

Geo-positioned Cadastral and Land data and Land records

QuantaSip G.I.S Pvt Ltd



Company Introduction

- QuantaSip is part of J&T Group an EPC contractor for Railway, Highway, Powerline and Irrigation Projects.
- Company has completed Google Map Data collection during 2008-2010 for Central and South India.
- Pan India Highway data collection for Ministry of Science's – SAFAR Project.
- Geo Positioned Data Collection for all power towers of MSETCL.
- Enlisted as preferred vendor with many Utilities. 80+ staff comprising of Geo Spatial Analyst, developers, data analysts and SME's
- Partnered with NPCI/NHAI for GIS enabled toll system



GNSS / GIS based Tolling System - Highlights

- Following the vision of our PM, MoR Shri Gadkari Ji Guidance NHAI has asked NPCI to prepare the GNSS/GIS and APR based Toll System.
- The Roll Out of the System is planned by EoY 2023.
- RBI approval for Pilot Area received.
- Fast Tag will be History.
- Pay per Use for Road Transport Use cases.
- Partnered with NPCI for GIS enabled toll system Implementation.

Geo fencing of Toll able Area – Survey and Mapping (GNSS)



Example virtual gantry definition at the entrance (in green) or exit (in black) of the toll-able road and also the polygon data (in yellow)

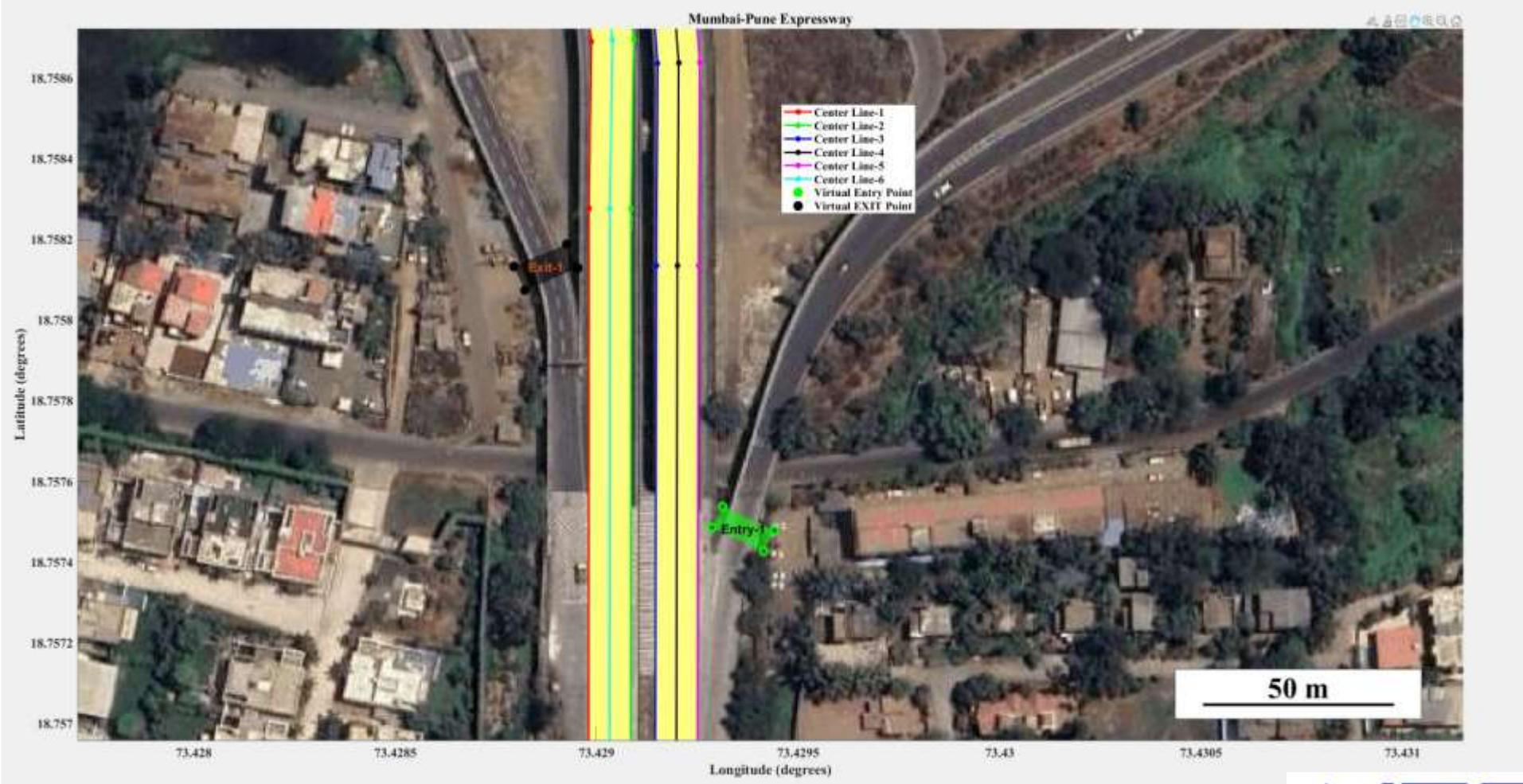
Virtual Gantries for Entry



Example virtual gantry definition at the intersection of the toll-able and non-tollable roads



