

# Going Beyond the Physical Address: AIM Locate Code Simplifying Addressing Challenges

*Location is more than an address*

Location-based Analytics has been important for decades—but the ability to do so was, at first, highly limited. Using census and administrative information, businesses were able to make decisions for site-selection, risk analysis, disease spread assessment, resource allocation, and disaster management, to develop the business ecosystem which has many interconnected economic influences. The perspective it provided was often a step forward, but the results were still broad generalities. Identification of location for a business decision making has significantly influenced the strategies based on insight at the granular level. More of the granular data has been analyzed using highly computationally intensive machines, which actions are both near real time and accurate. From last mile delivery to banking to insurance to public welfare decisions to any business where location has an important role to play, such location data becomes important.

Data available at point locations such as houses or points of interest increasingly include geographic elements—both in terms of where people live and how much time and money they spend on products/activities. This information, combined with ancillary insights, began to feed richer demographic profiles including behaviors, preferences, buying patterns, spending potential, and segmentation. Thus, it becomes business imperative to have a unique identifier for an address as an essential component of an administrative system for robust decision making.

## Need for a Unique Addressing System

As a general practice, either a GIS solution is deployed to do business decision making and overlay analysis or a Geocoding Engine is deployed to take such a business decision. Either solution has a major dependency on granularity and maturity of data. Such maturity has a direct relationship with countries addressing systems and GIS data. Developed countries have higher data maturity and get better results whereas in developing countries, and the countries which are not so developed, such data is either not matured or does not exist and the geocoding solution does not provide the granular insight. Geocoding solutions are dependent on the physical address components like House Number, Street Name, and Administrative Entities like District Name, City Name, Post Code etc. But such a solution may not work for the countries where a physical addressing system is either not available or not structured; hence the results will not be at the same scale. The data non-availability or the maturity of the data makes the business system more complex and a single GIS solution or Geocoding solution may not get the expected results.

Typically, identifiers differ across organizations. Today, the common practice by each provider is to use different identifiers for the same individual. In addition, constellation of attributes commonly used to identify a household is rarely captured in the same manner by each entity in

the diverse system existing within the local or global jurisdiction. So, development of unique, consistent, and simplified identifiers is essential to assure continuity of focused services offered.

There has been significant effort in the spatial community to address these challenges. Assigning unique codes for individual houses has been attempted in the past with varied approaches like assigning 3 words for a house as used by What3Words, Alpha-Numeric Codes as NAS of Google Codes, or Unique Postcodes for all houses as seen in Ireland, which was developed by European Union Geospatial consortium. This is not limited to such deployment, but the geocoding companies too are trying to assign a unique code to a geocoding result, similar to Map Codes of TomTom, or a unique key as a lookup by major geocoding providers. These systems have their own flaws, which include: reproducibility; coding and decoding mechanism; and non-hierarchical codes, which makes it more a unique ID, but with limited insight operations.

A single, global system of standards is fundamental to enable an efficient and effective implementation of Unique Identifiers by all stakeholders worldwide. A unique identifier for each household in the administrative system would have a plethora of benefits, including improved delivery of health facilities, determining loss, mitigating risks, learning about business potential, marketing, campaigning, facilitating efficient supply chain management, increasing community engagement, improving citizen services based on needs, offering improved teaching, learning environments in education system, and many more. This will not only help reduce administrative costs, but it will enable informed and fact-based decision making for use within the administrative systems.

There is considerable effort going across data vendors and industry verticals for the development and adoption of a unique identifier for the households. The reasons cited are to reduce administrative workloads and costs, enable faster access to information, and increase efficiency in the exchange of electronic data. The adoption of such a unique addressing system is the need of the hour for the developing nations such as India where a structured addressing system is lacking.

### Unique Addressing System needs for India

Much of the Government Planning for Citizen Welfare are done based on Census Data. Census 2011 has data up to Village Level. Many Hamlets and Scattered Houses are not enlisted in Census Data which is available in public domain (Figure 1). Most of these Hamlets and Scattered Houses are homes of the least privileged section of society. Hence, data on these sections of people may not be available to the Policy Makers.

