

Government of Uttarakhand, Finance Department
Uttarakhand Public Financial Management Strengthening Project
Center for Training and Research in Financial Administration, (CTRFA)
UTTARAKHAND, INDIA
REQUEST FOR EXPRESSIONS OF INTEREST
(CONSULTING SERVICES – FIRMS SELECTION)

India

Uttarakhand Public Financial Management Strengthening Project

Loan No.: IBRD 8928

Assignment Title: Consultancy for preparation of GIS Based property database and electronic Property Tax Register based on Door to Door Household Survey, Develop/procure Mobile based application and Implementation & Maintenance and provide Technical Handholding Support for above activity for Two Years in 06 ULBs (Rishikesh, Kotdwar, Roorkee, Mussoorie, Pauri, Chamoli)

Reference No. IN-CTRFA-215520-CS-QCBS

Request for Expression of Interest for Consultancy for preparation of GIS Based property database and electronic Property Tax Register based on Door to Door Household Survey, Develop/procure Mobile based application and Implementation & Maintenance and provide Technical Handholding Support for above activity for Two Years in 06 ULBs (Rishikesh, Kotdwar, Rorkee, Mussoorie, Pauri, Chamoli)

(CONSULTING SERVICES – FIRM SELECTION)

Application Deadline:	12 th February 2021
Type of Contract:	Consulting Service-Firm Selection
Method of Procurement:	Quality Cost Based Selection (QCBS)

Reference No : IN-CTRFA-215520-CS-QCBS

Date: 23rd January 2021

The GoUK has received a loan from IBRD for the Uttarakhand Public Financial Management Strengthening Project (UkPFMS) and intends to apply a part of the loan proceeds for this assignment toward the Consultancy for preparation of GIS Based property database and electronic Property Tax Register based on Door to Door Household Survey, Develop/procure Mobile based application and Implementation & Maintenance and provide Technical Handholding Support for above activity for Two Years in 06 ULBs (Rishikesh, Kotdwar, Roorkee, Mussoorie, Pauri, Chamoli).

1. The overall objective of the for Development of an Integrated GIS platform including Preparation of Property Tax Register based on GIS Drone Survey & DDHS, Development of Mobile application, Implementation & Maintenance for two years with Technical Handholding Support in 6 ULBs (Rishikesh, Kotdwar, Roorkee, Mussoorie, Pauri, Chamoli). The scope of the project broadly involves the following but not limited to:

Part A – Deployment of an integrated GIS platform consisting of GIS engine, Preparation and Implementation of GIS Property Maps and Property tax database – 18 Months on lumpsum basis

- Activity 1: Preparation of Drone Based GIS Base maps and property maps
- Activity 2: Door to Door Household Survey (DDHS)
- Activity 3: Migration of manual records to property tax database
- Activity 4: Integration of Drone based GIS maps with property tax data base
- Activity 5: Develop of SOPs and periodically review for the municipalities for property data updating
- Activity 6: Property dashboards along with integration with the GIS and property tax database NUS
- Activity 7: Training to staff on utilization and maintenance of the GIS platform developed.

Part B – Technical handholding and maintenance of GIS and Property tax database for 2 Years (after 18 months) on time basis

- Support and Maintenance of Integrated GIS platform and Property tax database for two years along with provision of handholding support to ULBs

The Finance Department through the Center for Training and Research in Financial Administration (CTRFA) now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The minimum required qualifications/criteria are available in Annexure 1 and terms of reference of the assignment can be accessed on the website <http://www.uttarakhandaudit.uk.gov.in> or can be obtained from CTRFA.

The attention of interested Consultants is drawn to paragraph 3.14 and 3.17 of the World Bank Procurement Regulations, July 2016 revised in November 2017 and August 2018 (“Procurement Regulations”), setting forth the World Bank’s policy on conflict of interest.

Consultant may associate with other firms to enhance their qualifications, but should indicate clearly whether association in the form of Joint Venture and/or sub-consultancy. In case of a Joint Venture, all the partners in a joint venture shall be jointly of severally liable for the entire contract, if selected

A Consultant will be selected in accordance with the **Quality Cost Based Selection (QCBS)** method set out in the Procurement Regulations.

Further information can be obtained at the address below during office hours *1000 to 1700 hours IST*.

Expression of Interest in the prescribed format along with relevant annexures must be delivered in a document form (hard copy or electronic pdf) at the address or mail id given below (in person, by post or by email) latest by **12th February 2021 by 17:00 Hrs IST**

**Project Director
Uttarakhand Public Financial Management Strengthening Project**

91, Race Course,

Near Police Line

Uttarakhand, India,

Mob: +91-9358119541,

E-mail: ukpfmswb@gmail.com

Annexure 1: Minimum Required Qualifications Criteria

S. No.	Basic Requirement	Specific Requirements	Supporting Documents Required
1)	Entity	Must be a legally constituted entity	Copy of the Certificate of Incorporation and constitutional documents
2)	Turnover	Should have an Average Annual Turnover of at least Rs. Five Crores and positive net worth during the last three financial years (2106-17, 2017-18, and 2018-19,).	Certified copy of the audited financial statements OR certificate from the statutory auditor.
3)	Overall experience	Should have at least 10 years' experience of working in GIS related works including GIS based data and having institutional facilities and availability of essential technology, the experience in Drone technology will be given additional advantage	Self-certification of details of the experience
4)	Technical Capability	Should have proven track record of having successfully carried out minimum two (2) assignments of similar nature in ULBs as technical integrator in mapping, developing and implementing GIS based property tax system including at least two or more of the following <ul style="list-style-type: none"> • GIS Base Maps • Drone Survey for ULBs • Door to Door Household Survey • Providing training, handholding and support to ULBs in the specific area in the last five years 	Copy of work orders for completed assignments (OR) Work completion certificates from client (OR) In case of ongoing consultancy, the completion should be substantial (at least 75% of the technical deliverables has been submitted to client satisfaction). Letter from client stating the status of delivery along with work order to be submitted.
5)	Staff	Should have at least 15 staff\consultants with relevant qualifications and at least 5 years' experience in any of the above areas.	Self-certification of list of such staff with qualification and experience as per format provided.

EOI FORMAT

Instructions

1. Please provide the details as required in the format. Non-completion of the format may lead to rejection during evaluation.
2. The consultant can add other materials about the Organization and other relevant details as annexure.
3. Please provide all documents requested as annexure.

Name of the Consultant	
Registered Address	
Phone No:	
Email id:	
Name of the Contact Person for this EoI	
Phone no. of the Contact Person for this EoI	
Email id of the Contact person for this EoI	
Do you have a HO in the State	Yes/No. If yes, please provide the address
Do you have a branch office in the State	Yes/No. If yes, please provide the address
Date of establishment	
Registration number if any with ROC, registrar of societies etc	
Number of full-time qualified staff	
PAN	
GST	

Financial Particulars of the Consultant

Financial year	Turnover	Net worth
2018-19		
2017-18		
2016-17		

Key Staff Brief Profile ***

Name of Staff	Age	Years of experience	Qualification	Number of years associated with the Consultant	Name of clients handled with nature of work done

*** Please provide detail CVs separately as per format given below

Relevant assignments – Last Five years***

Project Name	Funding agency Name	Client Name	Nature of work	Year of Work	Status (Completed/Ongoing)	Key reference person in client organisation with designation and email id
	Central/State/Multilateral/Bilateral funding agency					

*** Please provide detail citation of work separately in the format given below. Relevant assignments are in GIS related works including GIS based data and having institutional facilities and availability of essential technology, the experience in Drone technology will be given additional advantage. The assignment should be related to ULBS including GIS Mapping, Door to Door Household Survey and Training and handholding

