



Leveraging Satellite Data to Spot Early Signals of Unauthorized Government Land-use and Encroachment



How one of the fastest-growing cities in India is safeguarding land with SkySat imagery

CHALLENGE

A Growing Issue of Encroachment

Bhubaneswar is one of the fastest-growing cities in India, witnessing land-use changes on a daily basis. The present mechanism of detection and enforcement lacks adequate transparency and accountability, leaving public land prone to encroachment, engendering the haphazard growth of the city.

As a developing city, encroachments pose a threat to the protection of environmentally sensitive areas, such as wetlands, water bodies, forests, pipelines, floodplains, and more, which are vital to the long-term preservation of biological diversity and other natural resources both at the specific location as well as the greater region.

Moreover, unauthorized land use poses a challenge for planned development, leading to loss of revenue for the government from unauthorized buildings. Ultimately, there is an issue of revenue impact as well as planned development impact that encroachments or unauthorized changes pose for the government of Bhubaneswar.

About ORSAC & Vassar Labs

Odisha Space Application Centre (ORSAC) is the apex body of the State of Odisha for space technology applications where its team undertakes remote sensing, GIS, and GPS-based projects. Vassar Labs pioneers in IoT, machine learning, and artificial intelligence-based solution development and integration with geospatial decision support systems. Vassar Labs is the technology solution for ORSAC's Bhubaneswar Land Use Intelligence System (BLUIS).

Using their core technology, Vassar Labs developed and delivered a compelling AI-based solution on top of SkySat imagery to resolve land-use changes in the city of Bhubaneswar.

Planet

Planet is the leading provider of global, near-daily satellite imagery data and insights. Planet is driven by a mission to image all of Earth's landmass every day, and make global change visible, accessible and actionable. Founded in 2010 by three NASA scientists, Planet designs, builds, and operates the largest earth observation fleet of satellites, and provides the online software, tools and analytics needed to deliver data to users.

To learn more visit www.planet.com and follow us on Twitter at [@planetlabs](https://twitter.com/planetlabs)



BLUIS' GIS dashboard comparison of two images that capture an unauthorized land-use change indicated by the blue square.

THE NEED FOR REAL-TIME MONITORING

The accelerating pace of change in Bhubaneswar demands that its state agency has fast access to timely and precise information. Traditional satellite tasking models aren't equipped to deliver high-resolution imagery efficiently, and often the value of that imagery diminishes quickly. As a result, infrequent and outdated data leads to a lack of insight, inaction, and uninformed decision-making. Due to these challenges, real-time monitoring and enforcement are needed to check the risk of encroachments.

“The land is typically earmarked for a certain type of activity...but because of the rapid growth and therefore land encroachments, there's a significant loss of revenue for the government both from giving permission to build a building or tax collection that comes out of giving permission to build a building.”

