



### Connectivity for Ease of Working, Learning and Living

Amidst the COVID-19 crisis, our world is undergoing a major transformation. Today, economic activities are being stimulated by billions of online connections among people, businesses, devices, data and processes, leading to the emergence of the "digital economy". Similarly, education is largely being imparted in virtual classrooms, and work from home, or remote working, has become the "new normal". However, this digital transformation is incomplete until we ensure that all of us are 'connected'. According to the World Economic Forum, among the many inequalities exposed by

population) lack reliable access to broadband Internet. So, it's no surprise that President Joe Biden's infrastructure plan calls for investing \$100 billion to expand high-speed Internet connectivity, though experts argue that the administration is underestimating the need for broadband and that significantly more funding is required. A report developed by Boston Consulting Group in partnership with Common Sense suggests that nine million students in the US lack both home connectivity and an Internet-enabled device. The study finds that such vulnerable students are

poorest households, mostly based in rural areas, only 2.7% have access to a computer and 8.9% to the Internet. Poor or no connectivity particularly puts women at a disadvantage. According to the mobile gender gap report 2020, women and girls in India have limited access to technology, especially mobile phones and Internet. The overall gap between men and women when it comes to mobile Internet users is one of the highest amongst low and middle-income countries — 50%. Most women, especially in rural areas, have shared phones or one phone in the family, and even those who own



the pandemic, the digital divide is not only one of the starkest but is also among the most surprising. Mind you, this divide is not just reflected in developing or underdeveloped countries but is quite visible even in developed nations.

Take, for instance, the case of United States. According to reports, an estimated 21.3 million Americans (around 6.5% of the country's

mostly living in rural areas, federally subsidized or unstable housing, and are impacted by a variety of other demographic factors, including poverty.

Nearly 12,000 km away in India, the picture isn't too different. A recent report by Lancet Commission's India Task Force reveals that only 24% of the country's households have access to the Internet. Of the

personal devices have brick or basic phones which do not have Internet access.

The COVID-19 pandemic, while being an unprecedented crisis, is a unique opportunity for the world to wake up to the digital divide and ensure connectivity for all, so that there can be ease of working, ease of learning, and ease of living.





# DRONE MAPPING

by GA R.Turuva



From mining to construction, topographical surveying is essential for getting the job right. The rise of drone technology is changing the way surveying is done, making it accessible to a wide range of industries. Drones offer enormous opportunities for surveyors and GIS professionals. With the help of drones, it is possible to carry out surveys and process and deliver surveying data in a timely, accurate and safe way. Using drones for surveying and mapping has many advantages.

Surveying with a drone offers enormous potential to GIS professionals. With a drone, it is possible to carry out topographic surveys of the same quality as the highly accurate measurements collected by traditional methods, but in a fraction of the time. This substantially reduces the cost of a site survey and the workload of specialists in the field.

## What are drones used for in Land Management/Mapping and its Value?

**Land Use planning**  
The development of increasingly dense and complex areas requires intensive planning and therefore time-consuming and expensive data collection. Thanks to drones, urban land use planners can collect large amounts of up-to-date data in a short period of time and with far less staff. The images produced in this way allow planners to examine the existing social and environmental conditions of the sites and consider the impact of different scenarios.

For technical teams/geospatial information officers, when a new subdivision is proposed respective to its land tenure, the officers may

utilise drone technology to capture and collect real time data in a short amount of time. Remote areas which are difficult to access can be captured using drones with limited number of staffs which proves to be efficient in terms of time and the manpower needed. The images taken by the drones will be processed and can be used in field work with the latest roads, streets etc which will assist in navigating during LDVC inspections, Reassessment Inspections and etc.

