

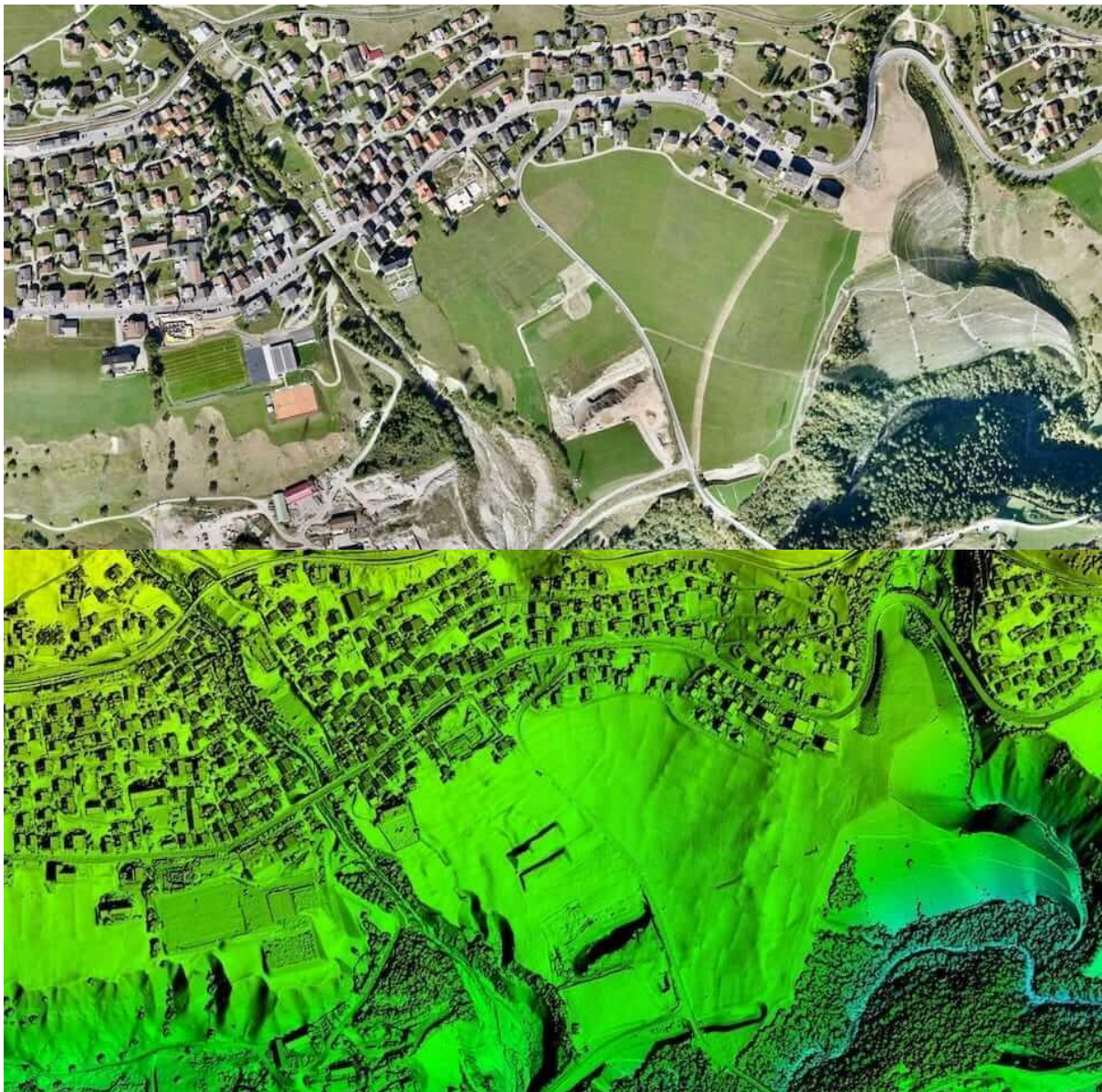
# MAPS TODAY

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Issue 15 – May-Oct 2021



GeoMap Society (GEMS)



Dept of Geography  
Osmania University

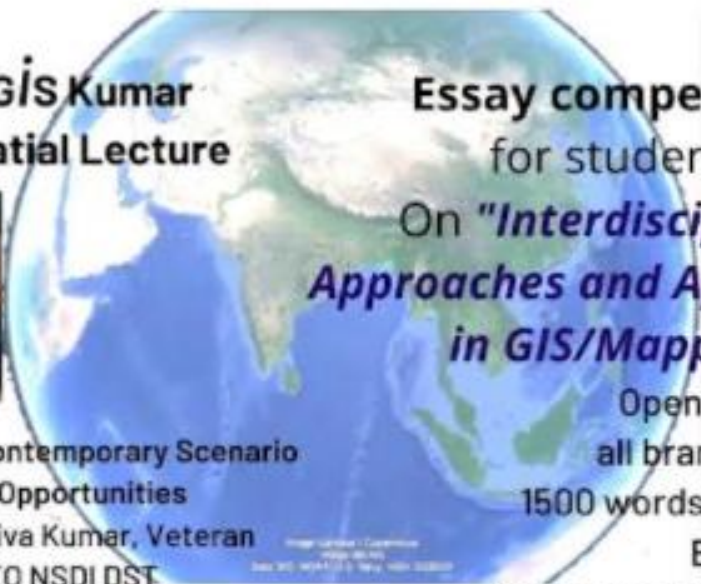


# International GIS Day Celebrations

Celebrating *GIS* Kumar  
Annual GeoSpatial Lecture



GIS Technologies- Contemporary Scenario  
& Emerging Opportunities  
By Maj Gen Dr R Siva Kumar, Veteran  
Former CEO NSDI DST



Essay competition  
for students



On "*Interdisciplinary  
Approaches and Applications  
in GIS/Mapping*"

Open to students of  
all branches and ages  
1500 words limit in english  
Essays to reach  
[geomapsociety@gmail.com](mailto:geomapsociety@gmail.com)  
by 15 Nov 2021

Main event on  
Wednesday 17 Nov 2021 at 3pm  
At Conference Hall, Dept of Geography  
Osmania University

Attractive cash prizes  
& certificates  
to all participants



RSVP:  
Maj Shiva Kiran- 9849047827  
Prof B Srinagesh- 9490792423





**GeoMap Society (GEMS)**

**Dept of Geography  
Osmania University**

On the occasion of  
**International GIS Day**  
At 3PM on Wednesday 17 Nov 2021  
At Conference Hall, Dept of Geography  
**Osmania University**  
Invites you to

The Inaugural of  
Celebrating GIS Kumar  
Annual GeoSpatial Lecture  
By  
Maj Gen Dr R Siva Kumar, Veteran  
Former CEO NSDI DST

Presentation ceremony  
Essay competition  
for students  
On "Interdisciplinary Approaches  
and Applications in GIS/Mapping"

**Chief Guest- Dr N Satyanarayana, IAS**  
Commissioner and Director Municipal Administration CDMA Government of  
Telanagana

Guest of Honour- Prof A Bala Kishan, Dean, Faculty of Sciences, OU  
Presided by Prof B Srinagesh, HOD, Geography Dept, OU

RSVP:

Maj Shiva Kiran- 9849047827

Prof B Srinagesh- 9490792423

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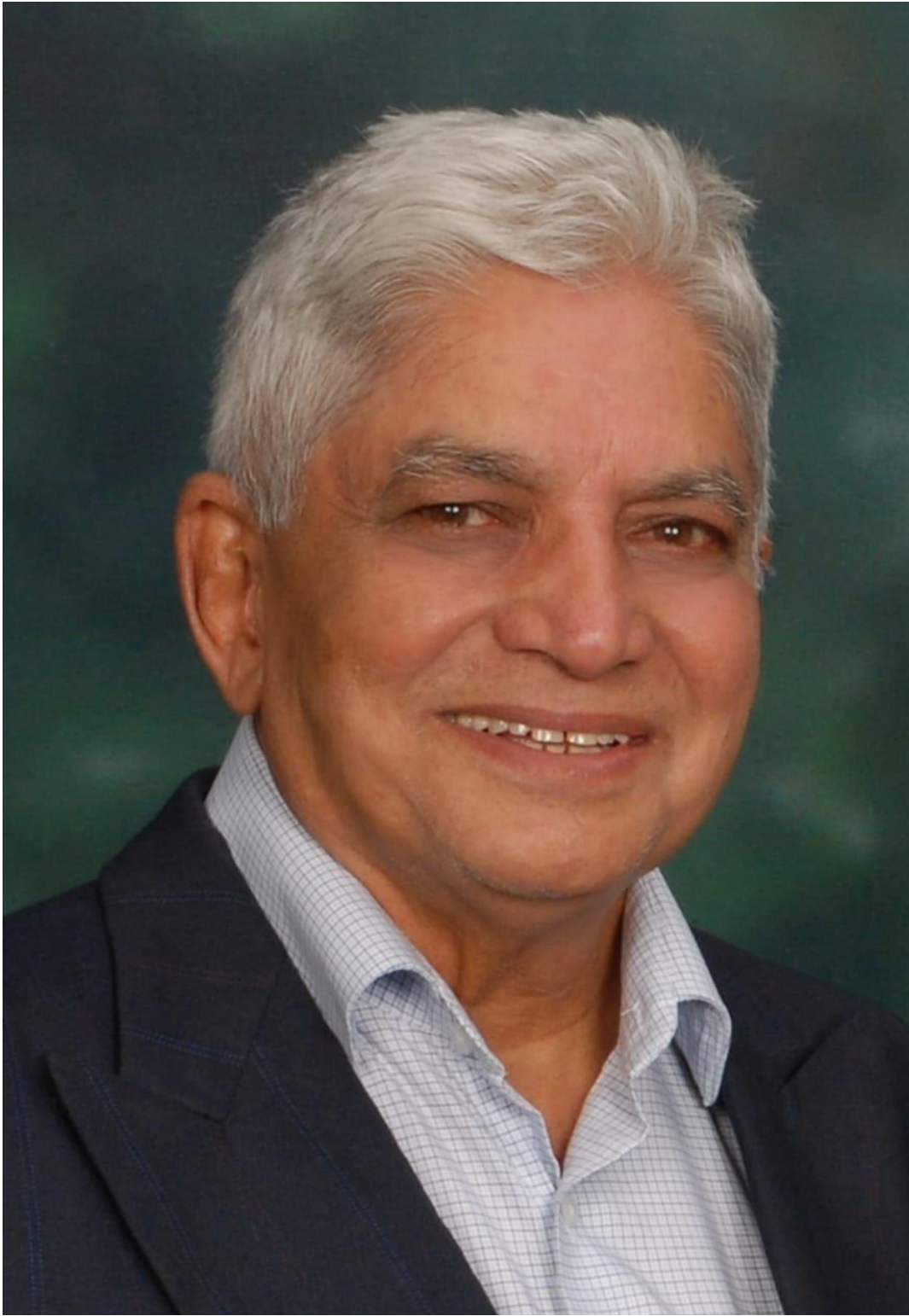
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**In loving memory of GS Kumar**



**GS Kumar- Former Director of Survey of India (1938-2021)**

Sri GS Kumar, former Director, Survey of India, known for his pioneering contribution to the GeoSpatial Industry, passed away yesterday. He was 83. An alumnus of the Civil Engineering Department of the Osmania University of 1962, GS Kumar went onto join the Survey of India (1963) after a short stint in the State Irrigation department. In Survey of India, he acquired experience in various aspects of Surveying and Mapping which included – Irrigation Project surveys, Town Surveys, Control Surveys, Photogrammetry, Research and Training.