PRAFULLA KUMAR MALLICK
CEO, ORSAC

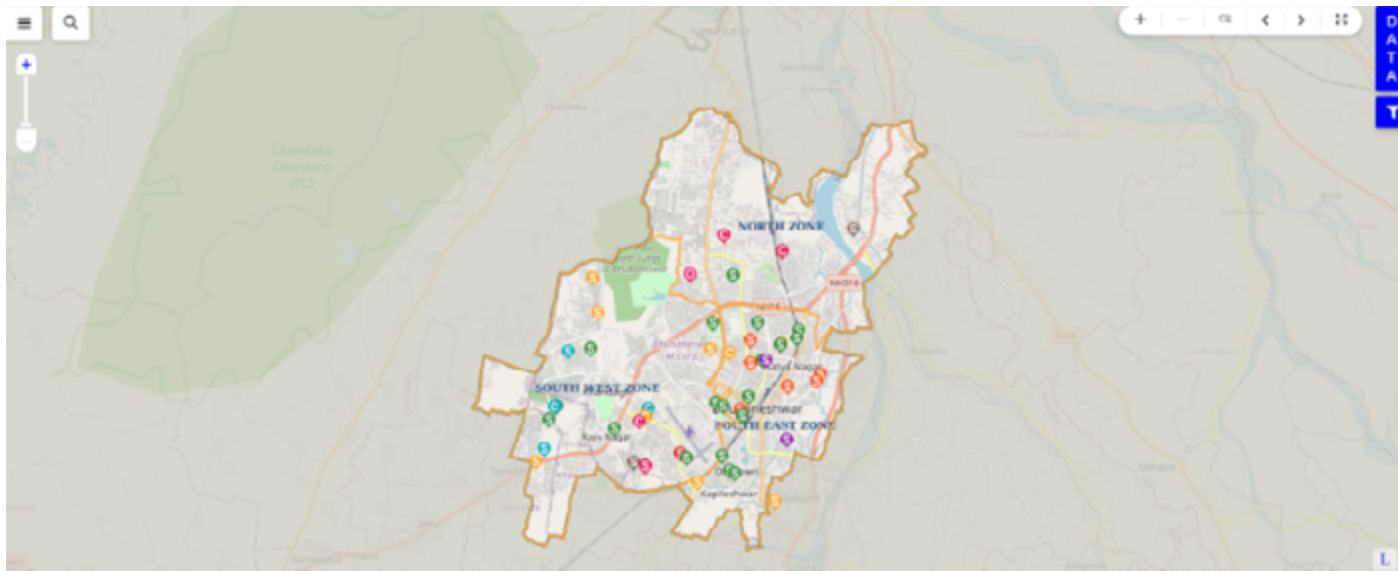
SOLUTION

Safeguarding Public Lands

To solve the problem of land-use change, ORSAC together with Vassar Labs leverages Planet's high-frequency and high-resolution SkySat imagery on a monthly cadence to monitor unauthorized land-use changes and encroachments in Bhubaneswar. This imagery is integrated into a system called Bhubaneswar Land Use Intelligence System (BLUIS).

The BLUIS system downloads SkySat data and the imagery is passed through an algorithm that classifies the imagery. The system then looks at the temporal change in the imagery, detecting any changes in the land where new buildings have been constructed. These changes in the imagery are alerted to Bhubaneswar officials for further validation and action perspective.

In order to safeguard the public lands, BLUIS has geo-tagged all government land in Bhubaneswar. BLUIS taps Planet's satellite imagery and Vassar Lab's artificial intelligence to detect all changes taking place on government lands. A mobile app alerts the enforcement authorities of any new construction on government land. GPS on the app guides the enforcement staff to the exact location. Evidence of encroachment is uploaded on the app as geo-tagged images and videos.



The geo-tagged government land in Bhubaneswar.

AN INNOVATIVE SOLUTION

BLUIS enables government officials to identify any unauthorized changes in government lands through three different means. The first is through Planet's high-resolution satellite imagery where the images are sent through an AI and ML algorithm to detect land-use change. Changes are also detected with crowdsourcing through a simple mobile application where citizens can report any unauthorized change. Department officials can also report a change to the mobile application.

Prior to an officer traveling to the encroachment site for validation, the officers compare past and current Planet imagery of the site in question to gain a better understanding of the changes that have taken place over time. All images and information are stored on a GIS dashboard that provides real-time visibility alerts and to identify illegal land use. The dashboard allows for effective collaboration between ORSAC, government officials, and Bhubaneswar citizens. Bhubaneswar is the first state in the country to tap space technology for safeguarding government land.

"We sincerely believe that the Government land should be protected and this high-resolution satellite imagery has a crucial role to play. To avoid the problem of illegal encroachment, the Government of Odisha together with Vassar Labs has developed a system called Bhubaneswar Land Use Intelligence System or BLUIS that uses high-resolution satellite imagery from Planet along with Artificial Intelligence and Machine Learning."