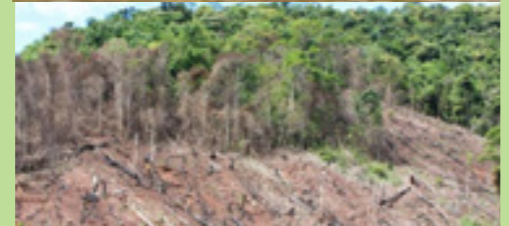
For R&D Department, drone technology will be crucial in determining:

**Land Use Cover Mapping** – Using real time images collected from Drones will then be overlaid with cadastral data, leasemaster, TLC and other relevant information. As to classify the land use types merged with the High-Res Imagery. This will be incredibly helpful in the compilation of papers, reports etc.

## Inspections

- Reassessment Inspection
- Monitoring
- Compliance Inspection
- EIA Screening Inspection
- Logging/ Gravel Extraction

The results from these inspections a very more detailed and precise as



the data is collected with limited time and staff which will reduce time and resources consumed.

## Marketing and Quality Advertising

The Tourism Dept may well utilise drone technology to provide a visual interpretation of tourism concepts to clients and landowners. In addition to aerial photographs and video, work in real estate drone photography can include capturing enough visual data to create a 3D or Orth mosaic map of a property. Potential buyers can use these maps to familiarize themselves with it as they consider making a purchase. When it comes to drone footage and photography, you can use these powerful tools in many of your already-established marketing strategies. Incorporate drone video footage in the organizations: Website & landing pages. Social media channels.

## Land surveying / cartography

Survey drones generate high-resolution Orth mosaics and detailed 3D models of areas where low-quality, outdated or even no data, are available. They thus enable high-accuracy cadastral maps to be produced quickly and easily, even in complex or difficult to access environments. Surveyors/Planners can also extract features from the images, such as signs, curbs, road markers, fire hydrants and drains After post-processing with a photogrammetry software, these same images can produce incredibly detailed elevation models, contour lines and break lines, as well as 3D reconstructions of land sites or buildings.

## Drone Image Processing Software

Drone2Map for ArcGIS is a desktop

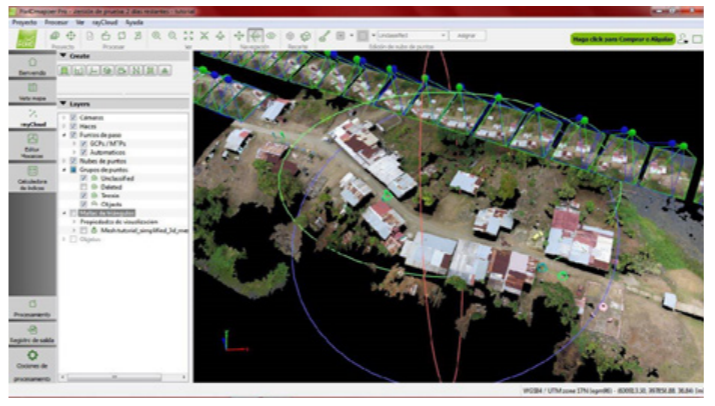


app that takes geolocated pictures from drones of all shapes and sizes. The app detects camera and sensor parameters and then intelligently applies appropriate defaults and creates professional imagery products, such as orthomosaics and 3D meshes—in minutes—not days. The photogrammetry engine in Drone2Map for ArcGIS is powered by Pix4D, an industry leader in professional image processing software.

These products can be used for visualization and analysis in ArcGIS. Land analysis, infrastructure inspection, and monitoring are just three of the many ways this imagery can be used in ArcGIS. Other areas that can benefit from Drone2Map for ArcGIS include defense, law enforcement, precision agriculture, forestry, disaster response, asset and facility management, transportation, insurance, real estate, city planning, and mining.

**Pix4D** - This professional photogrammetry software uses images to generate point clouds, digital surface and terrain models, Orth mosaics, textured models and more. It is most often used by geospatial professionals such as surveyors and civil engineers.

## Weighing the Costs of Hiring Drone



## Services and Purchasing a Drone.

- Hiring Drone Services

Commercial drone service providers can charge a rate of \$100-\$500 per hour, depending on the industry, with the most used rate being about \$150 per hour. Real estate photography services tend to be priced closer to \$150 per hour, while oil & gas services are at the higher end of the range.

