

**Transforming Geospatial Intelligence:  
What3words and Its Integration with Major  
Mapping Platforms**

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**Abstract**

This article examines the transformative impact of What3words on the Geographic Information Systems (GIS) industry and its integration with leading mapping platforms. What3words, an innovative global addressing system that divides the world into 3m x 3m squares and assigns each a unique three-word address, offers a solution to the limitations of traditional addressing systems. The article explores the implementation and benefits of What3words integration with Google Maps, Bing Maps, and Apple Maps, highlighting its enhanced precision, ease of use, and global applicability. Key applications across emergency services, logistics, and delivery, tourism, and travel, and humanitarian aid are analyzed, demonstrating the system's versatility and potential to improve operational efficiency and service delivery. The article also discusses future developments, including augmented reality integration, advanced analytics capabilities, and enhanced data interoperability, which promise to revolutionize geospatial intelligence further. By providing a comprehensive overview of What3words' functionality, benefits, and prospects, this research underscores its significance in advancing the field

of geospatial technology and its wide-ranging implications for various industries relying on precise location data.

**Keywords:** What3words, Geospatial Intelligence, Mapping Platform Integration, Location-Based Services, Addressing Systems

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## 1.Introduction

The advent of Geographic Information Systems (GIS) has revolutionized our ability to analyze and visualize spatial data, becoming an indispensable tool across various industries. However, traditional addressing systems often fail to provide the precision and simplicity required for modern geospatial applications [1]. Enter What3words, an innovative global addressing system that divides the world into 3m x 3m squares, each assigned a unique three-word address. This paper examines the transformative impact of What3words on the GIS industry, focusing on its integration with leading mapping platforms such as Google Maps, Bing Maps, and Apple Maps. By offering a uniform, easy-to-remember, and highly precise method for location identification, What3words addresses many of the limitations inherent in conventional addressing systems [2]. As we delve into this technology's benefits, applications, and prospects, we will explore how What3words is reshaping geospatial intelligence and enhancing operational efficiency across sectors ranging from emergency services to humanitarian aid.

## II. What3words: An Overview

What3words is an innovative global addressing system that has revolutionized the way we think about location identification. By dividing the entire world into a grid of 3m x 3m squares and assigning each a unique three-word address, What3words offers a simple yet powerful solution to the challenges of precise location sharing and navigation.

### A. Concept and functionality

The core concept of What3words is elegantly simple: the entire surface of the Earth is divided into 57 trillion 3m x 3m squares, each assigned a unique combination of three words from a

vocabulary of 40,000 words. These word combinations are randomly assigned to ensure even distribution and to avoid creating patterns or intentional word associations. The system uses a proprietary algorithm to convert geographic coordinates into these three-word addresses and vice versa [4].

For example, the entrance to the Eiffel Tower in Paris is identified by the three-word address "///toned.melt.ship". This address refers to a specific 3m x 3m square at that location. The system is designed to be language-independent, with addresses available in multiple languages while maintaining consistency in location reference.

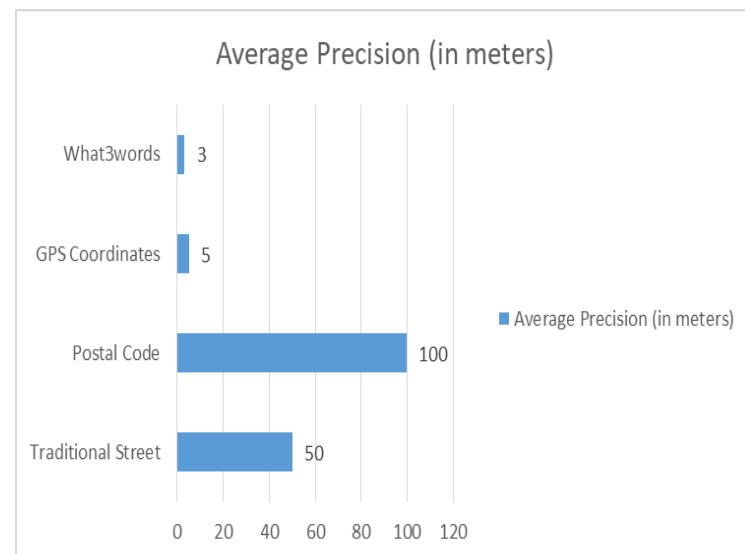


Figure 1: Comparison of Location Precision Across Different Addressing Systems [2-4]

## B. Key benefits

### 1. Simplicity:

- Easy to remember: Three-word addresses are significantly easier to recall and communicate than long strings of numbers or complex street addresses.

