4th Questionnaire on 3D Land Administration: status December 2022 Trinidad and Tobago

This questionnaire is an activity of the **FIG Working Group 3D Land Administration 2022-2026**. The purpose of the survey is to make a world-wide inventory of the status of 3D Land Administration Systems/ Cadastres at this moment (2022) and the plans/ expectations for the near future (2026).

This is the first time that the questionnaire 3D-Land Administration is conducted as a successor of the questionnaire on 3D-Cadastres that was conducted three times by the FIG working group on
3D-Cadastres. The first time was in 2010 to document the status in 2010 and expectations back then for 2014. This was followed by second questionnaire in 2014 (with status 2014 and expectations 2018) and the third one conducted in 2018 (status of 2018 and plans for 2022).

The earlier responses have been analysed and reported on van Oosterom et al. 2011, Karki 2013, van Oosterom et al. 2014 and Shnaidman et al., 2019. The results of the three earlier questionnaires are available via the participants pages of the 3D Land Administration Working Group website:http://www.gdmc.nl/3DCadastres/participants/.

The purpose of this survey is to make a **world-wide inventory of the status of 3D Land Administration** at the current moment and the plans/ expectations for the near future (2026). By sharing this information, it should be **possible to improve cooperation, learn from each other and support future developments**.

A few notes and suggestions, which shall be helpful when completing the questionnaire, are given below:

- The conceptual model used as background for the 3D Land Administration questionnaire is the **ISO 19152:2012 standard** (ISO, 2012), **the Land Administration Domain Model (LADM).** A new edition of the LADM is **under further development in ISO/TC 211** and is being developed as multipart standard, comprised by the following parts: **Part 1** – Generic Conceptual Model; **Part 2** – Land Registration; **Part 3** – Marine Georegulation; **Part 4** – Valuation Information; **Part 5** – Spatial Plan Information and **Part 6** – Implementations.
- In this questionnaire the concept of 3D Land Administration with **3D parcels** (or 3D spatial units in LADM terminology) is intended in the **broadest possible sense**. However, what exactly is (or could be) a 3D parcel is dependent on the legal and organizational context of the specific country/ state/ province. Therefore, **3D parcels include land and water spaces,**

both above and below the earth's surface.

- A more **formal definition**: A **3D parcel** is defined as "*the spatial unit against which (one or more) unique and homogeneous**[1]** rights (e.g. ownership right, lease or other land use right), responsibilities or restrictions are associated to the whole entity, as included in a Land Administration system*."
- A **3D parcel is a 'legal object'** describing a part of the space. Often there is a relationship with a real world/ physical object, which can also be described in 3D. Please be aware of the difference between these two types of objects and that the focus in the context of 3D Land Administration is on the spaces of the legal objects and not the registration of the physical objects as such.
- As the definition above is quite abstract, at the questions below, more specific and real-world examples are being used. Inspecting some of the completed 2010, 2014 and 2018 questionnaires from other countries might help when formulation the answers for your jurisdiction.
- If a certain question is not relevant or if you have no clue what to respond, do not spend any time on this (and leave the field blank).
- Similar to the earlier Questionnaires on 3D- Land Administration, the completed forms will be made available on website of FIG Working Group on 3D Land Administration.
- Please complete this questionnaire before *15 December 2022* and send it to E.Kalogianni@tudelft.nl (the word document completed, or the link with the google document completed) and state as email subject **"Completed FIG Questionnaire on 3D Land Administration 2022-2026 for xxx"** and at the "xxx" name the country.

The questionnaire follows similar structure with the previous ones, with the difference that each section is permeated twice, once to complete the current status (2022) and once for the expectations on 2026. You can navigate from one section to a previous or a following from the buttons "previous" and "next" respectively. Once you research the last section and you complete your contact information you can submit the form.

The **structure of the questionnaire** is as follows:

1. Section 1 - GENERAL/APPLICABLE 3D REAL-WORLD SITUATIONS - Status 2022
2. Section 2 - GENERAL/APPLICABLE 3D REAL-WORLD SITUATIONS - Expectations 2026
3. Section 3 - INFRASTRUCTURE/ UTILITY NETWORK - Status 2022
4. Section 4 - INFRASTRUCTURE/ UTILITY NETWORK - Expectations 2026
5. Section 5 - CONSTRUCTION/ BUILDING UNITS - Status 2022
6. Section 6 - CONSTRUCTION/ BUILDING UNITS - Expectations 2026
7. Section 7 - COORDINATES - Status 2022
8. Section 8 - COORDINATES Expectations 2026
9. Section 9 - REPRESENTATION OF 3rd DIMENSION: HEIGHT (OR DEPTH) - Status 2022
10. Section 10 - REPRESENTATION OF 3rd DIMENSION: HEIGHT (OR DEPTH) - Expectations 2026
11. Section 11 - TEMPORAL ISSUES (4th DIMENSION) - Status 2022
12. Section 12 - TEMPORAL ISSUES (4th DIMENSION) - Expectations 2026
13. Section 13 - RIGHTS, RESTRICTIONS & RESPONSIBILITIES (RRRs) - Status 2022
14. Section 14 - RIGHTS, RESTRICTIONS & RESPONSIBILITIES (RRRs) - Expectations 2026

15. Section 15 - THE CADASTRAL DATABASE (Digital Cadastral Database - DCDB) - Status 2022
16. Section 16 - THE CADASTRAL DATABASE (Digital Cadastral Database - DCDB) - Expectations 2026
17. Section 17 - PLANS OF SURVEY - Status 2022
18. Section 18 - PLANS OF SURVEY - Expectations 2026
19. Section 19 - DISSEMINATION OF 3D LAND ADMINISTRATION INFORMATION - Status 2022
20. Section 20 - DISSEMINATION OF 3D LAND ADMINISTRATION INFORMATION - Expectations 2026
21. Section 21 - STATISTICAL INFORMATION - Status 2022
22. Section 22 - STATISTICAL INFORMATION - Expectations 2026
23. Section 23 - REFLECTION
24. Section 24 - OTHER ISSUES/ CONTACT INFO

The questionnaire has been prepared by Peter van Oosterom ,Eftychia Kalogianni, Abdullah Kara, Rod Thompson, Sudarshan Karki, Anna Shnaidman, Alias Abdul Rahman, Hendrik Ploeger, Christiaan Lemmen. The questionnaire is grouped in various blocks. This has no meaning in the sense of priority, and it is often the case that a question could belong to multiple blocks. Please do not feel disturbed by this.
[1] Homogenous means that the same combination of rights equally apply within the whole 3D spatial unit. Unique means that this is the largest spatial unit for which this is true. Making the unit any larger would result in the combination of rights not being homogenous. Making the unit smaller would result in at least 2 neighbour 3D parcels with the same combinations of rights (ISO19152:2012).

4th Questionnaire on 3D Land Administration: status December 2022

1. GENERAL/APPLICABLE 3D REAL-WORLD SITUATIONS - Status 2022

This part of the questionnaire refers to the **applicable 3D real-world situations to be registered by 3D parcels at the current situation (2022)**. It also addressed the types of 3D geometries, which are considered to be valid 3D representations for these parcels.

1.1. Are all 3D parcels (3D spatial units in LADM terminology) constrained to be within one surface 2D parcel?

Yes. Different strata (condominium) rights limits may be shown in vertical section within the 2D parcel but they are constrained to be in the one parcel.

1.2. Are 2D and/ or 3D ambulatory* boundaries permitted?

[*] An ambulatory boundary is a boundary of a land parcel which follows the movements of a natural feature such as a river. Its position determined at points of time (when a survey is carried out), but between such "fixes", the definition of the property is the position of the real world natural feature.

2D ambulatory boundaries are permitted, both riparian and littoral. 3D ambulatory boundaries do not exist.

1.3. Regarding the legal/ physical relation of 3D objects:

(a) Is it allowed to have 3D parcels (spatial units) not related to physical constructs or objects? (e.g. airspace, subsurface volumes)
(b) If 1.3.a positive: approximately what proportion of new 3D parcels (spatial units) would involve such cases (not related to physical object)?

