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Creating Power Automate (aka MS Flow) webhooks for Survey123 surveys in ArcGIS Online

Update: Update: Microsoft recently renamed Flow to Power Automate - [link](#).

Note: Creating webhooks in ArcGIS Enterprise was introduced in v10.7 and the authoring process in that environment is different and will be discussed in a future post.

Starting with Survey123 for ArcGIS 3.0, webhooks can be set up and activated when a survey response is submitted. What does this mean? Basically, when a survey is successfully submitted, different workflows can be triggered based on the content of the submission: sending notification emails, adding results to a spreadsheet and so on.

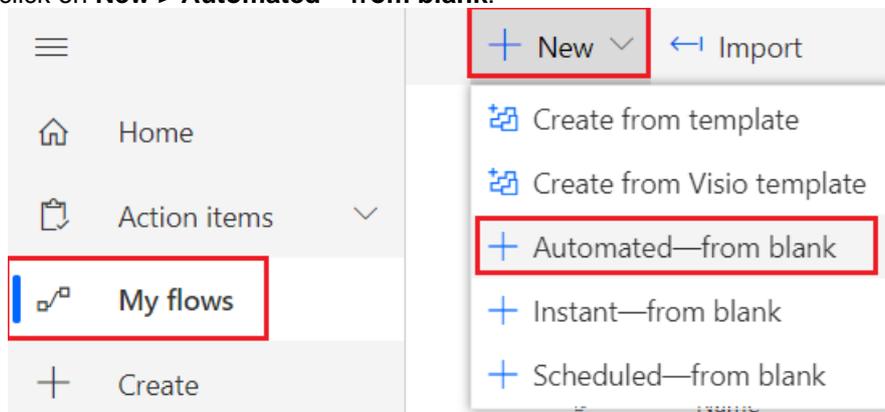
There are a wide variety of workflow services available, such as Power Automate (aka MS Flow), Integromat, tray.io, Zapier, IFTTT, n8n.io, CloudHQ and the list goes on. Most (if not all) of them can be used to incorporate Survey123 as a trigger to build your automated process. Out of these, Integromat and Power Automate have a Survey123 connector making it easier to implement your processes. This article guides through an example using Power Automate.

What will you need to create Survey123 webhooks?

- ArcGIS Online (AGOL) Organisational account
- Your Survey123 form published into AGOL
- Office 365 account to access Power Automate

Below is a workflow for creating a webhook that triggers an alert email if the submitted data meets a condition (for example the weather is Adverse).

1. Open Power Automate (go to your Office 365 account and search for the app), go to *My flows* and click on **New > Automated – from blank**:



2. Give your webhook a meaningful name, so you know which one to edit/disable later on when you have more of them.
3. Search for 'Survey123' under *Choose your flow's trigger*, select **When a survey response is submitted** and log in to your AGOL account (you only need to log in once, the connection is stored in your Flow profile). Click on **Create**.

Build an automated flow

Free yourself from repetitive work just by connecting the apps you already use—automate alerts, reports, and other tasks.

Examples:

- Automatically collect and store data in business solutions
- Generate reports via custom queries on your SQL database

