



Navigating the location data landscape: A comprehensive buyer's guide for mobility data

Introduction

Welcome to Quadrant's ultimate Location Data Buyer's Guide. As pioneers in location data and business intelligence services, we strive to leverage location data, providing businesses with invaluable, actionable insights.

Location data refers to data linked to specific geographical locations, sourced from mobile GPS, Wi-Fi, Bluetooth beacons, cell towers, IP addresses, among others. Understanding the intricacies of these sources is a critical step in making informed purchasing decisions. We fervently believe in the game-changing power of location data, and our dedication to delivering value has positioned us as a global, trusted partner.

This buyer's guide is inspired by our extensive industry experience and legacy of hundreds of successful projects that simplify the complexities of the location data realm and help you make informed purchase decisions. This eBook will provide key considerations, ensuring you source data that perfectly aligns with your unique requirements.



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Challenges

The increasing demand for location-based intelligence is met with various issues - low-quality, fraudulent data is rampant, leading to potentially false insights even with sophisticated algorithms and software. The effects of such low-quality data negatively impact a company's bottom line and only become apparent after faulty decisions have been made. Here are a few common challenges facing location data consumers.



- ⚠ **Transparency in Data Sourcing:** Location data comes from a variety of sources, with differing levels of accuracy and coverage. However, many data providers often lack transparency about their sourcing methods, leaving organizations in the dark about the reliability and suitability of the data for specific use cases.
- ⚠ **Compliance with Data Privacy Laws:** Many vendors fail to comply with data privacy regulations when sourcing or monetizing data, putting organizations at risk of financial penalties and reputational damage. This is exacerbated by misunderstandings about what kind of data is classified as Personally Identifiable Information (PII).
- ⚠ **Vendor Inflexibility:** The rigid business models and pricing structures of many data vendors can be prohibitive, particularly for smaller businesses and researchers. This creates a barrier to accessing vital location intelligence.
- ⚠ **Quality Control:** Vendors often blend location data from multiple sources, leading to overlapping and duplicate records. The resulting poor-quality datasets are not only more costly, but they also require additional time and resources for data preparation.
- ⚠ **Inconsistent Coverage:** Reliable location data must offer consistent coverage across different regions. Yet, many vendors provide data feeds with fluctuating counts and inadequate coverage, particularly in less dense suburban and rural areas. This inconsistency limits the efficacy and applicability of the data.
- ⚠ **Other Industry Limitations:** Areas with low smart-device usage limit data availability, restricting insights from less dense regions. Also, publishers' data privacy concerns and lack of regulation understanding add hurdles to data collection and usage. Lastly, abrupt policy changes by OS providers disrupt data collection, causing significant fluctuations in available location data volumes.

Types of Location Data

As you venture into the world of location data, you will find that it comes in various forms. Each type of location data, or "data feed", has unique characteristics that lend themselves to specific use cases. In this chapter, we'll delve into these types and explore their potential applications.



- ✓ **Raw Data:** Raw data comes directly from mobile devices without any processing. It often includes latitude-longitude coordinates, timestamp, device ID, and occasionally, additional sensor data such as accelerometer or barometer readings. This type of data is extremely granular and can provide the richest context about a user's location. However, it also requires the most processing and cleansing to remove noise and inaccuracies. Use cases for raw data are diverse and include detailed mobility studies, traffic flow analyses, and personalized location-based services.
- ✓ **Persistent Data:** A persistent location data feed is tailored to your exact business requirements. As a chronological record of recurring device movements, it generates a wealth of actionable insights over time, with minimal data preparation. Unlike raw data, persistent location data feed is ideal for understanding movement patterns and consumer behavior at a deeper level.
- ✓ **Bidstream Data:** Bidstream data refers to location data that comes from the process of real-time bidding in digital advertising. It includes user behavior data and can be a source of broad, anonymized population movement trends. Although it's less precise than other types, it is highly scalable. For marketers, it's an excellent source of insights for understanding customer behavior, delivering targeted ads, and measuring campaign effectiveness.
- ✓ **Wi-Fi and Beacon Data:** Wi-Fi and beacon data are forms of indoor location data. Wi-Fi data is based on the strength of a device's connection to various Wi-Fi access points, while beacon data comes from Bluetooth devices that emit signals which smartphones can detect and interact with. These sources can deliver highly accurate location data in indoor environments, making them ideal for retail analytics (in-store footfall analysis), indoor navigation (like malls or airports), and proximity marketing.

