

NAVIGATING OPENSTREETMAP

**How to make the most of an
increasingly valuable mapping asset**

 **accenture**

OpenStreetMap at a glance

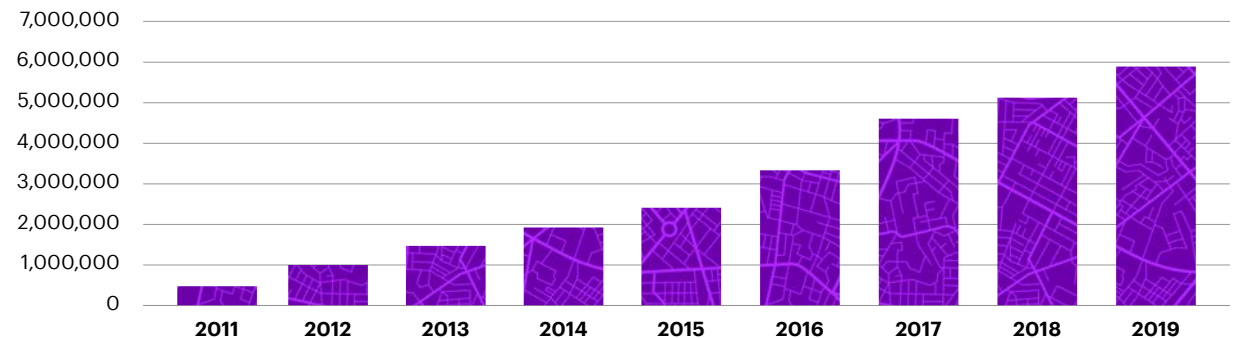
OpenStreetMap is a free, editable map of the whole world created by a large and growing community of mappers. The OpenStreetMap project maps physical features on the planet and includes data about roads, buildings, addresses, businesses, points of interest, railways, trails, transit, land use and natural features, and more. With OpenStreetMap, the raw mapping data is contributed by users and is liberally licensed under ODbL. You can download the data directly and create your own map or use the data to suit a particular scenario. The number of registered members continues to grow year-over-year.

The rise of OpenStreetMap

Geospatial platforms power diverse organizations and products, from mobility and logistics to social networks, telecommunications, humanitarian efforts and hospitality. As the geospatial industry rapidly evolves, the use of open data, particularly OpenStreetMap (OSM), is also growing fast.

OSM was founded in 2004 as a free and open alternative to commercial mapping data. It now covers the globe, with edits coming from more than a million contributors. Hobbyists, enthusiasts, GIS professionals, humanitarian volunteers, organized mapathon participants and increasingly, corporate mapping teams can between them contribute up to 5 million individual map edits every day.¹

Membership Growth Over Time



Source: <https://osmstats.neis-one.org/>

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Map editing activity is creating a virtuous cycle. As the participation in OSM increases, growing awareness drives more frequent contributions and verifications. The more people that use and contribute to the map, the better it gets. In recent years, that expanding feedback loop has prompted many medium-sized and large companies to invest significantly in the project. (See “Density of Corporate Contributions by Year”)

This includes novel approaches, such as applying AI to improve the basemap:

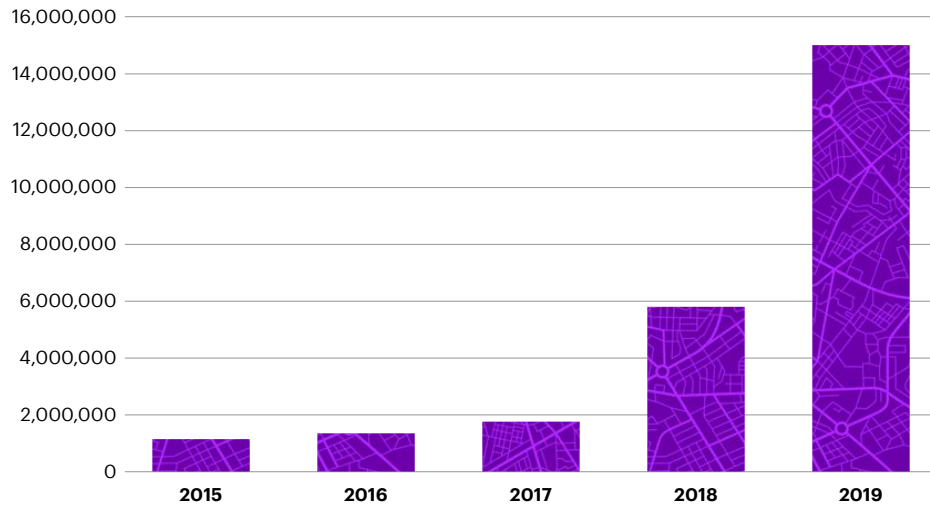
The Amazon Logistics team contributes to OSM by directly incorporating driver feedback to update maps.

