

Technology Integration & Advancement in Land Record

D.Dighal , Esri India



Preamble

- Land Record is Dynamic.
- Land has a Value and sometimes it's the ONLY asset to Citizens.
- Land Record , Land Use , Land Cover is an important data for country growth
- Boon for BFSI (Banking , Finance , Insurance sector) with Digital Property Card



Land Records Management Programme in India & Role of GIS

DILRMP

(Digital India Land Record Modernization Programme)

- Non Abadi Area
- Computerisation of LR
- Automation of Sub registrar office
- Integration of LR & Property Registration
- RoR in the Web
- Survey / Resurvey
- Digitisation of Cadastral Map
- Textual & Spatial Data integration
- Creation of modern Record Room
- Citizen Centric Interface

SVAMITVA

(Survey of Village Abadi & Mapping with Improved Technology in Village areas)

- Adadi Area
- Drone Survey of Abadi area
- Fresh Digitization and Ownership data capture
- End to End Digital Land survey
- CORS aided field data capture
- Digital Property Card
- Citizen Centric Interface
- BFSI sector ready database

SVAMITVA

World Largest Drone Mapping Project

Phase I - Pilot Scheme (April, 2020- March, 2021)

Pilot States- Haryana, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh, Uttarakhand, Punjab, AP, and Rajasthan

210 CORS network establishment - Punjab, Rajasthan, Haryana and MP

Phase II (April 2021 – March, 2025)

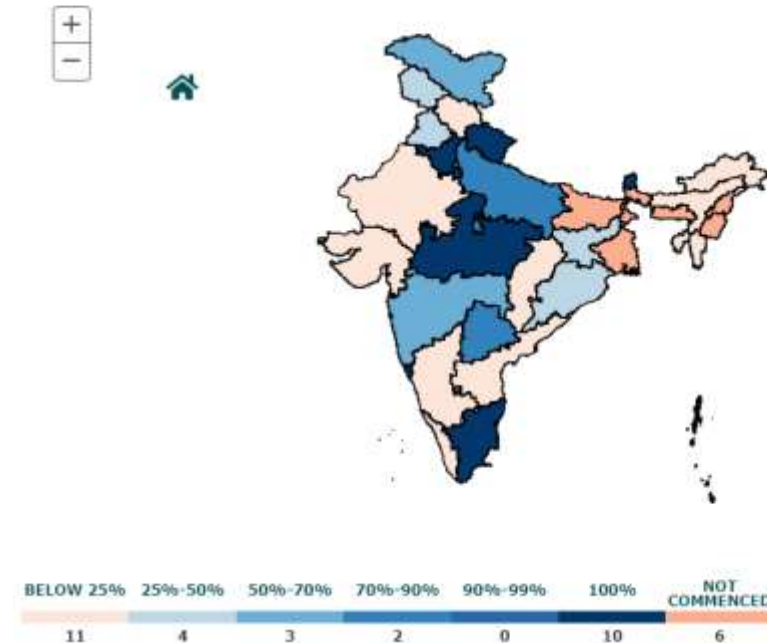
Complete survey of remaining villages

357 CORS establishment

SVAMITVA SCHEME
Survey of Villages Abadi and Mapping with Improved Technology in Village Areas



Drone Flying Status



NIC
Powered by Bharatmaps

Type village name...

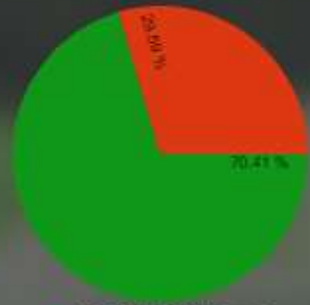
State

S.No	Name	Drone Flying	Feature Extraction	Maps Handed Over To State	Maps Provided For Enquiry	Property Card Prepared
1	Andaman And Nicobar Islands	187	100	100	100	4
2	Andhra Pradesh	3831	2587	734	726	0
3	Arunachal Pradesh	335	248	66	0	0
4	Assam	36	35	17	0	0
5	Chhattisgarh	3088	2823	1486	1304	18
6	Dadar And Nagar Haveli And Daman And Diu	77	76	56	56	0
7	Delhi	31	31	0	0	0
8	Goa	410	0	0	0	0
9	Gujarat	2083	711	108	107	11
10	Haryana	6514	6498	6336	6321	3477