- ✓ **Geospatial Imagery Data:** Geospatial imagery data, often derived from satellite or drone imagery, provides a macroscopic perspective. It's used extensively in fields like agriculture for crop health analysis, in urban planning for land use studies, in environmental studies for tracking deforestation or glacier movement, and in insurance for assessing property risk or damage.
- ✓ **Cell Tower Data:** Cell tower data is produced when mobile devices connect to cell towers. It's less accurate than GPS data but provides wider coverage, even in areas with no internet access. This data type can support use cases in market research, such as studying population mobility patterns, and in emergency services, where it helps locate callers.
- ✓ **IP Address Data:** IP address data can provide a coarse, city-level or regional location based on the IP address of a device. It's widely used in digital marketing for geo-targeted advertisements and content, in cyber security for detecting fraud, and in digital rights management for ensuring content licensing agreements are upheld.



Understanding the different types of location data feeds is crucial to your decision-making process. Each data type has its own unique advantages and use cases, but it also comes with its own challenges and limitations. The next chapters will explore these aspects, providing you with a holistic view of the location data landscape.

Limitations of location data types

Every type of location data, despite its immense potential, comes with a set of challenges. These challenges, even if they are not roadblocks, must be considered and assessed to make an informed purchase decision. Let's explore these limitations and help you discern the best fit for your specific needs and use case.



- ✓ **Raw Data:** While raw data offers the most granular detail, it also requires significant processing and validation. Noise, inaccurate readings, and privacy considerations make it vital to have robust data processing capabilities. Furthermore, the sheer volume of raw data can demand substantial storage and processing power.
- ✓ **Persistent Data:** Persistent location data signals can benefit businesses by minimizing preprocessing and storage costs of raw data while offering actionable insights. However, challenges exist such as vendor reliability with regards to data volume, authenticity, and compliance with data privacy regulations like GDPR and CCPA, which can potentially have legal implications.
- ✓ **Bidstream Data:** Bidstream data can provide insights into broad user behavior trends, but it has its limitations in terms of accuracy and freshness. As it's generated during the ad-bidding process, the location data might not represent the exact current location of the user. Also, the user's consent for using this data for purposes other than advertising must be obtained, ensuring ethical use.
- ✓ **Wi-Fi and Beacon Data:** While Wi-Fi and beacon data provide precise indoor location information, the setup cost for Wi-Fi access points or Bluetooth beacons can be high. These technologies also require user permissions, and signal strength can be influenced by obstacles like walls and floors. Despite these challenges, the precise insights they offer into indoor behavior make them invaluable in retail and building management contexts.

✓ **Geospatial Imagery Data:** This data offers a macro view but can be less useful for real-time or individual-level tracking. The cost of procuring satellite or drone imagery can also be high. However, this type of data is great for use cases that require a broad perspective over a large area, such as land use or environmental analyses.

✓ **Cell Tower Data:** Cell tower data provides wide coverage, but its accuracy is comparatively lower. The data is also susceptible to changes in network infrastructure. Still, for use cases where detailed precision is not crucial, such as broad mobility studies or emergency services, cell tower data offers a viable solution.

✓ **IP Address Data:** IP address data gives a rough estimate of a device's location at the city or regional level, but it is far less precise than GPS or cell tower data. It's also affected by VPN usage and dynamic IP allocation by service providers. However, for geo-targeting of digital content and broad trend analysis, IP address data provides a convenient and scalable solution.



Choosing the right type of location data for your analyses is crucial for supporting your business' objectives. The right data type can significantly improve the precision of insights, resulting in better intelligence and decisions, optimized resources, and higher ROI. To evaluate potential data sources for quality, reliability, and compliance, businesses must first firmly define their use case requirements. Let's explore the diverse range of real-world applications that can benefit from different types of location data.

