



# SMARTER ADDRESSING FOR A SMARTER PLANET

A USER-FRIENDLY SYSTEM BASED ON THREE SIMPLE WORDS MAKES GEOGRAPHICAL INFORMATION ACCESSIBLE TO A WIDER GLOBAL AUDIENCE. GILES RHYS JONES EXPLAINS

The geospatial industry is worth an estimated US\$150bn annually, yet there is no precise global address or location reference system that can be used easily by everyone outside it. Latitude and longitude coordinate pairs do provide a precise location reference but, whilst this is great for machines and trained professionals, it is ineffective for people. Coordinates are impossible to remember, even in the short term, and errors in understanding, transcription and communication make the widespread use of geospatial information prohibitive.

Specifying and communicating the location of roads, bridges, canals, dams, and buildings without a standard street address is challenging especially when moving between devices, writing them down, telling someone over the phone, radio or in person. Try doing it with untrained people and errors are guaranteed.

Around 75% of the world's countries suffer from inconsistent, complicated or no addressing systems. This means that, according to the UN, around four billion people are 'invisible' – unable to get deliveries, receive aid or exercise many of their rights as citizens because they simply have no way to communicate where they live. In remote locations, water

facilities are difficult to find, monitor and fix. But even in the other 25% of countries with more advanced address systems, people get lost, assets are difficult to manage, local businesses can't be found and deliveries go astray. This costs companies and economies billions. At best, poor addressing is costly and annoying in developed countries; at worst, it hampers the growth and development of nations around the world, ultimately costs lives.

Satnavs can give you four possible routes to get 'there', with state of the art traffic avoidance and points of interest along the route, but defining 'there' is actually our single biggest issue.

Having spent 10 years organising live music events around the world Chris Sheldrick, CEO of what3words, constantly faced the huge logistical frustrations that came with poor addressing.

He resorted to using the latitude and longitude coordinate system to be precise but realised that human beings aren't designed to input 18 numbers without errors. Every event, without fail, trucks carrying equipment and musicians themselves simply didn't arrive where they were supposed to be.

Particular low points were having bands and equipment strewn across various hillsides near Rome because the 'address' they were given took everyone to different places, and a phone call from a keyboard player who said: "It appears we may have sound checked at the wrong wedding in Birmingham."

Chris discussed the idea of a more usable and less error-prone version of the latitude and longitude coordinate system with a mathematician friend, who subsequently wrote an early version of the what3words algorithm on the back of an envelope. They quickly realised it could do more than help musicians get to gigs on time and company was founded by the pair and two other friends in London, UK, in March 2013.

what3words is a global address system based on a worldwide grid of 3mx3m squares. It uses an algorithmic engine similar to that of a coordinate system and that has given each of these 57 trillion squares a pre-assigned and fixed address of three words. It is available in nine languages including English, Spanish, French, Portuguese, Russian, Turkish, Swahili and 14 others are on the way, including Arabic and many Indian languages. In development is voice-recognition, which could be a game changer for car navigation, for the visually impaired and for wearables.

### Words beat numbers

The use of words means non-technical people can find any location accurately and communicate it more quickly, more easily and with less ambiguity than any other system. A 1957 study in the *Journal of Psychology: Interdisciplinary and Applied*, 'A comparison of immediate memory span for digits, letters, and words', suggests that our ability to remember three words long enough to write them down is near perfect whilst our ability to remember a sequence of digits or letters of the appropriate length for 3mx3m addressing is zero. Words can easily be remembered, written, said, printed or shared digitally.

An algorithm and wordlist underpin the system. Since the what3words system works using an algorithm, rather than a database, the core technology is contained in a file around 10MB in size. This means it can be used offline with no data connection and installed on the simplest of smartphones or devices.

The wordlists have 25,000 words per language, 40,000 in English, as the sea has been addressed as well as land. They go through multiple automated and human review processes, including removing offensive words and homophones, such as 'sale' and 'sail'. Each wordlist is curated to ensure that the words are meaningful and in daily use in local languages.