No. Condominium rights relate to the building and to the 2D parcel. Mineral mining rights refer to each surface parcel.

1.4. Are disconnected parts of a single 3D parcel allowed?

Only in the instance of the common areas being tied to the condominium apartment. They cannot be transferred separately.

1.5. Spatial limitations – e.g. the 3D parcel 'must be' related to a closed volume or is it allowed to have 'open' or unbounded 3D parcels (e.g. towards the sky)?

The parcels are not spatially or graphically defined in 3D. It is assumed that each parcel, defined in 2D are unbounded towards the sky.

1.6. Are curved surfaces to bound the 3D parcels allowed?

Curved surfaces are allowed on both 2D and 3D parcels if surveyed and defined mathematically or graphically.

1.7. Must the curved surfaces (if allowed) be cylindrical sections, or any other constraint?

No. They can be defined graphically.

1.8. Any other constraints – e.g. all surfaces must be horizontal or vertical?

No. They can be surveyed or defined graphically.

1.9. Is there legislation (law and/or regulations) for 3D descriptions of parcels? If so please, mention law and article(s).

Land Surveyors Rules – Rule 19.
"The following plans shall be prepared for all Townhouse Schemes and Condominium schemes:
(1) A location plan which shall record the cadastral data including "common areas" and sufficient measurement to be able to replace all structures
(2) Strata plans for all floors within the condominium scheme
(3) Elevation plans showing each façade view".

1.10. Is the legal text available in original language? For example, professional or scientific papers/reports, which explain and justify the registration of 3D parcels.

N/A. The country is English-speaking

1.11. Is the legal text (relevant part) available in English translation at an official document?

N/A. The country is English-speaking

1.12. Do you have example descriptions of typical 3D parcels; either ‘prototype’ or ‘operational’?

Graphic descriptions can be provided.

1.13. Is there a formal model for the 3D parcels (UML style); e.g. based on ISO TC211 series (especially LADM, ISO 19152)?

No. The legal registry is currently introduced the LADM ISO 19152 for an upgraded registry of title. However the registry is not responsible for the graphic description of the parcel.

1.14. Are natural resources (groundwater, mining rights, geo-thermal extraction and storage) shown in your land administration?

If yes, are they considered as 3D parcels (spatial units) with RRRs attached? What about mining concessions (could be limited in time)?

No. They are not shown in the land administration. Mining concessions on land cover the whole 2D parcel. Mining concessions in the marine environment are leased by blocks and the RRRs are included in the deed. Other natural resource rights are not shown. Reserves such as gas pipelines are shown as 2D parcels. Mining rights are linked to the surface parcels. Oil mining leases in the marine environment are also linked to the surface parcel

1.15. Are legally restricted spaces, above or below the earth's surface, such as polluted areas considered as 3D parcels?

No they are not considered to be 3D parcels. Restrictions and all RRRs are sometimes listed in the deed or are listed in planning policy. They are not graphically depicted.

1.16. Are spatial plans considered as 3D parcels (so rights or restrictions are related to them)?

Sometimes they are called 'spatial development plans', 'zoning plans' or 'physical plans' (land use, urban, regional, environmental, ...).

Land use plans are not considered to be 3D. Rights and restrictions are expressed verbally regarding them. These development areas are described verbally in development plans. Spatial plans are completely separate from the cadastre and not related to the parcel. They are managed by the Town and Country Planning Division of the Ministry of Planning. https://www.planning.gov.tt/content/town-and-country-planning-division-services
They are not 3D.

1.17. Regarding the Marine Space:

(a) Is there a Marine Cadastre established? And if so, are 3D parcels included in this registration?
(b) Is the IHO Maritime Limits and Boundaries standard (S121) in use or under implementation?

(c) Is there a Marine Spatial Plan established? And if so, are 3D marine parcels included in this registration?

(a) There is no marine cadastre. Only lease blocks for oil and gas exploration and extraction are indicated graphically at the state institution with responsibility for oil and gas matters. https://ngc.co.tt/wp-content/uploads/pdf/publications/Energy-Map-of-Trinidad-Tobago-2017.pdf
(b) The IHO S121 is not in use.
(c) There is no marine spatial plan. There is a proposal: https://www.mspglobal2030.org/msp-roadmap/msp-around-the-world/americas/trinidad-tobago/

1.18. Is there any organised legal instrument for the management of common property? For example, does the law, regulations or systems recognize/require a specific right type for common property?

Only in common and joint tenancy with named rights holders exist. Management of common property in condominiums is done under the company's legislation https://rgd.legalaffairs.gov.tt/laws2/Alphabetical_List/lawspdfs/81.01.pdf where all owners collectively own the parcel and individuals own shares in the property.

1.19. Which agency is responsible for the recording of titles information?

Land Registry. https://agla.gov.tt/registrar-general/registrar-general-land-registry/

1.20. Which agency is responsible for recording cadastral transactions?

Surveys and Mapping. https://agriculture.gov.tt/divisions-units/divisions/surveys-and-mapping/

1.21. Are transactions for standard 2D lots and 3D lots done by the same agency or titles office?

Yes. All title processes are done by the Registrar General. All cadastral boundary processes are done by the Surveys and Mapping Division.

1.22. Are there any 3D storage permissions recorded (e.g. underground storage of CO2)?

No.

1.23 Has there been developed any country profile based on LADM ISO19152[1]?

(a) Does it support 2D spatial units?
(b) Does it support also 3D spatial units?
(c) Is there any provision to include/ align with the new LADM developments of the second Edition of the standard (inclusion of valuation information, marine spaces, spatial plans, interoperability/ reuse of BIM/IFC, ..)?

[1] If yes, is it included at the index presented at the Table 1 of the publication Kalogianni et al. 2021 [Kalogianni, E., Janečka, K., Kalantari, M., Dimopoulou, E., Bydłosz, J., Radulović, A., Vučić, N., Sladić, D., Govedarica, M., Lemmen, C.H.J. and van Oosterom, P.J.M. (2021). Methodology for the development of LADM country profiles, In: Land Use Policy, Elsevier, 105(105380), pp. 1-12, 2021. Available at: http://www.gdmc.nl/publications/2021/LUP_CountryProfile.pdf]?

If it is included, are there any further developments/ publications related to it apart from those mentioned at the table? In case there are, could you please provide with a link of a relevant publication?

No it has not been developed.

1.24. Any other geometric issues related to 3D parcels?

None

1. GENERAL/APPLICABLE 3D REAL-WORLD SITUATIONS - Expectations 2026

This part of the questionnaire refers to the **applicable 3D real-world situations to be registered by 3D parcels**. It also addressed the types of 3D geometries, which are considered to be valid 3D representations for these parcels.

1.1. Are all 3D parcels (3D spatial units in LADM terminology) constrained to be within one surface 2D parcel?

There are still plans to create legislation for the rights above surface (condominiums) but no plans to change or create a new graphic way of presenting them.

1.2. Are 2D and/ or 3D ambulatory* boundaries permitted?

[*] An ambulatory boundary is a boundary of a land parcel which follows the movements of a natural feature such as a river. Its position determined at points of time (when a survey is carried out), but between such "fixes", the definition of the property is the position of the real world natural feature.

There has been no discussion on changing to 3D ambulatory boundaries. 2D ambulatory boundaries at the coastline are being clarified based on sea level changes and the determination of high water mark. This is in discussion.

1.3. Regarding the legal/ physical relation of 3D objects:

(a) Is it allowed to have 3D parcels (spatial units) not related to physical constructs or objects? (e.g. airspace, subsurface volumes)
(b) If 1.3.a positive: approximately what proportion of new 3D parcels (spatial units) would involve such cases (not related to physical object)?

There are no plans to change.

1.4. Are disconnected parts of a single 3D parcel allowed?

There are no plans to change.

1.5. Spatial limitations – e.g. the 3D parcel 'must be' related to a closed volume or is it allowed to have 'open' or unbounded 3D parcels (e.g. towards the sky)?

There are no plans to change.

1.6. Are curved surfaces to bound the 3D parcels allowed?

There are no plans to change.

1.7. Must the curved surfaces (if allowed) be cylindrical sections, or any other constraint?

There are no plans to change.