Detailed Format for Citations

Assignment name:	Approx. value of the contract (in INR crores):
Country: Location within country:	Duration of assignment (months):
Name of Client:	Total N ^o of staff-months of the assignment:
Address:	Approx. value of the services provided by your Consultant under the contract (in current US\$ or Euro):
Start date (month/year): Completion date (month/year):	N ^o of professional staff-months provided by associated Consultants:
Name of associated Consultants, if any:	Name of senior professional staff of your Consultant involved and functions performed (indicate most significant profiles such as Project Director/Coordinator, Team Leader):
Narrative description of Project:	
Description of actual services provided by your staff within the assignment:	

Terms of Reference

Terms of Reference (TOR) for preparation of GIS Based property database and electronic Property Tax Register based on Door to Door Household Survey, Develop/procure Mobile based application and Implementation & Maintenance and provide Technical Handholding Support for above activity for Two Years in 6 ULBs (Rishikesh, Kotdwar, Roorkee, Mussoorie, Pauri, Chamoli)

Background

1. Urban Development Directorate, Government of Uttarakhand has initiated the process to provide good governance and improve physical and social infrastructure for the well-being of citizens with a thrust to address the needs of the urban sector through an integrated approach for sustainable local economic and urban development.
2. The concept of e-Governance has become the order of the day. To have a balanced urban development in the local bodies, use of Digital Technologies has become essential. Integrating different data sets onto a common platform enables evidence based planning and enhancement of efficiency in revenue collection activities by linking spatial and non-spatial data. The application of remote sensing technologies has proven to aid the overall objectives of e-Governance in ULBs and substantially help improve revenue collection and better delivery of public services. To achieve this goal of e-Governance implementation for all the services of the ULBs, large scale and detailed GIS base maps of the ULB along with structured data layers are required. The development of appropriate GIS has considerable potential to improve municipal planning, administration, and management in several ways. Property tax collections can be improved using GIS-based property mapping which could help the decision makers in making policies about taxation system, in efficient collection of taxes and utilization of existing manpower resources for maximum benefits in revenue collection.
3. Uttarakhand Urban Development Directorate (UDD) intends to deploy an integrated GIS platform consisting of GIS Based property database and electronic Property Tax Register based on Door to Door Household Survey (DDHS) in ULBs of the State. There are 91 Urban Local Bodies in Uttarakhand. In Second phase of the GIS enablement under UKPFMS project, Government of Uttarakhand is planning to conduct the above reforms in **Rishikesh, Kotdwar, Roorkee Mussoorie, Pauri, Chamoli** to implement a transparent property tax management system which will generate considerable revenue for the welfare of the public.
4. The properties tax Reforms would be initiated in 06 urban local bodies of the state. This will facilitate ULBs to assess number of unidentified and under-assessed properties and uses of municipal services (Street Lighting, SWM Bin location etc.,) and this will contribute to the improvement of the financial, planning and management capacity of the corporation through provisions of valid, reliable and credible spatial and non-spatial information integrated

seamlessly. Property survey is well recognized mechanism for, maintaining the database regarding unauthorized and unassessed property, revenue tax collection, reduce the losses, identify the performance gap, geographically locate the areas on the satellite maps/ images and provide the unique identity numbers to each property.

5. This Terms of Reference is for Development of an Integrated GIS platform including Preparation of Property Tax Register based on GIS Drone Survey & DDHS, Development of Mobile application, Implementation & Maintenance for two years with Technical Handholding Support in six ULBs (**Rishikesh, Kotdwar, Roorkee, Mussoorie, Pauri, Chamoli**)
6. The Government of Uttarakhand (GoUK) is being financed for a loan to fund the Uttarakhand Public Financial Management Strengthening Project (UkPFMS) and intends to apply a part of the loan proceeds for this TOR. The GoUK intends to hire a consultant to implement, maintain and support the Urban Development Directorate and Municipality in carrying out the following scope of work.

Objectives

7. The objective of this assignment is to implement and maintain GIS based property tax database for six ULBs namely **Rishikesh, Kotdwar, Roorkee Mussoorie, Pauri, Chamol**.
8. The area of the ULB is as per the present administrative boundary. The area is indicative and is based on the information available by the ULBs.

S. No	Name of ULBs	Area (sq. km)	Total Population	Total Ward	(No of properties) - indicative	No of properties covered under property tax	Property tax collected in lakhs	Annual percentage of property tax recovery	Officers assigned for property tax (Nos of staff).
1	Rishikesh	16	107000	40	10780	10780	102	60%	2
2	Kotdwar	54.59	135000	40	20000	4030	22	80%	1
3	Roorkee		180422	40	23500	19500	230	55%	4
4	Mussoorie	64.75	30118	13	6065	6065	187	66%	4
5	Pauri	42	25435	11	5087	4270	15.52		1
6	Chamoli	14.08	21447	11	4289	2030	12.63	50.52	5

Scope of Work:

9. The scope of the project broadly involves the following but not limited to:

Part A – Deployment of an integrated GIS platform consisting of GIS engine, Preparation and Implementation of GIS Property Maps and Property tax database – 18 Months on lumpsum basis

- Activity 1: Preparation of Drone Based GIS Base maps and property maps
- Activity 2: Door to Door Household Survey (DDHS)
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- Activity 6: Property dashboards along with integration with the GIS and property tax database of NUS
- Activity 7: Training to staff on utilization and maintenance of the GIS platform developed.

Part B – Technical handholding and maintenance of GIS and Property tax database for 2 Years (after 18 months)

- Support and Maintenance of Integrated GIS platform and Property tax database for two years along with provision of handholding support to ULBs

10. The first three activities of Part A are to be taken up as parallel activities as completion of one activity is not contingent upon the other activity. However, the planning and implementation is to be done keeping in view the project requirements and the outputs are to be integrated with property tax database.

Part A – Preparation and Implementation of GIS Platform, GIS Property Maps, and Property tax database

11. **Development of GIS platform, Preparation of GIS Base maps:** Preparation of GIS Base maps includes creation of Base maps using very high resolution drone imagery and survey of all physical features of the town, and up-scaling to 1:2,000 scale by augmenting the spatial & attributes at through field data collection and superimposition of town survey maps and cadastral maps, existing administrative boundaries, slum boundaries, localities/colonies/area boundaries, infrastructure details, water bodies, land marks and contours with reference to Mean Sea Level (MSL) at 1.0 meter interval etc.). The consultants would do the following

- a. Review of existing situation, collection of all available data from ULB, in soft copy and or hard copy including Municipal Boundary, Town survey maps, Cadastral maps, ward boundary maps, etc.;
- b. Design of proper grid and projection (UTM-WGS 84) for the whole ULB;
- c. Interpretation and digitization of all physical features for base map creation. The digitization process shall include vectorization, symbolization, layering, edge matching, topological integrity, and linking to Property Tax database;

12. **Processing of Very High Resolution (VHR) Remote Sensing Images Using Unmanned Aerial Vehicle (UAV) Technology for the ULBs :** The Consultant will Use Unmanned Aerial

Vehicle (UAV) Technology for creation of digital GIS maps of the ULBs under the project. The selected bidder has to acquire the Very high Resolution Remote Sensing images (10 cm or better). Flying the UAV and preparation of Base maps for the listed ULBs.

The bidder should have completed at least one drone based GIS base map preparation and house hold survey project in India.