Flow name: test

Choose your flow's trigger *
survey123

When a survey response is submitted Survey123

Skip **Create** Cancel

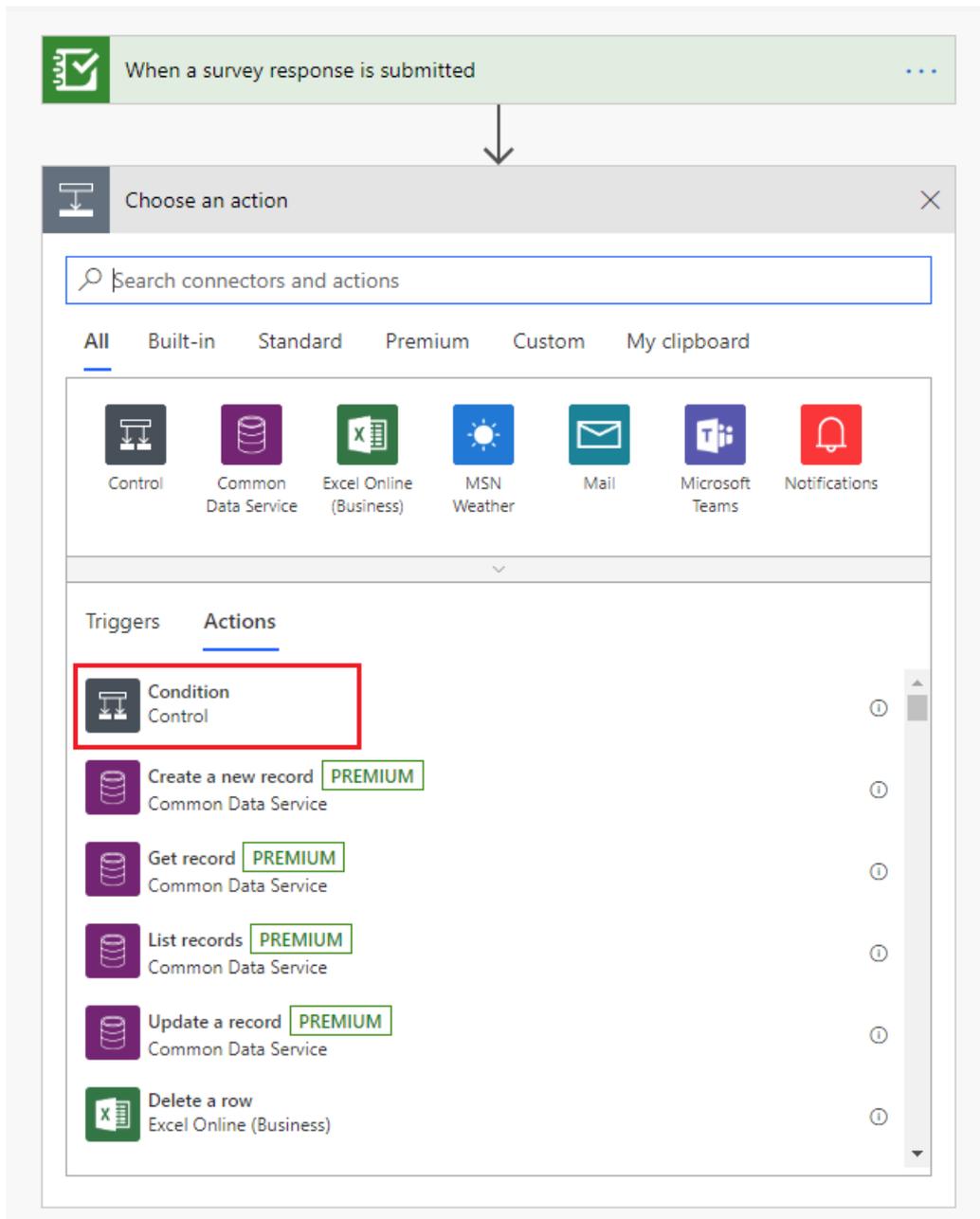
4. Select your survey from the drop-down and click on **New step**.