1.8. Any other constraints – e.g. all surfaces must be horizontal or vertical?

There are no plans to change.

1.9. Is there legislation (law and/or regulations) for 3D descriptions of parcels? If so please, mention law and article(s).

There are no plans to change.

1.10. Is the legal text available in original language? For example, professional or scientific papers/reports, which explain and justify the registration of 3D parcels.

N/A. The country is English-speaking

1.11. Is the legal text (relevant part) available in English translation at an official document?

N/A. The country is English-speaking

1.12. Do you have example descriptions of typical 3D parcels; either ‘prototype’ or ‘operational’?

There are discussions between professional land surveyors and the Cadastral agency on submitting cadastral plans in 3D cad files. It is hoped that this will be completed and in operation by 2026.

1.13. Is there a formal model for the 3D parcels (UML style); e.g. based on ISO TC211 series (especially LADM, ISO 19152)?

This is not in active discussion but it is hoped that it will have been done by 2026 as there are proposals to link the land registry to the cadastre.

1.14. Are natural resources (groundwater, mining rights, geo-thermal extraction and storage) shown in your land administration?

If yes, are they considered as 3D parcels (spatial units) with RRRs attached? What about mining concessions (could be limited in time)?

These are not under active discussion.

1.15. Are legally restricted spaces, above or below the earth's surface, such as polluted areas considered as 3D parcels?

This is not under active discussion.

1.16. Are spatial plans considered as 3D parcels (so rights or restrictions are related to them)?

Sometimes they are called 'spatial development plans', 'zoning plans' or 'physical plans' (land use, urban, regional, environmental, ...).

Spatial planning agencies are not authorised to create parcels.

1.17. Regarding the Marine Space:

(a) Is there a Marine Cadastre established? And if so, are 3D parcels included in this registration?
(b) Is the IHO Maritime Limits and Boundaries standard (S121) in use or under implementation?

(c) Is there a Marine Spatial Plan established? And if so, are 3D marine parcels included in this registration?

This will need to be led by the cadastral agency and there are no ongoing discussions.

1.18. Is there any organised legal instrument for the management of common property? For example, does the law, regulations or systems recognize/require a specific right type for common property?

There are no discussions to recognise this.

1.19. Which agency is responsible for the recording of titles information?

The land registry will continue to be responsible for recording of titles.

1.20. Which agency is responsible for recording cadastral transactions?

The Surveys and Mapping Division will continue to be responsible for recording cadastral transactions.

1.21. Are transactions for standard 2D lots and 3D lots done by the same agency or titles office?

The same cadastral agency will continue to be responsible for parcels whether 2D or 3D.

1.22. Are there any 3D storage permissions recorded (e.g. underground storage of CO2)?

There are no plans.

1.23 Has there been developed any country profile based on LADM ISO19152[1]?

(a) Does it support 2D spatial units?
(b) Does it support also 3D spatial units?
(c) Is there any provision to include/ align with the new LADM developments of the second Edition of the standard (inclusion of valuation information, marine spaces, spatial plans, interoperability/ reuse of BIM/IFC, ..)?

[1] If yes, is it included at the index presented at the Table 1 of the publication Kalogianni et al. 2021? If it is included, are there any further developments/ publications related to it apart from those mentioned at the table? In case there are, could you please provide with a link of a relevant publication?

It is hoped that this will be considered.

1.24. Any other geometric issues related to 3D parcels?

None.

2. INFRASTRUCTURE/UTILITY NETWORKS - Status 2022

This refers to the situation where an **infrastructure network** is considered to be **defined within the**

land administration. For example, in some jurisdictions, an underground network might be privately constructed for the purpose of leasing space in it for other organisations to run cabling. In this case, a network, or part of that network may be considered to be a real estate object.

2.1. Do you register utility networks as an entity in the land administration? (e.g. subterranean conduit networks)

No. Any network such as gas pipelines are recorded in relation to the 2D parcels. Pipeline networks for example are registered as a general plan denoting acquisition from the parent parcels.

2.2. If so, then:

(a) can the network structure be viewed graphically in the land administration?

(b) can the network structure be traced in the database(s)?

(c) are networks registered by means of a cadastral identifier (such as a 'parcel number')?

(d) are RRRs and parties attached to these network objects?
(e) in which format are usually the utility networks submitted for registration (i.e. CityGML Utility ADE, IFC, MUDDI, shp, …)?

The entire network cannot be viewed except in relation to the 2D parcels. All parcels do not have an identifier. RRRs are not attached.
(a) The land administration is an index to the plan so the structure can be viewed in 2D.
(b) Yes they can be viewed graphically.
(c) They are recorded as a plan number as the graphical aspect is separated from the legal aspect.
(d) No. Not in the database
(e) Cadastral plans are not submitted in digital file format.

2.3. Does the jurisdiction have private networks? If so please, mention law and article(s).

No. Networks such as gas pipelines, water and sewerage, and old railway lines, belong to state companies.

2.4. If so, are they registered as 3D property parcels (spatial units)?

No.

2.5. Is the text of relevant laws or regulations (question 2.3) available in original language? If so, give references to relevant document(s).

N/A. The country is English speaking.

2.6. Is the text of laws and regulations (relevant part) available in English translation of an official document?

N/A. The country is English speaking.

2.7. Do you have example descriptions of typical 3D parcels (spatial units) for networks; either ‘prototype’ or ‘operational’?

None.

2.8. If the network (legal) objects break at the surface parcel, how do you deal with intersecting networks or vertically parallel networks?

Not shown.

2.9. Any other geometric issues related to the registration of networks?

None

2. INFRASTRUCTURE/UTILITY NETWORKS - Expectations 2026

This refers to the situation where an **infrastructure network** is considered to be **defined within the land administration**. For example, in some jurisdictions, an underground network might be privately constructed for the purpose of leasing space in it for other organisations to run cabling. In this case, a network, or part of that network may be considered to be a real estate object.

2.1. Do you register utility networks as an entity in the land administration? (e.g. subterranean conduit networks)

No discussions currently

2.2. If so, then:

(a) can the network structure be viewed graphically in the land administration?

(b) can the network structure be traced in the database(s)?

(c) are networks registered by means of a cadastral identifier (such as a ‘parcel number’)?

(d) are RRRs and parties attached to these network objects?
(e) in which format are usually the utility networks submitted for registration (i.e. CityGML Utility ADE, IFC, MUDDI, shp, …)?

No discussions currently

2.3. Does the jurisdiction have private networks? If so please, mention law and article(s).

No

2.4. If so, are they registered as 3D property parcels (spatial units)?

No

2.5. Is the text of relevant laws or regulations (question 2.3) available in original language? If so, give references to relevant document(s).

N/A

2.6. Is the text of laws and regulations (relevant part) available in English translation of an official document?

N/A

2.7. Do you have example descriptions of typical 3D parcels (spatial units) for networks; either ‘prototype’ or ‘operational’?

No discussions currently

2.8. If the network (legal) objects break at the surface parcel, how do you deal with intersecting networks or vertically parallel networks?

No discussions currently

2.9. Any other geometric issues related to the registration of networks?

None

3. CONSTRUCTION/ BUILDING UNITS - Status 2022

This refers to 3D properties that are related to **constructions and apartment (condominium) buildings**. The individual units are often defined by the actual walls and structure of a building, rather than by metes and bounds, e.g. "*unit 5 on level 6 of … building*".

3.1. Do you register legal spaces for 3D construction/ building units (separate from the land)?

No.

3.2. If so, what are the conditions for doing so, and what are the most important types? E.g. apartment units (at least 2 or more in building), or also other buildings or even more general constructions (infra related; such as bridge, tunnel or even other, such as windmills, ...)

Condominiums or apartments only and they are registered with the land.

3.3. Does the jurisdiction have construction/building units? If so please, mention law and article(s).

Proposed legislation but currently dealt with under companies legislation
http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs/81.01.pdf

3.4. Is the legal text available in original language?

The country is English speaking

3.5. Is the legal text (relevant part) available in English translation at an official document?

The country is English speaking

3.6. Do you have example descriptions of typical 3D parcels; either ‘prototype’ or ‘operational’?

3.7. Regarding the boundaries’ definition:

(a) What would be typical 3D boundaries in an apartment complex: i) middle of the wall and floor/ceiling, ii) interior/ exterior of the wall or iii) walls, floor/ceiling as neutral/ shared 3D space?
(b). Is it mentioned in any legislation or is it the convention?

