

Government Blockchain Association

Lans Titling Working Group



Land Titling System Supplement

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Approval

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2. Introduction

This document is a supplement of the BMM and will be subject to meet the following criteria.

## Purpose

This document is used as a supplement to the Blockchain Maturity Model (BMM) and is used to assess solutions, using blockchain technology to maintain the register of real property record, process transfer of ownership, update record of ownership and notify to all parties concerned.

II. Real Property Defined: Real property is a parcel of land and everything that is permanently attached to the land. The owner of real property has all of the rights of ownership, including the right to possess, sell, lease, and enjoy the land.

**B. Identification/Ownership verification of the property description**

1. Geographic and physical attributes (coordinates, landmarks, etc.) of the property.

Legal Description if applicable and incorporate GIS data (Software suggestion is

CAMA software, used by Assessors, Appraisers and Modelers)

**C. Land Valuation**

1. System should be equipped to determine market based land valuation based on comparable in the identified property market, staying within a certain perimeter. Must have capability to identify minimum transaction value. This feature will enable:

a) Collection of accurate duties and taxes

b) Market value payment by Government upon compulsory land acquisition or private equity, individual or institutional buyers.

1. Purpose:

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II. Real Property Defined: Real property is a parcel of land and everything that is permanently attached to the land. The owner of real property has all of the rights of ownership, including the right to possess, sell, lease, and enjoy the land.

1. Scope

Solutions in-scope for this supplement are expected to have at least one or more of the following functions. They are:

* Transferring Real Property Rights
* Transferring Digital Property Rights
1. Requirements

## Interoperability

The solutions shall read and/or import data that:

* Defines the property known characteristics that includes both geometric and attributes.
* Uniquely identifying data of the property
* Identity of owner(s)
* Chain of ownership
* Restrictions on the property

The solutions shall:

* Export the above data elements based on defined roles and permissions.
* Identify the date/time stamp for all data recorded on the solution.
* Validate title records in accordance with the legal jurisdiction of the property.
* Notify property stakeholders when any change is made to a property record

**Notes:**1.Property data can include a court ordered transfer, purchase or sale, gifted or next of kin, or anything that would result in the change of ownership.

2. Property stakeholders may include the buyer, seller, insurer, bank, and governing authorities.

## Fractional Ownership

Fractional ownership applies to condos, co-ops, timeshare, and equities.

### Fractional Rights

The solution shall define the rights being fractionalized that meet regulatory requirements in the jurisdiction of the real property location.

**Notes:**Examples include equity, specific rights of use etc. Also proving authority to exercise fractionalized ownership within the rights afforded to the fractional owner.

### Fractional Revocation

The solution shall address the revocation of fractional rights by legal authority based on established rules.

## Land Property Transfer

Land Property Transfer is the process of changing the ownership record of a parcel of land between two entities.

The solution shall:

* Import and record spatial information.
* Prohibit the transfer of property without the consent of the property stakeholders or the lawful order from the legal authority with jurisdiction over the property.
* Describe the specific rights associated with the property.
* Update the chain of custody records.
* Notify property stakeholders of any change to the property ownership status.
* Identify and report any related encumbrances on the property.

## Property Chain of Custody Verification

Property Chain of Custody Verification is the activity of displaying the historical ownership of a parcel of land across three or more previous owners.

The solution shall:

* Include geographic and physical attributes (coordinates, beacons, landmarks, etc.) of the property
* Include the legal description including the title/deed information
* Maintain a date/time stamped image of previous ownership records

Acquisition / Transfer documentation of past transfer event, transferring real rights to present real property right owner. To include:

Location of historic jurisdictional authority indexing entry, for the applicable documents, and

An onchain, jurisdictional authority certified, duplicate of the applicable documents for best practices immutable evidencing.

Notes:

1. Best practices include the incorporation of Geographic Information System (GIS) data and use by assessors, appraisers, and modelers.
2. Computer Aided Mass Appraisal (CAMA) software is used to support chain of custody verification.

## Land Valuation

System should be equipped to determine market based land valuation based on comparable in the identified property market, staying within a certain perimeter. Must have capability to identify minimum **legal** transaction value. This feature will enable:

Collection of accurate duties and taxes

Market value payment by Government upon compulsory land acquisition or private equity, individual or institutional buyers.

## Transfer Event

System should be capable to record and apply law on different types of transfer/ lease/**or other transfer of real property rights event.** e.g. sale, gift, inheritance, court orders, government acquisition.