- **User-friendly:** The system eliminates the need for complicated coordinates or unfamiliar local addressing conventions.
- **Reduces errors:** The simplicity of the system minimizes the risk of miscommunication or transcription errors when sharing locations.

**2. Precision:**

- **High accuracy:** Each 3m x 3m square provides a level of precision that surpasses many traditional addressing systems, especially in rural or poorly mapped areas.
- **Consistency:** The uniform grid system ensures that every location, no matter how remote, has a precise and unique address.
- **Eliminates ambiguity:** Addresses like "10 Park Street" can exist in multiple cities, but a What3words address is globally unique.

**3. Global coverage:**

- **Universal applicability:** The system covers the entire world, including oceans, remote areas, and regions lacking formal addressing systems.
- **Language agnostic:** While the words themselves can be translated, the underlying system remains consistent across languages and cultures.
- **Offline functionality:** The core technology can function without an internet connection, making it useful in areas with poor connectivity.

What3words addresses many of the limitations inherent in traditional addressing systems and GPS coordinates. Its simplicity makes it accessible to a wide range of users, while its precision and global coverage make it invaluable for various applications, from emergency services to e-commerce deliveries. The system's ability to provide accurate location information in areas where traditional addresses are unreliable or non-

existent has significant implications for improving service delivery, navigation, and geospatial analysis worldwide.

Platform	Implementation Details	Key Benefits
Google Maps	<ul style="list-style-type: none"> <li>● Direct input of three-word addresses in the search bar</li> <li>● Available on desktop and mobile versions</li> <li>● Conversion of three-word addresses to geographical coordinates</li> </ul>	<ul style="list-style-type: none"> <li>● Enhanced precision in navigation</li> <li>● Ease of use for location sharing</li> <li>● Universal applicability across regions and languages</li> </ul>
Bing Maps	<ul style="list-style-type: none"> <li>● Search functionality for What3words addresses</li> <li>● API integration for developers</li> <li>● Incorporation into geospatial applications</li> </ul>	<ul style="list-style-type: none"> <li>● Improved geospatial analysis</li> <li>● Seamless integration with existing GIS workflows</li> <li>● Cross-platform consistency</li> </ul>
Apple Maps	<ul style="list-style-type: none"> <li>● Search and navigation to What3words addresses</li> <li>● Conversion of three-word combinations to</li> </ul>	<ul style="list-style-type: none"> <li>● User-friendly navigation on iOS devices</li> <li>● Precision routing to specific destinations</li> <li>● Enhanced accessibility in areas with poor</li> </ul>

	precise locations • Integration with the iOS ecosystem	addressing
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Table 1: Integration of What3words with Major Mapping Platforms [3]

III. Integration with Leading Mapping Platforms  
 Integrating What3words with leading mapping platforms has significantly enhanced the functionality and precision of geospatial applications. This section examines the implementation and benefits of What3words integration with Google Maps, Bing Maps, and Apple Maps.

#### A. Google Maps

Google Maps, one of the most widely used mapping services globally, has incorporated What3words functionality, allowing users to input three-word addresses directly into the search bar. This integration enhances the platform's ability to pinpoint exact locations, particularly in areas where traditional addressing systems are inadequate or non-existent.

Users can enter a What3words address (e.g., "table.chair.lamp") into Google Maps, which then converts it to geographical coordinates and displays the precise 3m x 3m square on the map. This feature is available on both desktop and mobile versions of Google Maps.

Benefits of integration:

- **Enhanced Precision:** Improves navigation accuracy, especially in rural or poorly mapped areas.
- **Ease of Use:** Simplifies the process of sharing and finding specific locations.

- **Universal Applicability:** Provides a standardized addressing system that works consistently across different regions and languages.