DILRMP Programme-Digitisation of Maps status

DIGITIZATION OF CADASTRAL MAPS

1,17,31,811 / 1,66,61,224
CADASTRAL MAPS / TOTAL MAPS

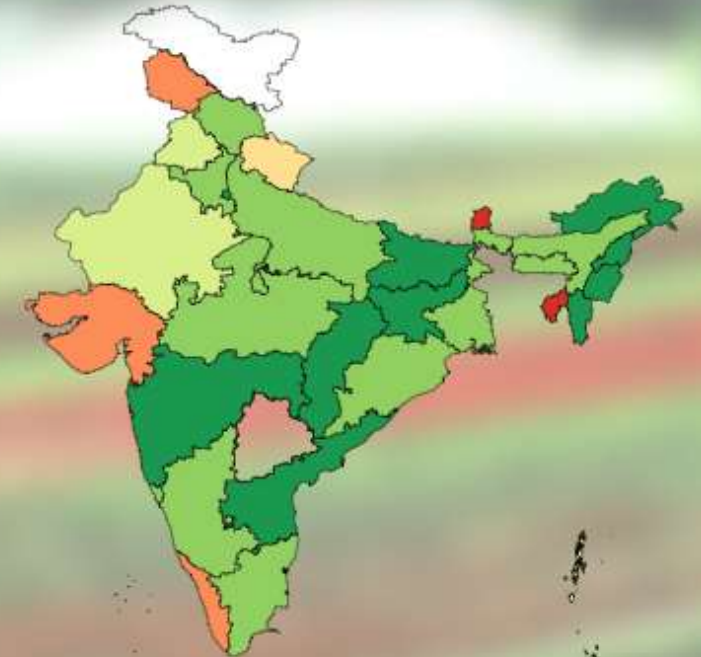


70.41 % COMPLETED
29.59 % NOT COMPLETED

FINANCIAL MONITORING GRAPH

0 % 1-24 % 25-49 % 50-74 % 75-99 % 100 %

DIGITIZATION OF CADASTRAL MAPS



DNLRMP-Survey & Resurvey



DIGITAL INDIA LAND RECORDS MODERNIZATION PROGRAMME - MIS 2.0

Department of Land Resources
Ministry of Rural Development, Government of India

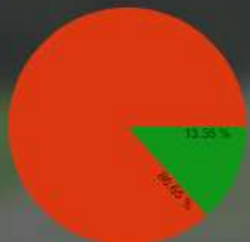


[HOME](#) [CONTACT US](#) [MAP OF COMPONENTS](#)

13-Nov-2022 4:15:33 PM

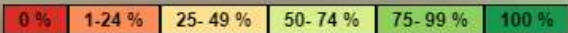
SURVEY/RE-SURVEY

87,708 / 6,56,792
VILLAGES / TOTAL VILLAGES

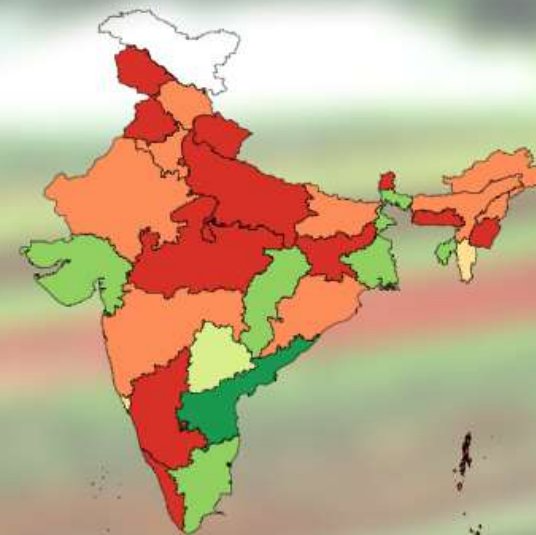


13.35 % COMPLETED
86.65 % NOT COMPLETED

FINANCIAL MONITORING GRAPH



SURVEY/RE-SURVEY



COMPUTERIZA

AUTOMATION

INTEGRATION
REGISTRATION

RECORD OF R

SURVEY / RE-SURVEY

DIGITIZATION

BHU-NAKSHA

TEXTUAL AND

STATE DATA C

TEHSIL MODE

CITIZEN CENT

3 Phase implementation



1. Integration of Image with Existing Map in central GIS lab
2. Creation of GIS Lab & working manual
3. Data model designing
4. Version Management



1. Enterprise GIS based feature & Image service publishing.
2. Job allocation for field survey
3. CORS enabled Android rover based Data update
4. HQ & District Based QA/QC



1. Enterprise based ULPIN integration
2. Implementation of Geo-Blockchain for dispute free property
3. Land valuation
4. Citizen Interface & subsequent self update

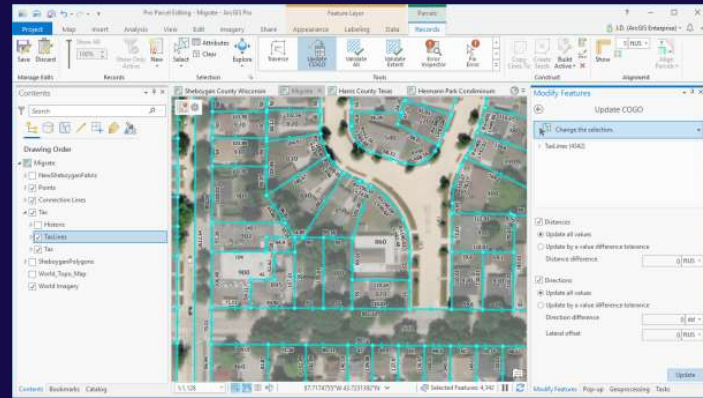
Enterprise Grade Version Managed Centralized Database



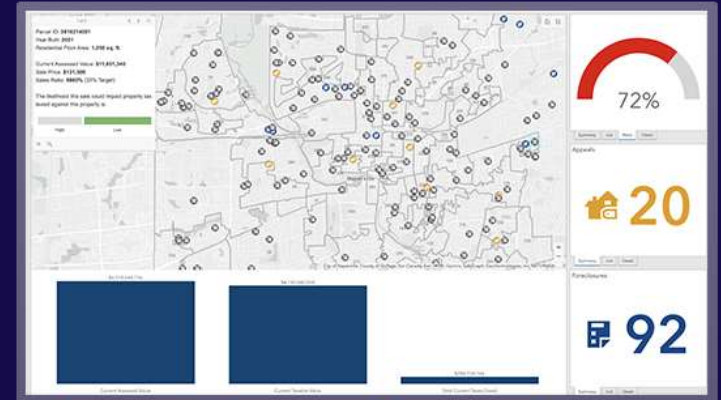
The seamless data flow from Lab to Field-Components