Equipment Details	
Type of UAV	Multirotor / Quadcopter
Altitude.	50 m
Ground Sampling Distance	2 cm/pixel
Sensors Type:	RGB
Sensors Specifications.	1/2.3" CMOS Effective pixels:16.2 M 3-axis gimbal
Data Resolution and Properties:	Single image resolution: 4k i.e. 4000X3000 Pixels Ortho imagery: 2-5cm/pixel

13. The base map shall contain all key physical features, the boundaries of each plot and Building (structure) and with identification number. The map shall be multipurpose and could be used by various sections of the ULB such as engineering, Revenue (taxation) and town planning. (see table below)
14. The preparation of base map shall be as per resolution given in the table above. To facilitate sharing of information between various municipal sections, it is critical that GIS base mapping be compatible with standard data base formats. The base map shall be prepared on various layers for effortless operation in GIS. Each map shall include, but not be limited to, the following

Map	Contents(layers)	Remarks
Base Map of Planning Area/ Census Urban Agglomeration Area	Agricultural area, forest, vacant land and other key physical features such as water bodies, canals, drains,rivers,major roads, railways, settlements etc. Location of geo-referenced survey control points using Differential Global Positioning System DGPS).Planning area/Census Urban Agglomeration Area boundary and Municipal area boundary.	Map based on latest Satellite Data on scaleof1:2000

City Base Map of Municipal Area	All major physical features with reference names, such as, main roads, other important roads, railways, airport, cantonment areas, important landmarks, colony names, water bodies, drains, canals, rivers, waste bin location, street light pole etc. Municipal area boundary, zone, ward, tax zone boundaries.	Map based on latest Satellite Data on scale of 1:2000
Property*	Plot and Building (structure) with unique IDs Vacant Lands Spatial distribution of slums Municipal area boundary, zone, ward and tax zone boundaries.	Property Mapping including slums on scale 1:1000
Administrative Jurisdiction	Municipal area boundary, zone, ward and tax zone boundaries	

*Note:1*The property layer shall be used for tax planning and administration purpose only. It should not be used for other tax calculation purpose or determination of legal title.*

15. **Plotting and Numbering of Plot and Building (structure):** Each property and each dwelling unit within it will be provided with a unique identification number (a Property Identification Number, PIN) based upon a pre-agreed codification system. As soon as the property mapping and numbering of one ward has been completed, the survey teams will begin the survey in the same area. The exercise must enable compatibility with the DDHS database which will assign a unique household number linked to the property number. These maps will enable spatial referencing of unique identification number given to the properties and plan the survey more systematically. This would further provide a spatial dimension to the tax records through linking of DDHS database (in Excel or SQL format only) with the property map for analysis purpose in GIS.

16. For preparation of GIS base map, all existing surveys and maps (including revenue maps and topographical maps) shall be utilized to the extent practical and reasonable. Revenue maps, commonly known as Cadastral maps are available and contain valuable geographic information and triangulation survey control points which are useful inputs for the preparation of GIS base map. These maps are available with the state Land Records and Revenue Department and ULB will facilitate in getting these maps.

17. The base map will be prepared using **the above data** created as per para 12. The steps required to undertake the preparation of GIS base mapping might be as follows:
 - a. Collection of secondary data of planning area / census urban agglomeration area.
 - b. Procurement of latest high-resolution satellite data in digital form covering the existing planning area / census urban agglomeration area including buffer.
 - c. DGPS ground control survey for providing control points evenly distributed over the study area.
 - d. Post processing of ground control data.

- e. Interpretation and digitization of satellite data in the different layers as specified in the table above.
 - f. Field verification to update the features, which are not visible on the satellite image.
 - g. Production of draft base map with different layers (property layer along with unique IDs) as mentioned above.
 - h. Incorporation of tax zone, ward, zone, municipal area and planning area / urban agglomeration area boundary.
 - i. Final GIS base map incorporating corrections.
 - j. City Base Map with the scanned Cadastral (revenue map) stored in secured folders for reference .
 - k. Finally, the GIS digital base map showing all the properties shall be linked with the MPHS database created by the vendor and accessible through API (including basic customization) .
18. For linking base map with DDHS, each plot/property will be given a unique identification number(ID) which will correspond to the plot /building number in the DDHS database file as specified above. The DDHS attribute data will be managed as regular tabular data, with a unique ID linking these data with other geographic features. These DDHS database should be viewed spatially (on the map) by linking with base map through unique ID fields. For example, the base(property) map linked with the DDHS revenue survey database will provide a graphic overview of un-assessed properties or under assessed properties.
19. In the case of digitization, the data is checked for dimensional accuracy, completeness, edge matching, symbology, and layering. The method to be adopted for base mapping and digitization shall confirm to the standards prescribed by Survey of India.
20. The consultant will ensure that: (a) all plots or buildings are marked on the property layer (including property survey sheets); (b)systematic unique IDs for all plots or buildings are present; (c) data entry of the MPHS database in agreed format ; (d) properties are linked with the DDHS data base through unique IDs as specified by ULBs; (e)all activities related to surveys, validation &approval process and final outputs.
21. The consultants will be responsible for providing the entire data in standard GIS format and as per the database structure as agreed with UDD. The consultants shall be responsible for referencing the property, tax & arrears data with property details (including existing property tax number) of available with the respective ULB.
22. The printed copies shall include standardized cartographic legends, bar scale, north sign,control points,sheet reference, adjacent map sheet numbers, date of acquisition of satellite data, title and project logo. The project logo shall be provided by the ULBs.
23. **DDHS includes door-to-door survey of properties**, measurement of properties, data gathering,

uploading image of property, updating data in Property tax database and supporting the assessment confirmation process. The complete task is focused on detailed door to door survey of each property/holding within municipal area which includes the existing municipal area and proposed extension of municipal limits for the respective towns. Property survey must be carried out for all the properties under Nagar Nigam limits.

24. This task involves Property data verification and collection of relevant information of each Property in the ULBs area through contact survey, data base generation and taking digital photograph of each property. The data base and digital photograph should link to GIS Base Map. The survey shall be carried out using handheld GPS Devices. The data necessary to correctly assess the taxation details of the property will include but not limited to
 - a. Constructed area of the house/property;
 - b. No. of storey's;
 - c. Basis of use, i.e. residential or commercial/industrial, lease/rent; and
 - d. Location, i.e. main road or main market;
 - e. Width of adjacent road.
 - f. Land/Vacant Land Area
 - g. Type of House: Pacca, Semi Pacca, &Katcha

25. This detailed household survey must be carried out for all dwellings, including vacant sites for attribute data compilation of Property Tax to create master database. Each property must be measured accurately using latest available technologies. Detailed list of the survey data is provided in a separate excel file which shall be agreed with Nagar Nigam during inception phase.
(please add the excel sheet as one of the attachment)

26. The Consultant shall organize detailed property survey with total built up area, area on ground floor and verification of total taxable area with floor wise structure and usage detail for each property as per the suggested format and its data base generation and integration with Base Map. The selected consultant shall study existing holding/house number in system of the respective ULBs and develop an improved, simplified and rational numbering system. During the survey the consultants shall collect and verify the information for each property as per property survey format agreed with ULB.