The cadastral surveyor will define the position while surveying. Middle of the wall and floor, ceiling, for internal apartments. Exterior of the walls for end apartments. This is determined by practice of the land surveyor.

3.8. Is common property inside the building registered? If so, how?

It is registered with the land and attached to the apartment.

3.9. Who owns the common property inside the building?

The condominium company owns all and the individuals own shares.

3.10. Who owns the land on which the apartment is built?

The condominium company owns the land.

3.11. Do you allow sub-division of apartments or apartment blocks?

Individuals can hold shares in the form of the apartment.

3.12. Can the land on which the building is built be sub-divided or sold or mortgaged without the consent of majority of the apartment owners?

No.

3.13. What is the numbering convention for apartments (please specify in terms of cadastral parcel as well as street addressing)

This is variable.

3.14. Are there any mandates* that set specifications on the delivery of design/ construction drawing of properties in BIM-based format, when registering new 3D parcels (from design)?

**That arise through legislation or from the procurement process.*

Cadastral plans are not submitted in digital form.

3.15. Are there any operational or in prototype stage platforms. implementations that reuse BIM information from design as cadastral/ land administration input?

No.

3.16. Any other geometric issues?

None

3. CONSTRUCTION/ BUILDING UNITS - Expectations 2026

This refers to 3D properties that are related to **constructions and apartment (condominium) buildings**. The individual units are often defined by the actual walls and structure of a building, rather than by metes and bounds, e.g. "*unit 5 on level 6 of … building*".

3.1. Do you register legal spaces for 3D construction/ building units (separate from the land)?

No discussions on doing this.

3.2. If so, what are the conditions for doing so, and what are the most important types? E.g. apartment units (at least 2 or more in building), or also other buildings or even more general constructions (infra related; such as bridge, tunnel or even other, such as windmills, ...)

No plans

3.3. Does the jurisdiction have construction/building units? If so please, mention law and article(s).

Only condominiums and they are related to the parcel.

3.4. Is the legal text available in original language?

The country is English speaking

3.5. Is the legal text (relevant part) available in English translation at an official document?

The country is English speaking

3.6. Do you have example descriptions of typical 3D parcels; either 'prototype' or 'operational'?

They are on 2D plans

3.7. Regarding the boundaries' definition:

(a) What would be typical 3D boundaries in an apartment complex: i) middle of the wall and floor/ceiling, ii) interior/ exterior of the wall or iii) walls, floor/ceiling as neutral/ shared 3D space?
(b). Is it mentioned in any legislation or is it the convention?

No plans to change.

3.8. Is common property inside the building registered? If so, how?

No plans to change

3.9. Who owns the common property inside the building?

No plans to change

3.10. Who owns the land on which the apartment is built?

No plans to change

3.11. Do you allow sub-division of apartments or apartment blocks?

No plans to change

3.12. Can the land on which the building is built be sub-divided or sold or mortgaged without the consent of majority of the apartment owners?

No

3.13. What is the numbering convention for apartments (please specify in terms of cadastral parcel as well as street addressing)

Variable.

3.14. Are there any mandates* that set specifications on the delivery of design/ construction drawing of properties in BIM-based format, when registering new 3D parcels (from design)?

**That arise through legislation or from the procurement process.*

No plans to change

3.15. Are there any operational or in prototype stage platforms. implementations that reuse BIM information from design as cadastral/ land administration input?

No

3.16. Any other geometric issues?

None

4. COORDINATES - Status 2022

This refers to the use of **x, y coordinates** and the relevant issues.

4.1. Do the plans of survey guarantee X/Y coordinates? (and are they relative or in an absolute spatial reference system?)

No. Parcels are relative to each other. Approximate coordinates of one point are given for location.

4.2. Are the cadastral database coordinates authoritative?

No.

4.3. If not, what is the authoritative source of X/Y coordinates?

The cadastral plan boundary dimensions are more authoritative than coordinates. The location of the marked boundaries on the ground is authoritative.

4.4. Do you have parcels defined by the walls of a building (with no recorded geometry)?

Not for surveyed parcels but there may be old deeds on which the verbal description is the only description of the parcel.

4.5. What is the spatial reference system for X/Y Coordinates? (Please , provide the EPSG)

UTM zone 20. Naparima datum. Various older mapping systems. https://epsg.io/?q=Trinidad+and+Tobago

4.6. When owners receive or purchase a copy of the plan what can they see on the plan to help them identify their parcel/lot

(e.g. bearings and distance, identifying corners or recovery marks, neighbouring lots, coordinates etc.)?

Lot numbers, neighbouring owners names or lot numbers, bearings and distances,

4.7. Have there been any changes, w.r.t. the spatial reference system, made in the way cadastral information is recorded and represented from a historical point of view?

Orientation on older plans were in Cassini grid or previously magnetic bearing orientation. Dimensions were imperial, now metric.

4.8. Any other X/Y coordinate issues?

Some maps present on WGS 84 instead of UTM Naparima datum, various transformation parameters.

4. COORDINATES - Expectations 2026

This refers to the use of **x, y coordinates** and the relevant issues.

4.1. Do the plans of survey guarantee X/Y coordinates? (and are they relative or in an absolute spatial reference system?)

There are discussions on presenting on WGS 84 instead of Naparima datum

4.2. Are the cadastral database coordinates authoritative?

No discussions on making coordinates legally authoritative.

4.3. If not, what is the authoritative source of X/Y coordinates?

No plans on changing to coordinates being authoritative.

4.4. Do you have parcels defined by the walls of a building (with no recorded geometry)?

More and more parcels are being surveyed

4.5. What is the spatial reference system for X/Y Coordinates? (Please , provide the EPSG)

Discussions are ongoing on moving to WGS 84

4.6. When owners receive or purchase a copy of the plan what can they see on the plan to help them identify their parcel/lot

(e.g. bearings and distance, identifying corners or recovery marks, neighbouring lots, coordinates etc.)?

There are plans to have identifiers for all parcels

4.7. Have there been any changes, w.r.t. the spatial reference system, made in the way cadastral information is recorded and represented from a historical point of view?

Discussions are ongoing on digital presentation

4.8. Any other X/Y coordinate issues?

None

5. REPRESENTATION OF 3rd DIMENSION: HEIGHT (OR DEPTH) - Status 2022

This section refers to the representation and registration of the **third dimension**.

5.1. Are the height values of 3D parcels relative to local ground?

Where cross sections are drawn on 2D cadastral plans, height values are relative to local ground.

5.2. Are height values reduced to a standard datum (absolute)? If so, what is the spatial reference system for this 3rd ordinate?

There is no standard referenced

5.3. In principle, is it possible to store both relative and absolute height/ depth values?

No heights are stored

5.4. Is the earth surface (elevation) explicitly stored (in the DCDB or other accessible register)?

No

5.5. What is the source of height values for the 2D surface parcel?

No heights are recorded on the 2D surface parcel. Dimensions are horizontal on the ground level.

5.6. How is elevation information recorded in the cadastral plan or database?

None recorded. Elevation recorded in cross sections on plan.

5.7. Do you expect the elevation recorded in cadastral plans to be used for any other purpose

(e.g. development of 3D city models or civil constructions etc.)?

None recorded

5.8. Are there any 3D City Model/ Digital Twin developments carried out at a national or city level that can be used for orientation or reference purposes?

No

5.9. Any other 3rd dimension ordinate value issues?

No

5. REPRESENTATION OF 3rd DIMENSION: HEIGHT (OR DEPTH) - Expectations 2026

This section refers to the representation and registration of the **third dimension**.

5.1. Are the height values of 3D parcels relative to local ground?

No immediate plans to change but changes should occur if 3D parcels are adopted.

5.2. Are height values reduced to a standard datum (absolute)? If so, what is the spatial reference system for this 3rd ordinate?

No plans to change.