Cloud Based Drone Processing



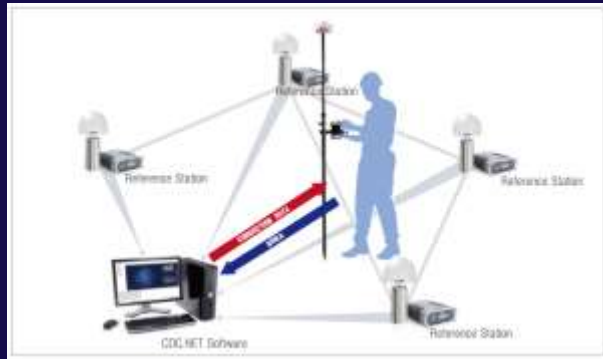
Desktop GIS with Workflow and Version managed Geodatabase



Dynamic GIS Portal with Dashboard
Dynamic GIS Portal with Dashboard



Geospatial Cloud



SOI- CORS

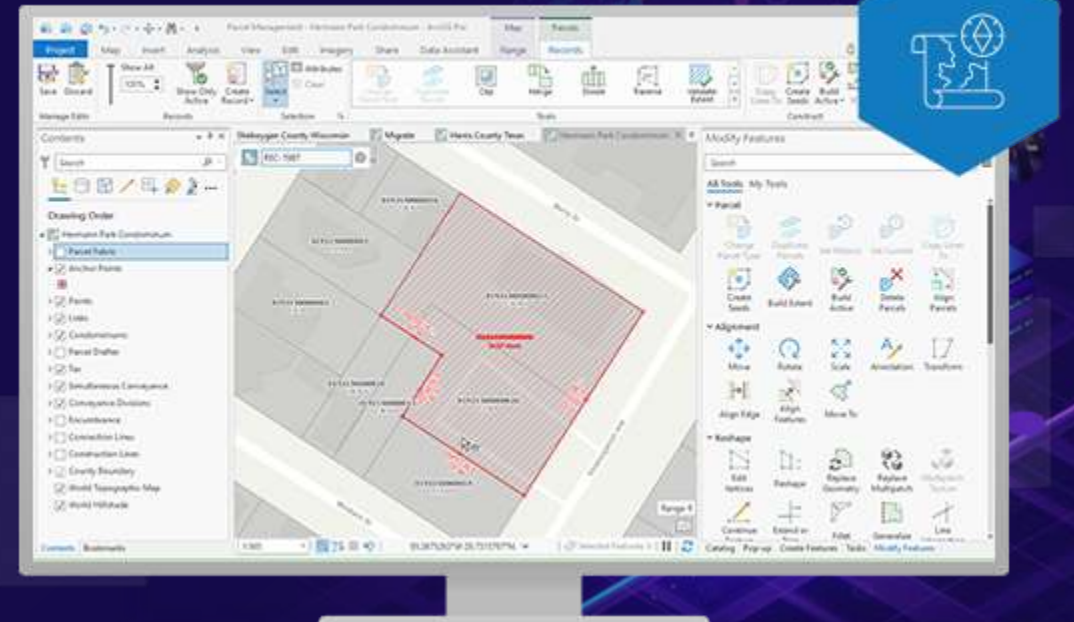
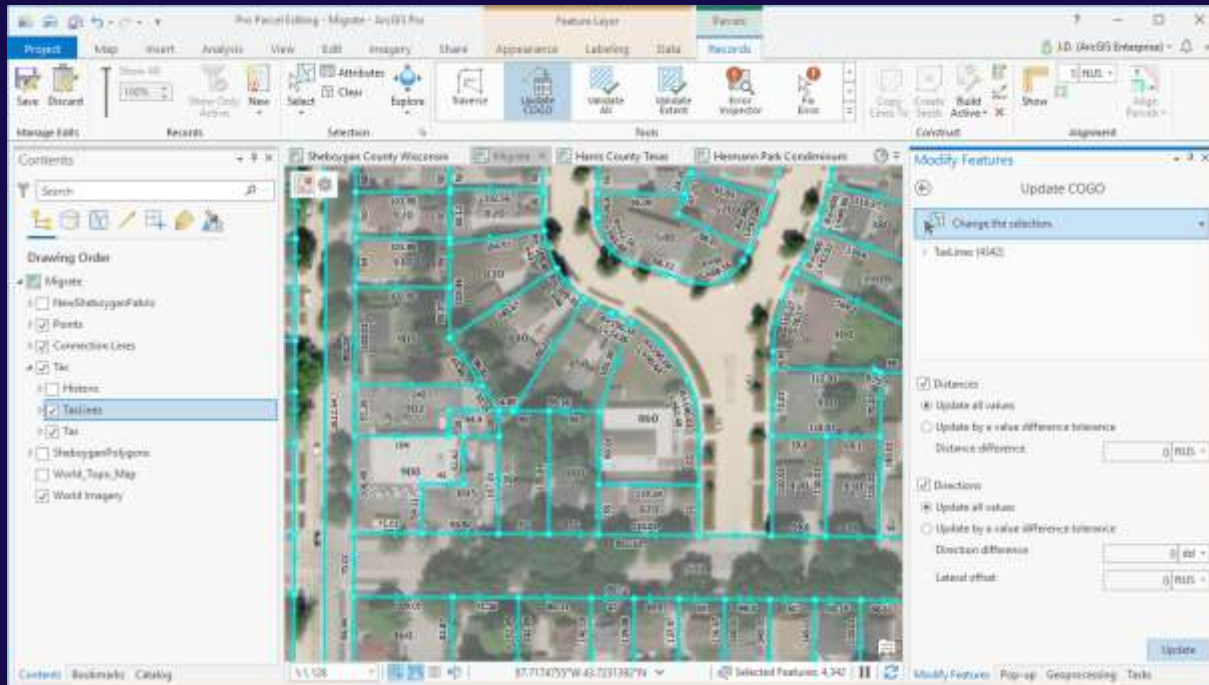