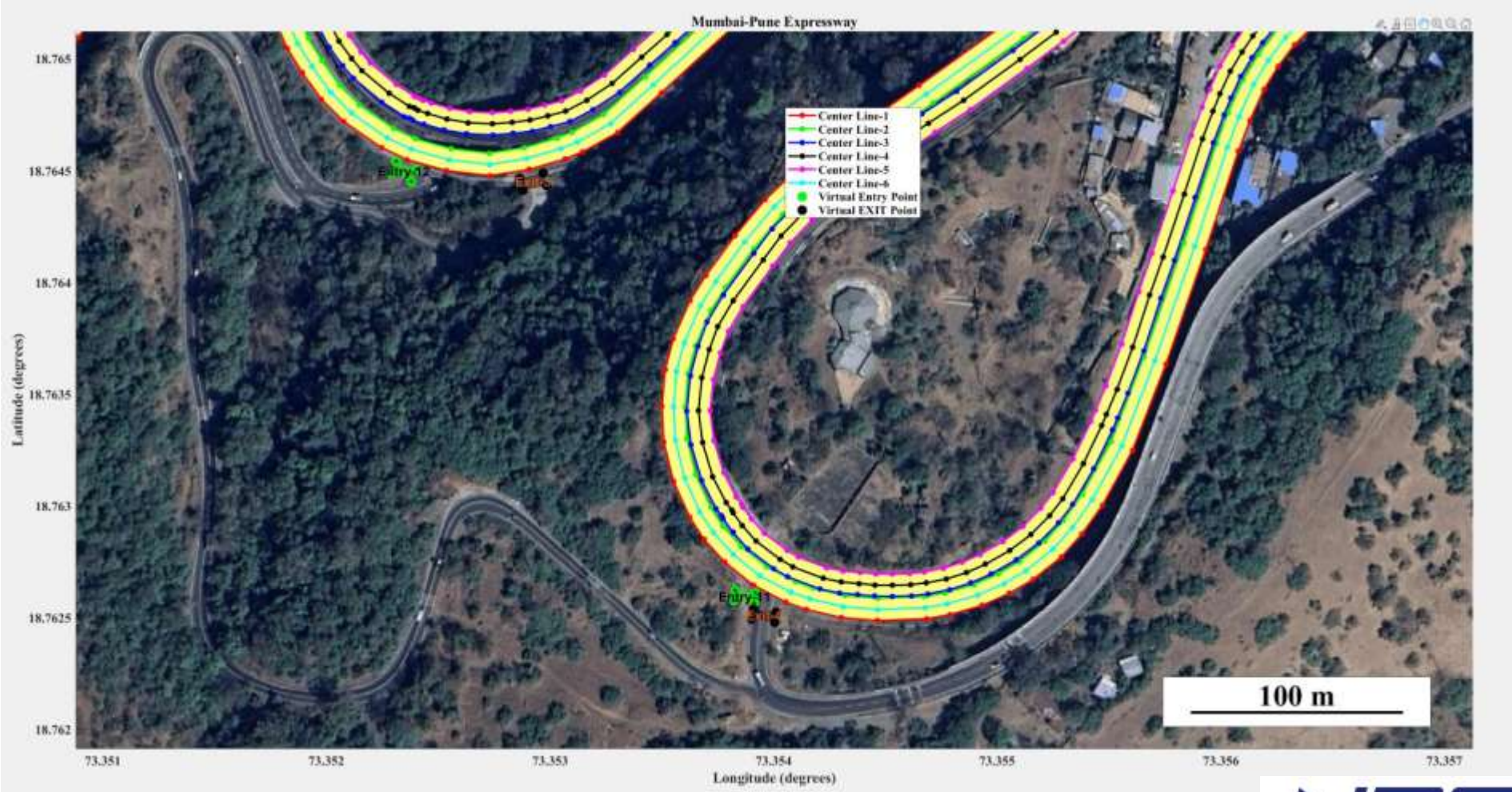
Virtual Gantries for Entry and Exit



Example of center-line data showing sufficient data points (variable sample distance) to capture the non-linearitie