Use cases for different location data types



- ✓ **Raw Data:** Raw location data is the most unprocessed, comprehensive form of location information and the most popular type of data among data scientists and business intelligence companies. As the most versatile type of location data, it serves as the foundation for a myriad of applications across industries. Because it is unprocessed, raw data provides unrivalled flexibility, allowing businesses to apply custom processing and preparation according to any mobility use case.

Transport economists, market researchers, urban planners, and governments utilize this data to monitor traffic, analyze the use of public spaces, forecast potential displacement after disasters, build smarter and efficient cities, and more. Retailers and other similar businesses can tap into this wealth of data to understand footfall trends, plan their opening hours, and strategize their marketing efforts accordingly. Real estate developers can use this data to identify potential high-value sites for new projects based on population movement trends.

Lately, mobility data has also been monumental in understanding the environmental impact of transportation choices, helping shape future urban planning with an environmentally conscious perspective. In essence, raw data proves to be an unrivalled, versatile resource, serving diverse needs while driving profitability, efficiency, and positive societal outcomes.

- ✓ **Persistent Data:** Persistent location data is ideal for highly targeted campaigns that focus on the permanent population in a region. Much smaller than a raw data feed this type of data requires minimal processing and allows for precise customer segmentation and insight into regular patrons, enabling demand prediction, service optimization, and subsequent profit maximization. Furthermore, when integrated with other data types, it can create comprehensive audience profiles, enabling an in-depth understanding of your market and customers, thus facilitating informed, cost-effective decisions.
- ✓ **Bidstream Data:** Bidstream data is often a treasure trove for e-commerce firms. Many brands use location data from digital ad platforms, unlocking valuable insights into online customer behaviors and preferences. By understanding their customers at a granular level, they can craft precisely targeted ads and boost conversion rates,

optimize marketing spending and deliver higher ROI. However, it is important to realize that bidstream data has its limitations when it comes to accurately understanding consumer behavior. Bidstream data may provide an overview of consumer behaviour, but might not reflect true intent and fail to predict trends unless observed over an extended period of time..

- ✓ **Wi-Fi and Beacon Data:** Best for indoor locations, Wi-Fi and beacon data helps unlock insights into customer behaviors inside shopping malls, commercial complexes, airports and other similar spaces. It can reveal store level, granular footfall patterns and dwell times, helping identify popular 'hotspots' and underused zones. These insights can revolutionize the utilization of spaces, improve store layouts, enhance crowd management and more. Based on a customer's shopping habits brands can better plan promotional activities and increase non-peak hour activity to boosts sales and consumer satisfaction.
- ✓ **Geospatial Imagery Data:** Geospatial imagery data is less about mobility and more about land utilization and precision farming. The insurance industry utilizes geospatial data for risk assessment, studying population distribution, accurately predicting areas susceptible to natural disasters. The energy sector, particularly renewable energy firms, capitalizes on this data to pinpoint ideal locations for solar panels or wind turbines, maximizing energy generation.
- ✓ **Cell Tower Data:** Ideal for urban planning and broader population analyses, cell tower data can help study population mobility and help government administration and urban planners make informed public focused investments. Cell tower data can contribute to a more functional urban landscape, potentially enhancing the quality of life for natives of an area, however, it doesn't not provide any intelligence about consumer behaviour that is commercially relevant.
- ✓ **IP Address Data:** IP-based location data is best suited for digital businesses. Lately, global streaming services are leveraging the IP based geoblocking to improve their profit margins. It can be used for geo-targeting and personalization, enabling businesses to deliver content or advertisements tailored to a user's location, thereby enhancing overall experience. Additionally, it plays a crucial role in fraud detection, with financial institutions and e-commerce platforms leveraging it to identify and mitigate fraud.

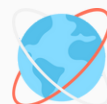
Selecting your ideal location data partner

Selecting the right location data vendor is a critical decision that can significantly impact the effectiveness of your location-based analyses and ultimately, business outcomes. When evaluating vendors, in addition to knowing the best type of data for your use case it is crucial to assess them on additional qualitative and quantitative parameters. Here are the key factors to consider when evaluating potential location data vendors.



