planet.

PLANET ANALYTIC FEEDS
FREQUENTLY ASKED QUESTIONS

Where can I get support for using Planet Analytic Feeds?

All feedback, requests, bug reports, and questions can be directed to support@planet.com

What types of applications can be built using Planet Analytic outputs?

There are a range of applications that can be built from our analytic outputs. Here are just a few to help get you started:

Road Detection and Building Detection

- Measure the number of pixels classified as road or building over time within your area of interest (AOI) to develop a proxy for development.

Vessel Detection

- Build out a time series analysis to develop a pattern of life of vessels detected per day for your AOI.

- View a docked vessel by querying the Analytics API for a specific geo-coordinated bounding box. When the result changes, it can indicate the vessel has left the port.

For more inspiration and guidance on the types of applications you can build, please see our Jupyter notebooks: https://github.com/planetlabs/notebooks/tree/analytics/jupyter-notebooks/analytics

Can I integrate Analytic outputs into my platform?
(ArcGIS or GQIS)

Road Detection and Building Detection outputs are available through a WMTS protocol, which can be used within standard GIS tools, like ArcGIS or QGIS. Learn how to leverage the WMTS protocol here. Vessel Detection outputs can be leveraged within standard GIS software by uploading the GeoJSON feature collections provided through the Analytics API.

How do I interpret the "score" surfaced in object-detection based Analytic Feeds?

Each detection comes with a confidence score labeled as "score" in the properties of the API response, which is an indication of how likely it is that the detection is accurate. Scores range from 0.25 to 1 with 1 being

the highest likelihood that the detection is a true positive. For applications which are very sensitive to detection errors (false positives), results associated with the "score" parameter below a certain threshold from the API response should be discarded. The optimum threshold highly depends on the use case, by filtering through the "score" parameter to balance the importance of precision vs recall.

How do I interpret cloud cover?

Cloud cover metadata represents the percentage of area covered by clouds within the PlanetScope scene from which the detection was made. This information is gathered from Planet's Data API and is available for you to query as well.

How do I get access to the source imagery (scenes for vessels and source quads for roads and buildings)?

For Vessel Detection, within each feature collection, there are links to the Planet Data API to get source imagery. Use the activate link to download the source imagery.

For Road Detection and Building Detection, there are links to the "source quad" used to derive the output as well as the "target quad" which is the output itself.

Do you support automated tip and cue with Planet Analytic Feeds?

Currently, "tip and cue" capability consists of detecting signals from the imagery or analytics and manually tasking a satellite by working closely with the Planet team.

Can you aggregate the number of detections or area classified over time?

Yes, with our Summary Statistics service, you can generate reports showcasing counts of detections or area classified over time. See the section on Summary Statistics for more information.

SUMMARY STATISTICS

What are Summary Statistics?

Planet's Summary Statistics service transforms our geospatial detections into statistical time series data - from a feature collection of bounding box coordinates to a count of detections per day. It enables data analysts that are more accustomed to working with time series and/or tabular data in Excel to work their magic with Planet data.

How granular does Summary Statistics get?

We pre-aggregate counts and area sums on a gridded representation of the earth at hierarchical zoom levels to deliver quick insights that we expect to be accurate to regions as small as 0.1 km2.

Is there a user interface that uses Summary Statistics?

No, currently Summary Statistics are served only through the Analytics API

What's the difference between Total and Unique detections?

Some Feeds product Summary Statistics reports that include a "Total" number of detections and a "Unique" number of detections. There are times when we capture an image of an area of interest multiple times within a day - in these cases, the number of detections generated can be exaggerated, since we're generating detections for the same feature multiple times. The "Total" number does not take this into account and reports the total number of detections made, regardless of whether it's the same feature being counted twice. The "Unique" number accounts for this phenomenon by removing detections that are within 10 meters and 20 minutes of another detection

What's the difference between UDM and UDM2? Why are both provided?

UDM stands for Usable Data Mask and it indicates what parts of an image could be used for different purposes. Our first iteration of a UDM surfaced the portion of the image that was usable and what portion should not be used based on cloud cover or image artifact. It masked out the parts that shouldn't be used.

UDM2 provides more information, classifying different parts of the image as cloudy, snow cover, shadow, light haze, heavy haze or clear. This new iteration generally performs better and when possible should be used, but there are cases where we are unable to generate this new and improved UDM2 asset, most notably for 3-band imagery and imagery that is unable to be fully rectified.

Because there are cases where UDM2 is not available, we provide UDM data as well.

How accurate are the results?

