Oct. 2013, <http://semcasting.com/about-us/news-and-events/144-human-demand-partners-with-semcasting-to-enhance-audience-targeting.html>. See also Semcasting, “Triton Digital Partners with Semcasting to Expand a2x Audience Targeting,” 1 Aug. 2013, <http://semcasting.com/about-us/news-and-events/141-semcasting-partners-with-triton-on-smart-zones>; Judith Aquino, “Ad Targeting Firm Semcasting Rolls Out Tool to Connect Online and Offline Data,” Ad Exchanger, 8 Oct. 2013, <http://www.adexchanger.com/data-exchanges/ad-targeting-firm-semcasting-rolls-out-tool-to-connect-online-and-offline-data/> (all viewed 5 Feb. 2014).

⁴⁵ Datalogix, “Digital Media.”

⁴⁶ Michel Benjamin, “1st, 2nd, 3rd Party Data: What Does it All Mean?” Lotame, <http://lotame.com/1st-2nd-3rd-party-data-what-does-it-all-mean>; Adobe, “Digital Marketing Suite/Adobe AudienceManager,” <http://www.adobe.com/products/audiencemanager.html>; BlueKai, “Data Management Platform,” <http://bluekai.com/data-management-platform.php> (all viewed 5 Feb. 2014).

⁴⁷ For example, AcquireWeb says that its has linked “over 120 million existing cookies to geographic ‘micro-zones’ (groups of zip9s). This allows us to leverage traditional offline consumer data to target online display advertising campaigns. ... Advertising at the ZIP+4 or neighborhood level to +120 million unique consumer devices tagged with actionable cookies” AcquireWeb, “Prospect Display Targets via cookie Targeting,” <http://www.acquireweb.com/prospect-data-services/prospect-display-targets-via-cookie-targeting/>; Placed, “Placed Targeting,” <https://www.placed.com/targeting> (both viewed 5 Feb. 2014).

⁴⁸ eMarketer, “How to Use Location Data to Target Unique Mobile Audiences,” personal copy.

⁴⁹ The tiles are designed to provide a “location history” consisting of a “list of geolocation records, each geolocation record including geographic coordinates expressed as a latitude and longitude and a time at which the mobile computing device was at the respective coordinates, each geolocation record being obtained by an end-user portable device having access to a location identifying service; obtaining a location-attribute score comprises: inferring locations between locations identified in the location history; for each identified or inferred location, retrieving respective tile records from a GIS, the tile records corresponding to a tile in which the respective location is disposed and adjacent tiles, each tile record corresponding to a geographic area of between 100 square meters and 100,000 square meters and being associated with one or more location-attribute scores, each location-attribute score corresponding to an activity of interest to advertisers and ordinal values indicative of a likelihood that a user is engaged in the respective activity in the tile during each of a plurality of time-bins, the time-bins defining different subsets of a week, including a weekday morning bin, a weekday lunch-time bin, and a weekend evening bin, and the attributes including the user being at work, the user engaging in sports, the user shopping, and the user engaging in tourism; determining a user-attribute score comprises: determining that location attribute scores for the tile records for the time-bin in which the user was at the location are consistent among the adjacent tiles; and in response, determining a plurality of user-attribute scores corresponding the location-attribute scores, the respective user-attribute score being an average of the corresponding location-attribute score for a time-bin including the time at which the user was at the location and previous scores for the attribute from

other locations; and storing the user-attribute score comprises: storing the averaged user-attribute scores in a user profile in the user-profile datastore, user profile being stored on a tangible, non-transitory, machine-readable medium, and the user-profile datastore being operative to respond to queries from advertisers for data relevant to the selection of advertisements.” Stephen Milton and Duncan McCall, “Apparatus and Method for Profiling Users,” United States Patent 8,489,596, 16 July 2013, <http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetacgi%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8489596.PN.&OS=PN/8489596&RS=PN/8489596> (viewed 4 Feb. 2014).

⁵⁰ Catalina, “Mobile Commerce,” <http://www.catalinamarketing.com/media-networks/mobile-commerce/>. Ongoing surveillance of individual users is a growing practice on mobile devices, including with apps. As CDD documented in its report submitted last year to both the NTIA and the FTC, there is the “real-time monitoring and assessment” of consumers, especially with gaming. Center for Digital Democracy, “New Report Exposes Flaws in NTIA ‘Multistakeholder’ Effort to Establish Privacy Safeguards: White House Must Act to Fulfill its Vision for a ‘Privacy Bill of Rights’/See cross-platform tracking/users as \$ ‘whales,’” 29 Aug. 2013, <http://www.centerfordigitaldemocracy.org/new-report-exposes-flaws-ntia-%E2%80%9Cmultistakeholder%E2%80%9D-effort-establish-privacy-safeguards-white-house-mus> (both viewed 5 Feb. 2014).

⁵¹ Thinknear, “Our Solutions,” <http://www.thinknear.com/solutions.html> (viewed 5 Feb. 2014).