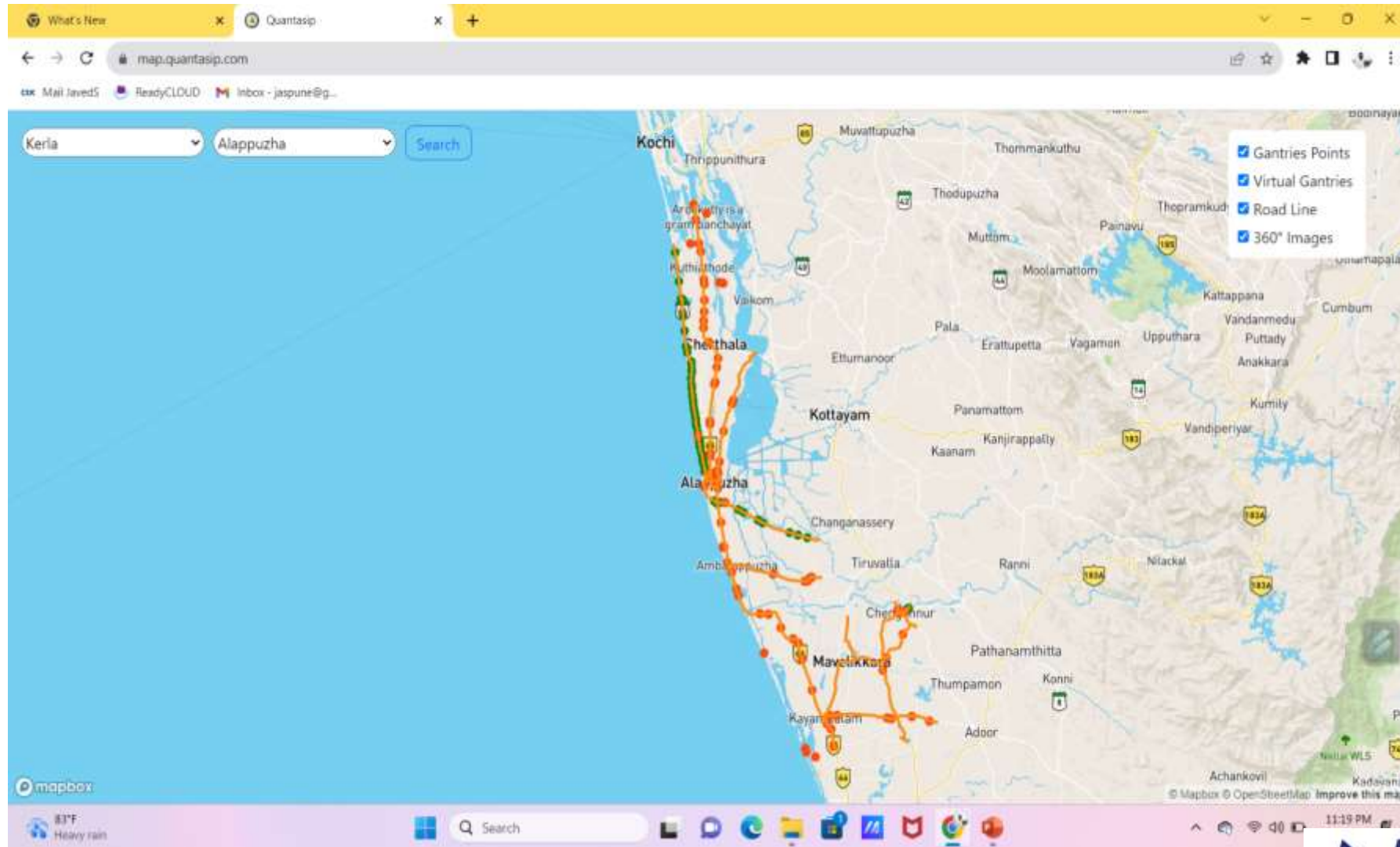
Virtual Gantries for Entry and Exit