When a survey response is submitted

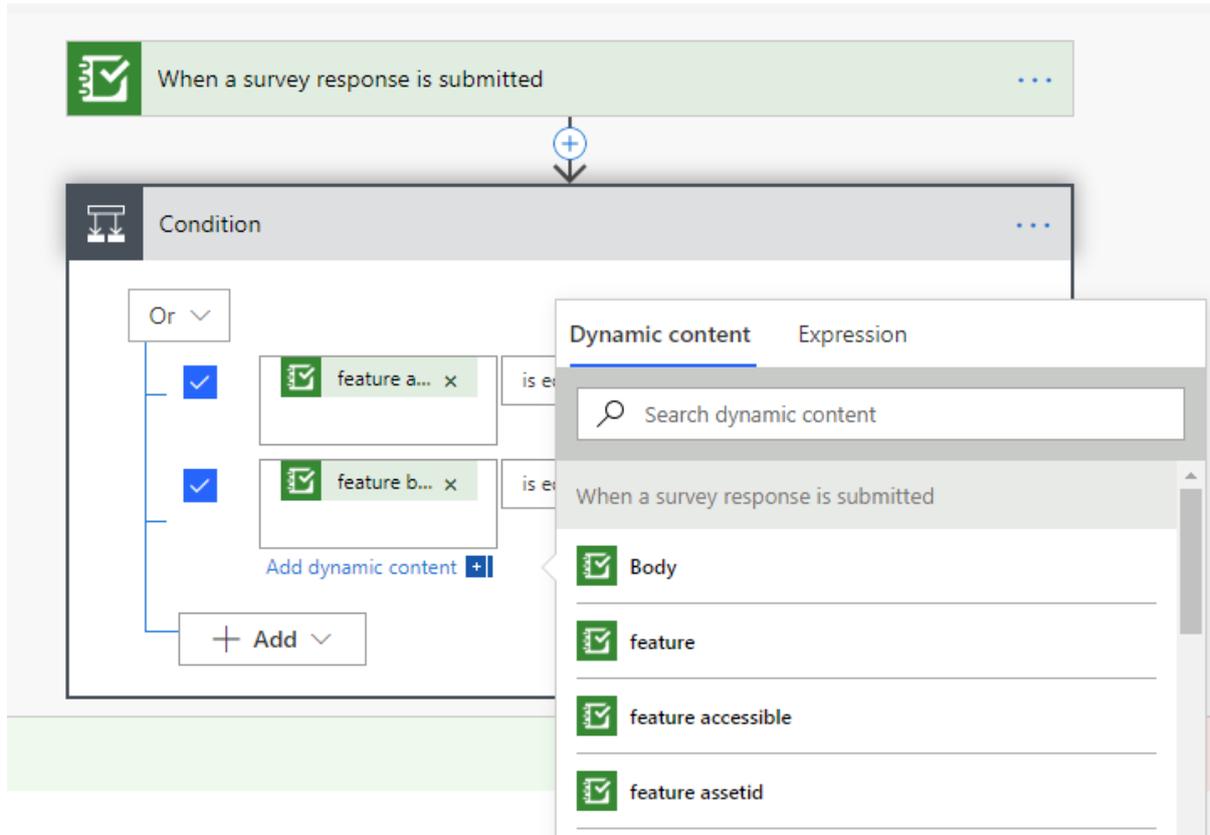
*Choose a survey Choose a survey

+ New step Save

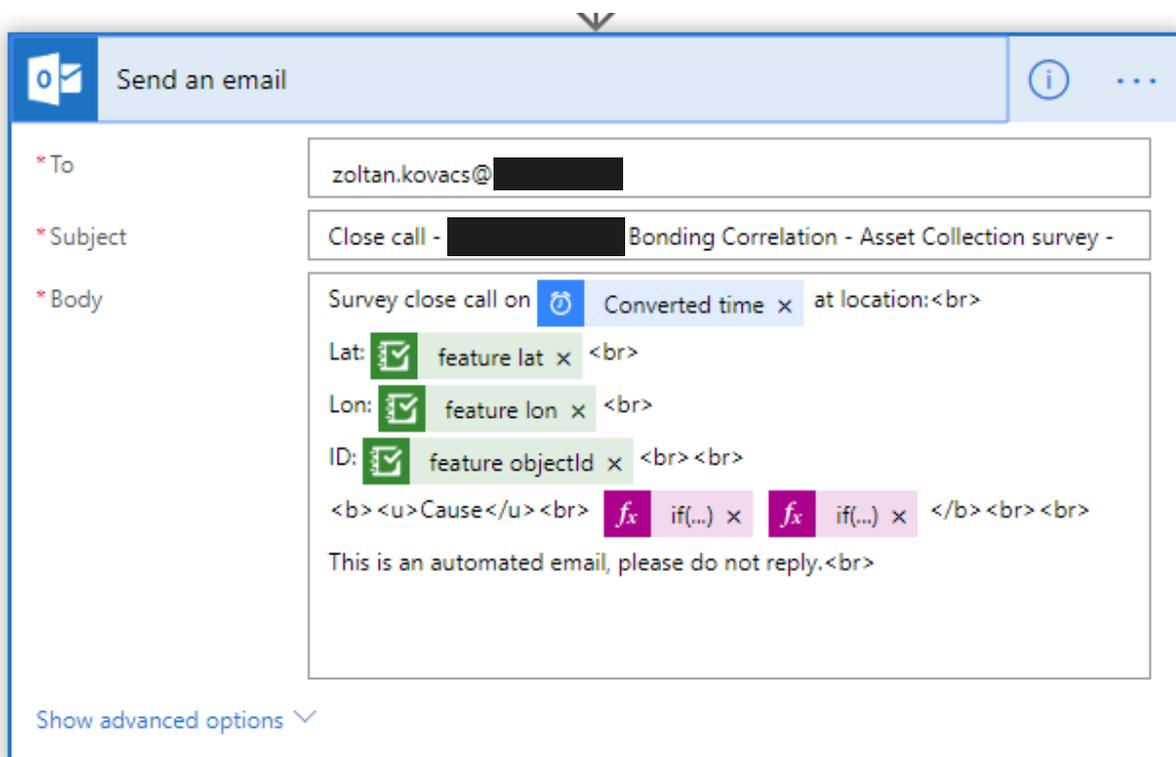
5. Choose an action, for example **Condition**



...and add your survey field(s) and the value(s) you want the webhook to be triggered for. You can select your survey fields from the *Dynamic content* part for the condition:



Under the 'If yes' branch, add a new step (click on the '+' sign) and search for *Send an email* (*Outlook*). Set up the required details and save your flow – use **both** **Save** buttons: one at the bottom and one in the top right corner!



You should be able to see the webhook triggered on the webhook's page under **Runs**:

Start	Duration	Status
Sep 5, 03:02 PM (5 min ago)	00:00:01	Succeeded
Sep 5, 03:02 PM (5 min ago)	00:00:01	Succeeded

If you click on an item on the list, you can see the details of that run. You can use this to see if a run failed (and why).