## Transfer Process

International standard transfer process with multiple checks and validation by the department concerned officer. Multiple checks must be applied including but not limited to physical presence of seller/legal attorney, bio-metric of the seller, photo of seller by system, ownership proof and details of unit sold (e.g. type, size, **description), and the consideration given for said transfer.**

## Real Estate Asset Type

1. System should have capability to identify and record different type of real estate asset as well as zoning, including but not limited to

a) House b) Villa

c) Flat

d) Commercial Property (Industrial, GSA, Retail, Multi-Family, Land - all types developed or undeveloped, Office Buildings, Hotels and Hospitality, Special purpose (churches or educational buildings or recreational facilities and Mixed Use)

## Title & Occupancy Information (Seller/Buyer or Current Owner)

1. Capable of recording the details of the chain of ownership, instrument used to show ownership (Whether General Warranty Deed or a Special Warranty Deed was used)

2. Capable of recording type of ownership

 a) Life estate

b) Leasehold agreement

c) Cooperative Ownership

d) Condominium Ownership

e) Joint Tenancy

f) Tenancy In Common

g) Trust Ownership

h) Community property

## Due Diligence Documents

1. All existing paper record must be maintained in the form of high-resolution images to ensure readability and clarity, for accurate store in appropriate digital system within the blockchain.

a) Tax certificate b) Deed

c) Encumbrances d) Platt Maps

e) Contingencies

f) All Inspection Documentation, including but not limited to objections, resolutions, extension on dates and deadlines, receipts

g) Any and all public notice documentation

h) Any settlement, disputed or contested claims documentation

i) Documentation of any certificates, related to the property such HOAs, development plans, platt maps, permits, easements or encroachment documentation

j) High Resolution Mapping and zoning information or change of zoning, use permits, special use permits etc.

k) County and state measurements in Square Feet, acres - if applicable - or Meters, depending on location.

l) Surveys, ILCs

m) Property description and breakdown of internal layout (Bedrooms bathrooms, etc), external layout (Sheds, barns etc.)

n) Any bill of sale tied to the sale of the personal property of a sale.

## Inheritance Law

1. System must have a provision to incorporate the inheritance law of the country and any other applicable valid law of the land, the system should have further capacity to accommodate special court orders on account of inheritance transfer.

2. Court Order

a) System must have provision to record the orders issued by the court of law about the real estate asset e.g. stay order, transfer order, ban on transfer, acquisition order etc. etc.

## Legacy system

1. System must be able to inherit all features and functions of legacy system and new system should not limit or eliminate the feature and productivity provided by the existing system, but instead improve it’s capabilities.

## Speed of Title Record System

1. System must be capable to process X% (e.g. 10-20% of total record) of transaction in the real time and simultaneously. A careful scientific consideration to be carried out to identify the system needs for the hardware, software, infrastructure and human resources. An underutilized system is as harmful as an underperforming system.

## Paper Record

1. In additional to digital record, system must capable to provide printed record of title with system generated endorsed stamp or special mark.

## GIS Data/Record of Surveys Updates

1. Land survey on regular interval (e.g. 6-12 month) to be carried out to re-define and update the record. Real estate record is very dynamic and keeps constant update as certain events (e.g. abrupt weather, infrastructure works, inheritance, new housing societies, mergence/depletion of Islands etc. etc.) effects type, size and/or nature of real estate asset.

## Government Orders

1. Eminent Domain or government sell/buy restrictions or change of laws, due to economic, social or environmental factors.

## Financial Exchanges

1. System should have the ability to record the history and all details of monetary exchange for property, such as loan, debt, cash transfer, institution used to facilitate transaction including but not limited to exchange QI fees (Qualified Intermediary), closing fees, DST QI fees, settlement statements from lenders or Title and Bill of Sale tied to transactions. In some cases, the documentation of the sources of wealth,

ensuring this standard counters the use or housing of illegal and unreported money in all real estate sectors.

## Environment Information

1. System should have the capability to categorize areas, parallel to county records and insurance premiums, regarding areas known for being high risk, due to reoccurring threat of extreme weather conditions or Seismic Zone Classification.

2. Any and all documentation pertinent to environmental inspections including but not limited to mold, Phase I or Phase II, IAQ (Indoor Air Quality), lead paint, radon, Septic, water, wetland, Stormwater assessment etc.

Appendix A: Definitions

|  |  |
| --- | --- |
| Term | Definition |
| Acquisitions | Buying |
| Dispositions |  |
| Real Property |  |
| Property Stakeholders |  |
|  |  |
|  |  |

**GIS Parcel Fabric technology** can significantly support the endeavor of using blockchain and GIS for land ownership and management. Parcel Fabric is a robust GIS tool specifically designed for managing and maintaining cadastral (land parcel) data. Parcel Fabric can enhance the integration of blockchain and GIS for land ownership through the following areas:

**Data Management:** Parcel Fabric provides a structured and organized framework for storing cadastral data, including parcel boundaries, ownership information, historical records, and spatial attributes. This organized data structure is essential for blockchain integration, as it ensures consistency and reliability in the data to be recorded on the blockchain.

**Spatial Accuracy:** Parcel Fabric allows for precise spatial representation of land parcels. When combined with GIS, it ensures that land boundaries are accurately represented on maps and in blockchain records. This spatial accuracy is crucial for verifying land ownership claims.

**Versioning and History:** Parcel Fabric supports versioning, enabling the creation of historical snapshots of cadastral data. This feature is valuable when recording land ownership changes on a blockchain. Users can reference these historical versions to trace the evolution of land parcels and ownership over time.