REVENUE_NAME	LATITUDE	LONGITUDE	ITDA_NAME_ENG	SECC SURVEY 2011	NREGS_CODE	JAL_SHAKTI_CODE	PMGSY_CODE	PMAY-G_CODE
Baski	18.23591	82.89045	Baski	584042	0300501415504	0302805155011400	111955	584042
Baski	18.22819	82.89831	Gondana	584042	0300501414705	0302805147051400	370261	584042
Baski	18.23987	82.89426	Jakaraguda	584042	0300501415503	0302805155031400	444205	584042
Baski	18.23555	82.89271	Kailodiguda	584042	0300501416201			584042
Devarapalle	18.21718	82.86405	Bairuguda	584040		0302805152011400		584040
Devarapalle	18.22570	82.86673	Bamsuguda	584040	0300501415201	0302805152011400	85847	584040
Devarapalle	18.21901	82.87204	Bondaguda	584040	0300501415701		174535	584040
Devarapalle	18.22327	82.88308	Devarapalle	584040	0300501415801	0302805158011400	263610	584040
Devarapalle	18.22539	82.88150	Dungiyaputtu	584040	0300501416001	0302805160011400	317174	584040
Devarapalle	18.22573	82.86298	Giriguda	584040	0300501415101	0302805151011400	362839	584040
Devarapalle	18.23361	82.87514	Gonduguda	584040				584040
Devarapalle	18.21495	82.86069	Irukuguda	584040	0300501416002	0302805160021400	434812	584040
Devarapalle	18.23052	82.89393	Piripodaru	584040	0300501415901	0302805158031400	856951	584040
Gugguda	18.26949	82.86438	Gaibandha	584044		0302805158041400		584044
Gugguda	18.25169	82.88582	Gugguda	584044	0300501414701	0302805147011400		584044
Gugguda	18.24920	82.88231	Kuntirangini	584044	0300501414702	0302805147021400	602321	584044
Gugguda	18.26421	82.85703	Morriguda	584044	0300501416501	0302805147081400	716405	584044
Gugguda	18.26436	82.87096	Pusali	584044	0300501414704	0302805147041400	881430	584044
Gugguda	18.25164	82.87571	Ranginiguda	584044	0300501414703	0302805147031400	910112	584044
Gugguda	18.24875	82.87231	Sindiputtu	584044	0300501416601			584044
Korraguda	18.22874	82.91598	Baringibandha	584068	0300501415504	0302805155041400		584068
Korraguda	18.22954	82.90984	Bijaguda	584068	0300501414404	0302805144041400	162662	584068
Korraguda	18.23464	82.91974	Kanjaraiguda	584068	0300501414403	0302805144031400		584068
Korraguda	18.23826	82.92018	Killoguda	584068	0300501416301			584068
Korraguda	18.23577	82.91103	Kontraiguda	584068	0300501414402	0302805144021400	578712	584068
Korraguda	18.23877	82.91641	Korraguda	584068	0300501414401	0302805144011400	581484	584068
Korraguda	18.22848	82.90915	Tengadaguda	584068				584068

Figure 1: The Missing Links

Apart from Hamlets/Localities, there are no unique identifiers for households/buildings, which may be useful for:

- Tracking beneficiary households of many citizen-centric schemes such as
  - Ujjwala Yojana
  - Toilets under Swachh Bharat Mission
  - Government Food and other Social Programs
- Review and Analysis of Current Access to
  - Education Services
  - Health Services
  - Emergency Services
- Tracking at Household level for
  - Pandemic Supplies and Vaccination
  - Property Taxes
  - Bank Accounts
  - Loans
  - Subsidy
  - Insurance
  - Voting
  - Passport Application
  - Postal and other delivery services
  - Industrial Activities
  - Commercial Activities, and many more

## Addressing with Unique Identifier

With the increased use of geospatial technologies under different schemes, coordinates are collected directly or indirectly using GPS aided field surveys, Satellite Images, Drone, LiDAR Surveys, etc. for:

- Schools
- Anganwadis
- Clinics
- Hospitals
- Commercial Entities
- Industrial Entities
- Each Building under Smart Cities (100 Cities)
- Each Building under AMRUT Towns (500 Towns)
- At Village level under Bhu Swamitva Yojna
- PMAY etc.

The coordinates themselves can solve most of the service-related problems, but not the problem of a physical Addressing System. The complexity of the physical addressing system can be simplified with the use of a Unique Identifier offering developed by AIM Locate. The Unique Identifier addressing system can coexist with a Physical addressing system and can be easily associated with any Physical entity.

The unique identifiers developed by AIM Locate to determine an address is based on Latitude/Longitude coordinates which is further simplified to an East/West and North/South description. The postcode is derived from the address component and is composed of 6 digits split into 3-digit by 3-digit values separated by a hyphen. Addresses are entirely hierarchical and address entities can be rolled up from granular to coarser resolution. The precision attributed to address entities with this unique system is up to 3 meters or more. Individual IDs can be easily mapped to a Census and is comprehensively supported by the system. The unique identifiers developed is not country specific but rather global in nature because of its unique design. Besides its simplified and unique design, the addressing system can be built quickly, comprehensively, and accurately. The underlying information behind the development of such a robust system includes High resolution imagery, Geographic reference street and landmark data, building outline information, and advanced Geographic Information System besides human intelligence.