In Survey of India, he began his career as Super-in-tending surveyor and took voluntary retirement as Director in 1992. Since then he was associated with the private sector as consultant and founding Chairman of MapWorld Technologies Ltd & GeoMap Systems Pvt Ltd. He pioneered GIS and Photogrammetry applications while organizing over 100 GIS/Photogrammetry Training Programmes. Widely travelled, guest faculty in Geomatics at several Institutions.

He was the first Indian to pursue a programme on “Aerial Photography” from ITC, Netherlands. He authored a book on “Aerial Photography” as also another book on “Fundamentals of GIS” besides publishing books on GPS. He completed M.Phil in Development Studies with dissertation related to GIS (1991).

Popularly known as GIS Kumar he is credited with starting Asia’s first journal

on GIS (Geographic Information System), “GIS India” in 1992, now an online journal “Maps Today”. As managing editor of the journal he strived to bring about awareness on GIS and mapping. He organised several national and international conferences on GIS, Mapping and Surveying. He is credited with introducing the system of Licensed Surveyors for cadastral surveys in the country. He also introduced the popular “GeoMap Quiz” Programme for school children. He was actively associated with the Institution of Engineers, Institution of Surveyors, Indian National Cartographic Association (INCA), and Engineering Staff College of India.

He was also the Correspondent of the Nishulk Prabhat Hindi / Telugu School at Khairatabad. The school and other children are supported by “Swati Foundation” for many years. He was a close confidante of Sri Vemuri Balram, Editor, Swati. He was associated with Swati magazine in its formative years. His wife Smt Janabai, had expired in Jan 2020. He is survived by his eldest son, Major G Shiva Kiran and younger son G Chandra Kiran.

He was a contemporary of Sri R Vidyasagar Rao, well known Irrigation Expert, Telangana. Dr DP Rao, Former Director, National Remote Sensing Centre (NRSC), Maj Gen (Dr)Siva Kumar , Dr Subba Rao, Former Surveyor General of India, Dr Raghavaswamy and Dr Prasanna Kumar, Chairman, Mahatma Gandhi National Council for Rural Education (MGNCRE) termed his demise as “a

loss to the Indian Geo Spatial Industry”.

### **A note from Shiva Kiran**

GS Kumar, my father left us on the 27<sup>th</sup> of May suddenly. The end was quiet and peaceful. That’s what a lot of my family and friends say. It was kind of a smooth transition. So much so that I expect him to just reach out anytime. His effervescent presence was such that he’d become me and us.

To the best part of my memory, Nanna (as me and my brother Chandra Kiran) called him; he was always involved / associated with us. “Detached Attachment” one of his many favs was what he practiced and believed in. Memories of our time at Bhubaneswar, where we would regularly read from “Adventures of Shivaji”- through guerrilla warfare, the clever Shivaji took on the treacherous Aurangzeb. It was a daily experience of action, drama and leadership much better than what is dished out today in the name of web series. The transfer to Madhupur, a small town in Bihar (Now in Jharkhand) where the Office, staff and the families stayed in one huge building called Sadhu Sanga on Pather chapti. His regular involvement with our studies at Carmel School. This was a punishment posting for him as he dared to take on the Military in Survey of India. A court case and the establishment was after him. But he took in on the chin and exactly like Shivaji, made an impact on the system and forced the government to change

the british legacy. So may calls / msgs from his colleagues and staff in Survey of India, the Class IV staff saw GOD in him, the staff a leader whom they could look upto, a mapping professional who felt that Mapping was the key to the country’s development. All along the urge to question remained. This spirit brought him and our family to the grace of Swatantra Senani Pandit Ramnandan Misra ji (affectionately called Babuji) who was associated with Mahatma Gandhi and Acharya Vinobha Bhave. Nanna’s many visits to Babuji at Dharbhanga brought in a metamorphosis in his attitude towards life and living. Our family’s association continued with Sri Vijay Misra ji (Babujis son). Whether Survey of India changed or not, Nanna did and with it a profound impact on all of us.

From Madhupur to Patna, to Nagpur, to Jabalpur and finally back again to Hyderabad in 1988-89. My brother Chandra Kiran remained with my parents whereas I had moved back to Hyderabad to be with my grandparents. Wherever he went ppl wanted him to settle down at that place. I often felt that both of them(him and my brother) were on the same intellectual plane and I had a lot of catching up to do.

He loved academics, topper from school days. He wrote the first book on “Aerial Photography” after a UN fellowship at the ITC, NetherLands. MPhil from CESS, BE -Osmania University.

After a short stint in the army, when I had to decide whether to come back to Hyderabad or continue, clear inputs from him made me decide to return, from 1995 to 2021 it's been quite a journey, mapping, environment management, GeoMap Quiz, MapWorld, GeoMap, Jana Mitra, GeoMap Society, Sukuki Exnora, Sukuki Apartments, Real estate, we thoroughly enjoyed the journey. GIS India, Asia's first journal on GIS- Geographic Information System. His friends would say he was GIS Kumar !!!

He would regale us with so many instances from the past that were just inspiring. His sports, ball badminton (Kumar Fives- Nanna, his brothers – Sasi, Vijay, Ramesh and my Grand father- G Sudershanum were a team), drama & theatre activities, writing and Publishing- Swati-the popular Telugu Monthly began in our garage- (Sri Vemuri Balaram acknowledges my father's contribution). Teacher, Professional, Yoga practioner, Homeopath, spirituality...he wore many hats with aplomb.

All our friends were his and his ours. There was no demarcation, all were family. In effect most of my friends would love to spend time with him. He could speak on anything under the sun. In most conversations he would advocate practising a healthy life- Yoga, and a positive attitude. Acceptance was his biggest strength.

To our entire family he was the eternal "Kumar Uncle"- esp on my mother's side. On his own side he was

respected and loved liked no one was. My uncles and aunts respected him and my cousins just loved and adored him.

In recent times his routine was- getting up early, preparing tea for the sanitation workers around our place by 6 in the morning, watching a bit of news and Brahma Kumari Sister Shivani from 630 to 7 am. Reading the newspapers from 7 to 8. Those were the best hours of my day too. He would keep a watch on the grand daughters- Sunandani, Malvika & Sunethra (SMS) and they could together set a house on fire. Malvika's 7 pm meditation calls was something he would eagerly look fwd to. Sunandani and Sunethra were truly blessed to have his physical presence to guide.

Institutions...

Survey of India, NRSC, Institution of Engineers, Institution of Surveyors, Engineering Staff College of India, WALAMTARI, Irrigation and Power Depts, Nishulk Prabhat, Osmania Graduates Association, GIS India, Maps Today, GeoMap Systems, Sukuki Exnora, Map World, GeoMap Society, JanaMitra, CARG

I acknowledge the presence of so many wonderful ppl in his life

Swatantra Senani Pandit Ram Nandan Misraji, Vijay Bhai and family

GIS / Mapping / Survey of India- NRSC

Dr DP Rao, Dr T Hanuman Chowdary, Prof Afzal Mohd, GS Oberoi, Prof Haragopal, VS Rao, KS



Bhatnagar, Gopal Krishna, IVM Murali Krishna, Brig Ahuja, Dr Murali Mohan, Dr Swarna Subba Rao, DR Raghavaswamy, P Satyanarayana, Sesa Rao, Ramana Kumar, Dr Ravi Gupta, Alla Rajesh, INrimit Subba Rao, NK Agarwal, HC Misra, Brig Dhal, MS Swamy, Dr Nagaraja, Dr Gangadhar, Dr Rameshwar Rao... Michael, B Khan, Rabindra Prasad, KP Misra, Srivastava

#### Family and friends

Pandurangam, Ishwar, Venkatesham, GH Naik, Murugkar Family, CD Sha, Chadda family, Rakesh Bhatnagar, KH Prasad, Dr Gita, Gayatri DP Rao, Namdev, Vardhanamma and family, Mohini, Padma, Surya, Gita & Hari, Mona Elizabeth, Taher & Asghar, Lateef, Neelkantam, Dr WG Prasanna Kumar, BT Srinivasan, Dr A Satyanarayana, Sudershan & Shankariah Family (Khairatabad Ganesh) Nishulk- Shравan Agarwal, Ashok Naredi, Gayatri, Rakesh, Jaywant, Dr Rajshekar Reddy (Homeo doctor), Ramchandrar, Sarojini, Rajendran (Advocate), Vamshi, Rama Krishna, Pradeep, Vinitha, Chitra, Nidhi, B Srinivas, Katti Raju, Amresh Mathur, Masthan, Venugopal, Sunil, Ravi Mathur, Murali Badam, Vanaja & Girija

Venkat Lakshmi, Pushpa, Meher, Shivani & Rama Krishna, Susheel & Indira, Shailendra, Vinay, Sabita, Priti-Kishore, Shilpa- Vijaya, Padma-Naveen & Praveen, Mahesh, Vinay, Vishal, Uday, Bharat, Kalyani- Sai, Surekha- Satyam, Uma-Suresh, Seenu-Renu, Krishna Kumari-

Suryanarayana, Aruna- Harnath, Jaya-Mohan, Ramesh- Amita, Vijay Kumar-Tara, Adinarayana, Prem Kishore

Chegoors, Gunturs.....

I am surely missing many of them, truly grateful for being part of GS Kumar.

My life time objective was to impress my father, be on his right side. Most of my family and our friends saw us as friends rather than father-son. We would fight, argue, collaborate, share, meditate laugh and were a team. He was blessed with a wonderful sense of humour- amongst the best was "To make God Laugh, tell him your Plans". Whether God Laughed or not, we sure did and he left with a smile on his face.

It was a life well lived, respected and loved and it was my privilege and honour to have him around for the best part of my journey . From the "known" to the "unknown" he would quip- in the context of surveying and mapping. Yes, from the supposedly known life he has transcended to the unknown. I am sure he used the correct map and GPS to get where he wanted to be.



## **GeoSpatial Community remembers GIS Kumar**

In an online remembrance session, GIS professionals shared their experiences with GS Kumar. He was a former director of Survey of India and pioneered GIS activity in the country.

Held as prelude to the longest day of the year-21<sup>st</sup> June, a geographically significant day more than 50 Geomatics professionals from Survey of India, NRSC spoke about GS Kumar's contribution to the field of surveying and mapping. The online meet was moderated by Major General (Retd) Siva Kumar, former head NSDI (National Spatial Data Infrastructure). He mentioned about how GS Kumar since 1981 took up promotion of spatial technologies in an inspiring way with passion, patience and perseverance. **Popularly known as GIS Kumar** he credited him with starting Asia's first journal on GIS (Geographic Information System), "GIS India" in 1992, now an online journal "Maps Today". As managing editor of the journal he strived to bring about awareness on GIS and mapping. He organised several national and international conferences on GIS, Mapping and Surveying. He is credited with introducing the system of Licensed Surveyors for cadastral surveys in the country. He also introduced the popular "GeoMap Quiz" Programme for school children. He was actively associated with the Institution of Engineers, Institution of Surveyors, Indian National Cartographic Association (INCA), and Engineering Staff College of India.