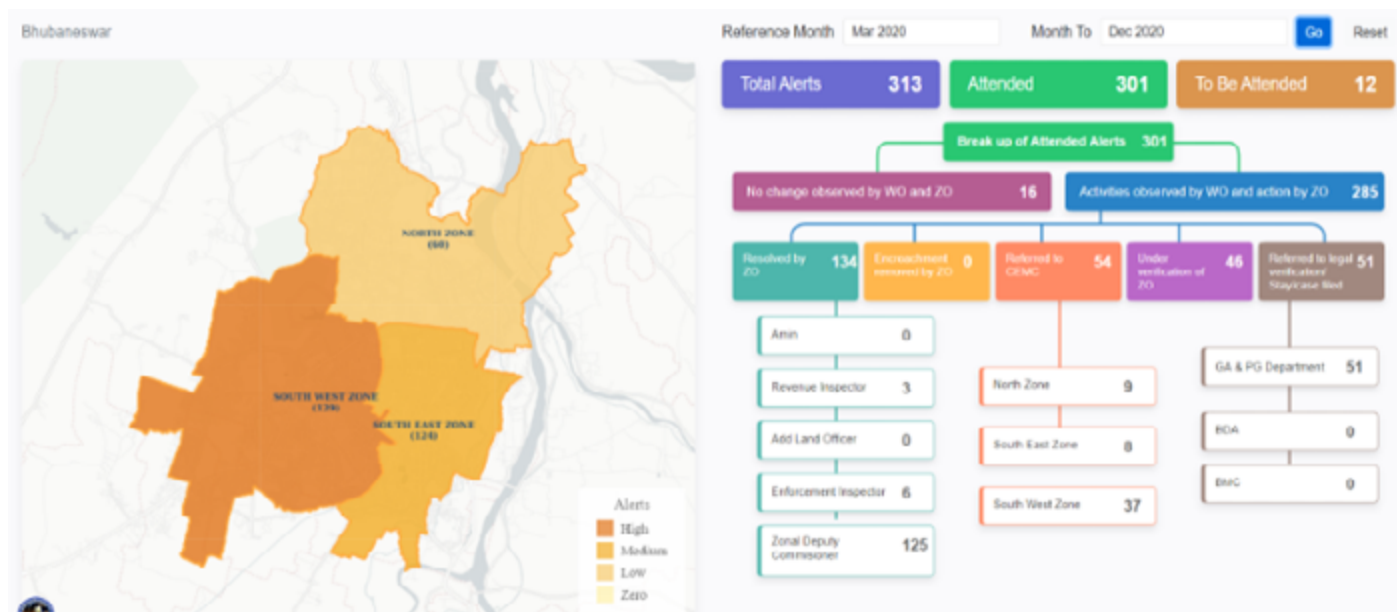
PRAFULLA KUMAR MALLICK
CEO, ORSAC



The comparison of past and current imagery captures an unauthorized new building indicated by the blue square identifying illegal land use.

"We use our [Vassar Lab's] core technology to develop and deliver a compelling AI-based solution on top of SkySat imagery."

LAXMI PRASAD PUTTA, CEO, Vassar Labs



BLUIS Dashboard shows an overview of alerts in Bhubaneswar from March 2020 through November 2020.

RESULTS

A Compelling ROI

With monthly SkySat imagery, land changes can be identified much sooner than the traditional satellite tasking models. The global coverage and responsiveness of Planet Tasking allow customers, like ORSAC and Vassar Labs, to access recent high-resolution imagery of places that are most relevant to their needs. Planet provides rapid revisit global intelligence across the globe, equipping users with information to make timely decisions, on their own terms. This early identification of changes reduces resource requirements and automatically identifies changes each month, therefore catching encroachments sooner, resulting in financial savings.

Since the inception of BLUIS, there have been 313 generated alerts. This system, powered by Planet data enables ORSAC to:

1. Identifying changes on time.

Automatically identify changes on a monthly cadence, so that they don't go unnoticed therefore preventing revenue loss.

2. Act on time for unauthorized land change.

Changes are verified and resolved in Service Level Agreement limits.

3. Save money and resources.

Early identification of changes reduces resource requirements, which results in financial savings.

GET IN TOUCH

We're Here to Help!

Get answers to technical questions about Planet products
support@planet.com

Contact Us

Learn how Planet can help you turn data into actionable insights
go.planet.com/getintouch

Learn More

www.planet.com



planet.