5.3. In principle, is it possible to store both relative and absolute height/ depth values?

No immediate plans to change

5.4. Is the earth surface (elevation) explicitly stored (in the DCDB or other accessible register)?

No immediate plans to change

5.5. What is the source of height values for the 2D surface parcel?

No immediate plans to change

5.6. How is elevation information recorded in the cadastral plan or database?

No immediate plans to change

5.7. Do you expect the elevation recorded in cadastral plans to be used for any other purpose

(e.g. development of 3D city models or civil constructions etc.)?

No immediate plans to change

5.8. Are there any 3D City Model/ Digital Twin developments carried out at a national or city level that can be used for orientation or reference purposes?

No immediate plans to change

5.9. Any other 3rd dimension ordinate value issues?

None

6. TEMPORAL ISSUES (4th DIMENSION) - Status 2022

This section refers to the representation and registration of the **fourth dimension**.

6.1. Are temporal limits part of the definition of a parcel (2D or 3D)?

No. The cadastral plan indicates the date of survey of the boundary.

6.2. Are moving parcels allowed?

No

6.3. Are there any limitations on the range of temporal limits?

(e.g. only on 3D apartments).

No

6.4. Is there any attempt to integrate 3D space and temporal representations, into a single 4D space/time representation?

No

6.5. In the case of tidal boundaries, what happens to the 3D ambulatory parcel if the 2D land parcel changes extent due to the movement of High Water Mark?

N/A. This will also change to the 2D parcel limits. The cadastral plan indicates the date of survey of the boundary.

6.6. In case 3D Marine Cadastre is present and moving boundaries are allowed, how is this represented?

e.g. using 4D geometry and topology.

N/A. The cadastral plan indicates the date of survey of the boundary.

6.7. Can time bound rights be created and extinguished in the title? (e.g. temporary titles created for a period and when the time is up it can be extinguished)?

No

6.8. Is it possible to identify all the changes made by any operator to the cadastral plans or database and to rollback if there is an error made?

The error can be corrected

6.9. For Cadastral transactions, how far in time do buyers need to make a search to ensure the title or deed is legal?

20 years

6.10. Are there object classes in the registration that require both real-world (or valid) times and database load (or system) times, i.e. bi-temporal support?

No

6.11. Any other temporal issues?

No

6. TEMPORAL ISSUES (4th DIMENSION) - Expectations 2026

This section refers to the representation and registration of the **fourth dimension**.

6.1. Are temporal limits part of the definition of a parcel (2D or 3D)?

No discussions on change

6.2. Are moving parcels allowed?

No discussions on change

6.3. Are there any limitations on the range of temporal limits?

(e.g. only on 3D apartments).

No discussions on change

6.4. Is there any attempt to integrate 3D space and temporal representations, into a single 4D space/time representation?

No discussions on change

6.5. In the case of tidal boundaries, what happens to the 3D ambulatory parcel if the 2D land parcel changes extent due to the movement of High Water Mark?

No discussions on change

6.6. In case 3D Marine Cadastre is present and moving boundaries are allowed, how is this represented?

e.g. using 4D geometry and topology.

No discussions on change

6.7. Can time bound rights be created and extinguished in the title? (e.g. temporary titles created for a period and when the time is up it can be extinguished)?

No discussions on change

6.8. Is it possible to identify all the changes made by any operator to the cadastral plans or database and to rollback if there is an error made?

No discussions on change

6.9. For Cadastral transactions, how far in time do buyers need to make a search to ensure the title or deed is legal?

No discussions on change

6.10. Are there object classes in the registration that require both real-world (or valid) times and database load (or system) times, i.e. bi-temporal support?

No discussions on change

6.11. Any other temporal issues?

No

7. RIGHTS, RESTRICTIONS AND RESPONSIBILITIES (RRRs) - Status 2022

This section refers to the **RRRs and their registration at the LA system.** At a vast majority of the countries, the restrictions and the responsibilities are not registered at the LAS.

7.1. Please provide the range of RRRs on 3D parcels. If there is an online depository, provide the link.

RRRs are not recorded in the cadastre, which is in 2D, only the physical extent. The land registry records transactions on deeds and titles on certificates of title.

7.2. Are there any limitations on the range of rights related to 3D spatial units? (e.g. subterranean parcels must be owned by Govt).

None

7.3. Are there any limitations on the range of restrictions or responsibilities related to 3D spatial units? (i.e. currently in use and related to 2D spatial units, but that would not be applicable to 3D).

None

7.4. Are there RRRs that are only allowed in 3D (and not valid for 2D)

None

7.5. Is there specific legislation (laws, regulations) defining 3D RRR types? If so, provide details, e.g. references to documents/ articles.

All laws leave the graphical definition up to the rules of the Director of Surveys and these rules only provide for 2D delimitation of parcels. For example in the Mining legislation: Minerals Act Chapter 61:03 the following occurs:
Form of Licence.
21. (1) Subject to this Act, every licence issued under this Act shall—
(a) be in such form and be subject to such terms and conditions as may be prescribed;
(b) specify the limits of the area in respect of which the licensee is authorised to explore for or mine, process, import or export minerals; and
(c) not be transferred or assigned without the written approval of the Minister.

And also:

35. (1) The holder of a licence shall—
(a) in furtherance of mining operations avoid damage to any adjoining or third party property;
(b) have the boundaries to his property properly demarcated at all times, and shall maintain a buffer zone of ten feet from the boundaries of the said property on all sides; and
(c) on completion of the operations authorised by the licence or on the date of expiration of his licence, whichever occurs earlier, rehabilitate and restore the land to the satisfaction of the Director

7.6. Can 3D sub-surface/above-surface parcel be owned by someone other that the person owning the land parcel?

Yes for example in oil mining rights.

7.7. What applications do you foresee for 3D land administration?

Condominiums and apartments as well as tunnels, and oil mining and mineral mining leases.

7.8. Are the administrative source documents (source of RRRs) title or deed based?

Some parcels are deeds based and some parcels are title based.

7.9. Who is responsible for the correctness of the specified 3D boundaries in spatial source documents (which authority)?

All laws leave the graphical definition up to the rules of the Director of Surveys and these rules only provide for 2D delimitation of parcels.

7.10. Is registration of 3D parcels done inside the cadastral mapping agency, the land registry or elsewhere?

Registration of parcels is done in the land registry.

7.11. Are 3D registrations handled by the same organisation that handles traditional (2D) land administration?

There are no 3D registrations but all registrations are handled at the land registry

7.12. Do you supply paper-based titles or deeds or proof of ownership? If yes, does this contain depictions of the 2D or 3D parcel?

Some deeds and all titles contain depictions of the 2D parcel.

7.13. Is the 3D registry separate or integrated with the 2D registry?

There is no 3D registry

7.14. Any other RRR issues?

Town and Country planning restrictions should be linked to the cadastre.

7. RIGHTS, RESTRICTIONS AND RESPONSIBILITIES (RRRs) - Expectations 2026

This section refers to the **RRRs and their registration at the LA system.** At a vast majority of the countries, the restrictions and the responsibilities are not registered at the LAS.

7.1. Please provide the range of RRRs on 3D parcels. If there is an online depository, provide the link.

There are no current plans or discussions.

7.2. Are there any limitations on the range of rights related to 3D spatial units? (e.g. subterranean parcels must be owned by Govt).

There are no current plans or discussions.

7.3. Are there any limitations on the range of restrictions or responsibilities related to 3D spatial units? (i.e. currently in use and related to 2D spatial units, but that would not be applicable to 3D).

There are no current plans or discussions.

7.4. Are there RRRs that are only allowed in 3D (and not valid for 2D)

There are no current plans or discussions.

7.5. Is there specific legislation (laws, regulations) defining 3D RRR types? If so, provide details, e.g. references to documents/ articles.

There are no current plans or discussions.

7.6. Can 3D sub-surface/above-surface parcel be owned by someone other that the person owning the land parcel?

There are no current plans or discussion to change.

7.7. What applications do you foresee for 3D land administration?

Inclusion of condominiums, apartments, restrictions on building heights and extents.

7.8. Are the administrative source documents (source of RRRs) title or deed based?

There are plans to convert all to title through systematic adjudication and titling.