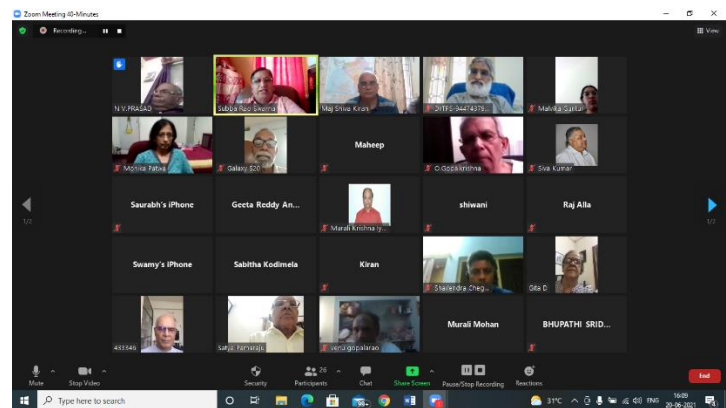
Dr DP Rao, former director of NRSC, spoke of his long association with GS Kumar and credited him with introducing photo gammatry as also unit rate system to promote geospatial entrepreneurship. He recalled the association at ITC Netherlands. He termed him “Ajata Shatru” in promoting technologies. The former Surveyor General of India, Dr Swarna Subba Rao, remembered GS Kumar’s contribution to removing the restriction policy on maps. Dr Raghavaswamy, Dr Sasi Kumar, Dr Pappan formerly of NRSC reminisced about his contribution and affable nature. Dr Maurali Mohan spoke about how he encouraged younger professionals to speak up.

Maheep Thapar, Monika Patwa, Mohini Gowri, Planners mentioned him as a mentor and a professional who provided an experiential discourse in GIS / Mapping. Rajesh Alla of IIC Technologies, P Satyanarayana and others spoke on GS Kumar’s ability to organise seminars and conferences on the subject.

Sri VS Rao, a mining professional spoke of his contribution to mining applications which were organised in association with Institution of Engineers and Engineering Staff College of India. Dr Sridhar, Head – Civil Engineering, Vasavi College of Engineering mentioned that GS Kumar was instrumental in starting the GeoSpatial elective in the college.

***Sri GS Kumar, former Director, Survey of India, known for his pioneering contribution to the***

***GeoSpatial Industry, passed away yesterday. He was 83. An alumnus of the Civil Engineering Department of the Osmania University of 1962, GS Kumar went onto join the Survey of India (1963) after a short stint in the State Irrigation department. In Survey of India, he acquired experience in various aspects of Surveying and Mapping which included – Irrigation Project surveys, Town Surveys, Control Surveys, Photogrammetry, Research and Training.***



[Fit-for-purpose Land Administration for All | GIM International \(gim-international.com\)](#)

## **Fit-for-purpose Land Administration for All**

By [Rohan Bennett](#), [Eva-Maria Unger](#) • May 19, 2020

Over the last decade, fit-for-purpose land administration (FFPLA) has developed into a viable philosophy with accompanying methodologies and tools for delivering land tenure security on a large scale. A new publication called '*Fit for Purpose Land Administration for All*', which is backed by Kadaster International, suggests that FFPLA should be recognized as a once-in-a-generation opportunity for all stakeholders, and specifically for private surveyors.

The methodologies and tools of FFPLA contribute to large-scale land tenure in several ways: by encouraging participatory approaches, simplifying legal procedures, streamlining institutional processes and making use of innovative frontrunners and leading-edge technologies. The benefits of the approach have been proven in many country contexts and FFPLA has been backed by the World Bank, International Federation of Surveyors (FIG) and UN-Habitat, amongst other leading agencies.

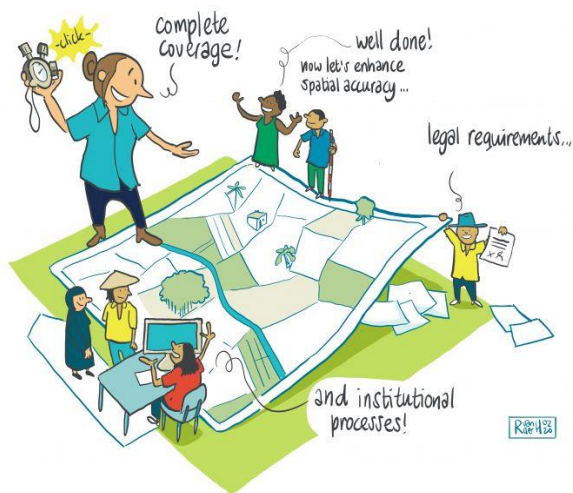
The FFPLA methodology emerged due to the problems with existing land administration approaches. Cadastral mapping and land registration activities are often slow, expensive and reliant on a few skilled professionals. In many countries, this has resulted in just a very small percentage of land rights

being formally recorded. This increases land disputes and uncontrolled development, decreases land productivity and may mean little or no government investment into land and infrastructure.

The aim of fit-for-purpose land administration is to achieve complete coverage and a complete overview first, and then improve incrementally over time, by enhancing spatial accuracy, legal requirements and institutional processes.

Whilst the benefits of FFPLA are now clear, it has still not yet become mainstream in many of the countries that need it most. FFPLA requires a whole-of-sector approach. In many countries, it is the role of the private sector to complete cadastral work. Although the need for FFPLA is often appreciated, private surveyors, lawyers, notaries, conveyancers and other land administration professionals rightly ask questions about its impact on job security and survey quality. Private surveyors were not involved in some FFPLA applications, and this highlighted the issue of stakeholder acceptance. For FFPLA to work in these countries, private surveyors also need to be on board. They must play a significant role in awareness raising, adoption, implementation and maintenance of FFPLA. The private sector is seen as essential for any level of scaled land administration in the developing world. Governments often lack the resources and technical capacity to sustain the land administration effort alone.





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Whilst the benefits of FFPLA are now clear, it has still not yet become mainstream in many of the countries that need it most. FFPLA requires a whole-of-sector approach. In many countries, it is the role of the private sector to complete cadastral work. Although the need for FFPLA is often appreciated, private surveyors, lawyers, notaries, conveyancers and other land administration professionals rightly ask questions about its impact on job security and survey quality. Private surveyors were not involved in some FFPLA applications, and this highlighted the issue of stakeholder acceptance. For FFPLA to work in these countries, private surveyors also need to be on board. They must play a significant role in awareness raising, adoption, implementation and maintenance of FFPLA. The private sector is seen as essential for any level of scaled land administration in the developing world. Governments often lack the resources and technical

capacity to sustain the land administration effort alone.

The work behind the new publication *Fit for Purpose Land Administration for All*, backed by Kadaster International, suggests FFPLA should be recognized as a once-in-a-generation opportunity for all stakeholders, and specifically for private surveyors. It maintains that, for those in the profession, FFPLA:

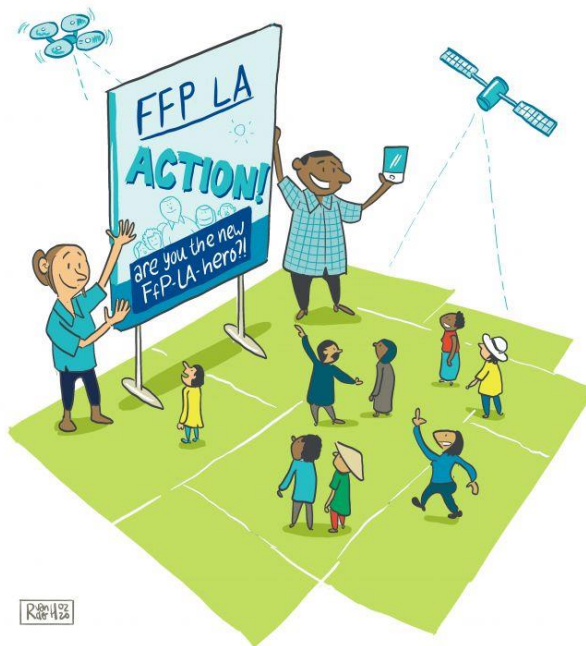
- Can mean more work and income, not less
- Will offer the opportunity to broaden professional horizons with the adoption of new technologies
- Presents opportunities for both undertaking and delivering new training
- Offers the opportunity to bring high-level technical leadership.

Moreover, the publication also busts a few myths, including by revealing that:

- Concerns over FFPLA accuracy and quality are hyped and misplaced
- Citizen confidence does not drop with the use of FFPLA
- Widespread FFPLA adoption can increase surveyor status and recognition
- Surveyors can play a role in raising awareness and helping to overcome legal and organizational blockers.

In many countries, many of the ingredients needed to make FFPLA a success are already in place. A willing, supportive and frontrunning surveying profession is essential. The new report

also shows how, through the adoption of FFPLA, surveying professionals will be playing a direct and meaningful role in responding to major societal concerns. This includes direct support to climate change response, disaster risk management, women's access to land, mass urban migration, overcoming conflicts and disputes, and the overall achievement of the 2030 Agenda and the Sustainable Development Goals (SDGs). In each case, the surveyor is a crucial community actor, delivering benefits to their community and raising the esteem of the profession... and all whilst doing business.



Actions can include undertaking FFPLA work in the field, educating the next generation of surveyors and taking up the role of FFPLA champion to advocate it across regional and global domains.

The publication provides guidance on pathways forward and support mechanisms for land sector professionals, including exposure to the global scene, key policies, agencies, resources and materials. A

simple self-assessment for countries helps to show land administration professionals and related associations where their country stands in terms of FFPLA uptake, and what actions are needed. Initial actions range from self-education and awareness-raising to instigating pilots and financing. Further actions can include undertaking FFPLA work in the field, educating the next generation of surveyors and taking up the role of FFPLA champion to advocate it across regional and global domains.

### **What is fit-for-purpose land administration?**

*Fit-for-purpose land administration (FFPLA) means that land administration systems should be designed to meet the need of tenure security for all in a relatively short time and at a relatively low cost, adapting relevant legal, spatial and institutional frameworks accordingly. The aim is to achieve complete coverage and a complete overview first, and then improve incrementally over time, by enhancing spatial accuracy, legal requirements and institutional processes.*

### **Fit for Purpose Land Administration for All**



*Rohan Bennett* Author

Rohan Bennett gained his PhD from the University of Melbourne, Australia. He is a geodetic advisor at Kadaster...



*Eva-Maria Unger* Author

Eva-Maria Unger is Land Administration Advisor at Kadaster International. She previously served as Chair of th...

**GIS / Map report on the status-District –Cases, Containment Zones & Beds-02052021**  
**Based on Daily Medical Bulletin report provided by Dept of Health-Govt of Telangana**

*Prepared by Maj Shiva Kiran, Phd-Development Studies & K Venugopal-GIS Engineer*

The Map depicts the status of the positive cases, CZs and Covid Care Beds as on 02 May 2021.

As compared to yesterday (01/5/2021) the districts of Suryapet and Vikarabad show a reducing trend. The border with AP on the eastern side does not seem to be a problem. Adilabad, KumaramBheem and Nirmal in the North Telangana show a reducing trend. The Southern districts show a reducing trend.