The screenshot displays a Microsoft Power Automate flow with the following steps:

- When a survey response is submitted** (Trigger, 0s): Initiates the flow.
- Condition** (1s): Checks the 'Expression result' which is 'true'.
- If yes** (Branch):
 - Add to time** (0s): Adds a time value.
 - Convert time zone** (0s): Converts the time zone.
 - Send an email** (1s): Sends an email with the following details:
 - To:** zoltan.kovacs@[redacted]
 - Subject:** Close call - [redacted] Bonding Correlation - Asset Collect
 - Body:** Survey close call on Thursday, September 5, 2019 3:01:59 PM at 10:00:00 AM
Lat: 51.532527788782104
Lon: -0.12211183016244012
ID: 10
<u>Cause</u> Bonding is NOT present
This is an automated email, please do not reply.

- If no** (Branch): This path is currently inactive.

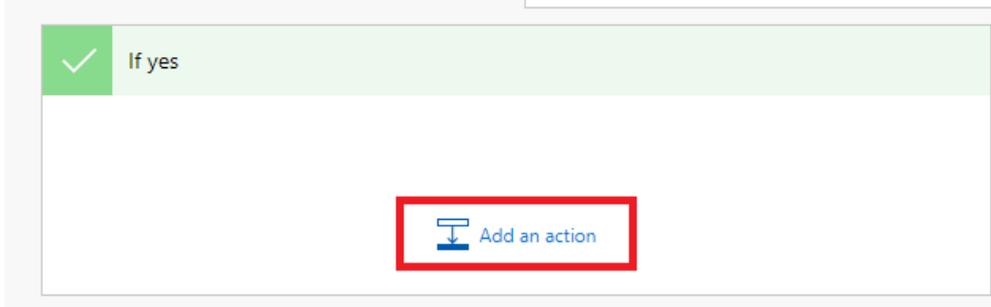
- Download your survey in Survey123 and test your trigger. If you downloaded the survey before the trigger was added, delete the survey in the app and re-download it. Otherwise your webhooks won't work.

Add survey time to your flow

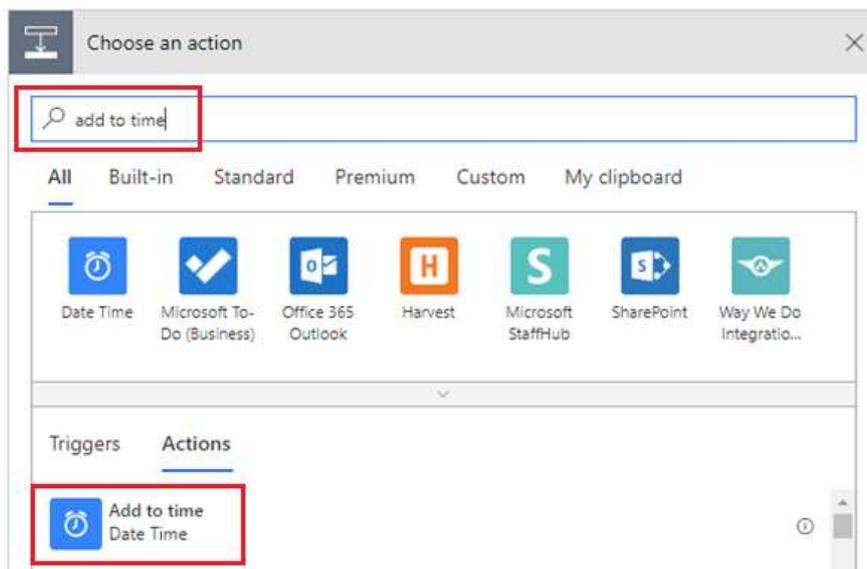
Survey123 submits date and time - if you have this type of question in your form - in UNIX format. This means that the date & time value from your form will be in **milliseconds**. By default, you cannot really display this in any usable format unless you convert it. There are many time converters available on the internet, like <https://www.epochconverter.com/>. Don't worry, we don't need to use these in Flow as we can set up a conversion function for this.