Industry	Average hourly rates by industry*
Real Estate	\$158
Agricultural	\$160
Construction	\$167
Surveying	\$175
Emergency Response	\$170
Mining	\$183

\*Based on survey results of an industry study conducted by Drone Services.

With the number of pending number of applications daily, we can say that the use of drone services will be needed on a daily basis, however, that will be time consuming, and resources will be wasted. Perhaps if once fortnightly drone services could be carried out as to provide a conducive result which will mount to average cost of over \$4000 annually. An added benefit is not having to be concerned on maintenance issues and the battery malfunctions as they a brittle gadget which will need trained personals to operate.

## Purchasing a Drone

In the initial stages of purchasing a drone has a abundantly long process in terms of obtaining a suitable drone capable of carrying out its job. Operators must complete the FAA test and receive Part 107 certification to be a licensed operator including the permits for operating under recreational or commercial purposes. Taking into consideration the maintenance of the delicate machines which charge at \$2000 - \$3000 depending on the bundle

of accessories equipped with the drone DJI Phantom 4 Pro V2

## Training and Certifications

At the bare minimum, every professional drone pilot has spent \$160 on passing their Aeronautical Knowledge Test, and most likely a training course (\$150-\$300) to help them pass the test. On top of that there are the hours of flight time mastering drone flight skills, and in many cases more training courses to help them specialize in a particular industry or application. These training courses can range in price from \$300-\$2,500, or even upwards, depending on the specific industry.

For example, you can take a real estate drone course to learn all about how to make a business shooting real estate photos with your drone for around \$350. At the higher end, getting a certification in thermal imaging for applications such as emergency services or industrial inspections will run somewhere around \$2,000.

Finally, if it is decided to bring the drone project in-house, remember that it may take some time to get all of the pieces in place. If you train an existing employee to do the job, the licensing process may take a few months; if you're hiring a licensed operator, they may need a little time to come up to speed on your application.





## CUSTOMISED SCRIPT TO PREVENT DOUBLE LEASING CHARTING



GIS has been labelled as a risk to TLTB operations in the past because of issues that can be directly linked to officer negligence and not adhering to EOM for geospatial processes. The most notable of these is charting of a new lease polygon over the existing lease master layer creating double or overlapping leases.

This issue has created a somewhat tainted image for the Board with some tenants choosing to take their problems straight to the Prime Minister's Office. Obviously this is upsetting news for the Honourable Prime Minister being the chairman of the TLTB Board of Trustees. Because of this, he had discussed the issue with CEO, Mr Tevita Kuruvakadua who has issued an ultimatum to have zero double leasing in 2021. This has been stressed numerous times by Deputy General Manager Operations, Research & Development, Mr Solomon Nata in internal meetings.

This challenge has created increased awareness amongst geospatial officers and TLTB as a whole, as it's driven by the Chairman of the Board and Executive Management.

To that extent, the Geospatial Committee and subsequently the IT Development & Monitoring Committee discussed and endorsed the creation of a script to try and work around this issue by returning an error if the new polygon overlaps with an existing polygon in the lease master live layer.

Common causes of errors leading to

double leasing are:

1. Geospatial skills - lack of know how on important aspects of surveying and mapping (projection, coordinate system, map scales and orientation)
2. Laxity in following correct processes
3. Illegal motives - collusion with others

### The Script

The SQL script was programmed by an external contractor with the assistance of new Geospatial Developer, Systems Analyst, Mr Sharukh Shar and was tested thoroughly by the IT Geospatial team and Land Use Planner Mr Ravi Singh. It is installed on the database end of the Board's ArcGIS platform where it will screen all new edits on the live lease master layer.

The script won't allow any new overlapping polygons in lease master from being saved and will return an error as shown in the picture above. All other GIS layer editing functions like adding, subtracting nodes, moving boundary vertices, creating new lease polygons within existing lease (subletting) can be done as long as they don't overlap with an existing polygon. This will in turn create clean geospatial layers and maps.