The western and central districts purportedly due to the Maharashtra border continue to show high number of cases. Districts of Sangareddy, Rangareddy, Medchal Malkajgiri and GHMC continue to be vulnerable.

The numbers on the map, placed at districts indicate Cases (today- 02 May 2021), Containment Zones and Beds respectively. GHMC area shows 1546 cases , 26 CZs and 910 CC centres Beds. showing increased cases, less CZs and same number of CC bedsreduced CZs meaning clustering.

Nizamabad with 301 cases shows no CZ !!!

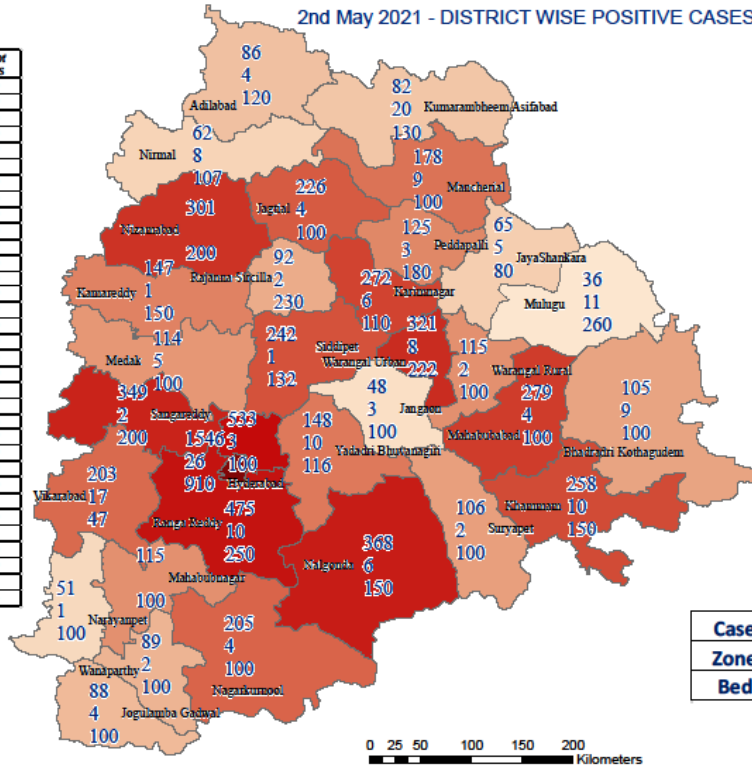
Beds availability is from Government hospitals

# TELANGANA STATE

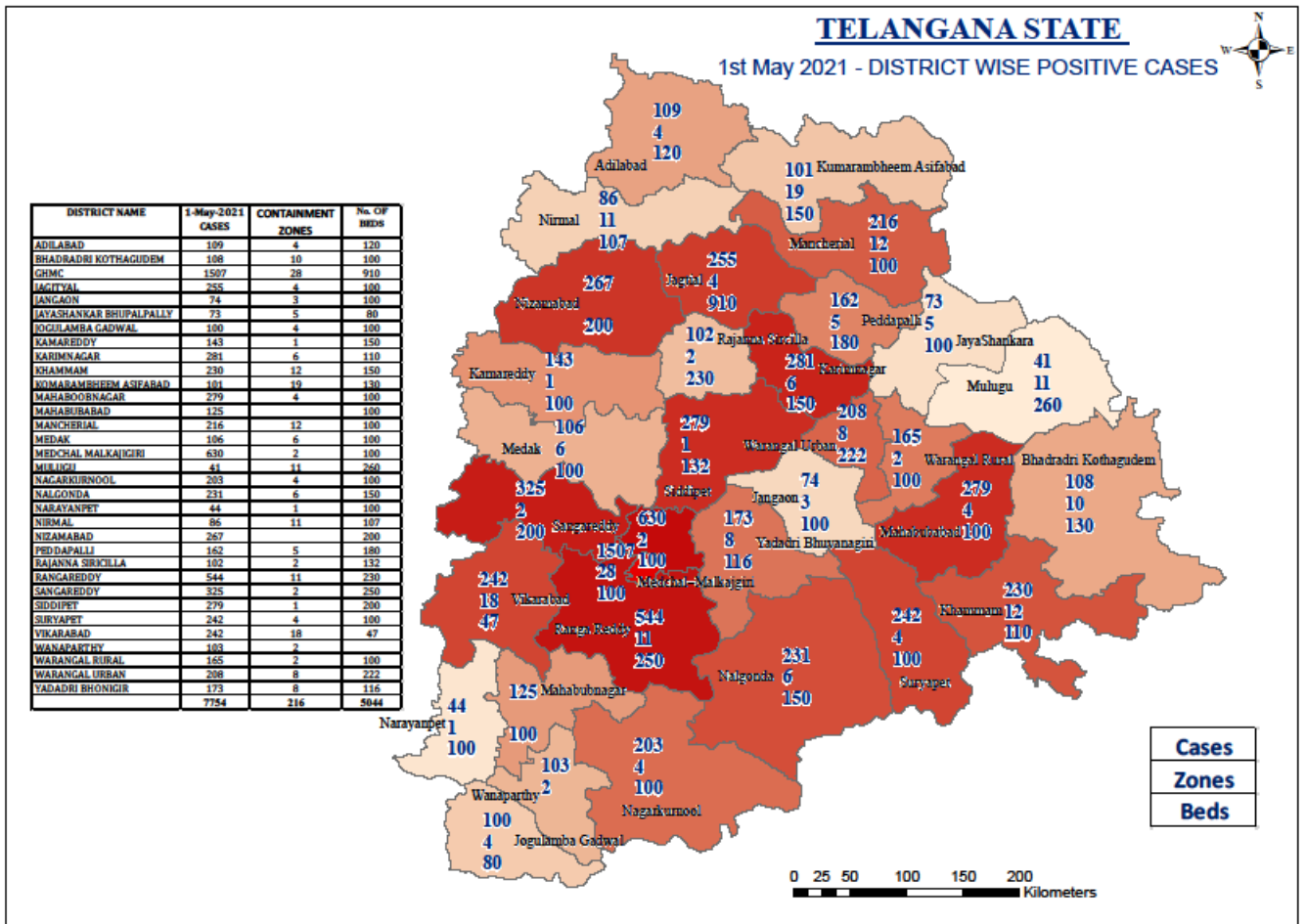
2nd May 2021 - DISTRICT WISE POSITIVE CASES



DISTRICT NAME	2nd May Cases	CONTAINMENT ZONES	No. Of BEDS
ADILABAD	86	4	120
BHADRADRI KOTHAGUDEM	105	9	100
GHMC	1546	26	910
JAGTYPAL	226	4	100
JANGAON	48	3	100
JAYASHANKAR BHUPALPALLY	65	5	80
JOGULAMBA GADWAL	88	4	100
KAMAREDDY	147	1	150
KARIMNAGAR	272	6	110
KHAMMAM	258	10	150
KUMARAMBHEEM ASIFABAD	82	20	130
MAHABOOBNAGAR	279	4	100
MAHABUBABAD	115	100	
MANCHERIAL	178	9	100
MEDAK	114	5	100
MEDCHAL MALKAJGIRI	533	3	100
MULUGU	36	11	260
NAGARKURNOOL	205	4	100
NALGONDA	368	6	150
NARAYANPET	51	1	100
NIRMAL	62	8	107
NIZAMABAD	301	3	200
PEDDAPALLI	125	3	180
RAJANNA SIRICILLA	92	2	230
RANGAREDDY	475	10	250
SANGAREDDY	249	2	200
SIDDIPET	242	1	132
SURYAPET	106	2	100
VIKARABAD	203	17	47
WANAPARTHY	89	2	100
WARANGAL RURAL	115	2	100
WARANGAL URBAN	321	8	222
YADADRI BHONGIR	148	10	116







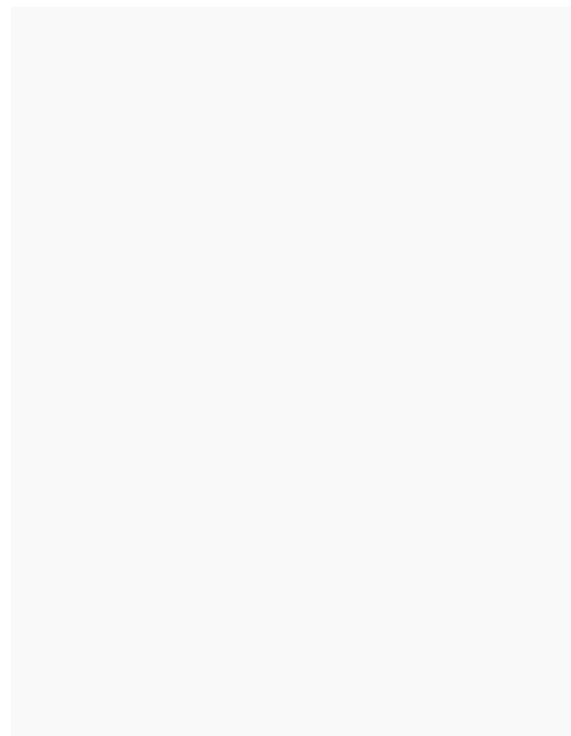
Date	Tests done	Positive cases
01 May	77930	7754
02 May	76330	7430

Patterns in GIS / Map analysis of case data 30 April and 01 May

Suryapet shows decreasing trend (Lighter shade of marron / red)

Western Districts other than Vikarabad leading onto GHMC show increase again.

Northern, Southern and Eastern Districts show continued reducing trends.