Following the webhook example in previous chapters,

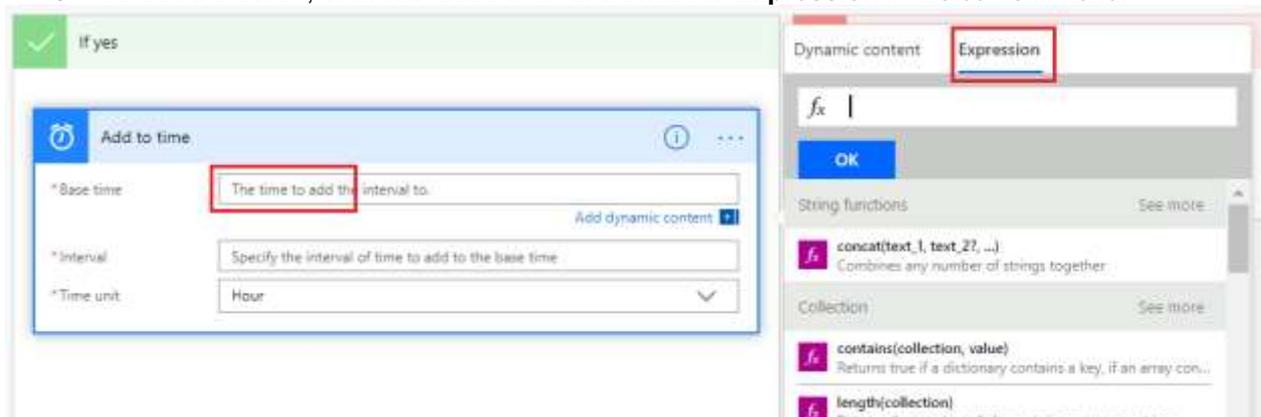
1. Click on **Add an action** under the 'If yes' branch of your condition:



2. Search for 'add to time' and click on the action on the result list.



3. To edit the action, click into 'Base time' and switch to **Expression** in the context menu:



4. Enter the following expression* into the function box and save your webhook.

```
addseconds('1970-1-1',div(triggerBody()?['feature']?['attributes']?['survey_datetime'],1000))
```

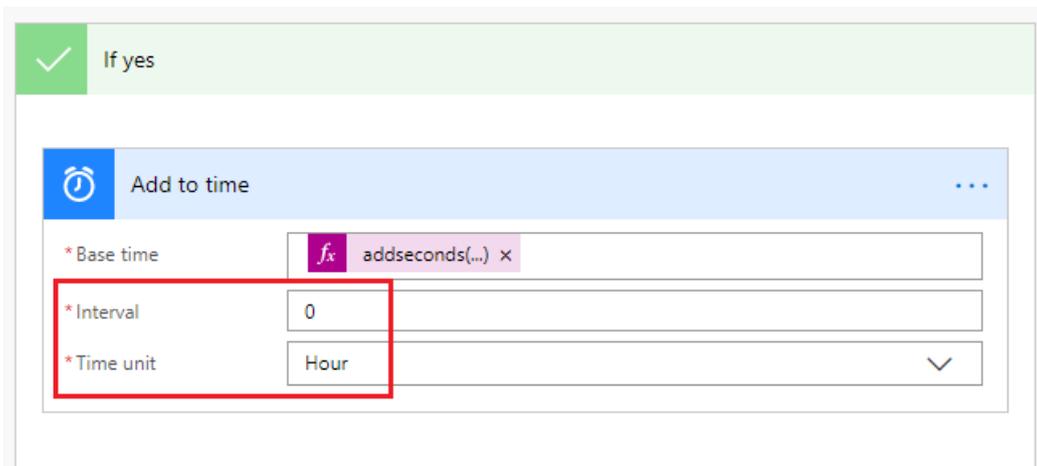
NB: This example assumes that the date/time field in your survey is called 'survey_datetime'. If it's different in your survey, you need to modify the expression accordingly.

* I am aware that a similar expression exists in [this](#) blog article, but all the date formatting strings I've tried gave me an error in Flow. I believe Flow was updated since that article and no longer accepts the formatting string as part of the expression. When leaving the formatting string out, the expression was accepted and works just fine.

So, what does the above snippet do?

The `addseconds()` function adds the seconds specified to a base time. The base time for Unix is 1st January 1970, hence the '1970-1-1' part as base. Then in the second parameter we call the dynamic value from the 'survey_datetime' field – but as this is in milliseconds, we need to divide this by 1000 as the function needs a value in seconds. That's why we use the `div()` function, which provides this division for us.

You can add a static hour/day/month/etc value to this calculation specifying the Interval and Time unit values in the step:



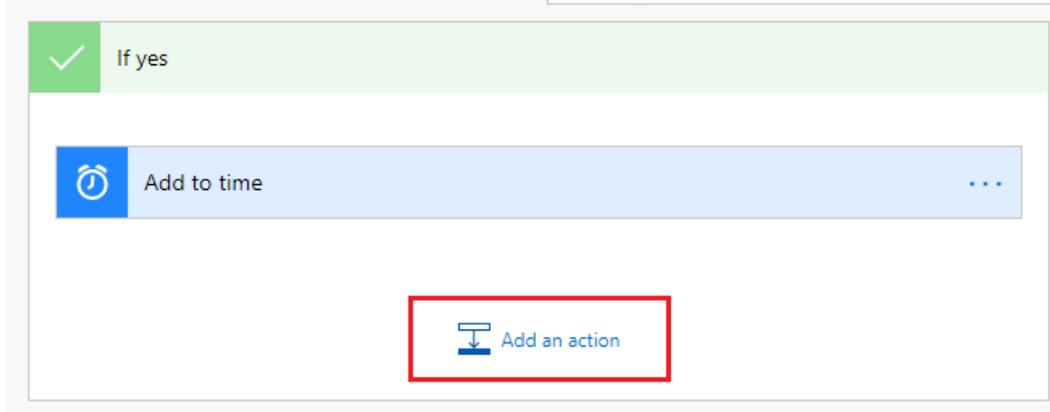
We'll use this function in the next step to convert the time zone.