#### B. Bing Maps

Microsoft's Bing Maps has also embraced What3words, integrating it into its geospatial platform to offer users more precise location services.

Bing Maps allows users to search for What3words addresses and incorporates them into its API, enabling developers to build applications that leverage this precise addressing system.

Benefits of integration:

- **Improved Geospatial Analysis:** Enhances the accuracy of location-based data analysis and visualization.
- **Seamless Integration:** Facilitates the incorporation of What3words addresses into existing GIS workflows and applications.
- **Cross-Platform Consistency:** Ensures compatibility with other mapping services that use What3words, promoting interoperability.

#### C. Apple Maps

Apple has integrated What3words into its Maps application, further expanding the reach and utility of this innovative addressing system.

Apple Maps users can search for and navigate to What3words addresses, with the app converting the three-word combinations into precise locations.

Benefits of integration:

- **User-Friendly Navigation:** Simplifies the process of finding and sharing exact locations on iOS devices.

- **Precision Routing:** Enables more accurate turn-by-turn directions to specific destinations.
- **Enhanced Accessibility:** Improves location services in areas where traditional addresses are unreliable or non-existent.

The integration of What3words with these leading mapping platforms represents a significant advancement in geospatial technology. By providing a universal, precise, and user-friendly addressing system, What3words enhances the capabilities of these platforms, making them more effective tools for navigation, location sharing, and geospatial analysis. This integration is particularly valuable in regions with poor infrastructure, disaster-stricken areas, and complex urban environments where precise location identification is crucial [3].

#### IV. Applications and Use Cases

The integration of What3words with major mapping platforms has opened up a wide range of applications across various sectors. This section explores four key areas where What3words has demonstrated significant impact: Emergency Services, Logistics and Delivery, Tourism and Travel, and Humanitarian Aid.

##### A. Emergency Services

In emergencies, every second counts. Traditional addressing systems can be imprecise, especially in rural or poorly mapped areas, leading to delays in response times. What3words addresses this challenge by providing precise location information.

For instance, in the UK, emergency services have integrated What3words into their systems. A hiker injured in a remote area can provide their three-word location to the emergency dispatcher,

allowing rescue teams to pinpoint their exact position quickly [5].

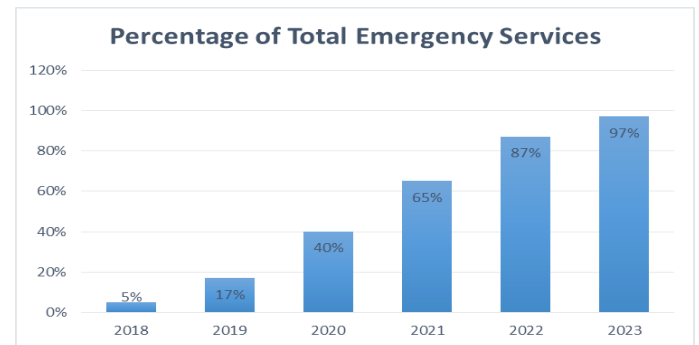


Figure 2: Adoption of What3words by Emergency Services in the UK [5]

Benefits:

- **Reduced response times:** Emergency responders can navigate directly to the precise location.
- **Improved accuracy:** Eliminates confusion caused by similar-sounding street names or incomplete addresses.
- **Enhanced accessibility:** Enables efficient response in areas lacking formal addressing systems.

##### B. Logistics and Delivery

E-commerce and delivery services often face challenges with unclear or incomplete addresses, leading to delays and failed deliveries. What3words provides a solution by offering exact drop-off points.

For example, a delivery company in a densely populated urban area can use What3words to locate specific apartment entrances or delivery points within large complexes, ensuring packages reach their intended recipients.

Benefits:

- Increased delivery accuracy: Reduces instances of misdelivered packages.
- Improved efficiency: Minimizes time spent searching for correct addresses.
- Enhanced customer satisfaction: Ensures timely and accurate deliveries.

**C. Tourism and Travel**

Tourists in unfamiliar destinations often struggle with navigation, especially in countries with different languages or addressing systems. What3words simplifies this process by providing a universally accessible method of location sharing.