7.9. Who is responsible for the correctness of the specified 3D boundaries in spatial source documents (which authority)?

There are no current plans or discussion to change.

7.10. Is registration of 3D parcels done inside the cadastral mapping agency, the land registry or elsewhere?

There are no current plans or discussion to change.

7.11. Are 3D registrations handled by the same organisation that handles traditional (2D) land administration?

There are no current plans or discussion to change.

7.12. Do you supply paper-based titles or deeds or proof of ownership? If yes, does this contain depictions of the 2D or 3D parcel?

There are no current plans or discussion to change.

7.13. Is the 3D registry separate or integrated with the 2D registry?

There are no current plans or discussion to change.

7.14. Any other RRR issues?

8. THE CADASTRAL DATABASE (Digital Cadastral Database - DCDB) - Status 2022

This section refers to the **structure and functionalities of the cadastral database**.

8.0. Is the database schema LADM based?

Yes through Trimble Landfolio.

8.1. Does the DCDB contain representation of 3D parcels (in any form)?

No

8.2. If so, how are they represented (in the DCDB)?

No

8.3. If so, how are they presented on cadastral “maps” (including screen presentations)?

They are not.

8.4. Are there possibilities to store geometry of 3D parcels in the DCDB?

Yes

8.5. Is it possible to manage a 3D topological structure in the DCDB?

Not tested

8.6. Are constraints/rules defined for valid 3D objects (closed volume, no overlap, no gap in 3D)? What about rules for a mix of 2D and 3D representations?

No

8.7. How can internal and external user query and visualize the 3D content supporting rotating, slicing, transparency, perspective (3D web/view service, 3D pdf documents, ..)?

N/A

8.8. What Spatial DBMS software do you use? Any 3D capabilities included and used?

Trimble Landfolio

8.9. Do you have any validation rules for 3D representation in the database?

No

8.10. What (GIS/CAD) software is used for updating, editing, analysis, and visualization of the cadastral data? Any 3D capabilities included and used?

Trimble Landfolio

8.11. What web software is used for remote data access/distribution and visualization? Any 3D capabilities included and used?

Trimble Landfolio

8.12. Is your DCDB organised as Multi-Layers or Object Oriented or some other data model?

Object oriented.

8.13. How do you query 3D objects in your DCDB?

N/A

8.14. Is it possible to query neighbourhood parcels to a 3D object, vertically as well as horizontally?

N/A

8.15. Any other DCDB issues?

8. THE CADASTRAL DATABASE (Digital Cadastral Database - DCDB) - Expectations 2026

This section refers to the **structure and functionalities of the cadastral database**.

8.0. Is the database schema LADM based?

There are no ongoing discussions to change.

8.1. Does the DCDB contain representation of 3D parcels (in any form)?

There are no ongoing discussions to change.

8.2. If so, how are they represented (in the DCDB)?

There are no ongoing discussions to change.

8.3. If so, how are they presented on cadastral “maps” (including screen presentations)?

There are no ongoing discussions to change.

8.4. Are there possibilities to store geometry of 3D parcels in the DCDB?

There are no ongoing discussions to change.

8.5. Is it possible to manage a 3D topological structure in the DCDB?

There are no ongoing discussions to change.

8.6. Are constraints/rules defined for valid 3D objects (closed volume, no overlap, no gap in 3D)? What about rules for a mix of 2D and 3D representations?

There are no ongoing discussions to change.

8.7. How can internal and external user query and visualize the 3D content supporting rotating, slicing, transparency, perspective (3D web/view service, 3D pdf documents, ..)?

There are no ongoing discussions to change.

8.8. What Spatial DBMS software do you use? Any 3D capabilities included and used?

There are no ongoing discussions to change.

8.9. Do you have any validation rules for 3D representation in the database?

There are no ongoing discussions to change.

8.10. What (GIS/CAD) software is used for updating, editing, analysis, and visualization of the cadastral data? Any 3D capabilities included and used?

There are no ongoing discussions to change.

8.11. What web software is used for remote data access/distribution and visualization? Any 3D capabilities included and used?

There are no ongoing discussions to change.

8.12. Is your DCDB organised as Multi-Layers or Object Oriented or some other data model?

There are no ongoing discussions to change.

8.13. How do you query 3D objects in your DCDB?

There are no ongoing discussions to change.

8.14. Is it possible to query neighbourhood parcels to a 3D object, vertically as well as horizontally?

There are no ongoing discussions to change.

8.15. Any other DCDB issues?

9. PLANS OF SURVEY (INCLUDING FIELD SKETCHES) - Status 2022

This section poses questions about the data acquisition process and **cadastral survey plans**.

9.1. Do the survey plans carry 3D parcel representations?

Yes, if necessary, there are cross sections to depict 3D situations on the 2D plan.

9.2. If so, how are they represented?

They are represented as cross sections. Different strata (condominium) rights limits may be shown in vertical section within the 2D parcel but they are constrained to be in the one parcel.

9.3. Is there specific legislation (regulations) describing the requirements for Plans of Survey in 3D? This could cover:
(a) accuracy/ quality,
(b) 3D survey method,
(c) conceptual information model survey plan,
(d) portrayal rules for graphic representation,
(e) format or encoding for submission.
If so, please give link to the relevant documents.

None. All rules for parcel presentation are created, and approved by the Land Survey Board and implemented by the Director of Surveys.

9.4. Is sketch level allowed (low geometric quality, but in principle enough to indicate the 3D object)?

No. There is no requirement for precision and polygon closure for cross section views

9.5. Is it possible to define a 3D parcel by referring to other 3D real world objects/ topography (and not specifying coordinates)?

Yes

9.6. In what format are the 3D parcels submitted for registration; attached to legal document in a single pdf (which has good 3D capabilities) or in an extension of (city) GML for 3D parcels, or….?

All submissions are required to be on paper.

9.7. Are the 3D parcels somehow checked for spatial validity; e.g. volume is closed, does not overlap with neighbour volume (and also no unwanted 3D gaps)?

No

9.8. Do you have examples of (prototype or production) 3D survey plans available?

On 2D paper plans

9.9. Are any reference objects visible on the survey plan (e.g. real buildings, roads, that is 3D topography)?

No

9.10. What form of 3D data acquisition is used (CAD, terrestrial surveying, sketches, stereo/oblique images, laser scanning, …)?

terrestrial surveying

9.11. What software do you use for creating and processing survey plans? Any 3D capabilities included and used?

Land surveyors use CAD software for preparation of survey plans, sometimes it is AutoCAD but not exclusively.

9.12. Can 3D parcels be subdivided, consolidated or nullified?

If approved by the Planning authority.

9.13. Is there any existing technical circular or directive to assist Surveyors in 3D data collection in the field?

No

9.14. Are the surveyors required to undertake a field survey for 3D cadastral data?

Yes, in most instances. No, where the information can be derived from the engineering building drawing.

9.15. Are building construction plans used to compile 3D cadastral information for apartments?

yes

9.16. Is 2D/3D field survey done by private licensed surveyors or by government surveyors?

Private licensed surveyors. Both can perform these surveys once licensed and registered.

9.17. Are plans of survey created for each new 2D/3D parcel or are they updated in an index map or a cadastral database.

Survey plans must be created. All subdivisions, new surveys, redefinitions, must be represented on a plan for submission to the cadastre for plan registration (not parcel registration). They are then updated on an index map.

9.18. Do you show dimensions or isometric views of 3D parcels on survey plans (do you also store this in a database)

Yes. Dimensions and cross sections are shown. These are scanned and stored as 2D plans in the database.

9.19. Do the cadastral survey plans differentiate between different types (e.g. volumetric plans, building plans and standard 2D plans)?

No

9.20. What are the usual elements shown on the plan (e.g. North Arrow, Marks table, Observation table, Administrative data, Plan face and dimensions etc.?)