Convert time zone

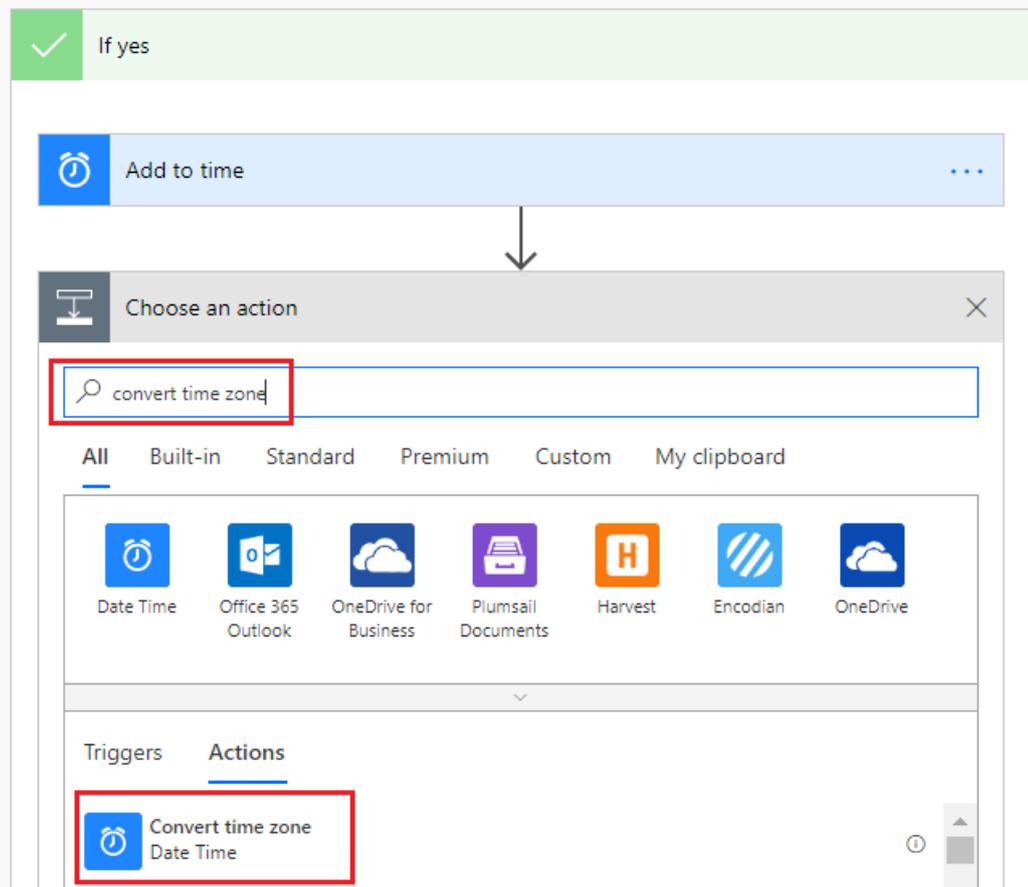
As discussed above, your survey's date & time is submitted in UNIX format (also known as UNIX Epoch, UNIX timestamp or POSIX time) which starts at midnight (UTC) on 1st January 1970. If your local time zone is different from UTC, you may want to convert the calculated time into your correct time zone.

The below steps assume you have completed the time calculation step in the previous section.