Data Quality

High-quality location data is characterized by accuracy, attribute coverage, and completeness. A few basic indicators of high-quality are DAU vs MAU ratios, event counts, horizontal accuracy etc.



Coverage

Geographical coverage is another essential parameter. Depending on your needs for regional, national, or local data, verify if the vendor can adequately cater to your business's geographical focus.



Freshness

Consider the ideal latency for your use case and then determine the vendor's data freshness, delivery cadence, and the suitability of their bulk data purchase or streaming subscription options.



Compliance

Considering global privacy laws, verify that the vendor adheres to regulations like GDPR & CCPA. Ensure they demonstrate their commitment to ethical practices, like PII anonymization & user consent.



Scalability

Ensure the vendor's scalability matches your project's scope. They should be able to provide geographic & time based customization, offer dynamic pricing & sufficient volume for the data you need.



Support and QA

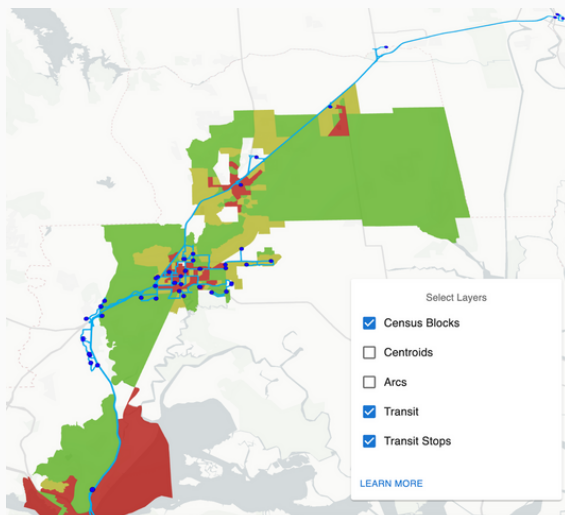
Evaluate your vendor's quality assurance, including deduplication & fraud assessment. Also, ensure that their technical support and solutions are tailored to your specific use cases.

Finding the right intelligence partner

The successful application of location data hinges not only on its quality but also on the ability to analyze and interpret it effectively. To unlock its full potential, pairing your location data with the right analytics partner is a strategic move that can significantly enhance your outcomes. There are a diverse range of consultancies and market research firms specializing in location data analysis across various business sectors. These agencies are well-versed in domain-specific challenges and have honed their expertise in interpreting location data in contextually relevant ways. With an in-depth understanding of the sector's unique nuances, they can decode complex location data, transforming it into actionable insights that cater precisely to a brand's strategic needs. Such specialized firms not only assist in making sense of the location data but also leverage their expertise to provide invaluable guidance, helping brands optimize strategies, identify opportunities, and overcome industry-specific challenges. Let's take a look at a few industry specific use cases and real-world case studies.

Use case example: Transportation intelligence

A practical use case is exemplified by Innovate Mobility, a premier transportation intelligence firm. They've crafted advanced models for optimizing traffic flow, managing fleets, and devising sustainable transportation strategies. These models are sought after by governments, city planners, and logistics firms, empowering them to enhance efficiency, cut costs, and prioritize sustainability through data-driven decisions.