High End GNSS in BYOD
Mode utilizing CORS

Building Block- Desktop GIS

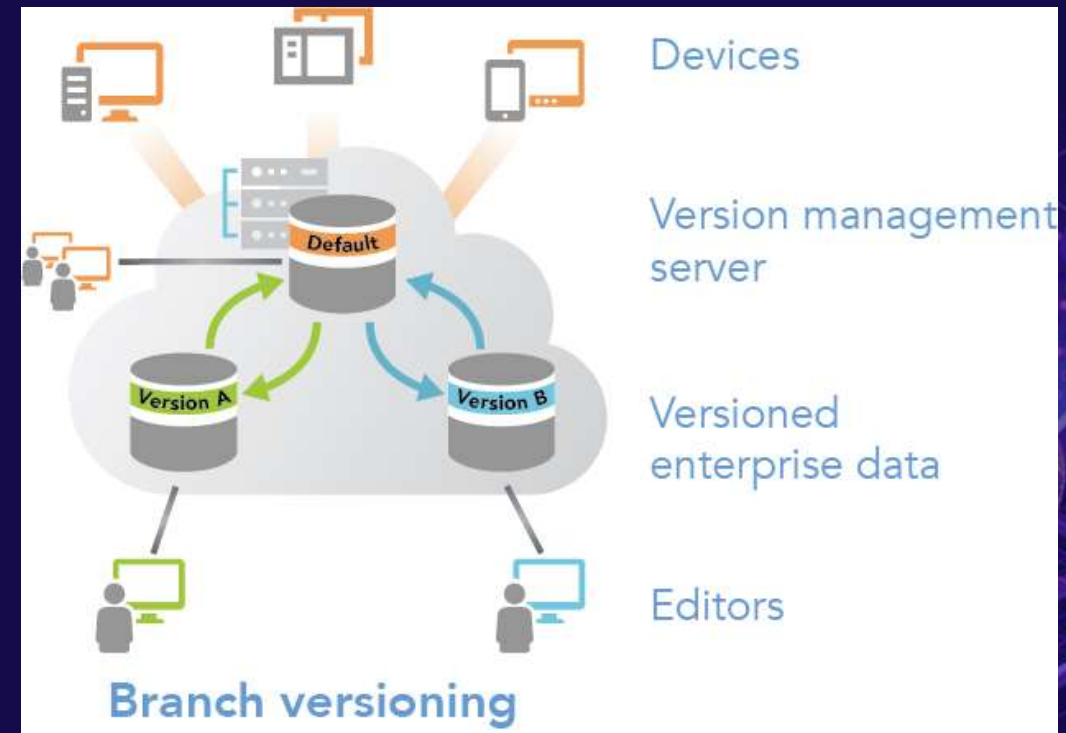
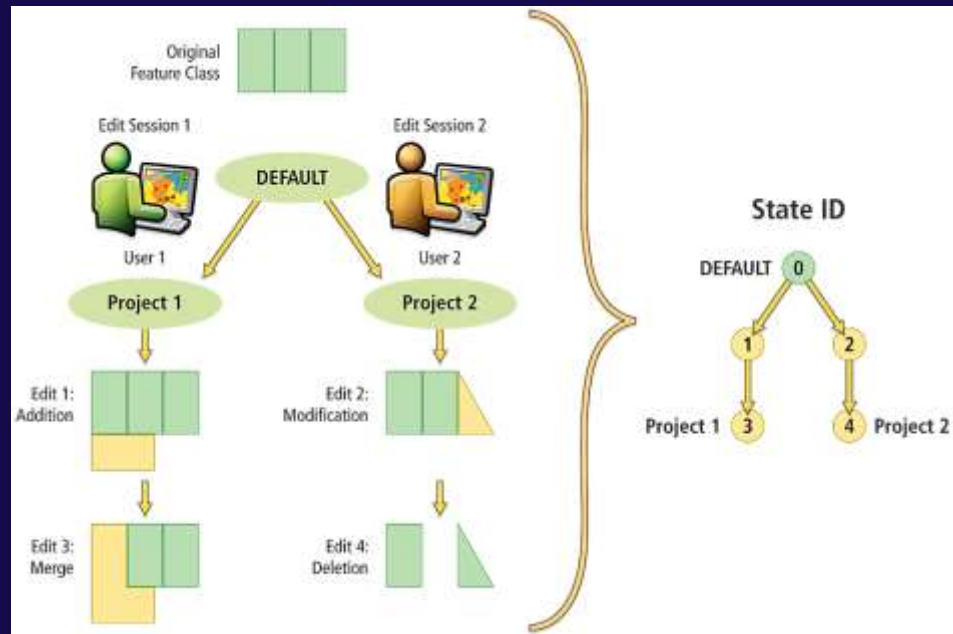
- Work from anywhere (remote working)
- Work on Enterprise Database (No file format)
- Work on web Service and Versioned data