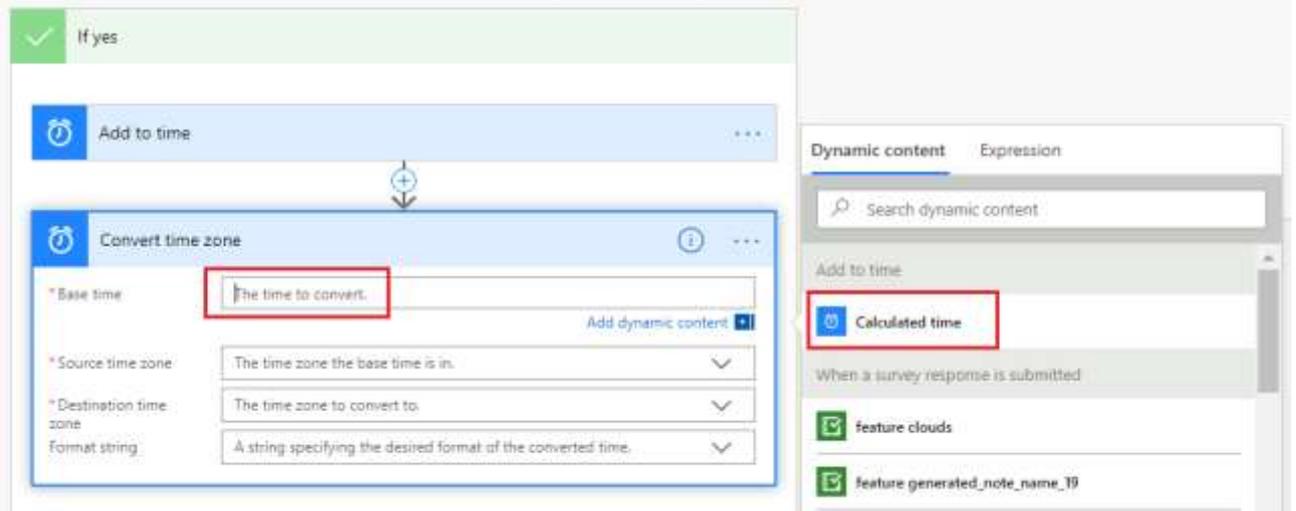
1. Click on **Add an action** under the 'If yes' branch of your condition:



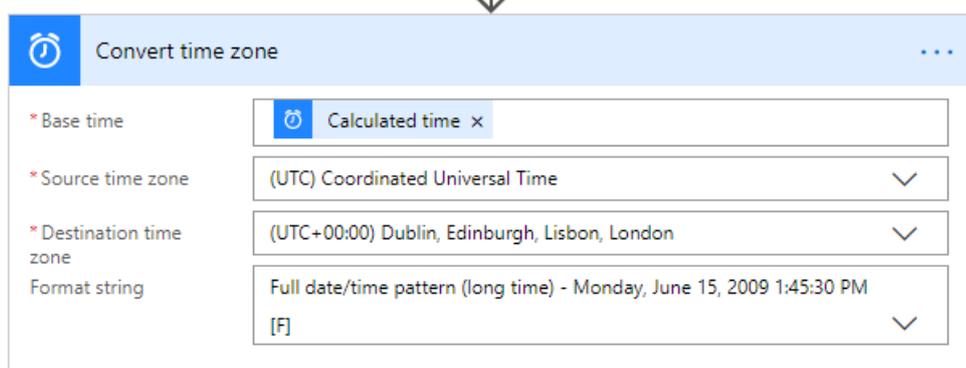
2. Search for 'convert time zone' and click on the action on the result list to add to your flow.



3. Click into *Base time*, go to **Dynamic content** tab of the context dialog select **Calculated time** – this is the function we created in the previous step.



4. Set up the *Source time zone* (it must be UTC) and your *Destination time zone*, then choose a *Format string* you want to use.