The words are sorted by the algorithm, taking into account word length, distinctiveness, frequency, and ease of spelling and pronunciation. Simpler, more common words are allocated to more populated areas that speak that language and the longest



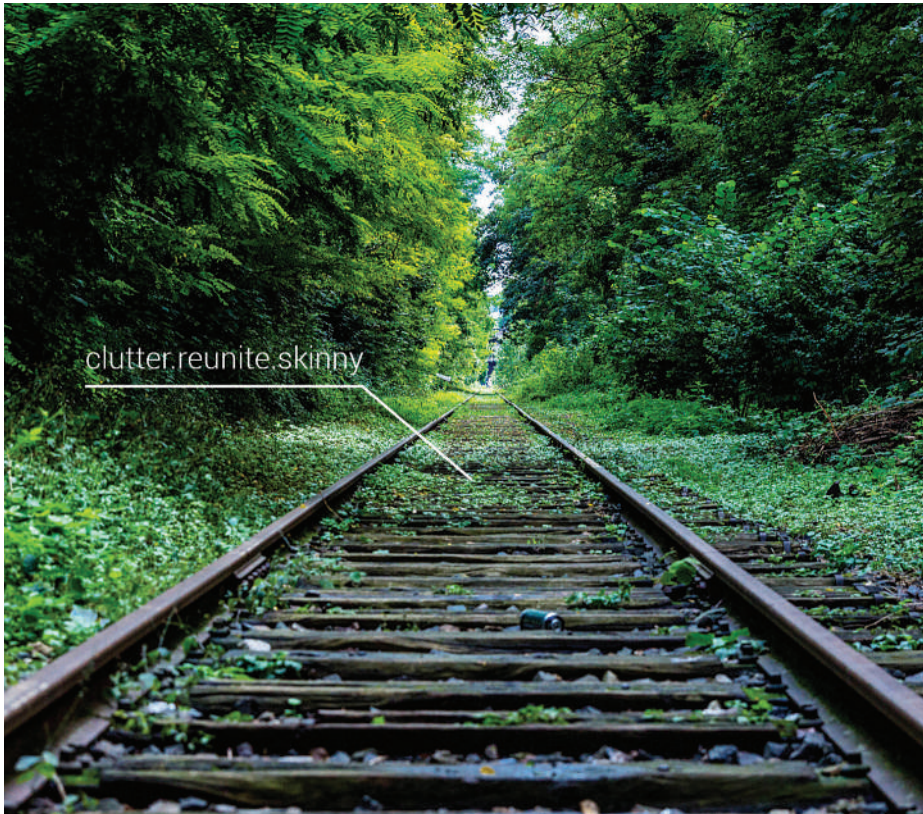
A house in Ghana with the results of the four different street addressing systems that have been used over the past decade (© Birgitte Refsing Nissen)



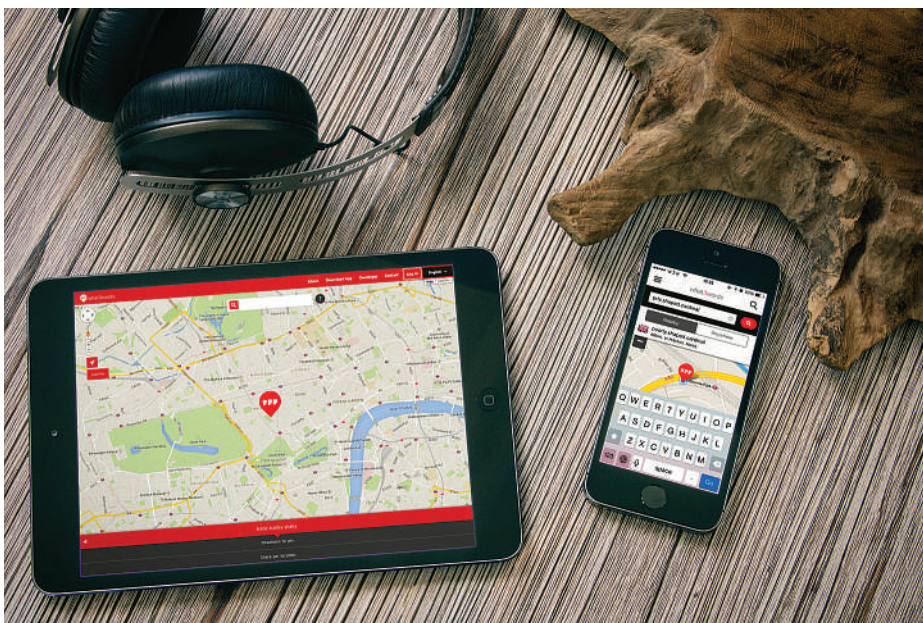
Being able to communicate a precise location simply is vital to maintain operational efficiency, safety and profitability