For instance, a traveler can easily find and share the location of a hidden beach or a specific entrance to a tourist attraction using a three-word address, regardless of their familiarity with the local language or geography.

Benefits:

- Simplified navigation: Enables easy location of points of interest, even in unfamiliar territories.
- Language barrier reduction: Three-word addresses work across languages, facilitating international travel.
- Enhanced travel experiences: Allows for easier discovery and sharing of unique locations.

**D. Humanitarian Aid**

In disaster-stricken areas or refugee camps, traditional addresses may be non-existent or unreliable. What3words enables aid organizations to coordinate efforts and deliver resources with pinpoint accuracy.

For example, during the response to a natural disaster, aid workers can use What3words to mark and share the locations of medical tents, food

distribution points, or areas in need of specific assistance [6].

Benefits:

- Improved coordination: Enables better organization and distribution of aid efforts.
- Enhanced precision: Ensures resources reach their intended destinations accurately.
- Increased efficiency: Reduces time spent searching for locations, allowing more time for actual aid delivery.

The versatility of What3words across these diverse applications demonstrates its potential to revolutionize how we think about and use location information. By providing a simple, precise, and universally applicable addressing system, What3words is enhancing operational efficiency, improving service delivery, and potentially saving lives in critical situations.

<b>Sector</b>	<b>Scenario Example</b>	<b>Key Benefits</b>
Emergency Services	Locating injured hikers in remote areas	<ul style="list-style-type: none"> <li>● Reduced response times</li> <li>● Improved accuracy in location identification</li> <li>● Enhanced accessibility in poorly mapped areas</li> </ul>
Logistics &	Precise identificat	<ul style="list-style-type: none"> <li>● Increased delivery</li> </ul>

Delivery	ion of drop-off points in complex urban areas	<ul style="list-style-type: none"> <li>● accuracy</li> <li>● Improved operational efficiency</li> <li>● Enhanced customer satisfaction</li> </ul>
Tourism & Travel	Sharing locations of points of interest in foreign countries	<ul style="list-style-type: none"> <li>● Simplified navigation in unfamiliar territories</li> <li>● Reduction of language barriers</li> <li>● Enhanced travel experiences</li> </ul>
Humanitarian Aid	Coordinating resource distribution in disaster-stricken areas	<ul style="list-style-type: none"> <li>● Improved coordination of aid efforts</li> <li>● Enhanced precision in resource delivery</li> <li>● Increased efficiency in aid operations</li> </ul>

Table 2: Applications and Benefits of What3words Across Different Sectors [5,6]

### V. Future Developments

As What3words continues to gain traction and integrate with major mapping platforms, several promising avenues for future development emerge. These advancements have the potential to further revolutionize geospatial intelligence and expand the utility of this innovative addressing system.

### A. Augmented Reality (AR) Integration

The integration of What3words with Augmented Reality technologies presents exciting possibilities for enhancing location-based services and navigation. AR could allow users to visualize three-word addresses in real-time through their smartphone cameras or AR-enabled devices.

Potential applications include:

- Navigation assistance: Overlaying directional cues and What3words addresses onto the real-world view, guiding users to their destinations with unprecedented precision.
- Location discovery: Enabling users to point their devices at buildings or landmarks to instantly see associated What3words addresses.
- Geospatial data visualization: Displaying location-specific data overlays tied to What3words addresses in real-time AR environments.

This integration could significantly enhance user experience in various fields, from tourism to urban planning. For instance, city planners could use AR to visualize proposed developments at specific What3words locations, providing a more intuitive understanding of spatial relationships and potential impacts [7].

### B. Advanced Analytics

The precision offered by What3words opens up new possibilities for advanced geospatial analytics. By leveraging the standardized 3m x 3m grid system, researchers and data scientists can perform more granular analyses and derive deeper insights from location-based data.

Future developments may include:

- Predictive modeling: Utilizing What3words addresses to enhance predictive models for urban development, environmental changes, or demographic shifts.
- Pattern recognition: Identifying micro-level patterns in spatial data that may be obscured when using less precise location identifiers.
- Machine learning applications: Training AI models on What3words-tagged data to improve location-based recommendations and decision-making systems.