Subdivided lots within an existing lease has to be treated differently as the script will treat it as double leasing. The way around this is to chart the new lease and clip old lease layer so there is no overlap.

Much of the geospatial processes around new innovations like this will involve changes in existing processes but as technical people, geospatial officers should keep updated with changes in their industry through media, internet and effective networking.

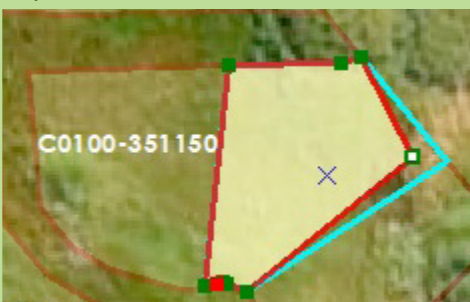
Double leasing is morally and legally wrong. We must work together to eliminate it and have zero double leasing in future.

### Sample Case

In the picture above, the NW geospatial team have to chart 3 new polygons (new leases) on lease master and faced problems with the script.

The team in collaboration with the Geospatial team at HO had to approach this task systematically, the steps of which are listed below.

1. Make lease master layer editable and right click to enable vertices.
2. Nodes are moved with snap enabled using a low tolerance
3. The Clip Tool is used to cut any possible overlap on new polygon.
4. Save and check that it's updated.



## TLTB SURPASSES 25,000 COMPLETED SURVEYS IN ARCGIS PLATFORM

Survey 123 is the most utilised app in the ArcGIS Online Suite in the case of TLTB. In just over 6 years, there have been 25,634 surveys in total captured within the app that has 12 working survey templates in total.

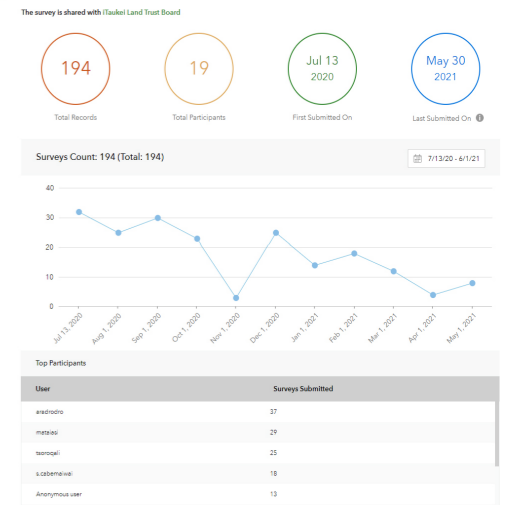
The most utilised survey is the 360 Non-Agriculture survey, which is normal in our operation as it includes all our lease types other than agriculture. A total of 19,731 surveys have been logged using this template accounting for over 76% of total app utilisation. The template for all lease types is 2nd on utilisation at 6% followed by LDVC Inspections and Arrears with 5% and 4.3% respectively. Development brief (2.3%), Community survey (2.18%) and LOU Consultation Meeting (1.82%) all have under 600 surveys completed. The new Consultation 2021 has a disappointing 194 recorded surveys since its creation in July 2020. Similarly, there are just 2 surveys completed for Tourism 360 so far.

Template Name	Logged	%
Consultation 2021	194	0.76
Community Survey	558	2.18
TLTB IT Form	44	0.17
Reaction level	100	0.39
LOU Consultation Meeting	466	1.82
Arrears	1,101	4.30
Tourism360	2	0.01
LDVC	1,287	5.02
360 Non Agriculture	19,731	76.97
360 All Lease Types	1,561	6.09
Development Brief	590	2.30
	25,634	

### The Consultation 2021 Survey

TLTB as an organisation is represented in a wide variety of meetings from Mataqali, Village, Tikina and Yasana to Government, shareholder and investors. The total number of meetings is hard to ascertain as records of these are often held within the various departments, regions or with the officer concerned. The survey 123 template - Consultation 2021, is an attempt to digitally record all the meetings and geolocate the meeting location so geospatial analysis can

be carried out later. This survey has been edited to include all meeting types that TLTB officers attend to in their day to day work. It includes lease application, LAU meeting, awareness, tenant dispute, LOU dispute, boundary dispute, fund distribution, financial literacy, government tour, reserve meeting, tikina council, seed fund grant and others.