- Historical records of parcels and lineage
- Record-driven workflows
- Flexible GIS data model
- Dual depiction of legal and physical world
- Web GIS Enabled



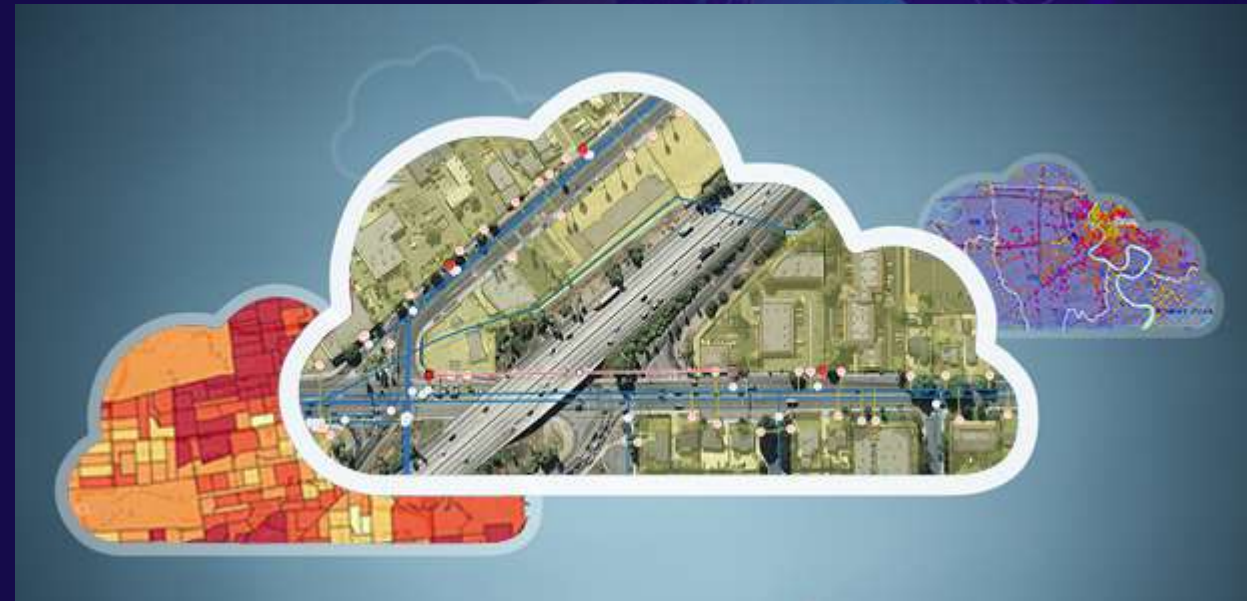
Version Management

- allows multiple editors to alter the same data in an enterprise database duplicating data
- Reconcile and post changes (Field or Lab update)
- Store all backward updates of the plot to roll back.



Role of Cloud

- Meity Cloud Policy help Land Record department to Store , Process , Roll out technology quickly
- Drone Processing in cloud help quick turnaround time
- ArcGIS enterprise on cloud help complete end to end data management
- Rolling out Citizen centric interface can be scalable , due to elastic nature of cloud



ULPIN / BhuAdhar integration

•Calculation of Interior Point :

•Step I : (Largest horizontal segment)

• Horizontal Segment: 361143.756299999 , 2773202.3439999996 , 361157.0087 , 2773202.3439999996

•Step II : (Mid point of largest horizontal segment)

•Point on Parcel : x : 361150.4171111173 y: 2773202.3439999996

•Interior Point P : (Mid point in WGS 84)

•x : 85.62334656418898 y: 25.068164087273757

Projection: WGS 84 (EPSG:4326)

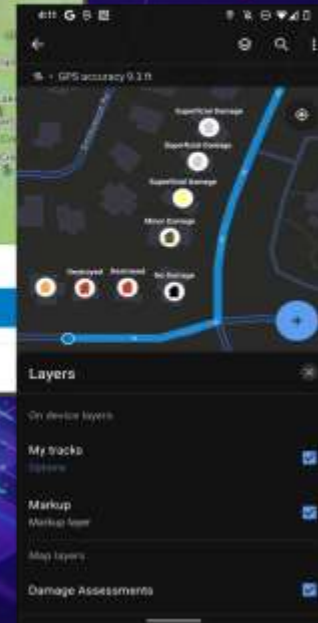
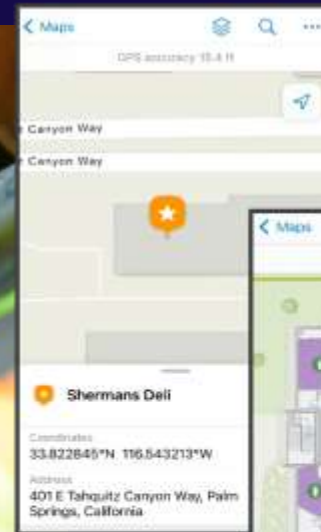
WGS-World Geodetic Standard 84

•EPSG- European Petroleum Survey Group- EPSG stands for European Petroleum Survey Group and is an organization that maintains a geodetic parameter database with standard codes, the EPSG codes, for coordinate systems, datum, spheroids, units and such alike.