**Data Validation and Quality Control:** Parcel Fabric includes tools for data validation and quality control. This helps ensure the accuracy and integrity of cadastral data, which is essential when linking it with blockchain records. Accurate data input into the blockchain reduces the risk of disputes and fraud.

**Integration with Blockchain:** Parcel Fabric can be integrated with blockchain platforms to securely record cadastral data. When a property transaction occurs, Parcel Fabric can trigger the creation of a blockchain record or smart contract, capturing details of the transaction. This integration ensures that the blockchain and GIS systems are synchronized and maintain data consistency.

**Blockchain Authentication:** Parcel Fabric can provide authentication mechanisms to ensure that only authorized users can make changes to cadastral data. Access control features can be combined with blockchain’s security to prevent unauthorized alterations to land records.

**Parcel Visualization:** Parcel Fabric allows for the visualization of land parcels in GIS maps, providing an intuitive interface for users to explore land ownership and boundaries. This visual representation can help users better understand land records.

**Efficient Data Updates:** When there are changes in land ownership or parcel boundaries, Parcel Fabric can efficiently manage updates and synchronize them with the blockchain. This ensures that the blockchain always reflects the most up-to-date land ownership information.

**Query and Reporting:** Parcel Fabric facilitates querying and reporting on cadastral data. When integrated with blockchain, users can easily access and verify land ownership records, making the process more transparent and efficient.

**Disaster Recovery:** Parcel Fabric includes backup and recovery features to safeguard cadastral data. In conjunction with blockchain’s data redundancy, this ensures that land ownership records remain resilient and recoverable in the face of disasters or data breaches.

In summary, Parcel Fabric technology can serve as a powerful tool for managing and maintaining cadastral data within a GIS environment, making it an ideal companion for integrating with blockchain technology to support land ownership endeavors. Together, they provide a comprehensive solution for secure, transparent, and efficient land ownership management.

**Computer Aided Mass Appraisal** (CAMA) systems play a crucial role in supporting land ownership and property management endeavors, especially when integrated with GIS and blockchain technologies. Here’s how CAMA systems can contribute:

**Accurate Valuation:** CAMA systems use sophisticated algorithms and modeling techniques to assess property values. Integrating CAMA with GIS allows for more accurate valuations by considering spatial factors like proximity to amenities, transportation, and other location-based attributes. This accurate valuation is essential for property taxation and fair land assessment.

**Data Integration:** CAMA systems can integrate a wide range of property-related data, including property characteristics, historical sales data, and ownership history. When linked with GIS, this integrated data can provide a comprehensive view of a property’s history and physical attributes, which is valuable for land ownership records.

**Parcel Identification:** CAMA systems often include parcel identification features, which help ensure that property assessments are linked to specific land parcels. This aids in the alignment of property valuation and land ownership records.

**Fair Taxation:** Accurate property valuations provided by CAMA systems contribute to fair taxation. Property owners pay taxes based on the true value of their assets, which can improve government revenue collection. Blockchain can help ensure transparent and tamper-proof property taxation records.

**Ownership Verification:** CAMA systems maintain historical ownership data. When combined with blockchain, these records can be securely stored and verified, reducing the risk of fraudulent ownership claims. Property ownership can be linked to blockchain identities, providing additional security.

**Streamlined Assessments:** CAMA systems automate the property assessment process, making it more efficient and reducing the potential for human error. This efficiency is valuable for both property owners and government agencies involved in land ownership and taxation.

**Spatial Analysis:** GIS integration with CAMA enables spatial analysis to understand how property values relate to geographic factors. This can assist in land-use planning, zoning, and infrastructure development decisions.

**Transparency:** By integrating CAMA with blockchain, the entire property valuation and taxation process becomes transparent and auditable. Property owners can easily access and verify their tax assessments, contributing to trust in the system.

**Smart Contracts:** Blockchain technology can be used to create smart contracts that automate property tax payments. Property owners can set up automatic payments based on their assessed tax value, and the blockchain ensures these transactions are transparent and secure

**Data Sharing:** Integration of CAMA with GIS and blockchain can facilitate data sharing among government agencies, real estate professionals, and property owners. This can lead to improved cooperation and coordination in land ownership and management.

**Disaster Recovery:** CAMA systems typically include backup and recovery features. When combined with blockchain’s data resilience, this ensures that property valuation and ownership records remain accessible even in the event of data loss or disasters.

In summary, CAMA systems, when integrated with GIS and blockchain technologies, provide a comprehensive solution for property valuation, land ownership records, and property taxation. This integration enhances accuracy, transparency, and efficiency in land ownership and management endeavors, benefiting both governments and property owners.

Appendix B: Land Title Data Standards

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Attributes | Description | Format |
|  | Fractional Rights |  |  |
|  |   |  |  |
|  |  |  |  |
|  |  |  |  |
| Property Attributes | Easements |  |  |
|  | Utilities |  |  |
| Imagery |  |  |  |
| Geological |  |  |  |

Appendix X: Authors & Contributors

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1. Parking Lot
2. Property Attributes

i) Easements

j) Oil/Mineral Rights