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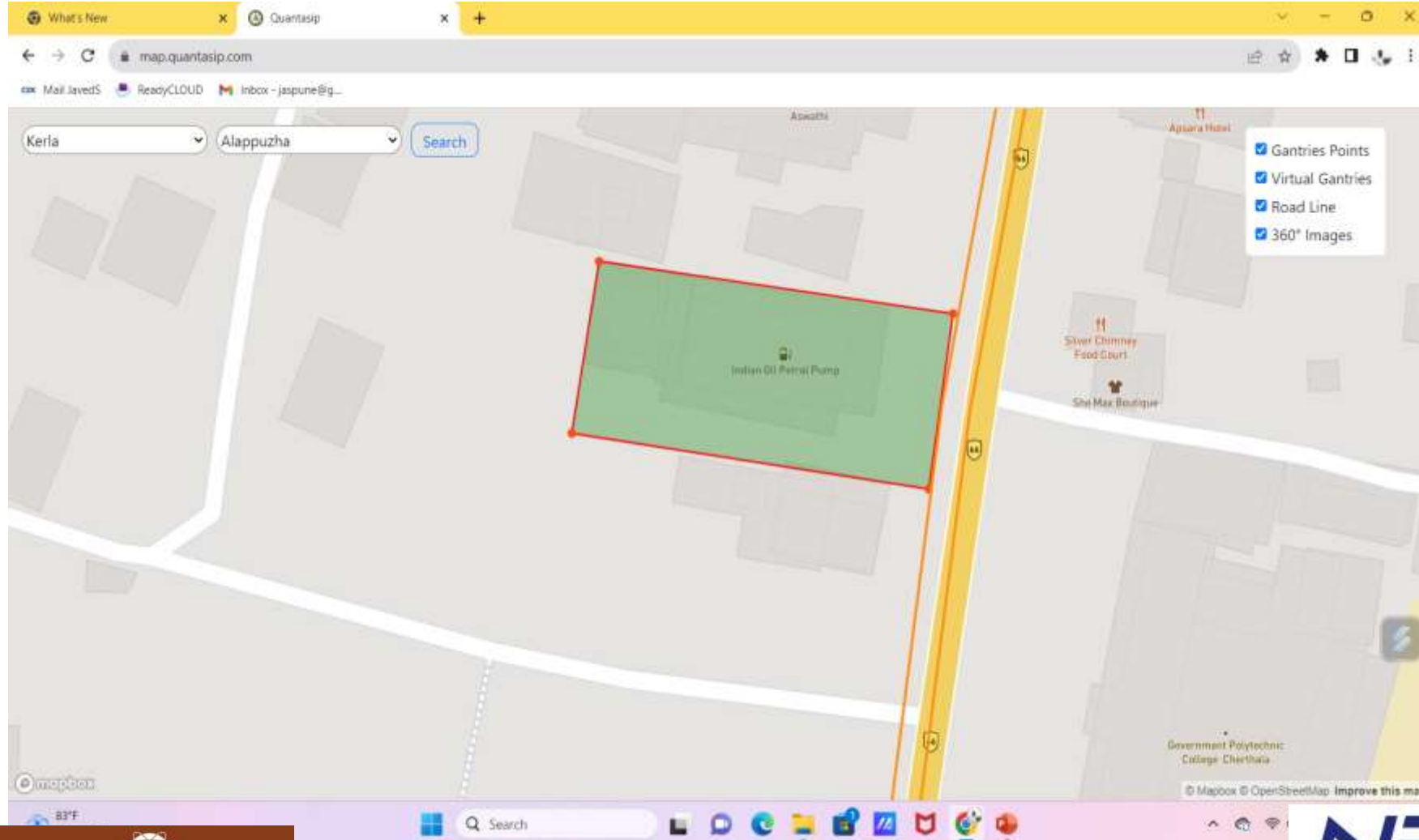