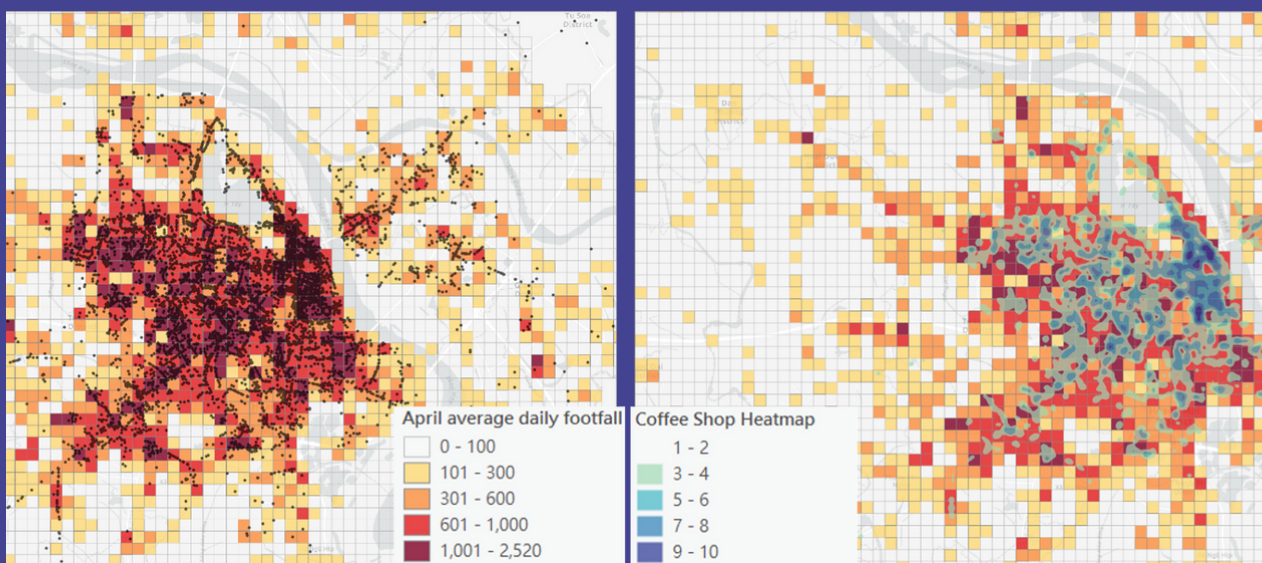
In a notable collaboration, Innovate Mobility joined forces with Quadrant to apply location data in a project for Fairfield, California's Public Works Department. The objective was to examine post-pandemic commuting trends and revamp the city's transit system. The location data analysis carried out by Innovate Mobility pinpointed transit deserts, proposed feasible microtransit routes, and facilitated a strategic revision to modernize the city's transit amenities. Consequently, this thorough analysis **secured Fairfield a \$1 million federal grant for transit service improvements.**

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Use case example: Retail business intelligence

Our client, getchee, leads the way in business intelligence with a focus on location-based insights for retailers. They offer expert analysis of location data, aiding retailers in optimal site selection, competition analysis, and customer segmentation. By combining location data from reliable vendors like Quadrant with getchee's BI tools, retailers can gain a comprehensive understanding of their competitive environment and effectively target their marketing efforts. This results in elevated sales, improved customer satisfaction, and higher ROI.

Using mobility data, retailers can evaluate consumer footfall within specific areas, generate retail outlet category-specific heat maps, and identify prime expansion opportunities, allowing for strategic workforce distribution and the creation of geotargeted marketing programs.



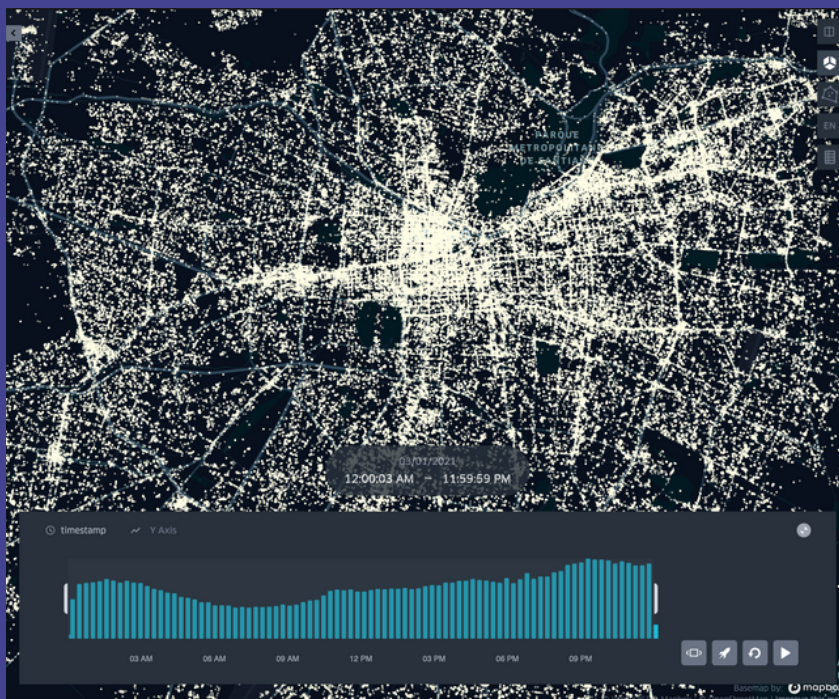
We recently hosted a webinar with getchee, highlighting the impactful role of location data in tackling retail industry challenges. The session, featuring experienced speakers and an interactive platform for dialogue, emphasized how location data can greatly enhance retail business strategy.