27. **Mobile app for survey:** A mobile app shall be designed and deployed for collection of data for door-to-door survey exercise. This mobile app shall enable real-time data collection facility. The mobile app must allow the following features:
 - a. Collection of geo-coordinates of surveyed properties
 - b. User-defined survey forms with maximum usage of choice-based questions
 - c. Digital photographs of the properties
 - d. Online and offline synchronization of survey data with central server

- e. Real-time Survey progress tracking
28. Before starting the surveys, the Consultant will
- a. Prepare a prioritized list of wards based on high revenue generating potential in close consultation with respective ULBs and
 - b. Prepare the questionnaires in English and Hindi and test both versions of the Questionnaires in the field. The Pilot should cover one ward which is prioritized and agreed with the respective urban Local body (ULBs). The pilot will include but is not limited to peer and cognitive (including language) pretests of all instruments, and piloting the assignment of identification numbers, interviews, quality assurance, survey administration and data management tasks. The Consultant will provide a report on findings and recommended changes and will agree with (ULBs) any refinements to the survey method and instruments.
29. **Survey training:** Subject to agreement with Nagar Nigam on the content and programme, the Consultants will develop survey administration protocols, training design and guidelines/manuals, and after review and approval of these by the Nagar Nigam, will provide training for field surveyors in the specific methods to be employed for all survey components. The training will also include elected participants from the Nagar Nigam officers and related stakeholders.
30. Survey will be conducted in the language of choice of the householder and will follow the sequence of the prioritized list of wards (high to low revenue generating wards) as agreed with respective ULBs. The survey will broadly consist of the following:
- a. The contact survey will collect data/information through a pre-designed questionnaire for property tax, dust bin, on-plot sanitation, transformer, sub -station and street light pole.
 - b. Consultants to take the photograph of each property in a best possible angle and attach the photograph with each questionnaire form filled up. All the softcopies of the photographs will then be hyperlinked with the property database. The resolution and size will be pre-decided and agreed with the Nagar Nigam.
 - c. Before the start of the contact-survey, the Nagar Nigam/UDD will generate from its manual or computerized records ward-wise lists of the properties on its property tax records.
 - d. Prior to the survey, the ULB will publicly announce the purpose, content and timing of the survey, in accordance with requirements in law.
 - e. For the survey, zones and wards will be classified according to their socioeconomic characteristic. More affluent zones/wards will be targeted as a priority as these will accrue greatest revenue and will be most likely to include unassisted new areas/colonies. This survey will therefore begin in high- and middle-income areas and will subsequently be extended to cover all properties in the entire municipal area.
 - f. The programming and area prioritization of the survey will be agreed prior to survey commencement as mentioned above.

- g. The contact survey will verify the data/information related to property tax assessment parameters as available with the ULB. The data necessary to correctly assess the annual rental value (ARV) of the property needs to be collected by the consultant. The ARV Format will be discussed and finalized with the selected vendor .
 - h. Comparison of DDHS data with the municipal records will result in identification of un-assessed and under assessed properties which will be reported to the ULB. ULB will ensure that all un-assessed properties are assessed, and under-assessed properties are reassessed, which will be assisted by consulting firms.
 - i. For on-plot sanitation the survey will obtain information on disposal facility, connected to municipal sewerage or septic tank, pour flush, other method.
 - j. The Consultant will ensure that it will report to the nominated municipal staff regularly.
- 31. Verification/reconciliation of Data:** The Consultant would be responsible for verification and reconciliation of data with the help of concerned revenue officials of Nagar Nigam.
- 32. Data collation and creation of records:** The Consultant will be required to complete all data entry work including photograph of each property and digitization of maps / sketches. Following completion of data entry and data entry QA, agreed reports from the data files and survey forms will be provided to the ULB. The ULB will compare the revenue data from the survey to their records and provide a list of exceptions (differences such as the dwelling is not on the ULBs records, or differences in some data element between the survey and ULB records). The survey consultants will confirm data entry for these exceptions comparing the original questionnaire to the data. The consultants will support in migration/digitization of ULB's existing data which would be required for updating of demand collection registers.
- 33. Compilation of Data as per database structure:** UDD will provide data fields and agree on a data base structure for Property; the consultant will compile the data strictly as per provided database structure. The consultant shall also integrate existing house number as per municipal record for each property except new properties identified during survey. Unique ID shall be structured for each property considering unique ID used for land parcel/buildings.
- 34. Integration of Database with Base Map:** The selected Consultant shall integrate the final data base for each property with the base map data base and update the layers of base map accordingly.
- 35. Digital Photograph of each Property geo tagged with Base Map:** The selected Consultant shall take digital photograph of each property and it should be linked with respective data of the building in base map.
- 36. Workshop and Training:** The Consultant shall organize work shop and training during the Project period separately in the respective ULBs. The participants of the work shop will be executives and staff of the ULBs and UDD team. All the workshops during the project period shall be focused on

work progress, training on survey, mapping, data base integration etc.

37. The Consultant should note that all the methodologies mentioned here are only for understanding of the process. Consultant are encouraged to include in their Technical Proposal a better approach, if feasible, for undertaking each of the mentioned tasks
38. **Migration of manual tax data into compatible database:** Consultant at the start of the assignment needs to understand the present system of property tax records and provide options for digitization. Government of Uttarakhand has signed a MOU with NIUA for implementation of e-Governance project, under which the NIUA is providing Property Tax Management Software to the ULBs . The consultant must work on the platform build by NIUA for Property Tax Software and integrate GIS Mapping and DDHS data. **The details of the software are provided in annexure 2.** The consultant should ensure compatibility and adequate fields should be captured in the database. The consultant will work with Nagar Nigams to understand the existing software and work out the solutions suitably.
39. **Update Property Tax demand:** The consultant is expected to set up the property tax database based on the current records available and then update it with survey results and finally link the database with the GIS maps.
40. **Features of the GIS Web Application which needs to be developed by the consultant and integrated with the NUIS property tax database:** The web application shall use GIS-based data including survey data to generate meaningful analysis for Nagar Nigam. The front end should be open source. It should allow an easy access to compare ward-wise tax collection, generate reports and download tax demand, Bills, notices of all buildings and premises. Following are the basic requirements of the application:
 - a. ULB users can edit or update the data
 - b. Querying GIS database
 - c. Geographic data creation, ward-wise data visualization
 - d. Access to digital photos of the properties
 - e. Floor-by-floor plans
 - f. Server based GIS must support open APIs that will allow other modules to be integrated
 - g. Must allow simultaneous usage of the application on standard web browsers
41. The web interface shall be designed in such a manner that the building footprints on the online GIS maps shall be color coded based on tax default, match/mismatch with ULB records, usage of properties, etc. The web-based property tax information system shall also allow an easy access to the ULB user to access the GIS-base view and generate thematic layers of property tax details for convenient view and reporting. The property tax information in real-time shall be accessible by simply clicking the building/plot on the map screen. The consultant should interact with the NIUA team, understand the existing functionality of the property tax software and dovetail the

web application in such a way that data and reports can be exchanged seamlessly between the two systems.

42. Rishikesh, Roorkee, Kotdwar, Mussoorie, Pauri, Chamoli are cities of high rise buildings and multi-use complexes. The web-based system shall also allow an easy access to the property tax assesses for every building using a simple click function.
43. The software shall be used by property tax department in Nagar Nigam/Nagar Palika hence it is required to be user-friendly for the target user group. The software must provide spatial and non-spatial data access at all times. The platform should have an efficient database management system to host the data.
44. All IPR of the software will rest with the Government of Uttarakhand. All mobile application, software application, GIS maps, property tax database shall be the property of Government of Uttarakhand and shall not be replicated/shared by the vendors without permission of the Government.
45. **Outputs and Deliverable:** The outputs should be provided in English and Hindi to the extent feasible.