Data Representation



District-Wise Data Representation with layers

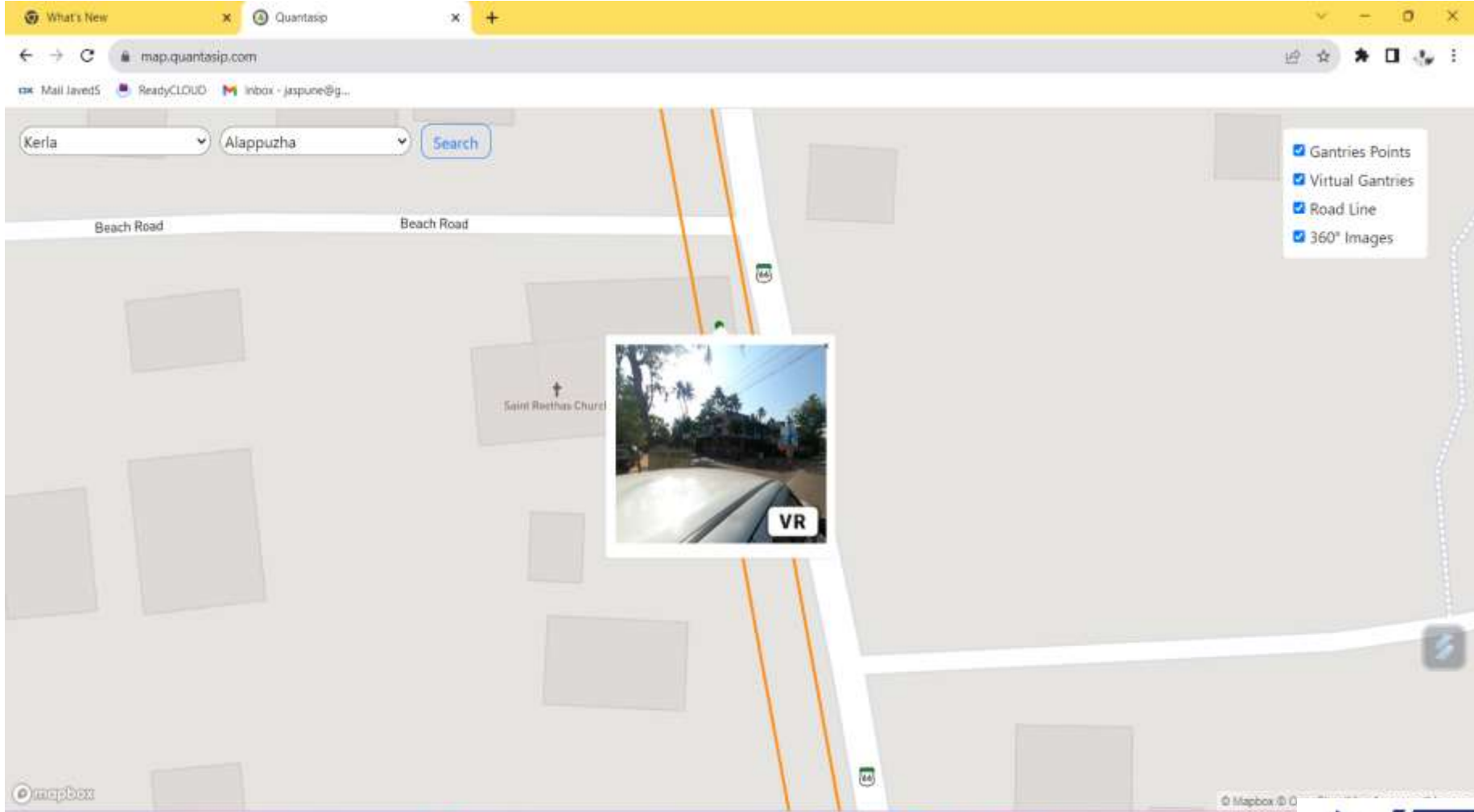
Non toll able use cases



District-wise Gantry Points & virtual Gantry



360° Photo collection as Quality Check



District-wise 360° Images



Quick Highlights

- Around 700,000 Km Tolled road coverage.
- Around 200,000 Non Tolled Coverages.
- RBI Approval for 1st Use case and trial run in 1st Week Sept 2023.



Other Products

- Smaller version of Land Database.
- Enhancing the Geo Spatial Data Quality of Cadastral Data.
- Seamless Data Connection of Land Data and Land Ownership.
- Geo Positioned Data Collection for all Agri support Eco System.
- Comprehensive Geo Spatial Data for Agri and Rural Area along with Urban POI's and APT's
- Launching API for Commercial Usages by Dec 2023



Key problems that we have solved:

- ✓ There is no national-level repository containing cadastral data of all States in 1 domain
- ✓ In some states the maps are not digitized
- ✓ Digital data is further not geo-referenced correctly
- ✓ Geo-referenced data is required to be reshaped as per open source satellite imagery (improves accuracy by 25%)
- ✓ Created database of land records. Linkages with cadastral data are in the pipeline



Red line=Cadastral
boundary given by Govt

Yellow line=Satellite data
based reading from us



Service I: Ready geo-referenced Cadastral datasets for 10 States and in-progress for 7 States



- ✓ Govt cadastral data procured under RoR (Right of Record) for (MH, *MP, HR, *AP, KR, Telangana, *Tripura, *Goa, *DL, *JH) (100% available)

- ✓ Data collection in progress for (UP, Rajasthan, Gujarat, Bihar, Assam, Chhattisgarh, West Bengal)

* Physical maps digitised

- ✓ Boundaries available at district, tehsil, Pincode and village level

- ✓ Local Govt Directory code is mapped to census villages (pan-India)