[WATCH WEBINAR RECORDING](#)

Use case example: Powering visual BI platforms

When it comes to transforming location data into visually intuitive insights, Mapoteca leads the pack. Specializing in geographical information system (GIS) technology, Mapoteca transforms raw location data into detailed, interactive maps. These visualizations enable businesses across industries to identify patterns, trends, and correlations that might be overlooked in traditional data presentations.

Through Mapoteca's powerful platform, companies gain valuable mobility insights at both broad (country-level) and granular (neighborhoods or specific stores) scales. Key examples include OXXO (Latin America's largest supermarket chain), which leverages Mapoteca's analytics tool for detailed visitation analysis to assess store performance, and Panama's top FMCG retailer, which uses the platform to optimize site selection for new branches. Mapoteca's platform empowers businesses to quickly generate their own actionable intelligence, without relying on market research firms or manual reports that are costly and time consuming.



Description: The image on the left was taken from Mapoteca's platform. OXXO visualizes the movement of people in Chile during different times of the day. As a result, they can identify foot traffic hotspots to determine suitable locations to expand their presence.

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Use case example: Marketing & advertising performance and ROI analysis

Applied Post is a market leader in using location data to drive marketing and advertising ROI. By pairing Quadrant's location data with their sophisticated analysis tools, Applied Post helps businesses optimize their marketing campaigns, understand customer behavior, and improve their advertising spend efficiency.

Applied Post leverages detailed local insights to guide retailers toward efficient and lucrative marketing strategies. In the dashboards we can see how a F&B retailer determined the ROI of an offline OOH campaign by geofencing a billboard's view cone and correlating data with actual traffic at the retail outlets to assume conversion rates. By geofencing their outlets in the neighborhood, the client was able to assess foot traffic and tailor marketing programs to attract, engage and retain consumers.

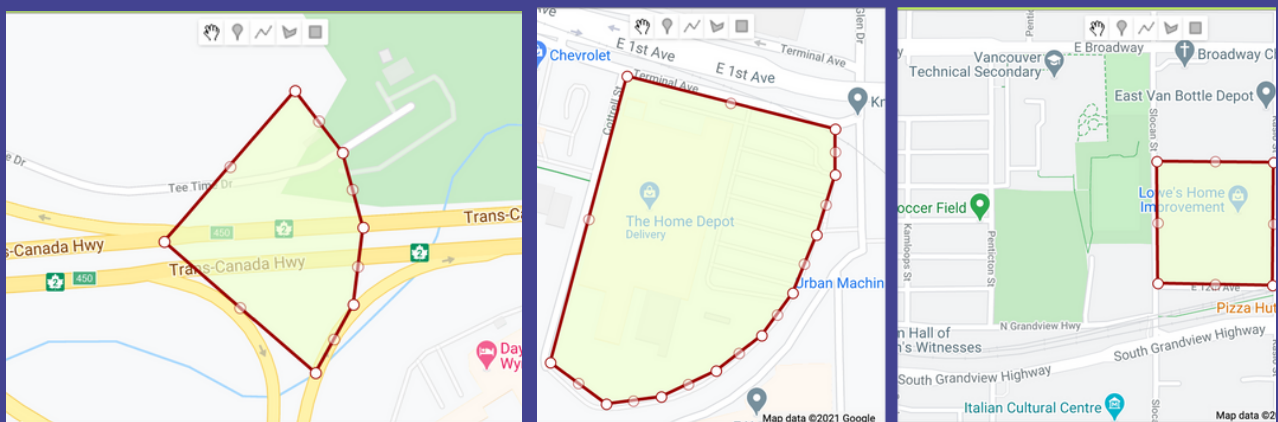


Image on the left shows a view cone around a billboard created to study mobility trends within the geofence to calculate ROI of an offline OOH campaign correlating data with foot traffic at the retail outlets (images on the right) to assume conversion rates. Images are representational only, and does not show actual analyses done by customer.