S.No.	Deliverable	Timeline from signing	Content of the deliverable	Payment percentage after approval from TRC
1	Inception Report	30days	<ul style="list-style-type: none"> • Brief of existing situation • Finalizing of AOI(Area of Interest) • Collection of secondary data & maps available with Nagar Nigam and other concerned departments • Data base design for MPHS Data &implementation of Property Tax System. • Proposed methods for data verification and quality control • Approval of survey questionnaire • 	2.5% of Contract price
2	Development of a Mobile based App /MIS Soft. & GIS application Soft.	3 months	<ul style="list-style-type: none"> • Development of a Mobile based App Technology Solution for conducting on site Door to Door Digital Survey of each property of Nagar Nigam Area on real time basis. The Mobile App should support iOS/Android platform 	<ul style="list-style-type: none"> • 2.5%of Contract price

S.No.	Deliverable	Timeline from signing	Content of the deliverable	Payment percentage after approval from TRC
3	Submission of GIS Base Map players of municipal Area and planning /census urban agglomeration area	6 months	<ul style="list-style-type: none"> • DGPS survey data and processed satellite data • GIS base map players as per scope of work • Documentation and proof or procurement of latest satellite data for project area if not provided by ULBs • Documentation of all activities performed for updation of demand collection register (as per municipal law)for surveyed wards to be approved by Nagar Nigam • Updated demand collection register: • Provide institutional options for setting up of GIS cell by the GoUK 	7.5 % of Contract price
4	First Interim Progress Report(i.e.) .completion of 25% of total wards) through on site Digital Surveys of properties within Nagar Nigam/ Nagar Palika areas	9 months	<ul style="list-style-type: none"> • Surveys for prioritized wards • Institutional options for location of database • Options for updating data base proposed and selected • Provide Staff training • Documentation of all activities performed for updation of demand collection register(as per municipal law) • Issuance of Smart Card each property owner • Provide details on requirements of the GIS cell and support in setting up the cell. 	<ul style="list-style-type: none"> • 10% of Contract price
5	Second Interim Progress Report (i.e.	12 months	<ul style="list-style-type: none"> • Surveys for prioritized wards • Provide Staff training • Documentation of all activities 	<ul style="list-style-type: none"> • 10% of Contract price

S.No.	Deliverable	Timeline from signing	Content of the deliverable	Payment percentage after approval from TRC
	completion of 25%of total wards) through onsite Digital Surveys of properties within Nagar Nigam / NaGAR Palika areas		<p>performed for updation of demand collection register (as per municipal law)</p> <ul style="list-style-type: none"> • Issuance of Smart Card each property owner 	
6	Third Interim Progress Report (i.e.completion of 25%of total wards) through onsite Digital Surveys of properties within Nagar Nigam areas	15 months	<ul style="list-style-type: none"> • Surveys for prioritized wards • Provide Staff training • Documentation of all activities performed for updating of demand collection register (as per municipal law) • Issuance of Smart Card to each property owner • Supply of Software to the ULB as specified in the RFP & ToR. 	<ul style="list-style-type: none"> • 10% of Contract price
7	Final Progress Report(i.e. completion of 25%of total wards) through onsite Digital Surveys of properties within Nagar Nigam / Naagr Palika areas	18 months	<ul style="list-style-type: none"> • Surveys for prioritized wards • Provide Staff training • Documentation of all activities performed for updating of demand collection register(as per municipal law) • Issuance of Smart Card each property owner • Installation & Monitoring of Software to the ULB as specified in the RFP & ToR. 	<ul style="list-style-type: none"> • 10% of Contract price
8	Final updated GIS maps, with	18 months	<ul style="list-style-type: none"> • Submission of Final Report along with configuration and 	<ul style="list-style-type: none"> • 17.5 % - This payment would

S.No.	Deliverable	Timeline from signing	Content of the deliverable	Payment percentage after approval from TRC
	updated property tax database		<p>activation of web- based software for dashboard, analysis, map-based visualization, ward-wise and property-wise reports, demand vs collection analysis, payment gateways, etc</p> <ul style="list-style-type: none"> • Final reports (GIS mapping, revenue surveys) covering all the activities carried-out during project implementation phase. • Consolidated Summary findings • Ward wise & consolidated MPHS data linked with GIS as well as MIS including Photographs. • All Final Maps incorporating Corrections • City Base map with Khasra maps as background 	be made after six months of handholding is completed.
8	Technical Hand holding Support	For year after the approval of final report (Quarterly Report	<ul style="list-style-type: none"> • Quarterly report with details of Tax Collection. • Annually updated demand collection register. • All Updated Maps, Data, Reports and updated demand collection registers in Soft & Hard copy: • Quarterly monthly report highlighting, but not limited to the following: • Support in billing, collection, notices • & SAF filling / verification process. • Support in updating property tax data and related GIS • On-the-job training 	<ul style="list-style-type: none"> • 30%(To be paid quarterly Payment will be made reports submitted by the consultants on approval of UDD

S.No.	Deliverable	Timeline from signing	Content of the deliverable	Payment percentage after approval from TRC
			<ul style="list-style-type: none"> • Record of trained ULB staff • Storage and Backup management • Documentation of all activities performed for updating of demand collection register (as per municipal law) for all wards. • At the end of the completion of handholding support, consultants should also submit the documentation of all the activities completed and consolidated summary findings of Handholding to NND. • Consultant should handover all the updated data, reports & maps etc. to the ULB at the end of project. 	

- a) *The detailed contents of their ports, data formats, monitoring and approval formats for the outputs and deliverables for each milestone shall be agreed with Nagar Nigam during the project implementation.*
- b) *Ward wise booklet for each property data output should be submitted in soft & Hard copy (softcopy in CD & Hard copy report of Comparison Analysis in A-3 size copy) duly approved by the Nagar Nigam concerned officer at respective milestone.*
- c) *The time frame excludes the approval period.*
- d) **Technical Handholding Support Phase** *Consultants will be responsible for updating property tax demand collection registers in each participating ULB for the next Two year. The consultants must provide experts for Two year to be positioned in each ULBs for GIS Implementation Support, and Data Management. The Consultant is required to provide support and maintenance for two year after completion of GIS mapping for all the software's and products provided by them.*

Key Experts

46. The professional requirements of personnel to be provided by each consultant for the Task are given in the following table detailing type of expertise, required skills and experience. The consultant needs to provide CVs of its proposed team for the Key Positions listed in the Table, in the prescribed format. CVs of Key Positions will be evaluated with reference to the specified experience and qualifications. The team of key professionals shall be adequately supported by junior non-key support functionaries in requisite disciplines including GIS and IT. The consultant

will set up a Project office in each ULB area during the survey period for better coordination. The consultant will appoint sufficient number of Project Managers and other staff for field activity as necessary for timely completion of the project. The team will work in close liaison with the local ULB office and respective UDD office.

47. An indication of the expertise required for the two parts for undertaking this task is given in the table below. The CVs of the key experts would be evaluated. The consultant is required to propose separate teams to manage the ULB's. Additional staff may be added as required by the consultants. Support staff CV would not be evaluated individually but would be marked on an overall basis as a part of the team profile.

48. Experts and staff for implementation : Key experts are expected to be working for 132 man months (4 experts x 33 months). Support staff for ULBs are expected to be working for 585 man months (3 staff x 5 ULBs x 39 months). The man months for actual survey and GIS work will be provided by the consultant based on the work assessment. The key experts will be placed in Dehradun and would travel and provide overall guidance and support to the ULB team. Each ULB team should have a team of 3 experts (GIS expert, IT expert, and Survey experts) and adequate support staff who deliver the above deliverables. The consultant is required to provide team structure and CV of the team for each ULB which would be evaluated on an overall basis.

Key Experts to be evaluated:-

	Key Experts	Qualification	Experience
1	Team Leader – One Position – 15 months and 18 Months for Handholding	<ul style="list-style-type: none"> • Master's in urban planning / B plan /M plan, B.Tech (Civil)/ M.Sc./M. Tech(planning) in relevant areas of geo informatics with minimum of 10 years' experience • Fluent in Hindi and good communication skills 	<ul style="list-style-type: none"> • Experience of in Undertaking Preparation of GIS Base Maps, revenue survey for Urban Areas as Team Leader • Track record of undertaking minimum similar to such tasks as Team Leader • Knowledge of working in ULB / City • Managed at least two similar projects
2	Lead GIS based Property Survey	<ul style="list-style-type: none"> • Experience in DGPS, PBM, Establishment Ground control points GIS Based field Survey, for base map & 	<ul style="list-style-type: none"> • Managed at least two similar projects • At least 10 years' experience in the