Sr.No	State	District Count	Tehsil Count	Village Count	Apprx Parcel Count (In '000)
1	Maharashtra	36	359	44501	2,74,427
2	Jharkhand	25	268	32716	1,41,916
3	Madhya Pradesh	51	354	55778	2,37,386
4	Karnataka	31	200	30715	1,39,065
5	Andhra Pradesh	24	1102	17949	1,39,106
6	Haryana	22	79	7008	43,099
7	Goa	2	12	411	2,548
8	Dehli	11	33	222	1,365
9	Telangana	33	594	11226	69,826
10	Tripura	5	45	836	5,183
	Total	240	3046	2,01,362	10,53,921

Service I: Ready geo-referenced Cadastral datasets for 10 States and in progress for 7 States (contd)



Available datapoints:

- ✓ Road network
- ✓ Railway network
- ✓ APMC (Maharashtra, Madhya Pradesh)
- ✓ District Co-operative Banks (ATM + Branches)
- ✓ Schools, Colleges, Hospitals, Govt Offices, Landmarks and other PoI (Point of Interest)

Technology stack: Open layer, geo-server, web-services; Front-end editing tool Q-GIS; Database: Post-gre SQL

Service I (contd): Process of geo-referencing



We are bridging the mismatch in boundaries between government's raw cadastral data and open-source satellite imagery

Process 1: Geo-referencing of raw cadastral data



Process 2: Correcting cadastral data with satellite imagery

*Each land parcel (gat/khasra #) is manually re-shaped as per the satellite imagery to arrive at the corrected boundaries.

AI/ML based automation of re-shaping is not possible due to the mismatch of sub-plotting in the govt cadastral system

*Typically in a 1 hectare (10,000 sqm) plot, deviation of open-source satellite imagery can be upto 25 sq mtr - 0.25%

Service I (contd): Existing attributes in the dataset



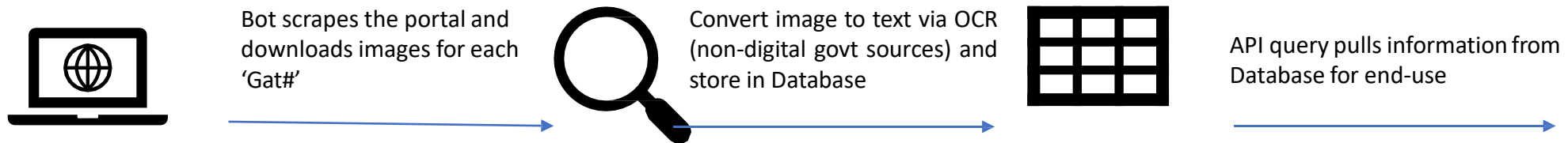
State	State_Code	District	Distt_Code	Tehsil	Teh_Code	Block	Block_Code	Village	LGD_Code	Khasra_No	Area_Ac	LU_LC	Remark
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	37	0.38016140117	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	39	8.35695646772	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	74	2.11524240778	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	79	8.44007809017	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	1	6.91058121676	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	13	6.71760284115	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	24	3.80103697154	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	97	4.67901034752	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	102	8.08716482213	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	64	5.20474317892	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	69	8.21822258895	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	20	0.68581877723	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	15	7.20600326443	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	92	7.86340441796	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	45	3.68558975466	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	34	3.85407935130	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	54	7.88696873736	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	59	4.91954497702	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	23	7.53770569729	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	36	0.24388333786	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	78	8.09754027921	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	83	8.77675970435	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	28	0.68399493351	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	4	2.79766951235	UR	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	101	6.68621543310	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	106	7.58978393392	AG	
Madhya Pradesh	23	Burhanpur	467	Burhanpur Nagar	06972	NA	NA	Bada buzurg	506180	68	2.18143700860	AG	

Above acreage is as per the polygon area of the satellite image. Acreage as per 7/12 can be additionally provided

Service II: Land record verification



- ✓ Downloaded and periodically maintain complete Land Owner Information for Maharashtra, Karnataka and Madhya Pradesh. Other 7 states will be completed by Dec 2023.
- ✓ In addition of 7/12 abstracts, we can provide 8-A (mutation entry)
- ✓ Key Fields in the database: owner name (transliterated in Unicode), acreage, recorded charges (to be extracted)
- ✓ Data can be refreshed as per requirement
- ✓ PoC for few Banks done
- ✓ API For Owner identification and Land Parcel Position Ready to use (MoU with few states in Advance Stage)



Service II (contd): Database linkages planned between cadastral data and land ownership database



- From geographical location, we can search land owner and land record information
- From parcel or farmer information, we can find the farm location on cadastral map