+ Leveraging Satellite Data to Spot Early Signals of Unauthorized Government Land-use and Encroachment



How one of the fastest-growing cities in India is safeguarding land with SkySat imagery

CHALLENGE

A Growing Issue of Encroachment

Bhubaneswar is one of the fastest-growing cities in India, witnessing land-use changes on a daily basis. The present mechanism of detection and enforcement lacks adequate transparency and accountability, leaving public land prone to encroachment, engendering the haphazard growth of the city.

As a developing city, encroachments pose a threat to the protection of environmentally sensitive areas, such as wetlands, water bodies, forests, pipelines, floodplains, and more, which are vital to the long-term preservation of biological diversity and other natural resources both at the specific location as well as the greater region.

Moreover, unauthorized land use poses a challenge for planned development, leading to loss of revenue for the government from unauthorized buildings. Ultimately, there is an issue of revenue impact as well as planned development impact that encroachments or unauthorized changes pose for the government of Bhubaneswar.

About ORSAC & Vassar Labs

Odisha Space Application Centre (ORSAC) is the apex body of the State of Odisha for space technology applications where its team undertakes remote sensing, GIS, and GPS-based projects. Vassar Labs pioneers in IoT, machine learning, and artificial intelligence-based solution development and integration with geospatial decision support systems. Vassar Labs is the technology solution for ORSAC's Bhubaneswar Land Use Intelligence System (BLUIS).

Using their core technology, Vassar Labs developed and delivered a compelling AI-based solution on top of SkySat imagery to resolve land-use changes in the city of Bhubaneswar.

Planet

Planet is the leading provider of global, near-daily satellite imagery data and insights. Planet is driven by a mission to image all of Earth's landmass every day, and make global change visible, accessible and actionable. Founded in 2010 by three NASA scientists, Planet designs, builds, and operates the largest earth observation fleet of satellites, and provides the online software, tools and analytics needed to deliver data to users.

To learn more visit www.planet.com and follow us on Twitter at [@planetlabs](https://twitter.com/planetlabs)



BLUIS' GIS dashboard comparison of two images that capture an unauthorized land-use change indicated by the blue square.

THE NEED FOR REAL-TIME MONITORING

The accelerating pace of change in Bhubaneswar demands that its state agency has fast access to timely and precise information. Traditional satellite tasking models aren't equipped to deliver high-resolution imagery efficiently, and often the value of that imagery diminishes quickly. As a result, infrequent and outdated data leads to a lack of insight, inaction, and uninformed decision-making. Due to these challenges, real-time monitoring and enforcement are needed to check the risk of encroachments.

“The land is typically earmarked for a certain type of activity...but because of the rapid growth and therefore land encroachments, there's a significant loss of revenue for the government both from giving permission to build a building or tax collection that comes out of giving permission to build a building.”