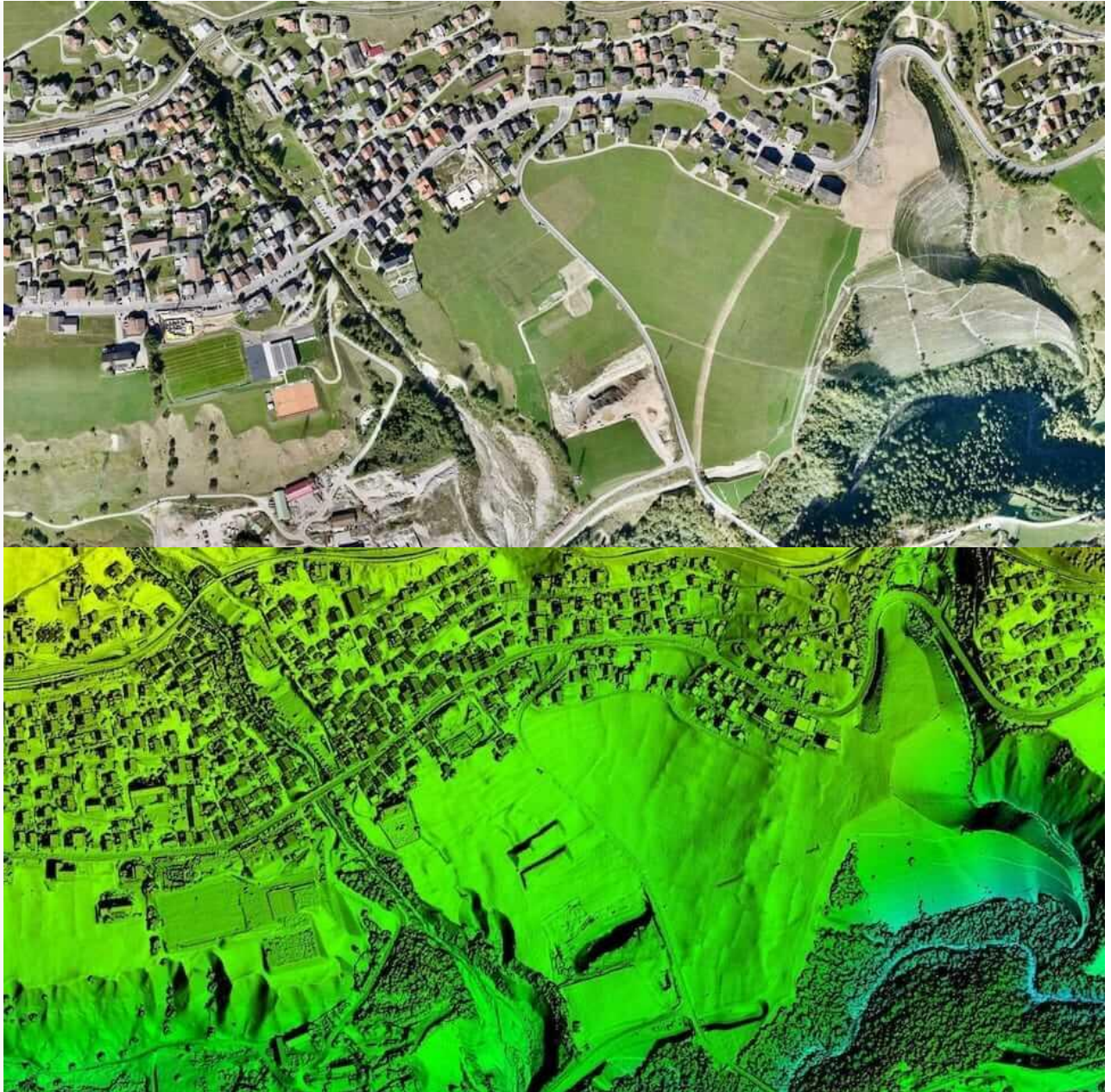


## SURVEYING WITH A DRONE

### Surveying & GIS

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.



Orthomosaic and digital surface model created from aerial images taken by the WingtraOne surveying and mapping drone

Surveying with a drone

1. What is meant by drone survey?

2. What are the benefits of drones in surveying?
3. What are drones used for in surveying?
4. What kinds of deliverables can you expect with drone surveying?
5. How accurate is a drone survey?
6. White Paper



- 7. What are the best drones for surveying?
- 8. How to do a drone survey?
- 9. How to process drone survey data?

- 10. What is the difference between lidar and photogrammetry?
- 11. Drone applications in specific industries

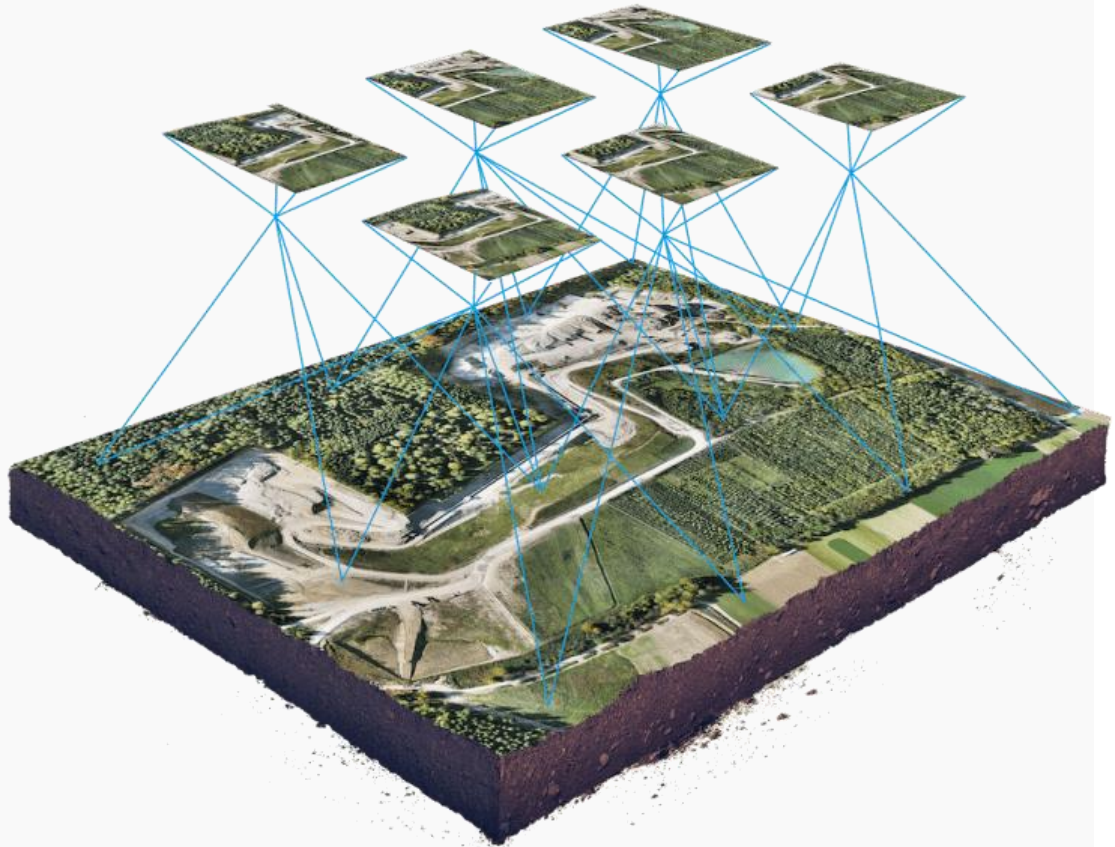
12. A drone survey refers to the use of a drone, or unmanned aerial vehicle (UAV), to capture aerial data with downward-facing sensors, such as RGB or multispectral cameras, and LIDAR payloads. During a drone survey with an RGB camera, the ground is

photographed several times from different angles, and each image is tagged with coordinates.



14. A drone survey refers to the use of a drone, or unmanned aerial vehicle (UAV), to capture aerial data with downward-facing sensors, such as RGB or multispectral cameras, and LIDAR payloads. During a

drone survey with an RGB camera, the ground is photographed several times from different angles, and each image is tagged with coordinates.



15.  
16. Photogrammetry combines images that contain the same point on the ground from multiple vantage points to yield detailed 2D and 3D maps.

17. From this data, a photogrammetry software can create geo-referenced orthomosaics, elevation models or 3D models of the project area. These maps can also be used to extract information such as highly-accurate distances or volumetric measurements.

18. Unlike manned aircraft or satellite imagery, drones can fly at a much lower altitude, making the generation of high-resolution, high-accuracy data, much faster, less expensive and independent of atmospheric conditions such as cloud cover.

19. What are the benefits of drones in surveying?



20.

21. Reduce field time and survey costs

22. Capturing topographic data with a drone is up to five times faster than with land-based methods and requires less manpower. With PPK geo-tagging, you also save time, as placing numerous GCPs is no longer necessary. You ultimately deliver your survey results faster and at a lower cost.





23.

24. Provide accurate and exhaustive data

25. Total stations only measure individual points. One drone flight produces thousands of measurements, which can be represented in different formats (orthomosaic, point cloud, DTM, DSM, contour lines, etc). Each pixel of the produced map or point of the 3D model contains 3D geo-data.



26.

27. Map otherwise inaccessible areas

28. An aerial mapping drone can take off and fly almost

anywhere. You are no longer limited by unreachable areas, unsafe steep slopes or harsh terrain unsuitable for traditional measuring tools. You do not need to close down highways or train tracks. In fact, you can capture data during operation without an organizational overhead.

29. What are drones used for in surveying?

30. Land surveying / cartography

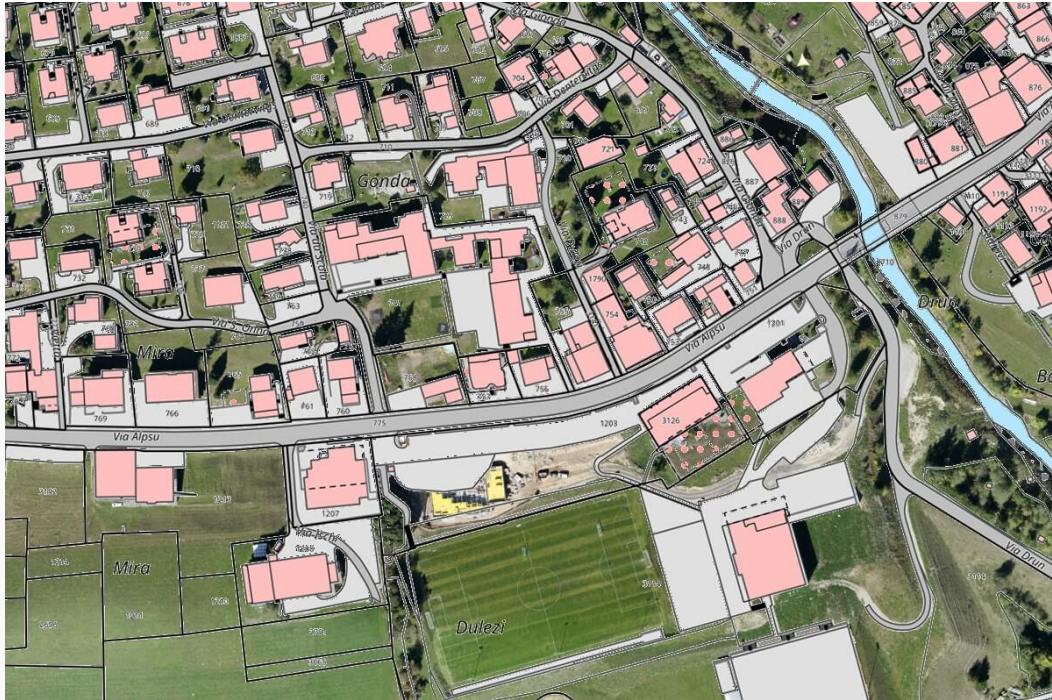
31. Survey drones generate high-resolution orthomosaics and detailed 3D models of areas where low-quality, outdated or even no data, are available. They thus enable high-accuracy cadastral maps to be produced quickly and easily, even in complex or difficult to access environments. Surveyors can also extract features from the images, such as signs, curbs, road markers, fire hydrants and drains.

32.



Cadastral map overlaid on aerial images





33.

Cadastral map overlaid on aerial images



34.