Planet's Summary Statistics service is built on top of our Analytic Feeds, which means the reports generated are directly correlated to the performance of our machine learning models. For more information, please refer to our Performance Factsheet.

What formats does Planet's Summary Statistics service support?

Reports can be formatted as follows:

- JSON response - this is the default
- GeoJSON response for analysis in GIS tools
- CSV file for standard time series analysis

See our Analytics API User Guide for more details

ROAD DETECTION

What is the smallest size road that can be detected?	Planet can detect roads greater than 10 m (~3 pixels). We define a road as anything that a vehicle would be able to drive on. Road Detection performs best in fully developed or undeveloped urban areas, but also performs very well in rural locations as well. Dry riverbeds, mountainous regions, and forests can cause some false positives, but overall the Analytic Feed has been generalized to work at planetary scale.
Why does the same road look different sizes month-to-month?	Planet's Road Detection leverages our monthly Basemap product to extract roads. Due to image variability – cloud cover, sun angle, registration issues, etc – certain roads may look different month over month.
Why do the position of the roads occasionally shift month-to-month?	Planet's Road Detection leverages our monthly Basemap product to extract roads. Due to image variability – cloud cover, sun angle, registration issues, etc – the registration of our basemaps may shift slightly month over month. As a result, our road detections also slightly shift to match the underlying imagery.
Why are certain roads missed?	Planet's Road Detection leverages our monthly Basemap product to extract roads. Due to variations or gaps in the mosaic, we may not be able to detect portions of a road. In addition, roads smaller than 10 m, unpaved roads, tracks, and some snowy conditions will not always be captured.

ROAD CHANGE DETECTION

What is Road Change Detection?	Planet's Road Change Detection is a technology assist that automatically enables customers to find new roads in our imagery. With this product, customers will see enormous efficiency gains when monitoring broad areas with few resources and will be aware of changes they couldn't find through other means.
What do you mean by change?	In this first release of Road Change Detection, only new roads are being detected. This means that destructed and updated roads will not be detected.

How is this different from Road Detection?

Whereas Road Detection extracts roads as features from a single Planet Basemap, Road Change Detection is a new analytic feed that compares road detections from a series of basemaps and points to where new roads have appeared.

Why do I see very few detections in certain months?

In snowy regions, there are several months in the winter where roads are covered in snow and where changes are not necessarily visible through satellite imagery. There will be a significant decrease in changes detected during those months.

Why are certain roads detected with a time delay?

We use our high performing road detection model to extract roads from the imagery. We run it over an extended period of time, gathering as many data points as possible. From month to month, variations in atmosphere, shadows and other factors cause very small differences in the outputs over time leading to significant noise or "flicker". We denoise the results by considering the temporal context of each pixel detected. This leads to a more consistent output, however it does introduce a "lag" or "time delay" for us to be able to detect change. We then compare the most recent de-noised output with the previous denoised output, pull out the differences and polygonize them.

Can I derive road networks from these detections?

Road Change Detection should be used to scan large areas and find the signal of where new roads have been constructed. It does not deliver road networks, but 8x8 pixels grid cells in vector format, which gives a precise location of the corresponding change.

Is there a user interface that uses Change Detection?

Yes, the Analytic Viewer.

BUILDING DETECTION

What is the smallest size building that can be detected?

Planet can detect buildings greater than 10 m (~3 pixels). We define a building as any structure that a person can stand beneath, thus structures such as tents would be detected. Our building detection performs best in fully developed or undeveloped urban areas, but also performs very well in rural locations as well.

Does Planet classify building type?	At this point, Planet does not classify building types (ie, commercial building, residential house, etc). However, we are interested in the use cases we could tackle together if building classification were made possible.
Why does the same building look different sizes month-to-month?	Planet's Building Detection leverages our monthly Basemap product to segment buildings. Due to image variability – sun angle, registration issues, etc – certain buildings may look different sizes month over month.
Why do the position of the buildings shift month-to-month?	Planet's Building Detection leverages our monthly Basemap product to segment buildings. Due to image variability – sun angle, registration issues, etc – the registration position of our basemaps may shift slightly month over month. As a result, our building detections also may slightly shift to match the underlying imagery.
Why are certain buildings missed?	Planet's Building Detection leverages our monthly Basemap product to extract buildings. Due to variations or gaps in the mosaic, we may not be able to detect portions of a building. In addition, buildings smaller than 10 m may be missed.