PRAFULLA KUMAR MALLICK
CEO, ORSAC

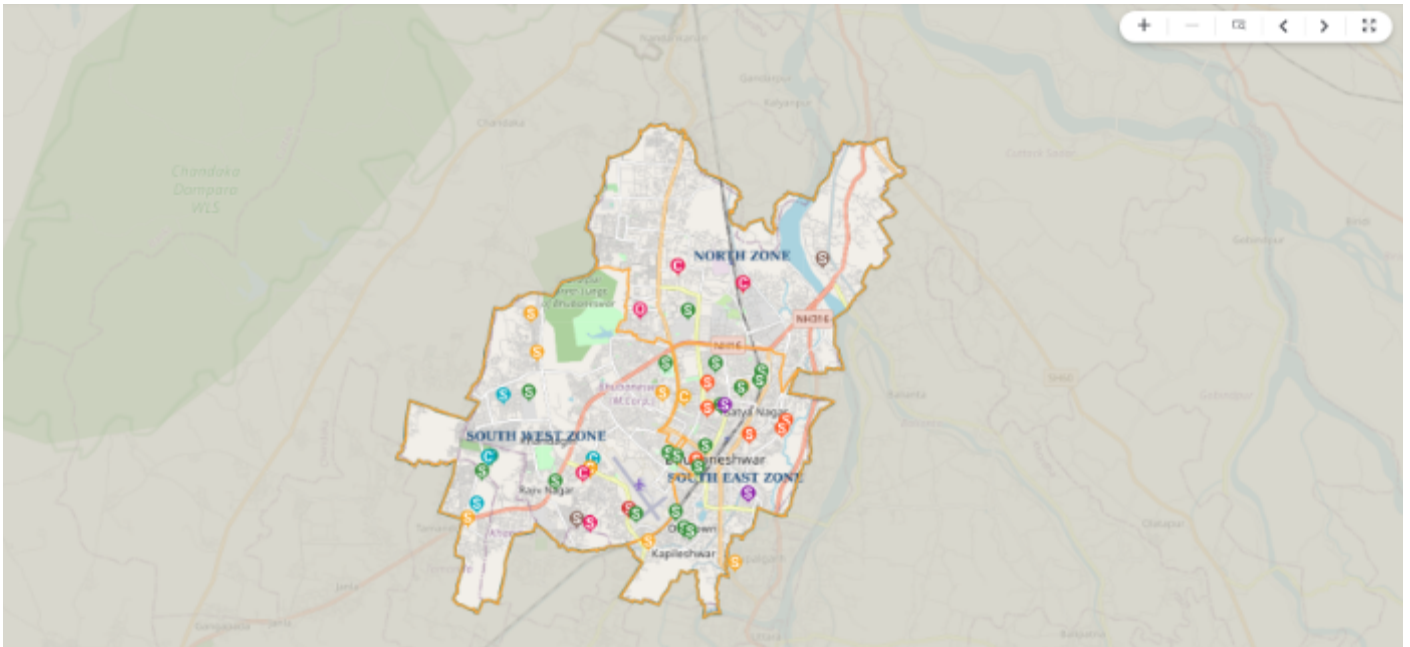
SOLUTION

Safeguarding Public Lands

To solve the problem of land-use change, ORSAC together with Vassar Labs leverages Planet's high-frequency and high-resolution SkySat imagery on a monthly cadence to monitor unauthorized land-use changes and encroachments in Bhubaneswar. This imagery is integrated into a system called Bhubaneswar Land Use Intelligence System (BLUIS).

The BLUIS system downloads SkySat data and the imagery is passed through an algorithm that classifies the imagery. The system then looks at the temporal change in the imagery, detecting any changes in the land where new buildings have been constructed. These changes in the imagery are alerted to Bhubaneswar officials for further validation and action perspective.

In order to safeguard the public lands, BLUIS has geo-tagged all government land in Bhubaneswar. BLUIS taps Planet's satellite imagery and Vassar Lab's artificial intelligence to detect all changes taking place on government lands. A mobile app alerts the enforcement authorities of any new construction on government land. GPS on the app guides the enforcement staff to the exact location. Evidence of encroachment is uploaded on the app as geo-tagged images and videos.



The geo-tagged government land in Bhubaneswar.

AN INNOVATIVE SOLUTION

BLUIS enables government officials to identify any unauthorized changes in government lands through three different means. The first is through Planet's high-resolution satellite imagery where the images are sent through an AI and ML algorithm to detect land-use change. Changes are also detected with crowdsourcing through a simple mobile application where citizens can report any unauthorized change. Department officials can also report a change to the mobile application.

Prior to an officer traveling to the encroachment site for validation, the officers compare past and current Planet imagery of the site in question to gain a better understanding of the changes that have taken place over time. All images and information are stored on a GIS dashboard that provides real-time visibility alerts and to identify illegal land use. The dashboard allows for effective collaboration between ORSAC, government officials, and Bhubaneswar citizens. Bhubaneswar is the first state in the country to tap space technology for safeguarding government land.

“We sincerely believe that the Government land should be protected and this high-resolution satellite imagery has a crucial role to play. To avoid the problem of illegal encroachment, the Government of Odisha together with Vassar Labs has developed a system called Bhubaneswar Land Use Intelligence System or BLUIS that uses high-resolution satellite imagery from Planet along with Artificial Intelligence and Machine Learning.”