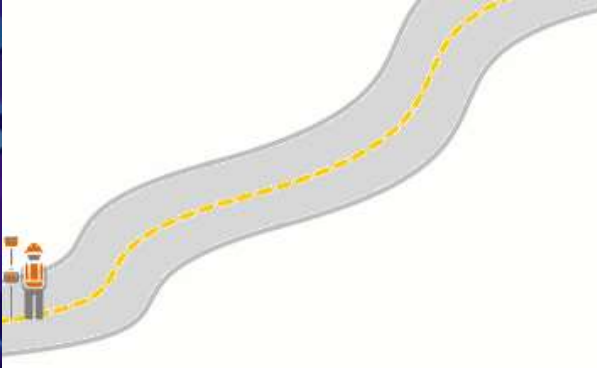
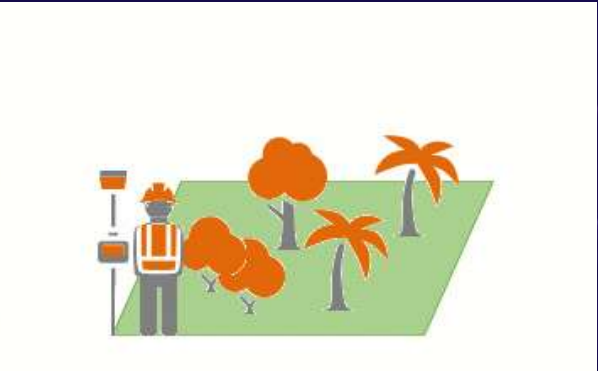
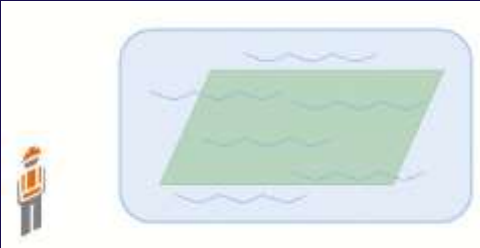


GNSS and GIS App (Power by Enterprise & BYOD based)

- Utilize CORS or Satellite based correction service
- Use normal android low cost device for mass scale field adoption.
- Rollout enterprise enabled GIS field App (all checks embedded in enterprise)
- Work on versional managed "Geo-Database"

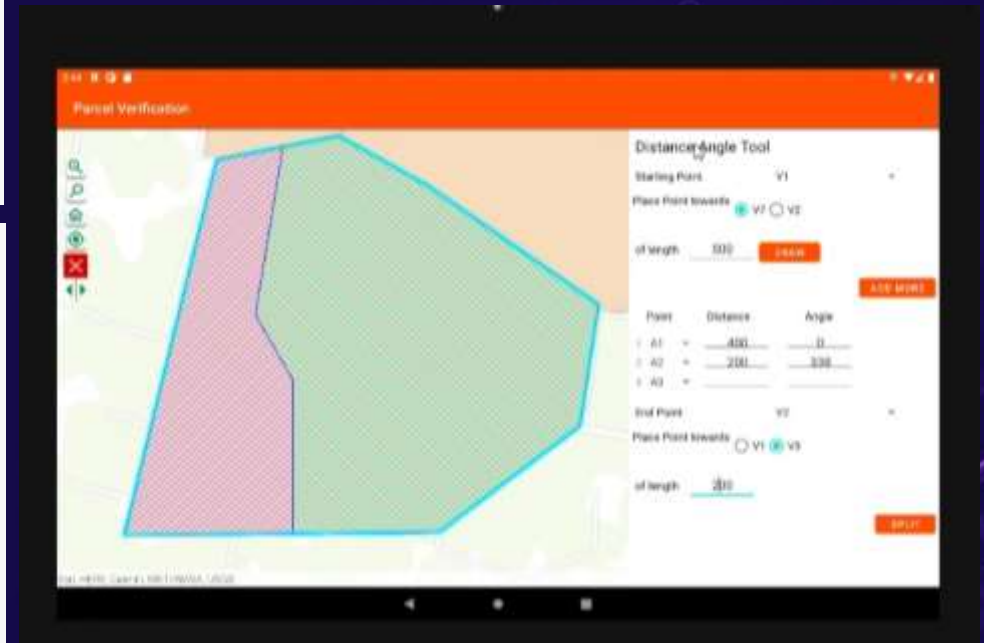
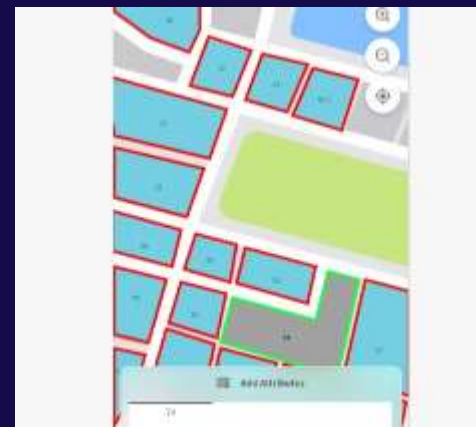