These advancements could lead to more accurate risk assessments for insurance companies, optimized resource allocation for city services, or improved environmental monitoring systems [8].

### C. Enhanced Data Interoperability

As What3words becomes more widely adopted, there is potential for enhanced data interoperability across different GIS platforms and location-based services. This could lead to more seamless data sharing and integration between various systems and applications.

Future developments may focus on:

- Standardized APIs: Developing universal APIs that allow easy integration of What3words functionality into a wide range of software and platforms.
- Cross-platform data exchange: Enabling effortless transfer of location data between different mapping services and GIS tools using What3words as a common reference.
- IoT integration: Incorporating What3words into Internet of Things (IoT) devices and smart city infrastructure to enhance location-aware services and data collection.

These improvements in data interoperability could facilitate more efficient collaboration between

different organizations and sectors, leading to better-coordinated responses in emergencies, more effective urban planning, and enhanced logistics operations.

The future developments in AR integration, advanced analytics, and enhanced data interoperability highlight the potential of What3words to continue transforming how we interact with and understand spatial information. As these technologies evolve, we can expect to see increasingly sophisticated applications of this innovative addressing system across various industries and disciplines.

### Conclusion

In conclusion, What3words has emerged as a transformative force in geospatial intelligence, offering an elegantly simple yet powerful solution to the longstanding challenges of precise location identification and sharing. Its integration with leading mapping platforms such as Google Maps, Bing Maps, and Apple Maps has significantly enhanced the utility and accessibility of location-based services across various sectors. From streamlining emergency response operations to revolutionizing logistics and delivery services, facilitating tourism experiences, and bolstering humanitarian aid efforts, What3words has demonstrated its versatility and impact. The system's key benefits of simplicity, precision, and global coverage address many of the limitations inherent in traditional addressing systems, particularly in areas lacking formal infrastructure. As we look to the future, the potential developments in augmented reality integration, advanced analytics, and enhanced data interoperability promise to further expand the capabilities and applications of this innovative technology. What3words is not merely an addressing system; it represents a paradigm shift in



how we conceptualize and interact with location data, paving the way for more efficient, accurate, and universally accessible geospatial solutions. As adoption continues to grow and new applications emerge, What3words is poised to play an increasingly pivotal role in shaping the future of geospatial intelligence and its wide-ranging applications across industries and societies worldwide.

#### References

[1] M. F. Goodchild, "Geographic information systems and science: today and tomorrow," *Annals of GIS*, vol. 15, no. 1, pp. 3-9, 2009.

[2] C. Barrington-Leigh and A. Millard-Ball, "The world's user-generated road map is more than 80% complete," *PLOS ONE*, vol. 12, no. 8, e0180698, 2017.

[3] M. Haklay, A. Singleton, and C. Parker, "Web Mapping 2.0: The Neogeography of the GeoWeb," *Geography Compass*, vol. 2, no. 6, pp. 2011-2039, 2008.

[4] C. Ellul, G. Gupta, M. Haklay, and K. Bryson, "A Platform for Location Based App Development for Citizen Science and Community Mapping," *Progress in Location-Based Services 2014*, Springer, Cham, pp. 71-90, 2015.

[5] Biswajit, Mukhopadhyay & Bhattacharjee, Buddhadev. (2015). Use of Information Technology in Emergency and Disaster Management. *American Journal for Environmental Protection*. 4. 101-104. 10.11648/j.ajep.20150402.15.

[6] Takahiro Yabe, Nicholas K.W. Jones, P. Suresh C. Rao, Marta C. Gonzalez, Satish V. Ukkusuri, Mobile phone location data for disasters: A review from natural hazards and epidemics, *Computers,*

*Environment and Urban Systems*, Volume 94, 2022,101777,ISSN 0198-9715, <https://doi.org/10.1016/j.compenvurbsys.2022.101777>

[7] Kikuo Asai, "Augmented Reality for Geographic Information Systems," in *Augmented Reality: An Overview*, IntechOpen.

[8] Smita Sunil Burrewar; Mazharul Haque; Tanwir Uddin Haider

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