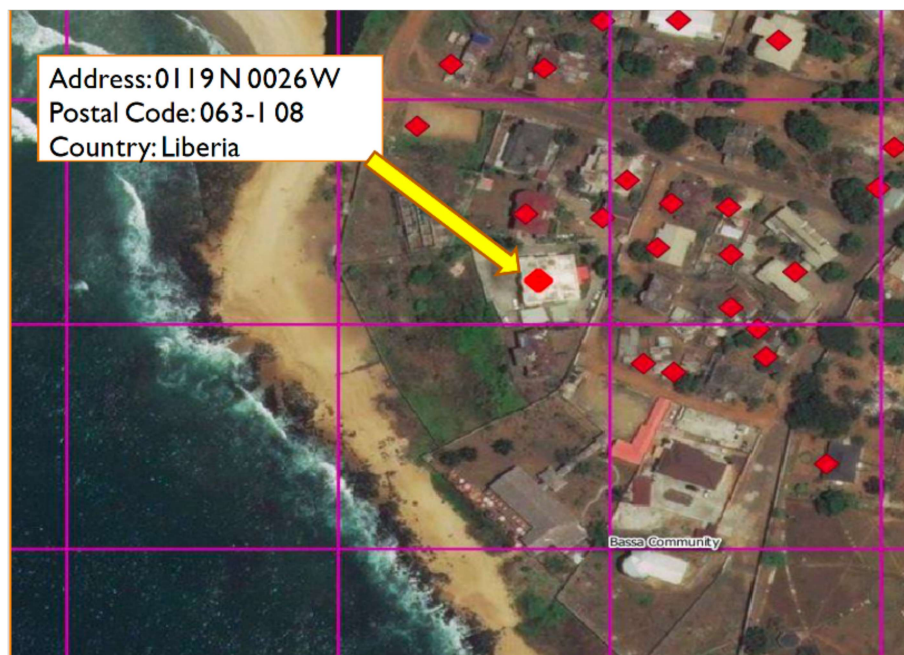


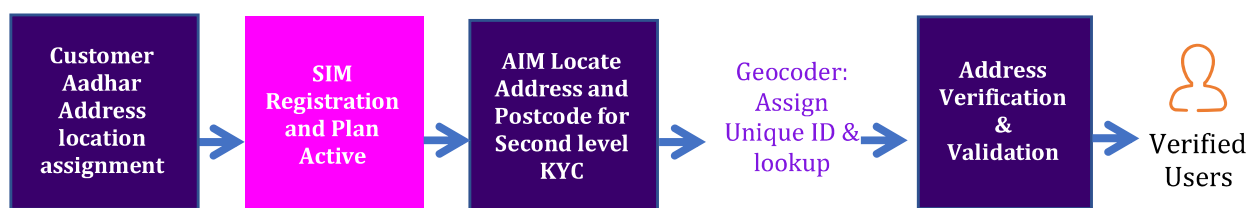
Figure 2: AIM Locate's Globally Unique Simplified Addressing System

## Addressing Business Vertical Need: A few case-studies

### Customer due diligence (CDD)/ Fraud management using Geolocation enabled KYC

The Telecom Service Provider or the Banking and Insurance Services carry out Know Your Customer (KYC) processes to verify the identities of their clients based on Aadhar (Unique Identifier number for an individual). This gives businesses the ability to onboard a customer, but does not eliminate the potential risk of fraudulent addresses associated with a specific client.

Second level KYC can be enabled using geolocation-based address verification and address linkage (if required), Telecom provider can tag all customer addresses and develop primary and secondary address linkage, if required, using Unique Addressing Identifier. This will reduce account abandonment and lead to more subscribers.



### Marketing to Commercial Businesses

By using Unique Identifier addressing solutions, Telecom Providers will be able to identify which geographies/institutions have the greatest revenue potential so that it can accurately plan the order in which different markets can be made eligible for their services. As part of the analytics, other pertinent data can be added to the system and joined to the commercial datasets by a



Unique Addressing Identifier. This will result in defining the target commercial markets by analyzing the business types and locations.