Rover Based ArcGIS Field App



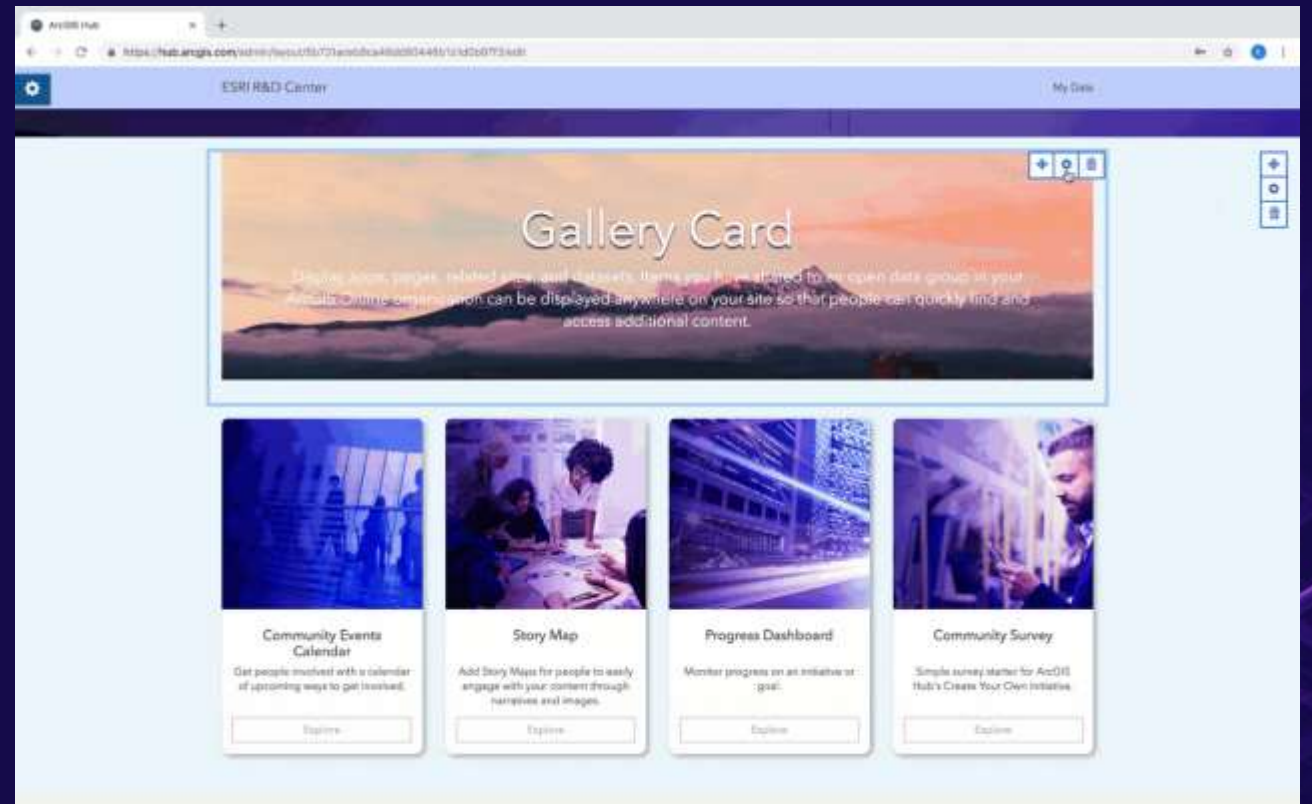
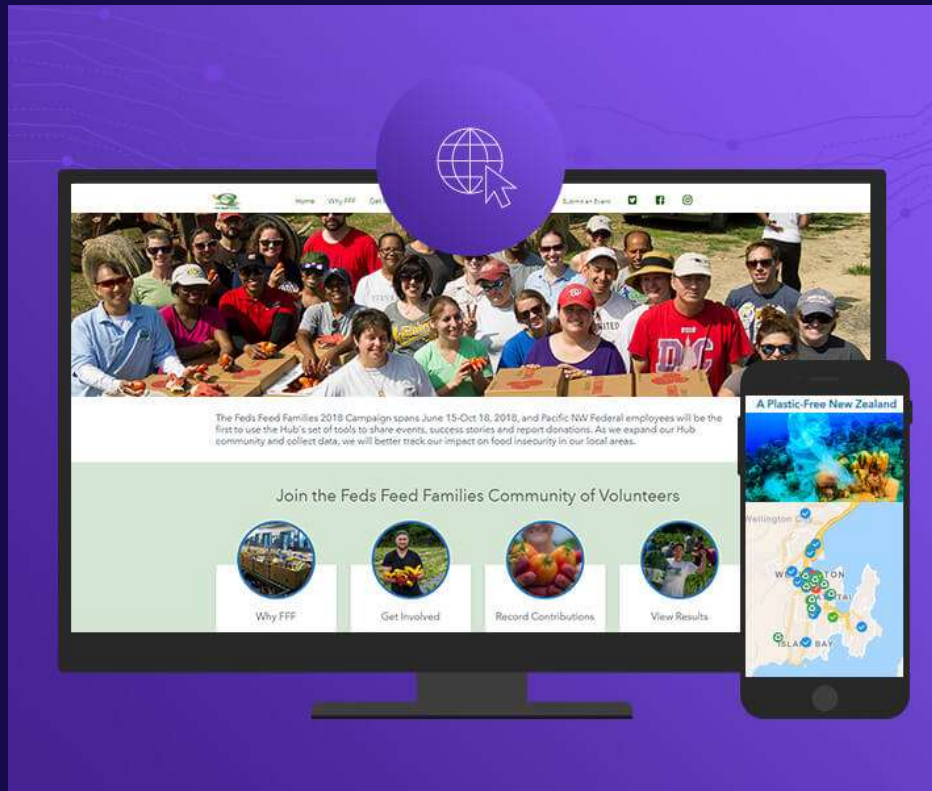
Custom Data collection

- User friendly at Patwari level
- Local language
- Split
- Merge
- Dimension based split



ArcGIS Hub and Site for Citizen Engagement

- ArcGIS Enterprise Sites allows you to create a tailored web page experience for your users to help you share your portal's authoritative GIS data to other departments more easily, even if they are not used to working in your GIS.