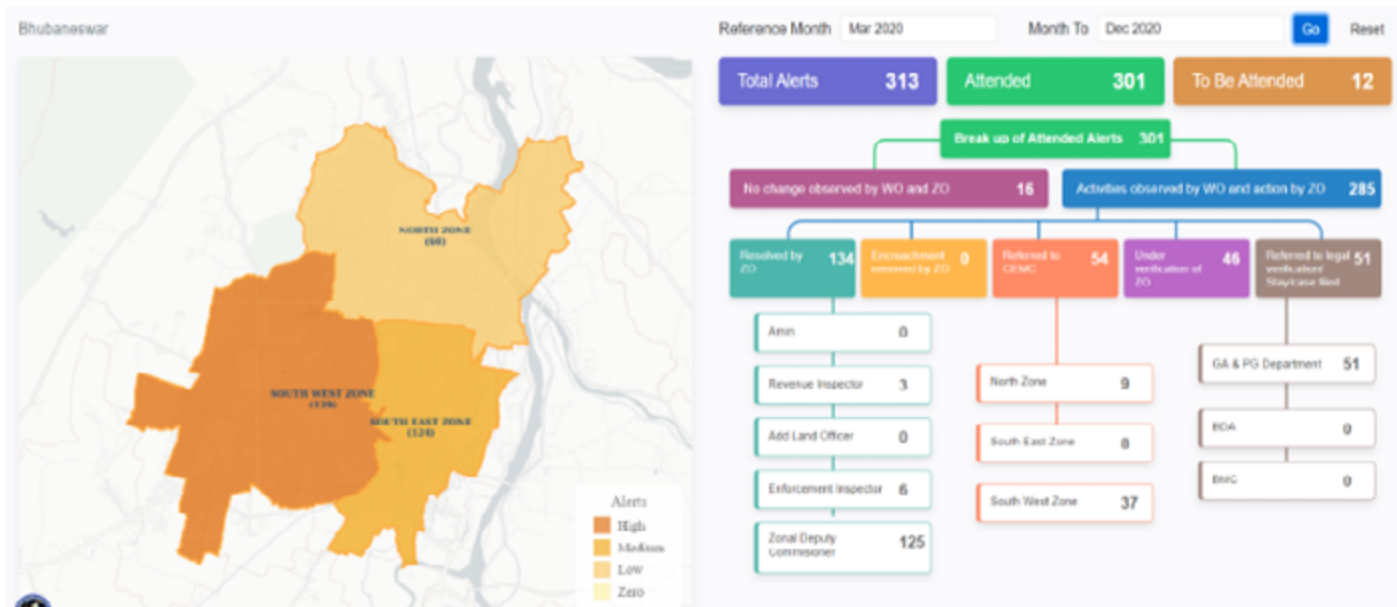
PRAFULLA KUMAR MALLICK
CEO, ORSAC



The comparison of past and current imagery captures an unauthorized new building indicated by the blue square identifying illegal land use.

“We use our [Vassar Lab’s] core technology to develop and deliver a compelling AI-based solution on top of SkySat imagery.”

LAXMI PRASAD PUTTA, CEO, Vassar Labs



BLUIS Dashboard shows an overview of alerts in Bhubaneswar from March 2020 through November 2020.

RESULTS

A Compelling ROI

With monthly SkySat imagery, land changes can be identified much sooner than the traditional satellite tasking models. The global coverage and responsiveness of Planet Tasking allow customers, like ORSAC and Vassar Labs, to access recent high-resolution imagery of places that are most relevant to their needs. Planet provides rapid revisit global intelligence across the globe, equipping users with information to make timely decisions, on their own terms. This early identification of changes reduces resource requirements and automatically identifies changes each month, therefore catching encroachments sooner, resulting in financial savings.

Since the inception of BLUIS, there have been 313 generated alerts. This system, powered by Planet data enables ORSAC to:

1. Identifying changes on time.

Automatically identify changes on a monthly cadence, so that they don't go unnoticed therefore preventing revenue loss.

2. Act on time for unauthorized land change.

Changes are verified and resolved in Service Level Agreement limits.

3. Save money and resources.

Early identification of changes reduces resource requirements, which results in financial savings.

GET IN TOUCH

We're Here to Help!

Get answers to technical questions about Planet products
support@planet.com

Contact Us

Learn how Planet can help you turn data into actionable insights
go.planet.com/getintouch

Learn More

www.planet.com