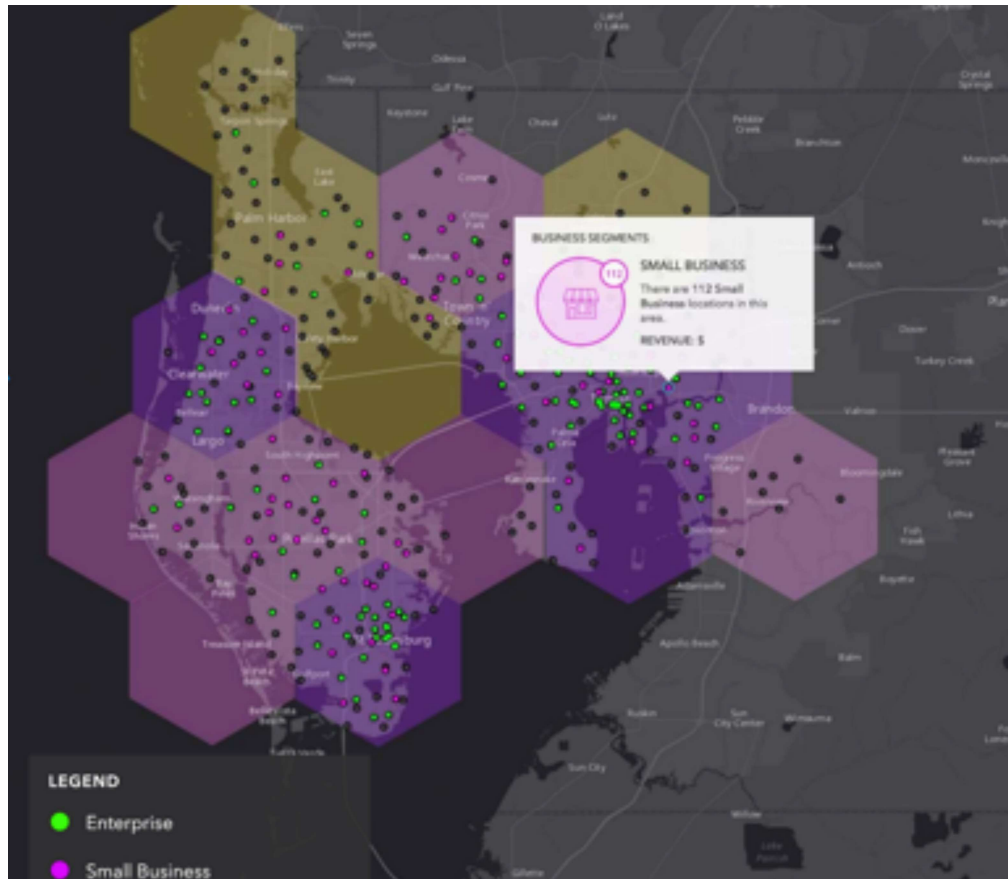


Figure 3: Analysis of AIM Locate Addressing

## Governance

Without an address, it is difficult to provide access to various public services and institutions, and hence, the discontent amongst the citizens.

For example, reliable census data is the basis of a country's population, assets, and basic needs. Census data helps to illuminate trends, measure important indicators that monitor development goals and identify critical areas of concern. Informal settlements such as slums, rural areas and other inaccessible areas are often omitted from census data because of their isolation. These communities are overlooked and remain excluded from policies, programs, and budget allocations. As a result, administrative officials are not aware of the scope of the challenges and have only a lack of understanding of the resources required for development, which prevents appropriate action. The AIM Locate addressing system can help in aiding appropriate policy roll-out at granular levels, expanding participation in government programs, implementing e-government features for good governance by spatially integrated facilities access across the nation.

Another example for good governance includes employment opportunities for all eligible citizens of the nation. However, living in an area without addresses can be an obstacle to being hired by a formal institution. Participation in the informal economy is often a product of the inability of individuals to meet the requirements of the formal labor sectors, which oblige a legal identity and an address. With this backdrop, it is of utmost importance to adopt a simplified, yet robust addressing system such as AIM Locate, which fulfills the basic need for digital identification.

## New Opportunities Each Day

No matter how a business decides to use Unique Identifier based Addressing, they offer any user anywhere in the world the opportunity to be serviced while allowing the administrative system to treat this just as they would identify a conventional address. This enables broad accessibility and inclusivity together with the ability for business verticals including Government outreach to expand to new regions worldwide easily and simply.

Telecommunications companies are exploring opportunities for melding location intelligence with the masses of data that they have on customers to promote their own services and those of partners. Insurance companies see potential uses in their own emergency response system for locating customers in hazard management crises to rapidly tying assets back to specific addresses. Social media companies are exploring ways that “check-ins” can help inform users, increase usage, and generate revenues for their companies and the companies that advertise through them. Government entities have opportunities to use in emergency preparedness, new program implementation, and law enforcement. Many other opportunities are sure to develop for this unique identifier based addressing system—it offers long-sought immediacy in location intelligence.