Amazon employs a large, 400+ person team to directly edit road names, turn restrictions, directionality and road connectivity to OSM in a number of countries including the United States and Great Britain. That team uses updated satellite imagery along with vehicle telemetry from delivery partners to find and update areas of the map to help packages reach their destinations. Amazon has made tens of thousands of edits over the years and these changes improve the map for everyone using OSM.

Mapillary is a Swedish startup that applies sophisticated computer vision algorithms to street-level imagery collected with simple hardware such as phones or action cameras.

The company applies AI to extract roadside features and makes those available to the OSM community for editing the map. Through crowdsourcing and commercial partnerships, the company has created a global catalog of over one billion images. They are taking advantage of AI on the edge and the increasing speed of spatial-data feedback loops to help improve the map for everyone.

Corporate Edits Over Time



Source: <https://www.mdpi.com/2220-9964/8/5/232>

OpenStreetMap participation has become so pervasive that many platform companies now use OSM data as a key component of a hybrid geospatial platform strategy, where it complements commercial data and services from Google, HERE, TomTom and others. For some, it is the *only* base mapping data set they use.

So why are geospatial leaders across platform companies using, contributing to, or considering OSM as part of their product strategy? In recent interviews, executives shared the following reasons:

- **In many countries, it's the best visual display map available.**
- **Access to the OSM geospatial data can increase the pace of development of new applications, reduces time to market, and provides independence and control when adapting the data for specific scenarios.**
- **When compared to commercial alternatives, OSM can offer stronger (and constantly improving) coverage of developing markets that will be crucial to serving 'the next billion' customers.**
- **Organizations are not just using OSM, they are working to improve it, and that trend is accelerating.**

While OSM is a tremendously valuable asset to the mapping community, (Accenture analysis values it at more than \$1.67 billionⁱⁱ), making the most of it requires careful and informed navigation. Expert teams and tools can help develop and execute a robust OSM strategy and there are active communities of professional and volunteer developers coordinating to improve data quality and richness globally, which is helping **OSM evolve in three primary ways:**

1

An increasingly positive societal effect

The global spread of OSM's passionate, engaged community of editors has resulted in high quality maps of areas traditionally underserved by commercial providers. OSM can be important for organizations interested in serving communities in emerging markets. Many remote communities are on the map for the first time, creating opportunities to serve them better.

As OSM edits are published in near real-time, they can be updated quickly to serve humanitarian efforts in the immediate aftermath of a major event or disaster. A growing number of employees at organizations including Accenture, Microsoft, Amazon, HP and Salesforce, volunteer to participate in Missing Maps Mapathons to edit OSM in groups as part of corporate social responsibility.

2

Applied Intelligence augmenting humans for data quality, freshness and coverage

Map-making is increasingly a human+machine activity (Google's "algorithms and elbow grease"). Machine learning and computer vision, anonymized sensor data and real-world imagery can all feed into richer, fresher, more complete map data. Early efforts in AI-assisted mapping for OSM include Map-with-AI from Facebook, which identifies missing roads and serves them up to human editors for verification. The right balance of humans and machines can help improve map quality and speed up editing.