Cadastral map overlaid on aerial images





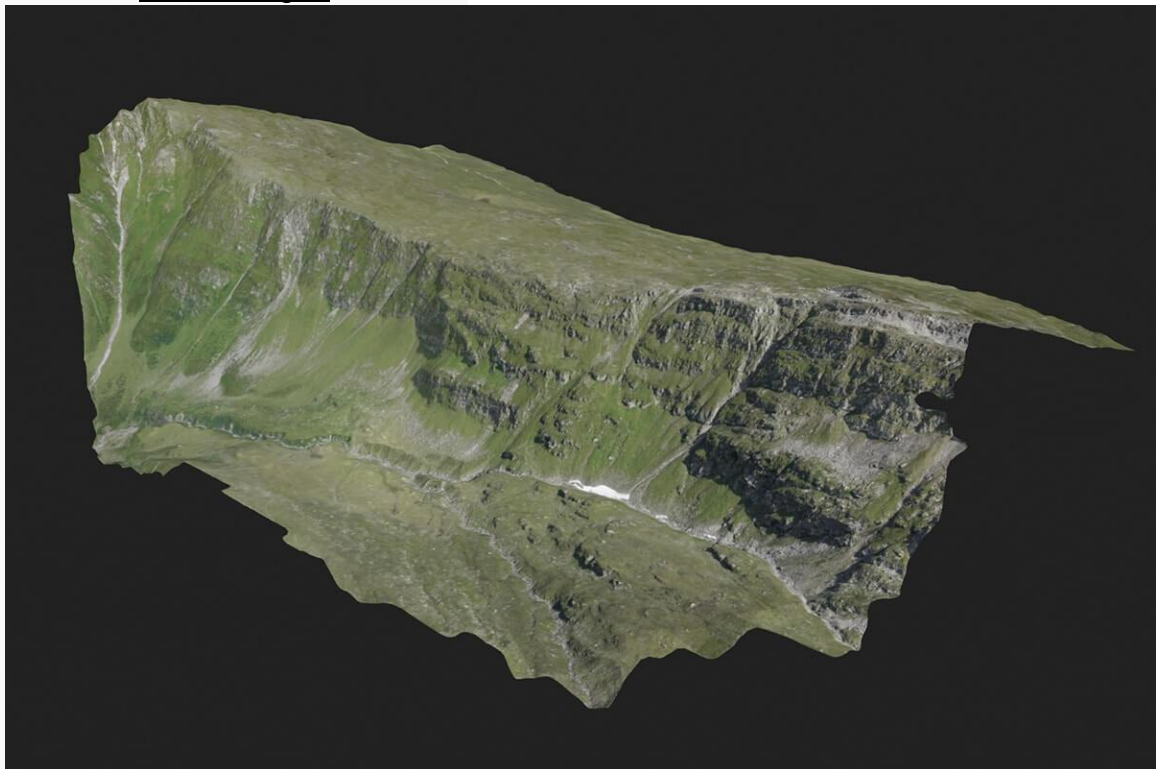
35.

Cadastral map overlaid on  
aerial images

36. After post-processing with a photogrammetry software, these same images can produce very detailed elevation models, contour lines and breaklines, as well as 3D reconstructions of land sites or buildings.

37. Land management and development

38. Aerial images taken by drones greatly accelerate and simplify topographic surveys for land management and planning. This holds true for site scouting, allotment planning and design, as well as final construction of roads, buildings and utilities.



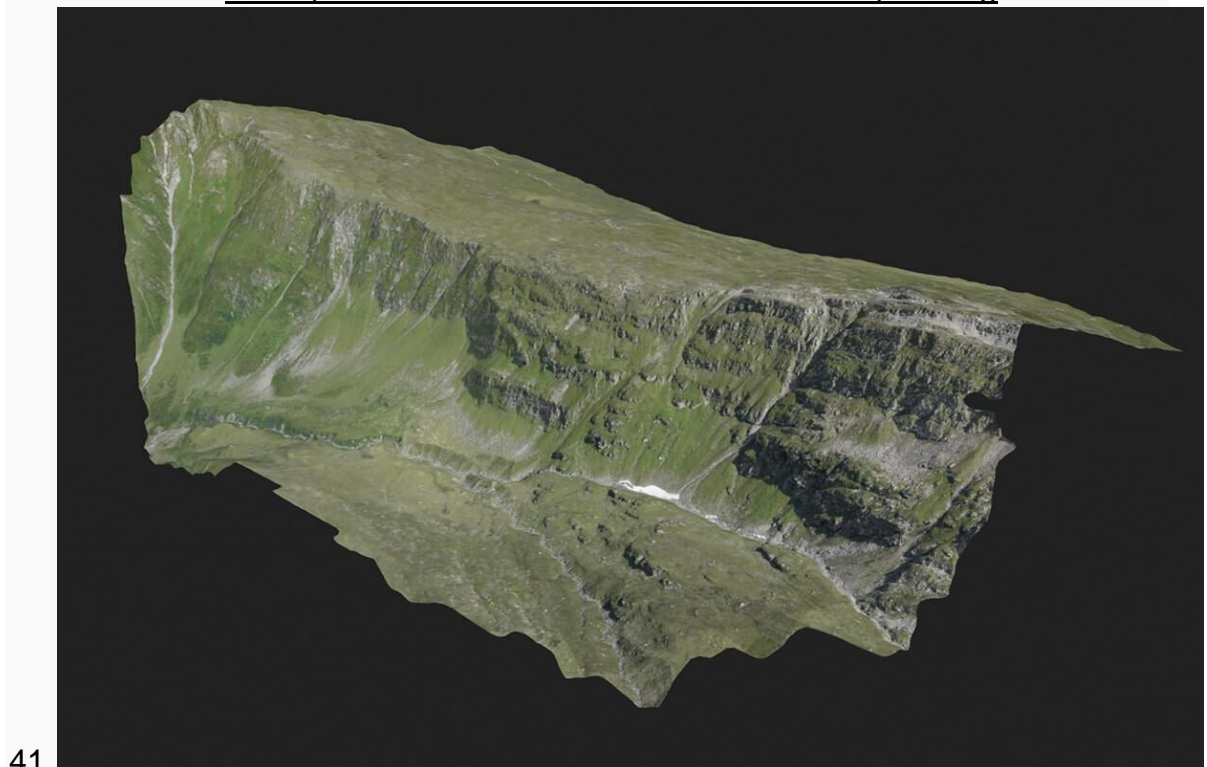
39.

Survey of a remote mountain area for pre-construction design of a wind farm



40.

Survey of an African road before construction planning



41.

Survey of a remote mountain area for pre-construction design of a wind farm





42.

Survey of an African road before construction planning

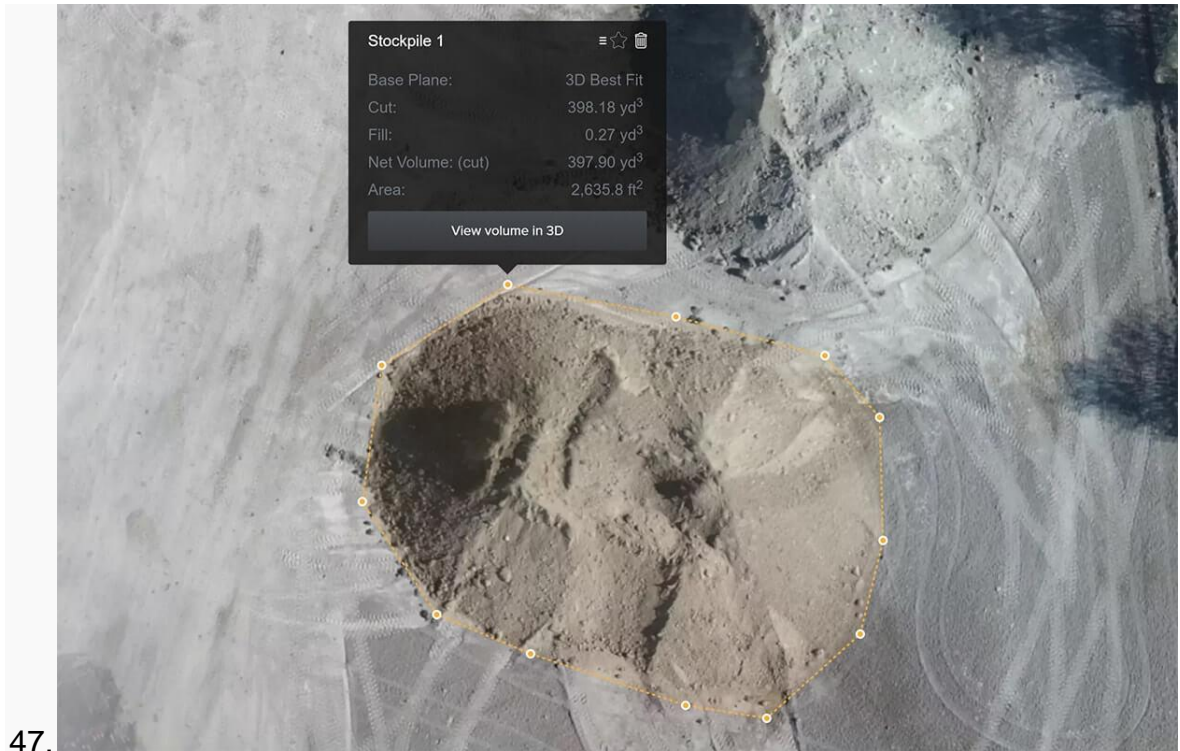
43. These images also provide the foundation for detailed models of site topography for pre-construction engineering studies. The generated data can also be transferred to any CAD or BIM software so that engineers can immediately start working from a 3D model.

44. As data collection by drones is easily repeatable at low cost,

images can be taken at regular intervals and overlaid on the original blueprints to assess whether the construction work is moving according to plan specifications.

45. Precise measurements

46. High resolution orthophotos enable surveyors to perform highly-accurate distance and surface measurements.



47.

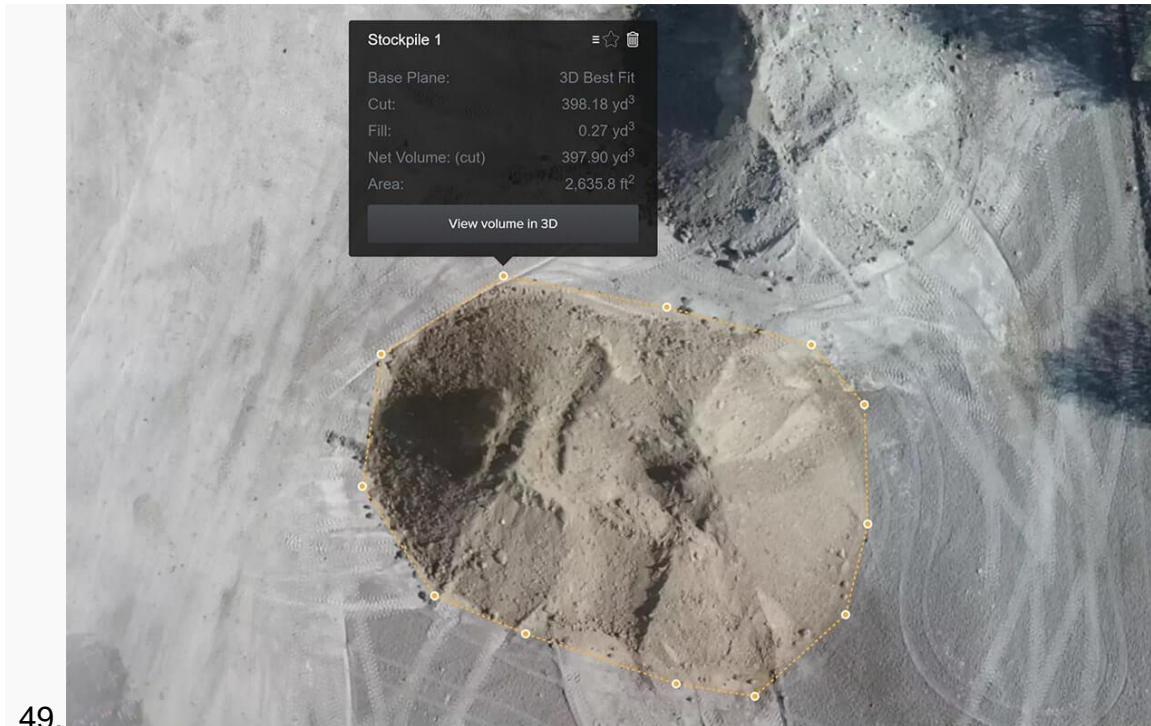
Stockpile volume measurement in a mining site



48.