	Expert/Survey Expert – 15 months and 18 Months for Handholding	<p>Revenue Assessment survey,</p> <ul style="list-style-type: none"> • Masters in Geology/ Geography/ M. Tech with 5 years of experience in Remote Sensing and GIS Or • Bachelors in Engg. with minimum 10 years' in civil eng g • Experience in the similar projects • Fluent in Hindi and effective communication skills 	<p>urban sector</p> <ul style="list-style-type: none"> • Knowledge of working in ULB / City • At least 5 years' experience in assets / Property survey in government Sector preference will be given to Revenue surveys.
3	Lead Remote Sensing and GIS Expert –15 months and 18 Months for Handholding	<ul style="list-style-type: none"> • Masters in Geo Informatics or Geography or Geology or Earth Sciences / Masters in Remote Sensing / Masters in Civil Engg with minimum of 10 years' experience in the similar field • Experience in developing and maintaining GIS for city planning and urban management purposes. • Experience in interpreting high resolution Satellite images, Topographic Mapping, DEM generation. Plan metric data generating for city planning purposes • Fluent in Hindi and good communication skills 	<ul style="list-style-type: none"> • Managed at least two similar projects • Knowledge of working in ULB / City • At least 5 years' experience in GIS of urban areas
4	Lead Data base Programmer/ MIS specialist – One 15 months and 18 Months for Handholding	<ul style="list-style-type: none"> ▪ Experience with RDBMS interfacing with spatial data bases in GIS software ▪ M. Tech in Computer Science or MCA ▪ At least 10 years' experience 	<ul style="list-style-type: none"> ▪ Managed at least two relevant project ▪ MIS related project completed in government/Urban sector

		<p>related to above activities</p> <ul style="list-style-type: none"> ▪ Sound understanding of ULB systems ▪ Fluent in Hindi & English 	
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Support staff for ULBs

	Experts required	Qualification	Experience
1	<p>Survey Expert –</p> <p>5 Positions – One for other 5 ULBs – 15 months and 24 Months for Handholding</p>	<ul style="list-style-type: none"> • Experience in DGPS, PBM, Establishment Ground control points GIS Based field Survey, for base map & Revenue Assessment survey, • Diploma in Survey/Masters in Remote Sensing / • Bachelors in Civil Engg. with minimum 5 years' • experience in the similar and Certification in Survey from SOI/ National/international institutes <p>Fluent in Hindi and effective communication skills</p>	<ul style="list-style-type: none"> • Managed relevant projects • Knowledge of working in ULB / City • Previous experience of carrying out similar surveys
2	<p>Remote Sensing and GIS Expert -</p> <p>5 Positions – One for other 5 ULBs – 15 months and 24 Months for Handholding</p>	<ul style="list-style-type: none"> • Masters in Geo Informatics or Geography or Geology or Earth Sciences / M.Tech in Geo Informatics/Masters in Remote Sensing / Masters in Civil Engg with minimum of 5 years' experience in the similar field • Experience in interpreting high resolution Satellite images, Topographic Mapping, DEM generation. <p>Plan metric data generating for city planning purposes</p>	<ul style="list-style-type: none"> • Managed relevant projects • Knowledge of working in ULB / City • At least 3 years' experience in assets / Property survey in government Sector preference will be given to Revenue surveys.

	Experts required	Qualification	Experience
		<ul style="list-style-type: none"> Experience in developing and maintaining GIS for city planning and urban management purposes. <p>Fluent in Hindi and good communication skills</p>	
3	<p>Data base Programmer/ Software expert</p> <p>One for other 5 ULBs – 15 months and 24 Months for Handholding</p>	<ul style="list-style-type: none"> Experience with RDBMS such as Oracle and inter facing with spatial data bases in GIS software B. Tech in Computer Science or equivalent Certification in RDMS and GIS soft wares Atleast 5 years' experience related to above activities Sound understanding of ULB systems Fluent in Hindi & English 	<ul style="list-style-type: none"> Managed relevant projects MIS related project completed in government/Urban sector

Support staff for survey and GIS related work

	Position	Qualification
4	<p>Contact Surveyors, and Supervisors as required</p> <p>Rishikesh – 6</p> <p>Roorkee-8</p> <p>Kotdwar -8</p> <p>Mussoorie- 6</p> <p>Pauri-4</p> <p>Chamoli -3</p>	<ul style="list-style-type: none"> Preferably graduates with minimum 2 years experience Sound understanding of contact survey requirements Fluent in Hindi
5	<p>GIS Operators as required</p> <p>Rishikesh –6</p>	<ul style="list-style-type: none"> Graduates with minimum 2 years' GIS experience. Fluent in Hindi

Roorkee- 8	
Kotdwar -8	
Mussoorie- 6	
Pauri-4	
Caamoli -3	

49. Experts and staff for Part B : Out of Part A Items to be provided by the Consultant: In addition to the results and deliverables listed above, the Consultant will provide:

- All materials (including satellite data) and equipment necessary for DGPS surveys, digitized base mapping, training and for MPHS surveys.
- All survey and data entry staff, including training.
- All satellite data processing, field survey and data entry staff.
- Organisation and training to enable municipal staff to participate in the GIS base mapping preparation, survey and data entry, and to manipulate and produce reports from the databases.
- Arrange equipment's – Computers, software including software for satellite data processing.
- Arrange for all transportation and travelling required for the TA.

Technical review committee

50. A Technical review committee headed by the Director (Urban Development) and comprising of representatives of the ULBs will carry out the review of all the outputs and provide comments which will be shared with the consultant for incorporation. The TRC will endeavor to review and provide the comments at the earliest, but not later than 4 weeks of submission of the reports and will inform the consultant in case of any delays.

Services & Support to be provided by Client

51. The assignment will be administratively coordinated by the Project Director for the Uttarakhand PFM project.

52. Technical coordination will be done by the Director (Urban Development).

53. The Urban Development Directorate will coordinate with departments for the workshops/training and to designate staff for training and facilitate meetings with the stakeholders. For training, GoUK will provide the venue and cost of trainee travel including TA/DA, but all other requirements will be arranged by the Consultant.

Annexure 1

GIS APPLICATION

Bidder will Design and Develop web GIS application for Nagar Nigam department using GIS platform. This application will cater to the viewing, analyzing, & utilizing the Geographic Information needs of the different departments of Nagar Nigam department. And will also play a role of decision support system and Backbone for Smart City Command Control System. The application should integrate/ link to the existing Nagar Sewa system through APIs or Web services. The detail of Nagar Sewa system are given in annexure -2

The required features to be developed for web GIS application is as follows: -

- Will be based on GIS Platform
- Existing Server, Client, Web, Mobile/Tablets to be supported
- Application will be open to integrate additional functionalities in future
- Visualization of data. g. Land Parcel Data DE Mon Satellite Image
- Will support multiple relational data base connections
- Shall have query-based results
- Application will have facility of Historical data analysis for Land parcel information, property tax information, building information using time series
- Will support distributed transaction. This allows multiple users to edit the map data same time
- Application will support DBMS
- Creation of server clusters with load balancing and fail-over functionality will be supported
- Application will have facility to configure additional menus for future functionality
- User authorization and authentication should be GUI based
- Application will have the facility to monitor application operations and status: Logged in user status, server load, data access status
- Application will have the facility to create custom GUI without business customization through designated application he selected bidders expected to follow the complete SDLC for the development of the GIS application
- Proposed/ Developed GIS Application software will follow National Spatial Data Infrastructure (NSDI) Met standards and should be compatible with National Urban Information System (NUIS) Scheme. Tightly integrate the spatial data with the existing system at ULBs.

- **Nagar Nigam Application should have following Modules**

S. No	Department Modules
1)	User Management Module
2)	Module for Property Tax Department
3)	Smart Card Application for Property Tax
4)	Module for Land Section Encroachment Analysis, Advertisement and Hoarding, Land Management
5)	Module for Light Section
6)	Module for Health Section
7)	Survey Mobile application

User Authentication –The application will be accessible through proper authentication procedure and only authorized users can view, update or edit the attribute data. The user will key in the Login Id and password to get access of applications.