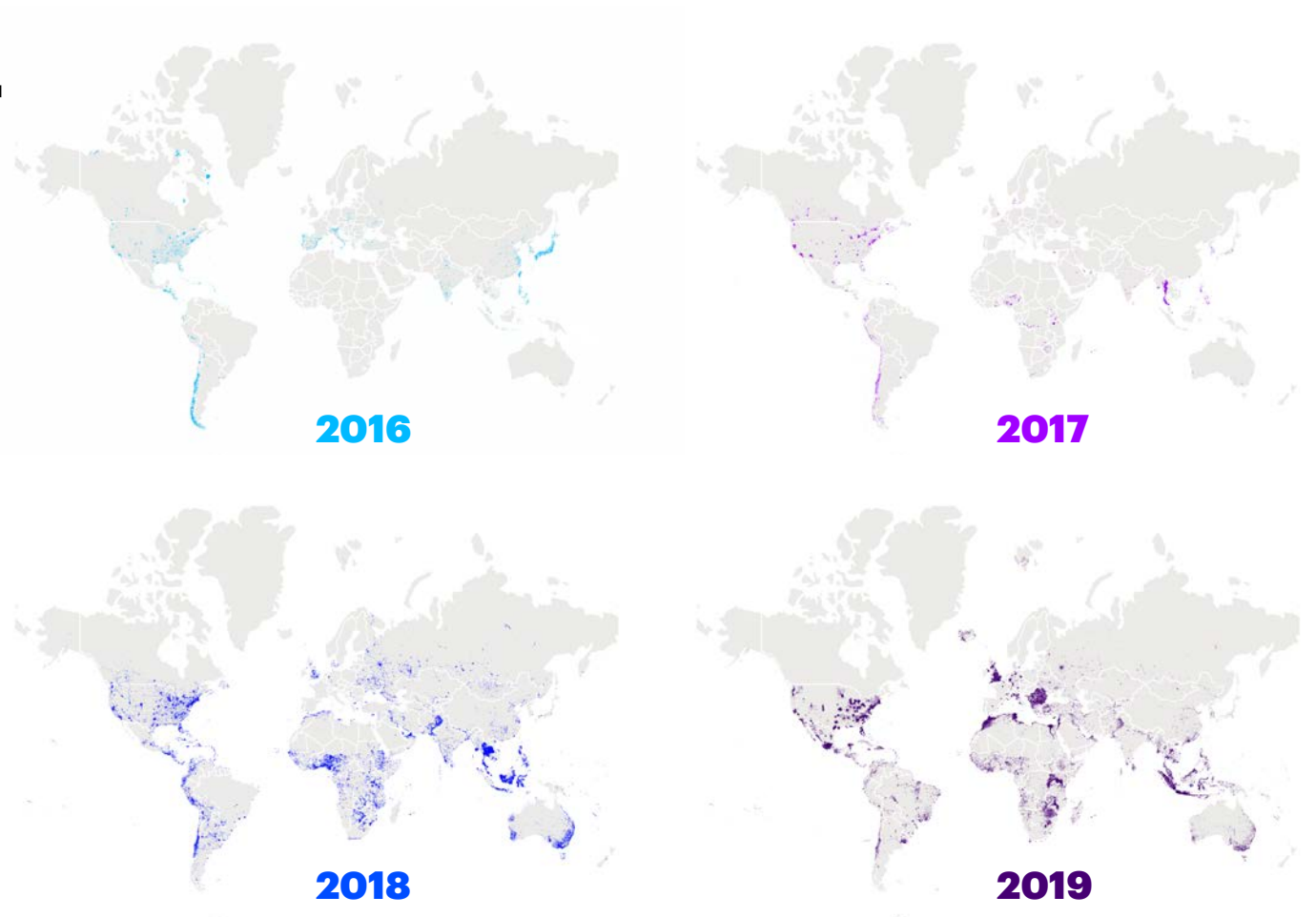
3

More authoritative data

A growing number of governments and owners of authoritative data are contributing to OSM. In some cases, these inputs are the most complete or up-to-date geospatial data available. Government organizations can also use OSM data in their area to see what the crowd is contributing.