North arrow, orientation grid, dimensions of boundaries, location data,
1 The following data shall be shown on cadastral survey plans:
(1) Unique Parcel Reference Numbers (if available)
(2) The cadastral sheet number.
(3) The development or village name.
(4) The county.
(5) The ward.
(6) The municipality where appropriate.
(7) The Survey Order number, and file number.
(8) The area of the parcel both in numbers and in words.
(9) The bearing and distance of every boundary line, and sufficient data to be able to check closure and the area of the parcel.
(10) The co-ordinates of at least one station on the survey derived from survey observations or the approximate co-ordinates of at least one station on the survey as obtained from topographic data derived from 1994 or later photography and obtainable at the offices of the Director of Surveys. Whether the co-ordinates are derived from control, or are approximate, must be denoted on the plan. Such co-ordinates are NOT part of the legal definition of parcels.
(11) The names of all known neighbours, or information which may be used to identify the neighbours.
(12) All structures existing on the site. Where the dimensions of a structure are not measured, the approximate position of the structure shall be shown in broken black lines.
(13) The position of all walls fences and drains etc in relation to the boundaries.
(14) All encroachments with the approximate area of the encroachment if possible. This includes overhead and underground encroachments. Encroachments shall be differentiated from the surrounding parcel by the addition of an area symbol
(15) The widths, names and types of all roads.
(16) The diameter and type of all utility pipelines where the reserves of these affect the allowable use of the land as defined by the planning authority.
(17) All utility poles where these fall within the limits of the parcel being surveyed.
(18) The scale at which the plan is drawn as a representative fraction e.g. 1:2500.
(19) The grid north which in every case shall be at the top, right of the plan, and if practicable shall be parallel to the side of the sheet and indicate the grid projection used. The dimensions of such grid north must not exceed 8 cm x 2 cm
(20) The projection – UTM Zone 20
(21) The date, signature and the seal of the TTLS.
(22) The procés verbal should contain a statement of professional responsibility in accordance with Regulation 25 (1) of the Land Surveyors Regulations 1998 e.g.

9.21. Are authoritative cadastral surveys carried out by government surveyors or private licensed surveyors or both?

Both once they are licensed and registered for the year

9.22. What is the legal description of a cadastral boundary (e.g. coordinates or bearing and distance or lines on plan or any other)?

bearing and distance.

9.23. How much time does it usually take for a subdivision process to complete?

Months for approval, surveying, Application for approval for subdivision, survey, approval of survey plan, registration of plan may take 3 months or longer.

9.24. What is the legal source for cadastral representation (e.g. cadastral plans, or DCDB or index plans or descriptive sketch/text etc.?)

cadastral plans

9.25. What is the positional accuracy of the cadastral plans (e.g. boundaries may be accurate but may not be referenced in datum properly)?

Boundaries are relative on the ground and on plan. Boundaries may be relatively accurate to the neighbouring parcel but approximate coordinates from hand held GPS units are given for location purposes that may be 5 m. off.

9.26. Any other survey plan issues?

9. PLANS OF SURVEY (INCLUDING FIELD SKETCHES) - Expectations 2026

This section poses questions about the data acquisition process and **cadastral survey plans**.

9.1. Do the survey plans carry 3D parcel representations?

There are no ongoing discussions to change.

9.2. If so, how are they represented?

There are no ongoing discussions to change.

9.3. Is there specific legislation (regulations) describing the requirements for Plans of Survey in 3D? This could cover:
(a) accuracy/ quality,
(b) 3D survey method,
(c) conceptual information model survey plan,
(d) portrayal rules for graphic representation,
(e) format or encoding for submission.
If so, please give link to the relevant documents.

There are no ongoing discussions to change.

9.4. Is sketch level allowed (low geometric quality, but in principle enough to indicate the 3D object)?

There are no ongoing discussions to change.

9.5. Is it possible to define a 3D parcel by referring to other 3D real world objects/ topography (and not specifying coordinates)?

There are no ongoing discussions to change.

9.6. In what format are the 3D parcels submitted for registration; attached to legal document in a single pdf (which has good 3D capabilities) or in an extension of (city) GML for 3D parcels, or….?

There are no ongoing discussions to change.

9.7. Are the 3D parcels somehow checked for spatial validity; e.g. volume is closed, does not overlap with neighbour volume (and also no unwanted 3D gaps)?

There are no ongoing discussions to change.

9.8. Do you have examples of (prototype or production) 3D survey plans available?

9.9. Are any reference objects visible on the survey plan (e.g. real buildings, roads, that is 3D topography)?

There are no ongoing discussions to change.

9.10. What form of 3D data acquisition is used (CAD, terrestrial surveying, sketches, stereo/oblique images, laser scanning, …)?

There are no ongoing discussions to change.

9.11. What software do you use for creating and processing survey plans? Any 3D capabilities included and used?

9.12. Can 3D parcels be subdivided, consolidated or nullified?

There are no ongoing discussions to change.

9.13. Is there any existing technical circular or directive to assist Surveyors in 3D data collection in the field?

There are no ongoing discussions to change.

9.14. Are the surveyors required to undertake a field survey for 3D cadastral data?

There are no ongoing discussions to change.

9.15. Are building construction plans used to compile 3D cadastral information for apartments?

There are no ongoing discussions to change.

9.16. Is 2D/3D field survey done by private licensed surveyors or by government surveyors?

There are no ongoing discussions to change.

9.17. Are plans of survey created for each new 2D/3D parcel or are they updated in an index map or a cadastral database.

There are no ongoing discussions to change.

9.18. Do you show dimensions or isometric views of 3D parcels on survey plans (do you also store this in a database)

There are no ongoing discussions to change.

9.19. Do the cadastral survey plans differentiate between different types (e.g. volumetric plans, building plans and standard 2D plans)?

There are no ongoing discussions to change.

9.20. What are the usual elements shown on the plan (e.g. North Arrow, Marks table, Observation table, Administrative data, Plan face and dimensions etc.?)

There are no ongoing discussions to change.

9.21. Are authoritative cadastral surveys carried out by government surveyors or private licensed surveyors or both?

There are no ongoing discussions to change.

9.22. What is the legal description of a cadastral boundary (e.g. coordinates or bearing and distance or lines on plan or any other)?

There are no ongoing discussions to change.

9.23. How much time does it usually take for a subdivision process to complete?

There are no ongoing discussions to change.

9.24. What is the legal source for cadastral representation (e.g. cadastral plans, or DCDB or index plans or descriptive sketch/text etc.?)

There are no ongoing discussions to change.

9.25. What is the positional accuracy of the cadastral plans (e.g. boundaries may be accurate but may not be referenced in datum properly)?

There are no ongoing discussions to change.

9.26. Any other survey plan issues?

10. DISSEMINATION OF 3D LAND ADMINISTRATION INFORMATION - Status 2022

This section refers to the **dissemination of 3D LA-related information** and the advances in this domain.

10.1. Is there a general-purpose web-based dissemination of 2D cadastral (graphical or text) information (e.g. a portal for the public or for professionals)?

If yes, please provide the link and refer it includes 3D data?

There is a portal for the public that is often inaccessible.
There is a portal for professional cadastral surveyors: http://www.surveys.gov.tt/Account/Login?ReturnUrl=%2F
These do not include 3D data except for the cross sections that can only be accessed by professionals.
https://uwi.maps.arcgis.com/apps/webappviewer/index.html?id=3cefab03e0c64532b4fa036618f914c7
There is also for individual plans: http://190.213.4.242/scandocs/
It does not include 3D data

10.2. Are there specific file formats or standards used to distribute 3D LA/ Cadastral information?

(e.g. LandXML, CityGML, BIM/IFC, 3D pdf,…)

Cadastral plans are disseminated in pdfs. There is no requirement to submit 3D cadastral information to the state

10.3. Are there specific cartographic styling rules for representing 3D cadastral plans, or to represent 3D cadastral objects on 2D cadastral maps?

Land Surveyors Rules – Rule 19.
“The following plans shall be prepared for all Townhouse Schemes and Condominium schemes:
(1) A location plan which shall record the cadastral data including “common areas” and sufficient measurement to be able to replace all structures
(2) Strata plans for all floors within the condominium scheme
(3) Elevation plans showing each façade view

10.4. Are there specific cartographic styling rules for 3D cadastral maps (models; e.g. as disseminated in 3D pdf)? If yes, are there 3D specific cartographic rules developed or being developed?