User Management Module – This module will provide options for user management for online application. This module will provide options to create a new user, modify the existing users, delete users and change password. The application has web-based user interface. The application runs so system browser with less complex it and easy to interact with the system without getting the special training to operate the application.

1. Online Property Tax Management System Software

- Please refer to NIUS software provided in the annexure 2. This module need not be developed but the GIS web software should be integrated with the NIUS software.

1. Module for Land Section

This solution will help NAGAR NIGAM officials to manage the estate related information along with analysis of slum area and ULB owned vacate land, Encroachment Analysis, Advertisement and Hoarding, and Land Management

Modules and Sub Modules of Land Management System:

Map Handling Module: User can view municipal plot details along with plot dimensions, detail so heritage structure with buffer analysis and ward,village and election boundaries. He/ She can also view and asses the area under slum and location of ULB owned vacant lands.

Municipal Service Query Module: Query module will support users to access details about encroachment and legal information of plots. Query system will also support user to see information based on plinth area, floor wise details.

Spatial Query Module: This will support user to analyze area under slum and the zone, ward and other information regarding location of vacantly and of ULB.

Reports: Reports will be generated queries results based on city survey number, built-up area,plinth area, floor details, date of possession,details of encroachment,slum details, ward boundaries etc.

2. Module for Light Section

It will enable Nagar Nigam users to planning and tracking of maintenance of all street lights within the municipal limits including all types of street lights, traffic signals,high mast lights, installation policy and Failure Statistics. The application system will enable users to identify position and numbers of street lights, high mast light, traffic signals on road and partition long with road street light information.

Map Handling Module: Map viewer will show all the roads within the municipal limits of Nagar Nigam with high mast lights, street lights it will also show traffic lights as point location.

Query Module: With queries user can identify position and numbers of street lights per km in a road, identifying roads with number of streetlights less than per km, traffic signals, and high mast lights on stretch of a road. User can also query Failure Statistics, installation policy etc.

Spatial Query Module: Spatial analysis will enable user to get information of traffic signals, number of street lights,within the buffer area or within the ward boundaries of the municipal limits and other relevant features based on selected area.

Reports: It will be generated on query results based on getting numbers of streetlights per km in a road, number of traffic signals on stretch of road, identifying roads with number of streetlights less than per km and failure statistics analysis based on user in putt the GIS application.

3. GIS enabled Survey Mobile Application- Unlimited User

Specific mobile app shall be designed and deployed for the purpose of collection of data for door-to-door survey exercise. This mobile app shall enable real-time data collection facility. The mobile app must allow the following features:

- 1.** Collection of geo-coordinates of surveyed properties

2. User-defined survey forms with maximum usage of choice-based questions
3. Digital photographs of the properties
4. Online and offline synchronization of survey data with central server
5. Real-time survey progress tracking

Property survey must be carried out for all the properties under Nagar Nigam limits. This task involves Property data verification and collection of relevant information of each Property in the ULB area through contact survey, data base generation, and taking digital photograph of each property .The data base and digital photograph should link to GIS Base Map. The survey shall be carried out using handheld GPS devices. The data necessary to correctly assess the taxation details of the property will include:

1. Constructed area of the house/ property;
2. no. of storey's ;
3. Basis of use,i.e. residential or commercial/industrial, lease/ rent; and
4. Location, i.e. main road or main market;
5. Width of adjacent road.

This detailed household survey must be carried out for all dwellings,including vacant sites for attributed at compilation of Property Tax to create master data base.

Each property must be measured accurately using latest available technologies.

Detailed attribute list of the survey data shall be taken from the data provided by Nagar Nigam .Bidder has to Design and Develop Geo Enabled Mobile Application

S.No.	Features	Compliance
Mobile application Features		
1.	Offline Working	
2.	Native android application so seamless support to phone hardware like GPS, Camera etc.	
3.	Offline Spatial and non-spatial data viewing and update.	
4.	GIS server attribute data display on geometry (offline support)	
5.	GIS layer on off	
6.	Zoom in-zoom out functionality	
7.	Current location of surveyor	
8.	GPS navigation	

9.	Add spatial feature	
10.	Spatial Feature (Point, line, polygon) creation	
11.	Local language support for data viewing, data entry	
12.	Local language searching and indexing for all attribute data.	
13.	Image compression and conversion to base64 for saving in database	
14.	Distinct form for Open Land, Building and Floor.	
15.	Video capture	
16.	Laser distance meter integration	
17.	Mobile application integration with DGPS	
18.	IMEI integration for data security and offline authentication	
19.	Resurvey module up to unit level.	
20.	Unlimited User	

Survey Mobile Server –Portal Feature		
S. No.	Features	Compliance
1.	User management module for addition and updating of surveyor, supervisor and administrator and workflow integration (Geographically boundary wise area allocation)	
2.	Project monitoring module with Gantt chart/ PERT chart	
3.	Survey allocation and management module	
4.	Map module for spatial data viewing, querying, exploration and allotment to surveyor	
5.	Report Module includes charts, maps, attribute query, image viewer and downloading functionality with local language support	
6.	Data QA-QC module	
7.	Resurvey allotment module to surveyor up to unit level	
8.	Attribute data upload functionality with local language support	
9.	GIS server integration for consuming wms, wfs, wmts services	

10.	Form builder for addition and updating in mobile forms for data capturing utility like text box, drop down box, multi- line text box, radio button, check box, file upload, camera utility, Laser Distance meter integration	
11.	Spatial query support	

Annex 2:

NUIS Property tax Software Overview of the Product

The Urban Development Department of Government of Uttarakhand has signed a MOU with NIUA for implementation of various E-governance project, under which the NIUA is providing Property Tax Management Software to the ULBs . The consultant must work on the platform build by NIUA for Property Tax Software and integrate GIS Mapping and door to door survey, data integration and handholding period . The computerized and automatic Property Tax system offered by NUS facilitates citizens who seek to pay their Property Tax within any Urban Local Body with a transparent, speedy, hassle-free and user-friendly procedure. Property Tax (PT) is one of the components of a smart city that has the capability of providing large amount revenue for a state.

Technology Components

Infrastructure

1. Cloud first design - compatible with AWS, Azure, Google Cloud
2. Containers - Docker - Allows Polyglot stack, Faster Deployment
3. Orchestration - Kubernetes - Managing cluster, Spinnaker
4. Monitoring and Alerting – Elastic Search/Kibana/Prometheus
5. CI/CD pipeline - Jenkins, Spinnaker
6. Repositories – github

Technology APIs

1. Defined Open API Specifications - Swagger 2.0
2. Spring Boot - REST layer
3. Kafka - Async processing for scale and extensions
4. TestNG/Postman
5. Elastic Search
6. Tech Agnostic - New APIs can be built on any stack

UI Technology

1. React JS - Mobile First UI
2. HTML5/CSS3
3. Designed to include modularized UI

Detailed Product Specifications

The Property Tax System (PT) provides a digital interface to make property assessments, pay property tax, generate payment receipts and monitor tax collection. It can be used by the citizens, Urban Local Body (ULB) counter and field employees and ULB Administrators to accomplish their specific tasks. It is available as a mobile-optimised and web-based application. The PT product features can be broadly classified into following modules:

1. Registration, Login and Creation of User Profile
2. Filing an Assessment for a Property
3. Searching for a Property
4. Modifications to a Property
5. Generate Demand Notice
6. Payments collection and Receipts
7. Dashboards and Reports
8. General Features

Module 1: Registration, Login and Creation of User Profile

This module provides enables the following capabilities

- OTP Based Login for Citizen via Web/Mobile App
- OTP Based Login for Employee via Web/Mobile App
- Provision for language selection during first time registration for both Employee and citizens
- Provision of creating a personalized Profile for Citizens and employees on Web App
- Login Credentials for various hierarchy of employees
- Role based access for performing different actions relating to property tax modules

Module 2: Filing an Assessment for a Property

With this feature, a citizen and employee can perform self-assessment for a new property in a specific financial year. This feature helps in registering a property in the system. Details of property can be entered online and this property can be assessed for calculation of taxes. Product is designed in a user friendly manner and reduces chances of error. System calculates tax automatically and creates a demand. If a user wants to reassess their property due to any reason (for e.g incorrect data, change in property etc), it can be done by editing details of last assessment. Employee can edit details of last assessment on behalf of a citizen based on property owner's input. Citizen can track status of their incomplete assessment. Any incomplete assessment can be searched and completed.