# NEW NORMAL PROTOCOL

## AVOID TOUCHING

# M E N

**M** MOUTH      **E** EYES      **N** NOSE

## INSTEAD FOLLOW

# W O M E N

**W** - WASH YOUR HANDS      **O** - OBEY SOCIAL DISTANCING      **M** - MASK UP

**E** - EXERCISE & EAT WELL      **N** - NO UNNECESSARY TRAVELLING



# ARCGIS ONLINE UTILISATION STATS - APRIL

Created  
7/8/2014

Renewal Date  
6/1/2022

Credits Remaining  
19,877.88

Quick Date Select ▾

Start: 4/1/2021 ▾

End: 4/30/2021 ▾

Credits

Content

Apps

Members

Groups

Apr 1, 2021, 12:00:00 AM GMT - Apr 30, 2021, 12:00:00 AM GMT

Interact with the charts, tables and map in this report to explore content activity and usage

## Content Summary

141

Items This Period

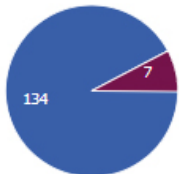
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Contributors

## Contributors

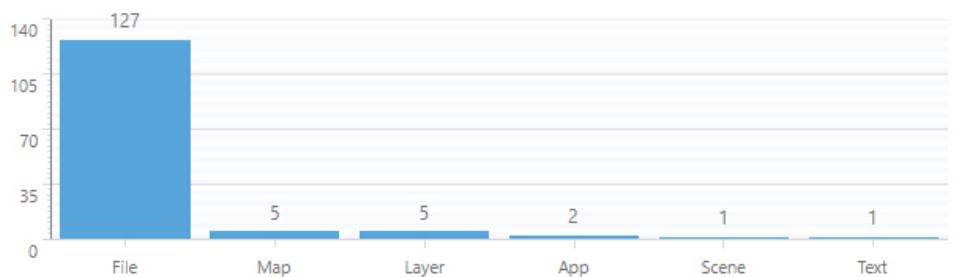
Member	Items
Inailolo	44
mnadakua	21
tltbgis	17
a.qiolevu	16
rturuva	9
btawake	7
buwawa	5

## Sharing Summary



- Public
- Private
- Organization
- Group

## Content Details



Item Name	Type	Member	Access
LOU Consultation Meeting	Form	tltbgis	Organizati...
PNB1_CE (2)	Feature Service	buwawa	Organizati...
CCMS Layer 2021	Feature Service	rturuva	Organizati...
Villages Polygons	Feature Service	rturuva	Private
NW CBUL 2021	Mobile Map Pack...	icorerrega	Organizati...
Pending Notices Batch 1 - CE Region	Web Map	buwawa	Organizati...
Rivers Polygons	Feature Service	rturuva	Private
Land Owning Affairs Unit Layer	Feature Service	rturuva	Private
360 Non Agriculture_OID20411_20210420092857	Microsoft Word	Inailolo	Private
360 Non Agriculture_12 records_20210419111855	Code Sample	btawake	Private
360Inspection All Lease Type_30 records_2021041609...	Code Sample	tltbgis	Private
360Inspection All Lease Type_2 records_20210419112...	Code Sample	btawake	Private
360 Non Agriculture_OID20198_20210414105315	Microsoft Word	mnadakua	Private
agriculture	Mobile Map Pack...	rsingh1	Organizati...
Mataqali	Web Map	rturuva	Private
360Inspection All Lease Type_34 records_2021041214...	Code Sample	mnadakua	Private

## MEET THE NORTH WEST GEOSPATIAL TEAM



**GIOI Tomu Vatucicila**



**GIOII Adrea Mocelutu**



**GIA Peni Matai**



**TGIA Anasa Qutonilaba**