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Use case example: Supply chain and retail distribution analyses

Predik Data-Driven has carved a niche for itself in the realm of supply chain and retail distribution analyses. By leveraging Quadrant's location data, Predik provides invaluable insights into logistical operations and retail distribution strategies. Their innovative data-driven models can predict demand patterns, optimize inventory management, and provide reliable market intelligence. Businesses utilize Predik's services to analyse foot traffic patterns around their own and rival outlets, thereby gauging competitor revenue and optimizing their operational models to enhance customer satisfaction.

Predik Data-Driven employed location data to examine mobility patterns around several home improvement stores in California, producing key competitive insights. By geofencing ten stores from two rival brands, Predik analyzed consumer behavior within these specific areas. The analysis allowed them to understand the geographical distribution of brands and develop effective customer retention strategies for their client.



PREDIK Data-Driven studied mobility patterns around ten home improvement stores in California to understand brand distribution, visit concentration, and inform customer retention strategies. By geofencing the outlets and analyzing mobile location data, they mapped consumer visits and performed competitor analysis, aiding strategy development. The heatmap showcases the use of geofencing to track foot traffic in one of the neighborhoods with home improvement stores.

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Quadrant's location data offering

Quadrant is the ideal location data partner for businesses seeking to leverage location-based insights to drive growth, optimize operations, and stay ahead in a competitive market. We are deeply attuned to our clients' unique needs and challenges and relentlessly pursue the delivery of the highest quality location data, with a strong commitment to flexibility, data privacy compliance, and transparency.



Ethically sourced

We source our data directly from its point of origin – GPS signals from first-party, opt-in mobile devices via Server-to-Server (S2S) integrations from a network of trusted publisher partners



Flexible pricing

We provide flexible pricing models to suit project scope, supporting businesses from start-ups to multinational corporations with high-quality data for substantial return on investment.



Flexible contract terms

Whether you require a global data feed recurringly or need data for a smaller region or period for one-off projects, we can supply data with flexible contract terms that fit the client brief.



High data quality & volume

We offer high-quality raw location data from 650+ million devices across 219 countries with 15+ billion daily mobile data events or persistent data signals to fit a tailored use case.



Data privacy compliance

We are GDPR & CCPA compliant and only collect data from opt-in user-consented devices. Our data feed is free of context, i.e., it doesn't record a person's identity, demographics, or any other form of PII.



Transparency

Our data, traceable via blockchain for origin and destination, underscores our commitment to transparency in all operations, from pricing to contract terms, enabling informed decision-making.

About Quadrant

Businesses rely on geospatial information to make sense of their surroundings. When observed over a period of time, movement patterns provide valuable insights that can be leveraged by businesses or governments to propagate the consumption of their services, expand availability, boost ROI, improve customer experience, and gain competitive advantage. Our customers trust us for the consistency, quality, and coverage of our location data. Combined with our manually collected and verified, on-demand POI data, we have the unique capability to be a holistic, one-stop-shop data partner for you.

Quadrant (An Appen Company) is a global leader in mobile location data, POI data, and corresponding compliance services. We provide anonymized location data and location-based business solutions that are fit for purpose, authentic, easy to use, and simple to organize. We offer data for almost all countries in the world, with hundreds of millions of unique devices and tens of billions of events per month, allowing our clients to perform location analyses, derive location-based intelligence, and make well-informed business decisions. With our POI Data-as-a-Service, our customers can apply analytical models against large, accurate POI datasets, deriving meaningful and actionable insights. With the increasing digital transformation of businesses, there is an enormous market need for quality POI data. Learn how you can leverage Quadrant's location data to make better business decisions and improve the foundation of geospatial applications. **Talk to a data consultant today!**



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