Workflow management from Lab to Field

- Automate Production process of Map
- Allocate Job
- Automate repetitive manual tasks such as data preparation and cleanup

Job Name	Assigned To	Status	Progress	Start Date
EDITS_14901	cpinas	Ready To Work	0	8/18/14, 12:00 PM
ForestJob_54437	tsipa477	Closed	100	6/16/13, 12:00 PM
Map Authoring 17201	Managers	Waiting	0	1-28/14, 12:00 PM
Map Request 4037	Managers	Closed	100	5/14/13, 12:00 PM
ForestJob_5262	Technicians	Ready To Work	0	10/7/13, 12:00 PM
Map Request 4483	tsipa477	Closed	100	5/13/13, 1:30 PM
EDITS_10801	Managers	Closed	100	9/17/13, 12:00 PM
JOB_801	Technicians	Closed	100	6/24/13, 12:00 PM
Map Authoring 12401	Managers	Closed	100	9/10/13, 12:00 PM
Map Request 4801	Managers	Closed	100	9/10/13, 12:00 PM
Map Authoring 15201	Managers	Closed	100	9/10/13, 12:00 PM

Job Name	Assigned To	Status	Progress	Start Date
JOB_701	John Smith	Environmental Search	Waiting	8/26/13, 12:00 PM
JOB_901	John Smith	Environmental Search	Waiting	10/24/15, 13:00 PM
JOB_101	John Smith	Environmental Search	Waiting	8/4/16, 12:00 PM
JOB_110	John Smith	Environmental Search	Waiting	7/30/17, 12:00 PM
JOB_120	John Smith	Environmental Search	Waiting	3/4/18, 12:00 PM
JOB_130	John Smith	Environmental Search	Waiting	8/8/13, 12:00 PM
JOB_140	John Smith	Environmental Search	Waiting	3/2/16, 12:00 PM
JOB_150	John Smith	Environmental Search	Waiting	5/14/13, 12:00 PM
JOB_160	John Smith	Environmental Search	Waiting	10/1/13, 12:00 PM
JOB_170	John Smith	Environmental Search	Waiting	11/1/13, 7:00 PM
JOB_180	John Smith	Environmental Search	Waiting	9/18/13, 12:00 PM
JOB_190	John Smith	Environmental Search	Waiting	4/26/13, 12:00 PM
JOB_200	John Smith	Environmental Search	Waiting	9/11/13, 12:00 PM

Web App for Generation of PDFs of Property Card



District (जिल्हा)		Taluk (ताहसील)		Block (ब्लॉक)		Gram Panchayat (ग्राम पंचायत)		Police Station (पोलीस)		Village Code : Name (गाव कोड : नाव)		Survey Year (संक्षिप्त वर्ष)		Document No. (अप्लिकेशन नं.)	
Mumbai		Mumbai		Trombay		Trombay		Trombay		164577		2020		16457700042	
1. Aashli Gate Number (आश्ली गेट नंबर)		2. Plot No. (प्लॉट नं.)		3. Property Unique ID No. (प्लॉट का यूनिक आईडी नं.)		4. Property Classification (कॉमर्स/रेसिडेंस)		5. Area of property (in sq.m.) (प्लॉट का क्षेत्रफल (चौकड़ेंटर मी.))		6. Dimensions (in m) (आयाम (मीटर मी.))		7. Property Sketch (नकाशे नक्शा)			
103		64		164577000401		4.1 Type (श्रेणी)		4.2 Sub Type (उप श्रेणी)		No. of Sides (प्लॉट की ओरों)		Lengths of Sides (प्लॉट की लंबाई)			
8. Bounded by - East (पूर्व चौकटी)		9. Bounded by - West (पश्चिम चौकटी)		10. Bounded by - North (उत्तर चौकटी)		11. Bounded by - South (दक्षिण चौकटी)									
12. Owners' Names (मू. स्वामियों के नाम)		13. Father/Mother/Husband/Wife Name (पिता / माता / पति / पत्नी का नाम)		14. Address of Owner (मू. स्वामी का पता)		15. Share of Owner (मू. स्वामी का हिस्सा)		16. GP Resolution No. and Date (गाविका प्रस्ताव संख्या एवं तिथि)							
राम प्रियम		रुद्रे लाल		राम प्रियम		1/2		12							
17. Remark (अभिलेखित)		18. Printed Date (मुद्रित तिथि)		19. Printing id (मुद्रित आईडी)		20. Service Charge (सेवा चार्ज)		21. Place of Issue (जारी करने का स्थान)		22. QR Code (क्यूआर कोड)		Digital Signature (डिजिटल सिग्नेचर)			
		2020-10-10 11:10		164577000401				महाराष्ट्र				ANOOOP KUMAR SRIVASTAVA 2020-09-19 20:35:21.347		Assistant Record Officer (सहायक अभिलेख अधिकारी), ताहसील : महाराष्ट्र, जिल्हा : मुंबई	

Project Progress dashboards- District/State Level