Volume measurement of a landfill in the Bahamas





49.

Stockpile volume measurement in a mining site



50.

Volume measurement of a landfill in the Bahamas

**51. Stockpile volumetric measurements**

52. With 3D mapping software, it is also possible to obtain volumetric measurements from the very same images. This fast and inexpensive method of

volume measurement is particularly useful to calculate stocks in mines and quarries for inventory or monitoring purposes.

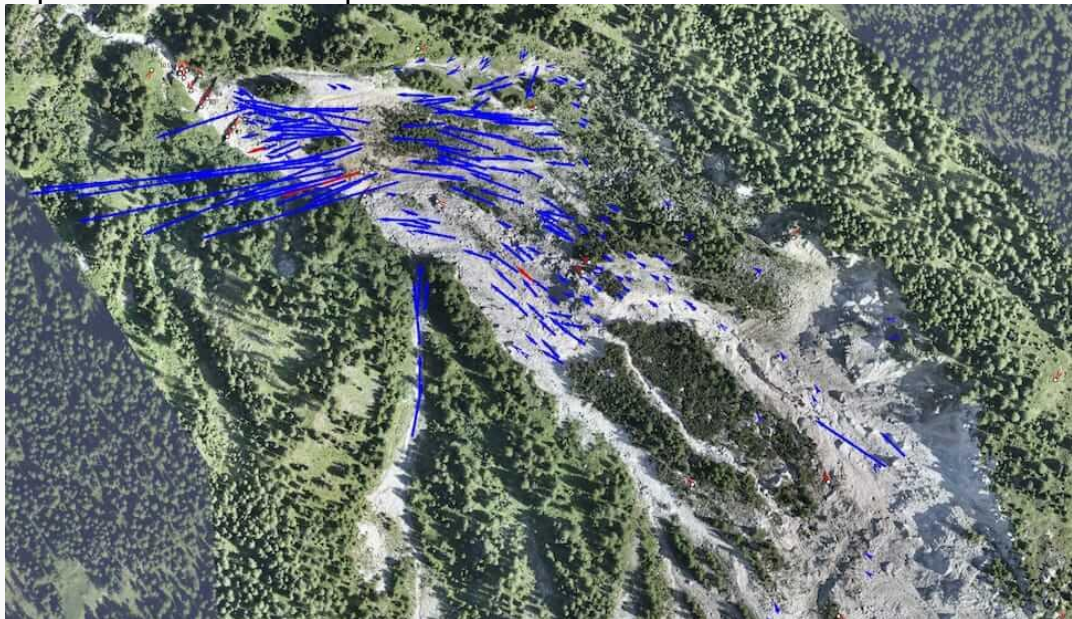
53. With a drone, surveyors can capture many more topographic data points, hence more accurate volume measurements. They can also do this in a much safer way than if they had to manually capture the data by going up and down a stockpile. Since drones are capturing the data from above, operations on site won't be interrupted. The short acquisition time enables capturing a site snapshot at a specific point in time.

54. Slope monitoring

55. With automated GIS analysis, it is possible to extract slope

measurements from DTMs and DSMs generated by drone imagery. Knowing the steepness of the ground's surface, the areas can be classified and used for slope monitoring purposes, including landslide mitigation and prevention.

56. With orthomosaics taken at different times, it is possible to detect changes in earth movement and to measure its velocity. This data can help predict landslides and prevent potential damage to roads, railways and bridges.



57.

58. From this image, it is possible to compare which part of the terrain is moving faster or slower. The length of the strokes represents the velocity of the earth movement. The longer the stroke, the faster the earth movement.

59. Compared to traditional monitoring techniques, where sensors are placed on single points, drones enable more comprehensive data collection.

Drones with PPK capability, which do not require laying out of multiple GCPs, are optimal for this application, since these areas are often hard to reach or even dangerous.

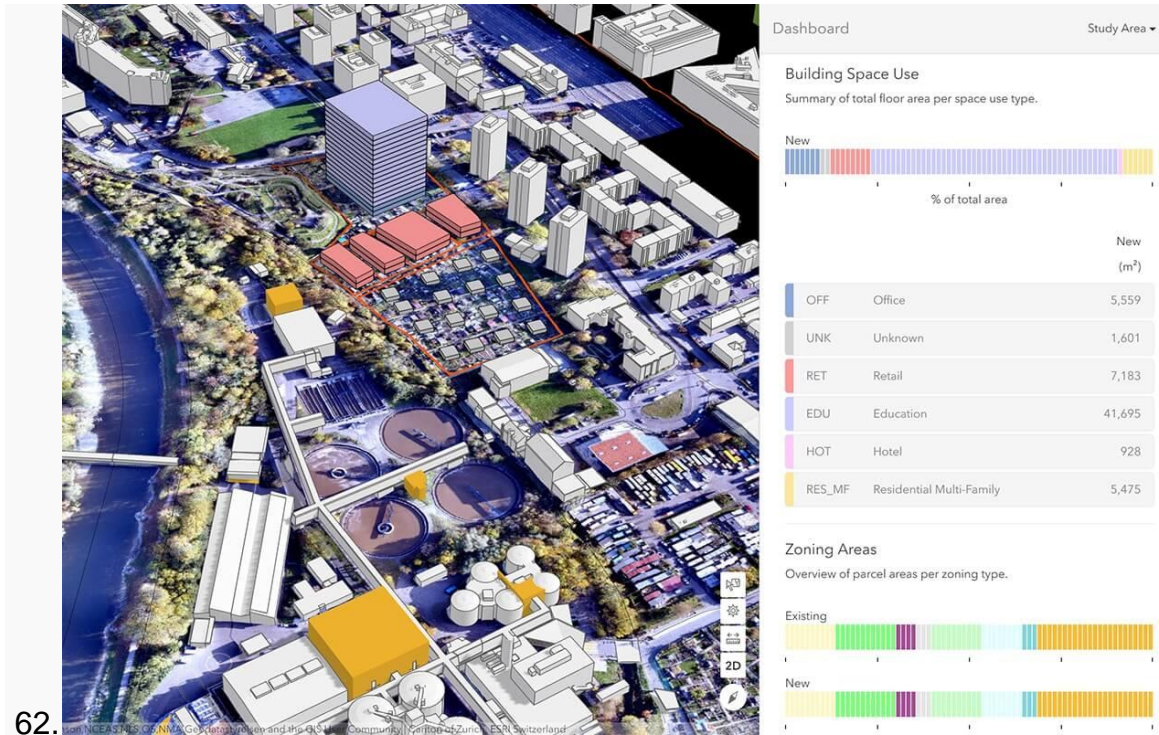
60. Urban planning

61. The development of increasingly dense and complex urban areas requires intensive planning and therefore time-consuming and expensive data

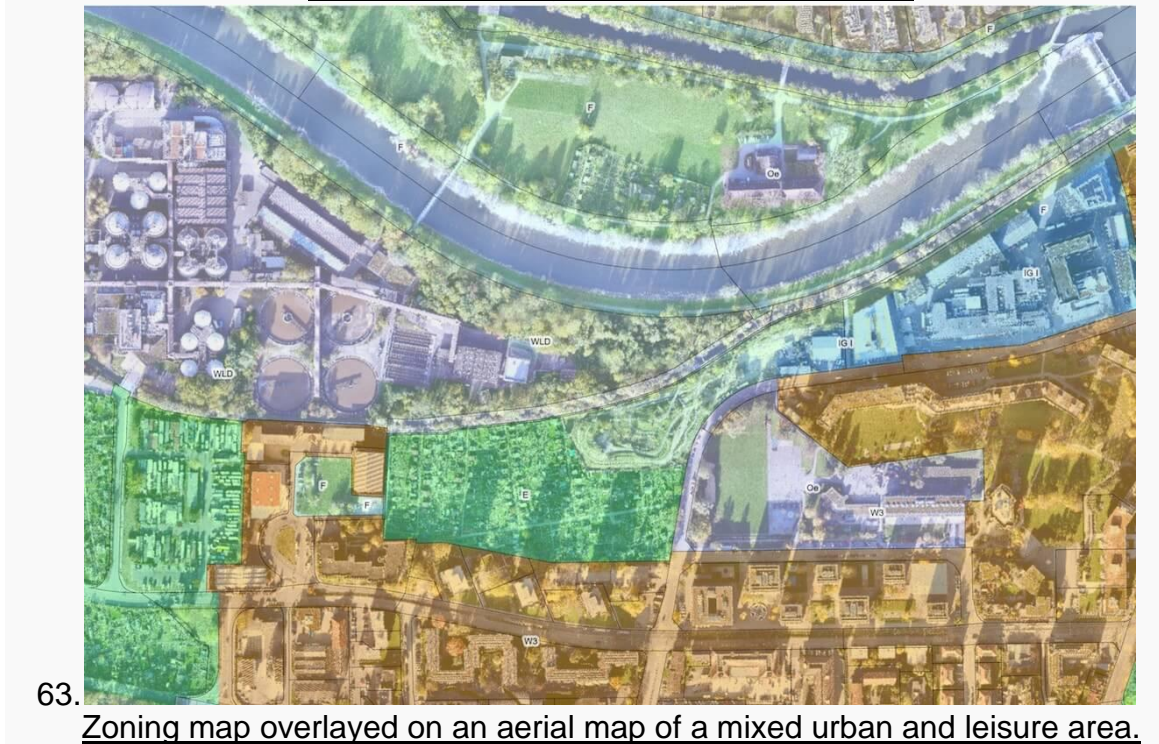


collection. Thanks to drones, urban planners can collect large amounts of up-to-date data in a short period of time and with far less staff. The images produced

in this way allow planners to examine the existing social and environmental conditions of the sites and consider the impact of different scenarios.



Projected buildings with surface allotments







64.