Density of Corporate Contributions by Year

The frequency and distribution across many continents of corporate contributions has increased dramatically over the past four years. There are paid mapping teams working alongside the volunteer mapping community in almost every part of the world. The trend is accelerating.



Who is using OpenStreetMap and for what?

OSM is in use across a vast array of companies and industries.



AR and gaming

Both Pokémon Go and Minecraft Earth, the global game recently released by Microsoft, take advantage of OSM for its underlying base map. Minecraft Earth Game Director Torfi Frans Olafsson says, “We have covered the entire planet in Minecraft. Every lake is a place you can fish, every park is a place you can chop down trees. We’ve actually taken maps of the entire world and converted them to Minecraft.”ⁱⁱⁱ Items such as buildings, roads, park and lakes are taken directly from OSM and made available in the game.



Humanitarian relief efforts

The International Red Cross and Médecins Sans Frontières (MSF International) used OSM as one element for their Ebola response, while the Humanitarian OpenStreetMap Team is actively engaged in improving map quality and coverage everywhere. During the crisis, OSM served as a valuable piece of health infrastructure. In another example, GIS and OSM helped field health workers in their contact tracing and monitoring of individual Ebola cases. Nigeria’s preventative efforts and overall aggressive approach towards contact tracing led to the relatively rapid eradication of the virus.



Shared mobility

Some ride-sharing companies use OSM for back-end scenarios such as accurate ETA and cost calculations. Grab, Lyft and Uber are all active contributors to OSM. Because OSM is a source of raw geospatial data, companies can ingest it to support scenarios that would otherwise not be cost-effective.



Map display and navigation

Facebook uses OSM as the base map across its products, while Apple Maps attributes OSM as one data provider in many countries. Bing Maps used computer vision to extract building footprints for the US and Canada and released them in a license compatible with OSM. Snap uses maps to help connect its users, and Craigslist uses it to help buyers locate sellers.

OSM has evolved to be an important part of many organizations' geospatial strategies. Given the tremendous growth in the number of contributors and amount of corporate interest, it will only continue to become more accurate, more globally comprehensive and more widely adopted in the future. It's time to consider how best to use this increasingly valuable asset.

Recommended Best Practices

For organizations that are new to OSM or considering using OSM or other open geospatial data, we recommend the following best practices:

- 1** Understand how and where OSM augments a geospatial strategy.
- 2** Know where to license the additional geospatial data required to fill gaps.
- 3** Maintain transparency with the project and engage the community to help make OSM better. Be prepared to work with the community or through a third party who understands the ecosystem.
- 4** Understand the guidelines and how to comply with the license and attribution requirements.
- 5** Don't duplicate effort, focus on where you can create additional value for your organization.
- 6** Pick the right scenarios for the right markets.
- 7** Take a holistic view of the costs and benefits of working with OSM. It is not a like-for-like replacement for commercial services.
- 8** Understand the issues and have a risk management strategy.
- 9** Develop a technology strategy for ingesting, storing, publishing, and managing data.
- 10** Regularly review your approach, and have processes in place to assess and benchmark quality, and adapt as the data evolves.

Accenture's Geospatial Platforms team has more than ten years of experience working on and with OSM, using OSM in commercial platforms at scale, OSM pipelines, editing operations and machine learning projects, and advising companies on their OSM strategies, products and operations. Based on this experience we offer the following guidance.

For more information on how Accenture can help your organization accelerate your geospatial strategy and OSM, contact:

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ⁱ <https://osmstats.neis-one.org/?item=changesets>

ⁱⁱ Accenture applied four methods to generate a valuation range for OSM. After evaluating the variability and uncertainty of many of the underlying assumptions in these approaches, the community replacement cost method was deemed the most reliable method for estimating the value of the OSM asset. Combining the total replacement cost of the OSM database, the value of the software development effort and industry standard maintenance costs yielded a total community replacement cost of \$1,672,415,000.

ⁱⁱⁱ <https://www.theverge.com/2019/5/17/18627341/minecraft-earth-ios-android-free-ar-game-features-pokemon-go>

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