No.

10.5. Is the 3D Cadastral information accessible in integrated manner with the 2D Cadastral information?

Yes

10.6. Are there specific symbols on the 2D cadastral map (paper, digital or web-based) indicating the presence of 3D Cadastral objects (and in web-context perhaps even linked)?

No

10.7. Is the legal information (RRRs and Parties) available in integrated manner in dissemination portal with the 3D Cadastral objects? (even if source of legal data may be a different organization, but then use information infrastructure approach)

No. The Planning authority does not have this information in digital form. There is no link between the land registry and the cadastral agency through a parcel identifier.

10.8. Are 2D/3D cadastral data available to the general public or just to the relevant parties?

Some to the public and some to land surveyors only. The public can access the 2D plans with 3D cross sections on them.

10.9. Any other 3D cadastral information dissemination issues?

10. DISSEMINATION OF 3D LAND ADMINISTRATION INFORMATION - Expectations 2026

This section refers to the **dissemination of 3D LA-related information** and the advances in this domain.

10.1. Is there a general-purpose web-based dissemination of 2D cadastral (graphical or text) information (e.g. a portal for the public or for professionals)?

If yes, please provide the link and refer it includes 3D data?

No plans to change

10.2. Are there specific file formats or standards used to distribute 3D LA/ Cadastral information?

(e.g. LandXML, CityGML, BIM/IFC, 3D pdf,…)

No plans to change

10.3. Are there specific cartographic styling rules for representing 3D cadastral plans, or to represent 3D cadastral objects on 2D cadastral maps?

No plans to change

10.4. Are there specific cartographic styling rules for 3D cadastral maps (models; e.g. as disseminated in 3D pdf)? If yes, are there 3D specific cartographic rules developed or being developed?

No plans to change

10.5. Is the 3D Cadastral information accessible in integrated manner with the 2D Cadastral information?

No plans to change

10.6. Are there specific symbols on the 2D cadastral map (paper, digital or web-based) indicating the presence of 3D Cadastral objects (and in web-context perhaps even linked)?

No plans to change

10.7. Is the legal information (RRRs and Parties) available in integrated manner in dissemination portal with the 3D Cadastral objects? (even if source of legal data may be a different organization, but then use information infrastructure approach)

No plans to change

10.8. Are 2D/3D cadastral data available to the general public or just to the relevant parties?

No plans to change

10.9. Any other 3D cadastral information dissemination issues?

11. STATISTICAL INFORMATION - Status 2022

This part of the questionnaire refers to **statistical information** (and is most relevant for jurisdictions with parts of 3D Cadastre registration operational, but all are encouraged to complete this section, and especially the expectations for 2022).

11.1. What is the smallest 2D and 3D parcel that is present/ allowed to be registered in the land administration?

No limit as it may be an encroachment being transferred. The Planning authorities control subdivisions and do not normally approve subdivisions of parcels to less than 465sqm. Volumes are not used.

11.2. What is the largest 2D and 3D parcel that is present allowed to be registered in the land administration?

No limit.

11.3. What is the typical (or average) size of 2D and 3D parcels which are registered in the land administration? Subdivide by nature of 3D parcel when relevant (e.g. related to building, apartment, airspace, tunnel,…)

Typical residential parcel is approximately 450 sq metres but may be smaller. 3D parcels are not given volumes.

11.4. How many 2D and 3D parcels do you currently have in your land administration?

200,000 2D parcels. It is not known how many condominium parcels there are but these are not registered as 3D.

11.5. Which year did you start registering 3D parcels in the land administration?

Not yet.

11.6. What is the ratio of 3D parcels in rural vs. urban areas?

N/A but most condominium apartments are in urban areas.

11.7. Please specify names of cities or towns or suburbs or regions or locations where there are significant numbers of 3D parcels.

There are more condominium apartments in and around Port of Spain, the capital city.

11.8. Please provide the following data: (a) Size of jurisdiction in square kilometres

(b) Current number of 2D parcels
(c) Current number of 3D parcels
(d) Current population

(a)Trinidad and Tobago is approximately 5,000 sq. kilometres.
(b) It has been estimated that there may be 500,000 parcels but many are not registered nor surveyed
(c) There are no official 3D parcels but there are many condominiums and apartments.
(d) The current population of Trinidad and Tobago is approximately 1.5 million

11.9. Approximately what are the proportions of various types of the 3D parcels (related to apartments, subsurface parking, subsurface shopping centres, bridges, tunnels, airspace, utility networks, etc)?

There are no 3D parcels

11.10. Approximately what surface area of the jurisdiction is affected by 3D parcels (the total area of all the footprint of all 3D parcels).

Port of Spain, the location of many 3D parcels, is 12 sq kilometres

11.11. Any other interesting statistical fact(s)?

11. STATISTICAL INFORMATION - Expectations 2026

This part of the questionnaire refers to **statistical information** (and is most relevant for jurisdictions with parts of 3D Cadastre registration operational, but all are encouraged to complete this section, and especially the expectations for 2022).

11.1. What is the smallest 2D and 3D parcel that is present/ allowed to be registered in the land administration?

There are no plans to change.

11.2. What is the largest 2D and 3D parcel that is present allowed to be registered in the land administration?

There are no plans to change.

11.3. What is the typical (or average) size of 2D and 3D parcels which are registered in the land administration? Subdivide by nature of 3D parcel when relevant (e.g. related to building, apartment, airspace, tunnel,…)

There are no plans to change.

11.4. How many 2D and 3D parcels do you currently have in your land administration?

There are no plans to change.

11.5. Which year did you start registering 3D parcels in the land administration?

N/A

11.6. What is the ratio of 3D parcels in rural vs. urban areas?

There are no plans to change.

11.7. Please specify names of cities or towns or suburbs or regions or locations where there are significant numbers of 3D parcels.

There are no plans to change.

11.8. Please provide the following data: (a) Size of jurisdiction in square kilometres

(b) Current number of 2D parcels
(c) Current number of 3D parcels
(d) Current population

There are no plans to change.

11.9. Approximately what are the proportions of various types of the 3D parcels (related to apartments, subsurface parking, subsurface shopping centres, bridges, tunnels, airspace, utility networks, etc)?

There are no plans to change.

11.10. Approximately what surface area of the jurisdiction is affected by 3D parcels (the total area of all the footprint of all 3D parcels).

There are no plans to change. The cadastre is proposed to be updated with 60,000 plans currently not included.

11.11. Any other interesting statistical fact(s)?

12. REFLECTION

This section is only relevant in case also one of the previous questionnaires for your jurisdiction (2010, 2014 and/ or 2018) was completed (otherwise skip this section).

12.1. Compared to the 2010, 2014, 2018 and 2022 expectations, which 3D land administration developments did go faster than expected?

None

12.2. Same question, but now, which developments did go slower than expected?

The systematic adjudication and titling anticipated to begin has not yet begun. New aerial photography and attendant orthophotos at 25 cm resolution was acquired for the country in 2015. LiDAR data was acquired for the country in 2015. It was hoped that these data could be used to advance the 3D cadastre but this has not happened. Updating of the revised georeferenced cadastral index has not been completed.

12.3. If some (limited) form of 3D Land administration functionality has become available, what are the observed benefits? And for who?

None began.

12.4. What are the (top 3) challenges of issues to be addressed to realize further 3D Land administration progress?

Systematic adjudication and titling, condominium legislation, convincing the Government of the benefits
Acquiring financial support for the development
Capacity building of relevant personnel

12.5. In case of not, yet, fully operational status, were there any 3D LA/ Cadastre registration pilots to take steps towards a more complete implementation?

No

12.6. In case of known legal barriers, have there been made progress in creating and adopting new legislation to support 3D land administration?

No

12.7. Any other reflections?

13. OTHER ISSUES

At this section, please include any other issues that may be of interest in an international context (for example, in some foreign jurisdictions 3D parcels can only be separated by horizontal planes) and your contact details.

13.1. Country (State, Province)

Trinidad and Tobago

13.2. Name/ Surname

Dr Charisse Griffith-Charles

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13.3. Contact details/ Address

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Address

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13.4. Other issues