Map View

Select District: Raigarh
Select Tehsil: Baramati
Select Village: Marnaewadi
Enter Gut Number: 12

Load/Refresh

Print Close Back

Land Ownership

Select District: Raigarh
Select Tehsil: Baramati
Select Village: Marnaewadi
Enter Gut Number: 12

Load/Refresh

भूमापन क्रमांक: 12

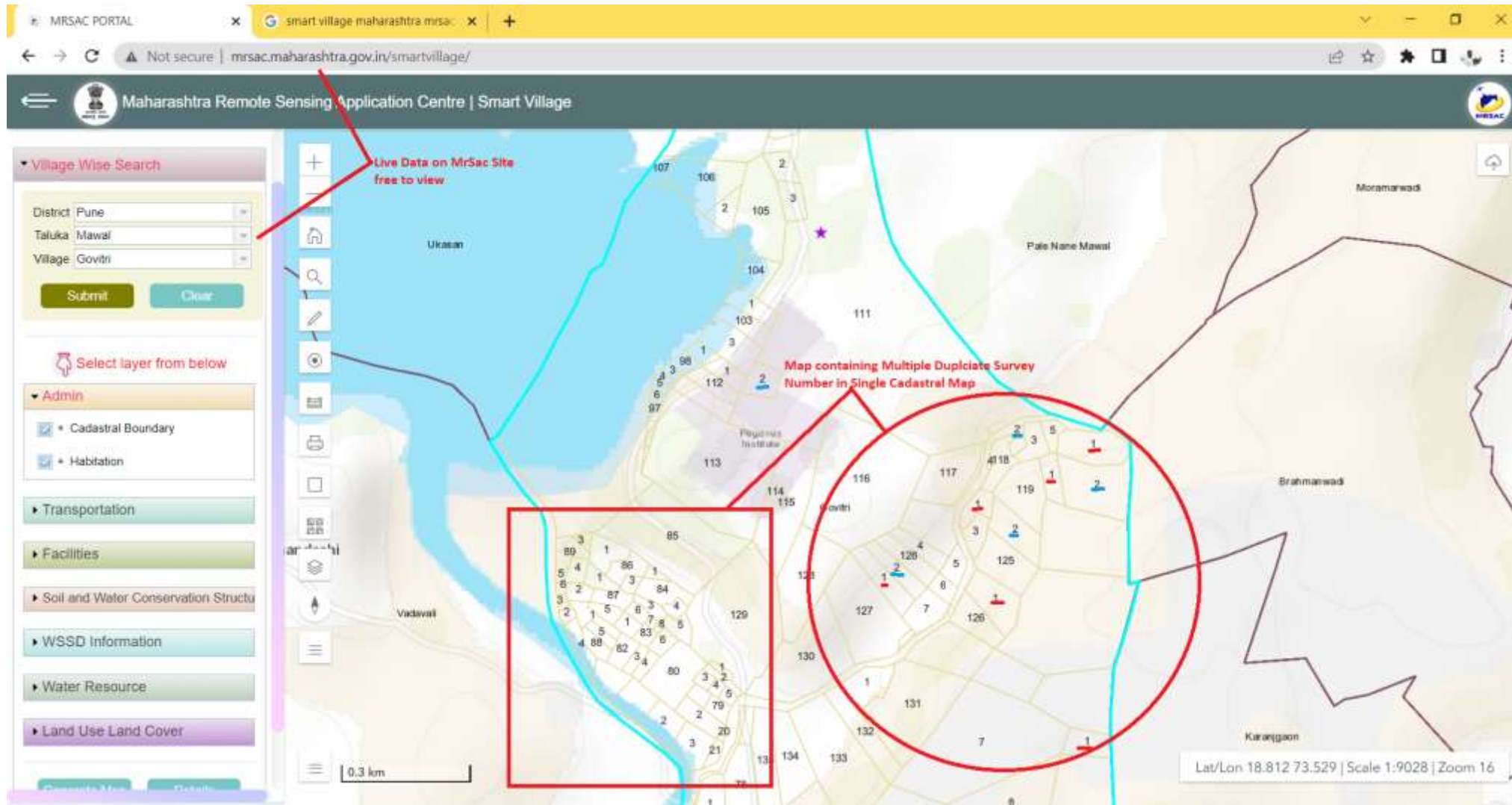
क्र.सं.	प्लॉट नं.	प्लॉट क्षेत्र	प्लॉट क्षेत्र	प्लॉट क्षेत्र	प्लॉट क्षेत्र	प्लॉट क्षेत्र
1	12	1.50.00	1.50.00	0.00.00	1250	प्लॉट क्षेत्र: 12