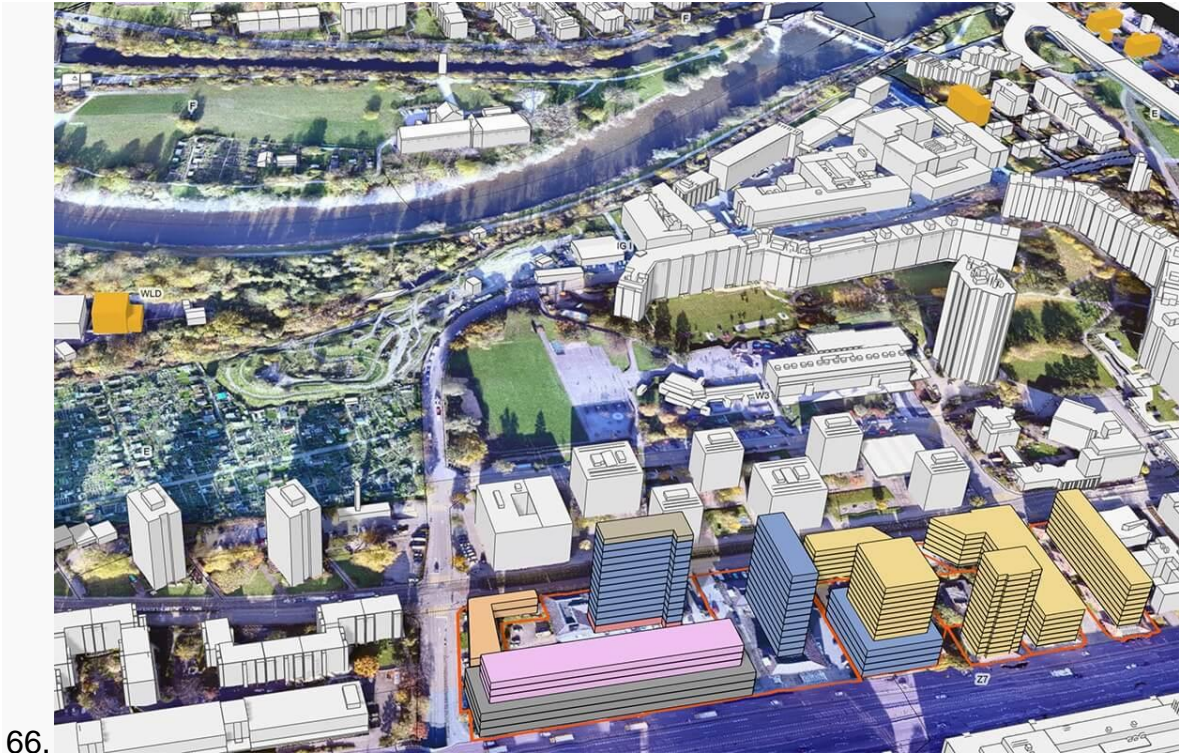
Aerial map with construction zones, as well as existing and projected buildings



65.

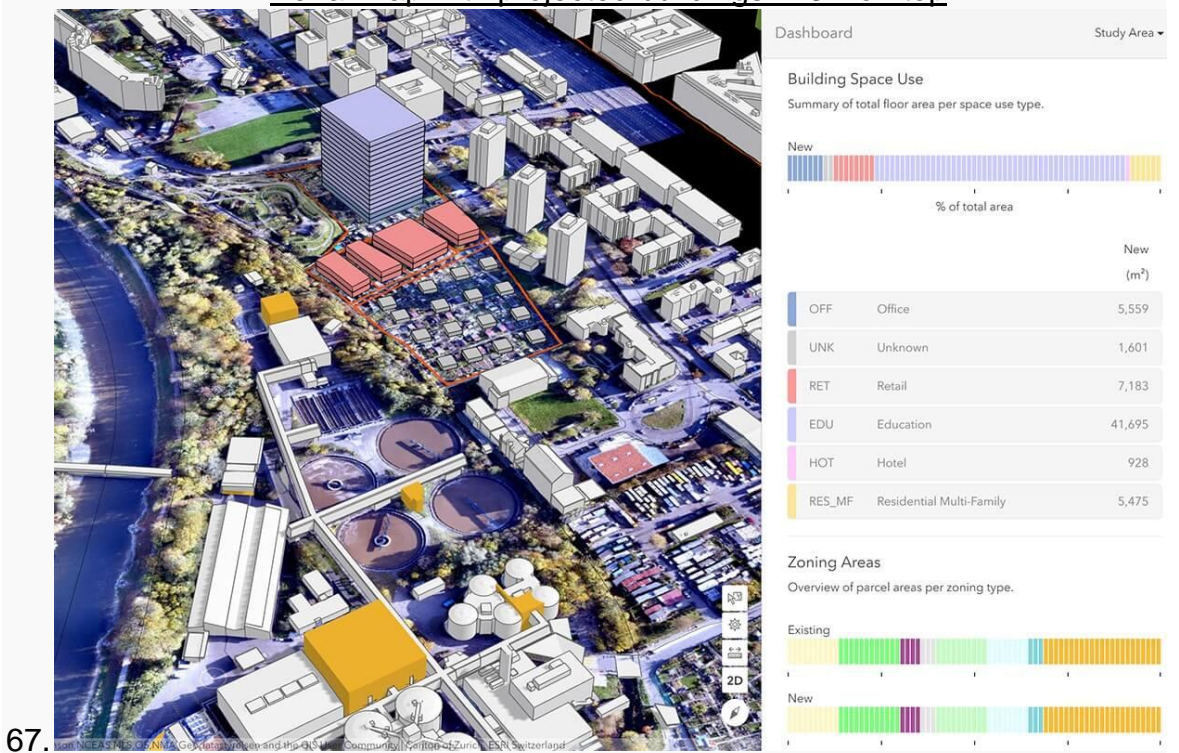
Aerial map with existing and projected buildings





66.

Aerial map with projected buildings in 3D on top



67.

Projected buildings with surface allotments





68.

Zoning map overlaid on an aerial map of a mixed urban and leisure area.

69. Thanks to 3D models, buildings can also be easily overlaid onto their environment, giving planners and citizens an

experimental perspective of a complex development project. 3D models also allow analysis an





Source: The Better India

United Nations  Nations Unies

SECRETARIAT OF UN COMMITTEE OF EXPERTS  
ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT  
UN STATISTICS DIVISION  
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Internet location: ggim.un.org

STAT 421(4-113)

29 March 2021

Dear Dr. Dutta,

**Second United Nations World Geospatial Information Congress**

At the outset, please allow me to sincerely thank the Ministry of Science and Technology, India for enthusiastically responding to our call to host the Second United Nations World Geospatial Information Congress (UNWGIC) in July 2020, and for the subsequent submission of a detailed proposal in October 2020. Your proposal was professional, well prepared and had considered at length the importance, significance and responsibility associated with the distinction of hosting a United Nations organized event held quadrennially to bring together all stakeholders in geospatial information management, and working in partnership for the betterment of people, planet, prosperity and peace.

The Expanded Bureau of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) was honored to receive your detailed proposal which, along with other proposals, was subjected to a consistent and transparent evaluation criteria and assessment framework. In making its assessment, the Expanded Bureau appreciated India's very specific and straightforward approach to hosting the Congress. With a focus on engaging young professionals, the involvement of the academic sector, support for developing countries, and the extra attention given to them, India clearly demonstrated its professional approach and what it wishes to achieve as an outcome of hosting the Second UNWGIC.

Additionally, we are of no doubt that the Government of India would successfully host the Second UNWGIC and place it more firmly on the world geospatial stage, advancing the United Nations agenda and programme on global geospatial information management for the benefit of all, bridging the geospatial digital divide, and leaving no one behind.

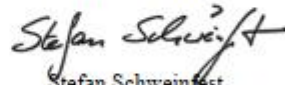
Therefore, it is with great pleasure that I inform you that the Expanded Bureau, in making its final decision, has unanimously agreed to accept the offer from India to host the Second UNWGIC. May I be the first to congratulate you on behalf of our Expanded Bureau and wider global geospatial information community.

Dr. Debapriya Dutta  
Adviser & Head/Scientist-G  
Department of Science & Technology  
Ministry of Science and Technology  
New Delhi, India

We look forward to working with the Government of India and its Ministry of Science and Technology to successfully realize the Second UNWGIC in Hyderabad. At an appropriate and mutually convenient time, the Secretariat, with support from the Expanded Bureau, will reach out to begin discussions, initially to conceptualize and scope the Second UNWGIC. This will be followed by the preparatory work required towards formalizing the modalities of the UNWGIC, including the Host Country Agreement, the Congress Steering Committee and the International Advisory Committee.

Our deep appreciation and thanks for India's continuing support and contribution to the United Nations agenda and programme on global geospatial information management.

Yours sincerely,



Stefan Schweinfest  
Director, Statistics Division/DESA  
UN-GGIM Secretariat



## Overview



RACURS, Russia

The PHOTOMOD software family comprises a wide range of products for the remote sensing data

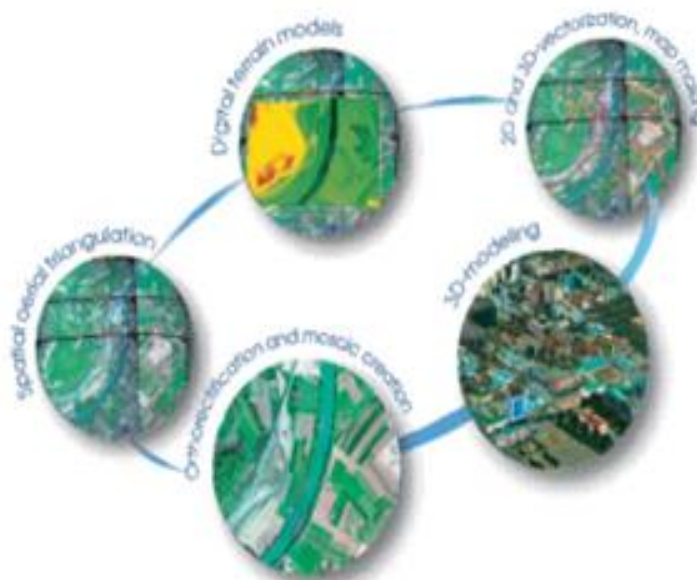
photogrammetric processing. This state-of-the-art software allows the extraction of geometrically accurate spatial information from almost all commercially available types of imagery, whether obtained by film or digital cameras, UAS, high resolution satellite scanners.

PHOTOMOD's flexible modular architecture and powerful import/export tools permit a variety of configurations: **Complete Digital Photogrammetric Workstation** (standalone configuration), high productivity distributed network environment for accomplishing large projects, complementary workplaces that can be used along with third-party systems to increase the overall productivity during the most time-consuming and labor-intensive operations like feature extraction and DTM creation.

Today PHOTOMOD is the most popular digital photogrammetric software in Russia and is also used in 70 countries all over the world. PHOTOMOD is the only digital photogrammetric system with the Russian Federation Ministry of Defense certificate and also the main digital photogrammetric software for the Federal Space agency of the Russian Federation (ROSCOSMOS) and Russian Federal Service for State Registration, Cadastre and Cartography (ROSREESTR)

General questions: [info@racurs.ru](mailto:info@racurs.ru)

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## GIS Driven Multidiscipline Engineering Consultancy

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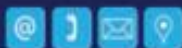
- Highway Engineering & Construction Supervision
- Public Health Engineering
- Irrigation, Flood Control & Water Management
- Cross Country Pipeline Transportation, City Gas Network
- Environment Impact & Management Plan
- Town Planning, Electrical, Telecom & Utilities
- Right of Way Acquisition & Permitting and Clearance
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- Airborne and Ground Geophysical Surveys
- Route Planning & 3D Corridor Mapping
- GIS/CADD Data Processing
- Geodetic, Topographic, Cadastral, Hydrological Surveys

### HONOURS & AWARDS

Geospatial World Excellence Award 2018  
Best Professionally Managed Company 2014  
Geospatial Company of the year 2013  
National award for Excellence in Engineering Consultancy 2012  
Project of National Excellence - Urban Infrastructure 2011  
Export Excellence Award 2008 & 2010



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