This module provides following capabilities:

- Citizen/CSC can Assess New Property (By Different Financial Years)
- Citizen/CSC can Capture Address, Assessment Info, Owner Info for all types of properties like residential houses, flats and commercial buildings.
 - Sample of details captured:
 - Door Number
 - Mutation number
 - Number of floors
 - Area covered
 - Owner and co-owner
 - Mailing & permanent address
 - Built year
 - Individual room measurements

- System computes property tax automatically as per process and rules of a State
- System has a facility to make entry in system by inspector after site visit and assessment of the same by superintendent
- System supports dynamic calculation for late fees, interest, rebates, etc. as on the day of demand generation
- System fetches the data of previous year property data while e-filing for current year so that all the dues are calculated.
- System assigns a unique property ID based on the process defined in the ULBs
- Citizen/CSC : View/Print Summary of Filled Form
 - Assessment Form
 - Assessment Form is also sent by email to citizen
- Upload Documents
 - Ownership/Title related
 - ID Proof
 - Any other statutory documents

Module 3: Searching for a Property

Citizen or Employee can track down the status of their incomplete assessment. Any incomplete assessment can be searched and completed.

This module provides the following capabilities:

- Citizen/CSC can search for Property by
 - Mobile No
 - City
 - Property Tax Unique ID
- Citizen / CSC can view Incomplete Assessments
- Citizen / CSC can reassess Searched Property
- View Property details and pending dues

Module 4: Modifications to a Property

System provides ability to capture mutation and transfer of ownership. It reduces interfaces between the user and State and promotes greater transparency. It also helps in reducing time taken for mutation after registration. System provides ability for alteration of assessment after verification and inspection. Any structural changes like addition / extension / reduction of existing built up area or construction type OR utility changes like usage or occupancy have an impact on the increase / decrease in property tax demand. These changes can be handled by the 'Additional / Alteration of Assessment' feature. System provides the ability for bifurcation / amalgamation of property. Property bifurcation / amalgamation undergoes an approval process. Parent property needs to be modified accordingly, which can be done in the system

This module provides the following capabilities:

- Mutation of property and change of ownership details
- Capture Extension / Addition and Alteration and reassessment based on changed property details
- Bifurcation of property
- Amalgamation of property

Module 5: Generate Demand Notice

System has capability to automatically generate demand notice for a financial year based on set triggers like time-based roll over on completion of a financial year. System notifies citizens about demand through SMS / Email. Generated Bills can also be grouped and printed for physical distribution by the ULB employees. System provides capability to Employees to merge and download bills based on given parameters to plan their distribution drives.

This module provides the following capabilities:

- Generate Demand Notice based on periodic basis
- Group Demand Notices
- Print Demand Notices
- Cancel Demand Notices
- Send notifications to citizens on demand generation - SMS, Whatsapp, Email, Physical bill

Module 6: Payments collection and Receipts

Citizen / Employee can view payment status of previous assessments from Assessment History section. Payment for any assessment with full or partially paid amount can be completed. Receipts for assessment can be downloaded in Assessment history section after searching for the property details.

This module provides the following capabilities:

- Payment of Property Tax - Online, Cheque, Cash, DD, during assessment
- Partial Payment of Property Tax - Online, Cheque, Cash, DD, during assessment
- System allows a citizen to pay for anyone's property without changing the demand
- The system can also be integrated with PoS machines to enable doorstep collection of property tax and issue of receipt

Module 7: Reports and Dashboards

PT reports provide facility to access receipt register, cancelled receipt register, account receipt register, ULB wise PT collection report, DCB Register. All reports can be downloaded in PDF / XLS format. State level administrator can monitor property tax collections, assessments and other information at a state level through dashboards.

This module provides the following capabilities:

- State Dashboard: View Reports for Total Collections, Properties Assessed, ULBs on Prod, Usage Type, Payment Distribution
- State Dashboard: PT Collection Timeline (Monthly, Weekly)

- State Dashboard: ULB Wise (Collection, Assessments)
- Cancelled Receipt Register Report
- PT Collection Report (ULB/Date Wise)

Module 8: General Features

Notifications

The system has the capability to send notifications to citizens. These notifications can be sent for various steps like - assessment completion, payment reminder, payment confirmation. These notifications can be sent in the language chosen by the ULB through all channels - SMS, WhatsApp, Email.

Legacy Data Migration

The system has the capability to migrate Demand and Collection. In most states, the preliminary step would be to migrate Legacy data of existing properties / connections along with the Demand and Collection details. This would ensure that subsequent demand generation happens through the system

Configurable Masters

The system provides the following masters that can be configured as per the State’s

Requirements:

- Charges & Calculation: Calculation Engine, Rebate, Penalty
- Rate Master
- State Masters: Property Ontology, Documents List, Employee Data Mapping, Boundary Data Mapping

List of Features - Property Tax

List of Functionalities	Corresponding Features
Registration, Login, Creation of User Profile	Provision for Language Selection during first time registration via Mobile/ Web App
	OTP Based Login for Citizen/ Employee via Mobile/ Web App
	Login Credentials for various hierarchy of employees.
	Provision of Personalized Profile for Citizen/ Employee on Web App
Filing an assessment for a	Citizen/CSC: Assess New Property (By Different Financial Years).

property	Citizen/CSC: Capture Address, Assessment Info, Owner Info.
	Citizen/CSC: View/Print Summary of Filled Form
Searching for a property	Citizen/CSC: Search Property (By Mobile No., City, Property Tax Unique ID, Existing ID)
	Citizen/CSC : View the Searched Property
	Citizen : View My Properties
	Citizen : View Incomplete Assessments
	Citizen/CSC: Edit the Searched Property
	Citizen/CSC: Reassess Searched Property
Generate demand notice	Generate Demand Notice based on periodic basis
	Group/ Print/ Cancel Demand Notices
	Send notifications to citizens on demand generation- SMS, WhatsApp, Email, Physical bill
Modifications to a property	Mutation of property and change of ownership details
	Capture Extension/ Addition and Alteration and reassessment based on changed property details
	Bifurcation/ Amalgamation of property
Payment collection and receipts	Payment of TAX (Online, Cheque, Cash, DD): During Assessment
	Payment of TAX (Online, Cheque, Cash, DD): Partial Payment
	Citizen/CSC: Download Receipts for payments
Dashboards and reports	State Dashboard: View Reports for Total Collections, Properties Assessed, ULBs on Prod, Usage Type, Payment Distribution
	State Dashboard: PT Collection Timeline (Monthly, Weekly)

	State Dashboard: ULB Wise (Collection, Assessments)
	Cancelled Receipt Register Report
	PT Collection Report (ULB/Date Wise)
General features	Notification
	Legacy data migration
	System assigns a unique property ID based on the Process defined in the ULBs.
	System has the facility to classify the property based on its type.
	System allows changing the type of property.
Configuration masters	Configurable Rate Master (ULB Specific) : Fire Cess/ Building Height
	Charges & Calculation : Calculation Engine, Rebate, Penalty
	State Masters : Property Ontology, Documents List, Employee Data Mapping, Boundary Data Mapping