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What do you mean by change?	In this first release of Building Change Detection, only new buildings are being detected. This means that destructed and updated buildings will not be detected.
How is this different from Road Detection?	Whereas Building Detection extracts buildings as features from a single Planet Basemap, Building Change Detection is a new analytic feed that compares buildings detections from a series of basemaps and points to where new buildings have appeared.
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Yes, the Analytic Viewer.

VESSEL DETECTION

What is the smallest size vessel that can be detected?

Planet can detect vessels down to about 10 m in size (~3 pixels), however the accuracy at this size is not very reliable. Small islands, waves, and clouds could easily be interpreted as small boats (even by the human eye) and particularly on cloudy days or rough sea states. The bigger the vessel is, the higher the likelihood that it will be accurately detected. Vessels in the 10-30 m range will be detected with varying accuracy, while vessels greater than 50m will return higher performing results.

Why do I not see any detections on certain days?

There are many reasons this could be the case – a few most likely scenarios would be:

- **Your AOI was partly cloudy this day**. If clouds blocked our view of the ground where detections would have taken place, our feeds will not be able to detect anything

- **Your AOI was completely cloudy**. If clouds completely blocked out your area of interest, Planet might not publish the imagery. If there is no published imagery, there can be no detections.

- **There was nothing to detect.** It could be that although we had a clear shot of the area, there were no objects to detect this day

Why are certain vessels missed, even though they look identical to others detected?	The Analytic Feeds have a number of layers that ultimately result in a bounding box output. Perhaps the vessel is a slightly different color, there is a haze and cloud over the vessel, and the sea state is slightly different. All these factors contribute to the output.
Why do the cadence of detections vary day-by-day?	Some days there may be little to no detections due to the factors listed above. Other days, we may have two separate satellites cross your AOI at different times of the morning. In this case, we may detect the same object multiple times in a day.
Does Planet classify vessel type, color, other features?	Planet is supporting Vessel Detection at the moment, though other features are being considered for the product roadmap. We'd be very interested in what classifications would be useful for you and what use cases you have for them.
Can Planet run the analytic over open water (i.e. not a port)?	Our current capability is optimized for ports and shorelines only. Ports generally have stationary vessels, calmer sea states, and docked vessels. To run analytics over open water, the Analytic Feed will need to be trained with a different dataset (eg, varying wake sizes, wave types, sea states, and other maritime objects.) Planet is exploring this opportunity further.
Why are there duplicate detections in some AOIs?	On some days, we may have two separate satellites cross your AOI at different times of the morning. In this case, we may detect the same object multiple times in a day. These are separate detections, but of the same vessel.
Why are so many false positives detected, even when there is no object in the image?	As the Vessel Detection Feed analyzes the image, it may detect waves, sea texture, islands, clouds, and other image artifacts and determine that a vessel is present. Some of these detections may have lower confidence scores and can be filtered out.
Why does the bounding box not exactly match the vessel (partial fit or over fit)?	These Analytic Feeds work by detecting different features on the vessel – lines, edges, corners, shapes, etc. As the feeds analyzes the image, it may detect these features and determine a box that may only fit over part of the actual vessel.

Can Planet match this data with AIS data?	Planet can demonstrate how to match AIS data with imagery and has working relationships with existing AIS providers. Planet does not provide the AIS data or implement the integration. However, on request, Planet can work with the user to demonstrate how this is done.

PLANE DETECTION

What is the smallest size plane that can be detected?	Planet can detect planes down to about 25 m in length (~7 pixels). Planes in the 25-30 m range will be detected with varying accuracy, while planes greater than 30m will return higher performing results.
Why do I not see any detections on certain days?	There are many reasons this could be the case – a few most likely scenarios would be:

- **Your AOI was partly cloudy this day**. If clouds blocked our view of the ground where detections would have taken place, our feeds will not be able to detect anything

- **Your AOI was completely cloudy**. If clouds completely blocked out your area of interest, Planet might not publish the imagery. If there is no published imagery, there can be no detections.

- **There was nothing to detect.** It could be that although we had a clear shot of the area, there were no objects to detect this day

Why are certain planes missed, even though they look identical to others detected?	The Analytic Feeds have a number of layers that ultimately result in a bounding box output. Perhaps the plane is a slightly different color or there is a haze and cloud over the plane. All these factors contribute to the output.
Why do the cadence of detections vary day-by-day?	Some days there may be little to no detections due to the factors listed above. Other days, we may have two separate satellites cross your AOI at different times of the morning. In this case, we may detect the same object multiple times in a day.
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GET IN TOUCH

We're Here to Help
Please reach out with any questions regarding Planet Analytic Feeds to support@planet.com

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go.planet.com/getintouch

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www.planet.com