VIEW ONLY - NOT FOR LEGAL PURPOSE

Print Close Back

Service III: Data Cleaning, Correction – Case 1

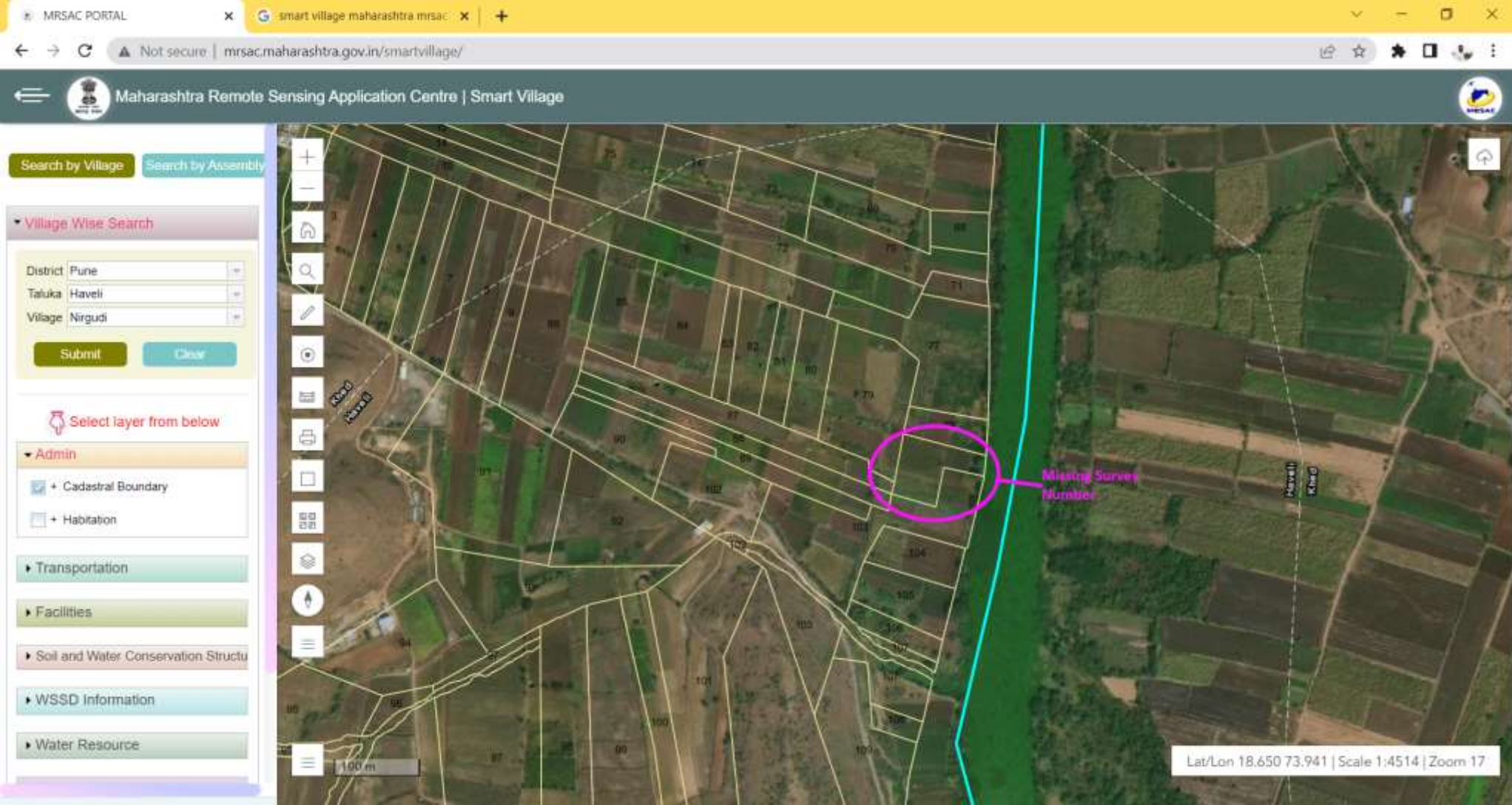
- In depth study and analysis of the data and correction of existing data.
- Logical and reasonable analysis to improve data in relation with Land Owner Information



Service III: Data Cleaning, Correction – Case 2 – Contd..



- Missing Survey number in existing data.



A close-up photograph of a person's hands holding several fresh, vibrant green leaves. The person is wearing a green and yellow patterned garment. The background is a blurred field of similar green plants, suggesting a farm or agricultural setting. The lighting is bright and natural, highlighting the texture of the leaves and the skin of the hands.

Let's get in touch!
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