Communicating location is key when responding to emergencies or natural, environmental or humanitarian disasters



Easy and user-friendly addressing can help drive the adoption of geospatial data across entire organisations, between companies and to the public at large



The what3words address platform can be accessed with its own app and site

words are used for addresses in unpopulated areas. For example, shorter more common English words are in the UK but more complicated ones are in the Sahara, where you are less likely to find a wandering person from the UK.

The system is non-hierarchical and since all the units referenced are the same size, there is no need to interpret the code to know what size of area is being referenced. The system is also non-topological: the three words used to reference any square on the Earth's surface do not depend on the three words to reference any adjacent squares.

Importantly, the algorithm shuffles similar-sounding three-word combinations around the world to make it really obvious if you have made an error in typing or when saying them. For example, table.chair.lamp and table.chair.lamps are purposely on different continents. Error detection also makes intelligent suggestions about where you mean as you type, even if you make typos.

What3words has its own apps for iOS, Android, web and other platforms. You can also easily batch convert and reverse geocode your lat-long coordinates to what3words and back online or through an Excel plug-in.

It is also accessible using a range of other GIS software, including ArcGIS and FME: what3words is a locator in ArcGIS so allows forward and backward look-up and batch geocoding across all the ArcGIS platforms; in FME, it is a transformer. We also offer an Excel plug-in and online batch conversion ourselves.

The API and SDK are plug-ins for businesses and developers for whom communicating location is important. The what3words app and site also allows users to open a three-word address in other apps or services. At this point, the three-word address is converted back to lat-long coordinates, so you can navigate to a three-word address by opening it in Waze, CityMapper, or Apple or Google Maps.

### A three-word address ecosystem

To date, the system has been integrated into more than 25 apps and services, and discussions with other companies is ongoing. For example, you can use three-word addresses with the PointPlot and poimapper surveying apps on your iPhone. You can also navigate to a precise location using Navmii, an app used by 25 million people worldwide, or Kartverket, the Norwegian national mapping agency.

The United Nations recently integrated three-word addresses into its disaster reporting app and the British Museum geotagged more than a million archeological finds in the UK with the system. Three Swahili words are being used in Tanzania to map water points, cholera outbreak, report violence affecting the upcoming elections and tag mosquito traps that require servicing.

What3words is also in discussions with a number of postal services in both the developed and developing world. In the developing world, it offers a quick-to-implement, robust and scalable solution to enable door-to-door deliveries efficiently. In the developed world, we can reduce the costs of last-mile delivery and offer a solution for the far-flung parts of service. It can also free people from delivery to home or work, and enable same-day and within-the-hour delivery to any 3mx3m square on the planet.

**OUR ABILITY TO REMEMBER THREE WORDS LONG ENOUGH TO WRITE THEM DOWN IS NEAR PERFECT WHILST OUR ABILITY TO REMEMBER A SEQUENCE OF DIGITS OR LETTERS OF THE APPROPRIATE LENGTH FOR 3MX3M ADDRESSING IS ZERO**

*Giles Rhys Jones is director of marketing at what3words ([www.what3words.com](http://www.what3words.com))*