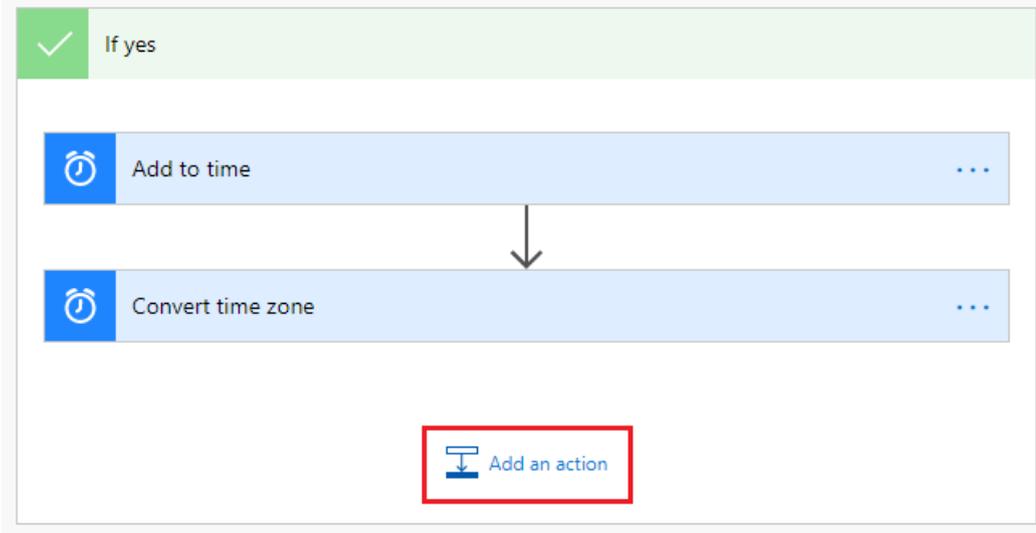


Email format and other advanced settings

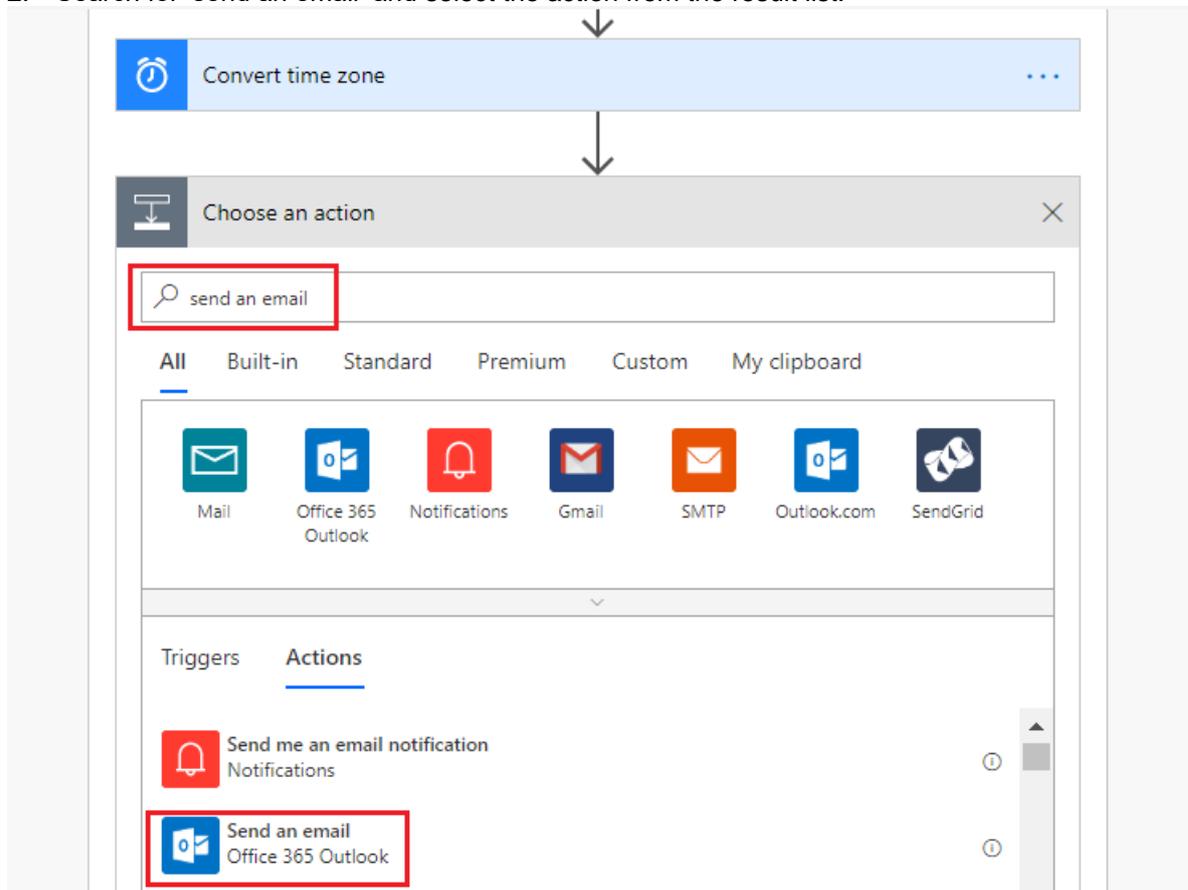
In this section we'll see how to set up an email template for our webhook containing dynamic elements from the survey data and where to access additional webhook settings.

The steps below build on the webhook started above but can be applied to any other webhook.

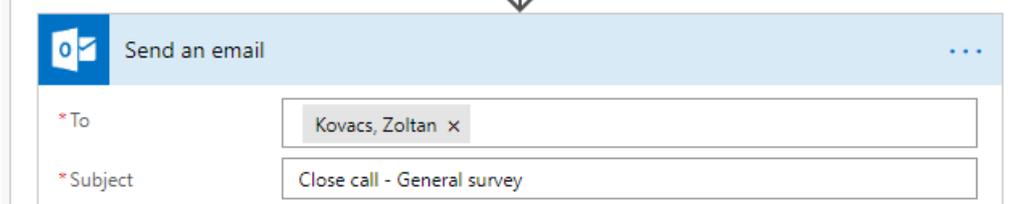
1. Click on **Add an action** under 'Convert time zone' of the *If yes* branch of your condition.



2. Search for 'send an email' and select the action from the result list.



3. Complete the *To* and *Subject* fields (you should be able to search for your O365 contacts).

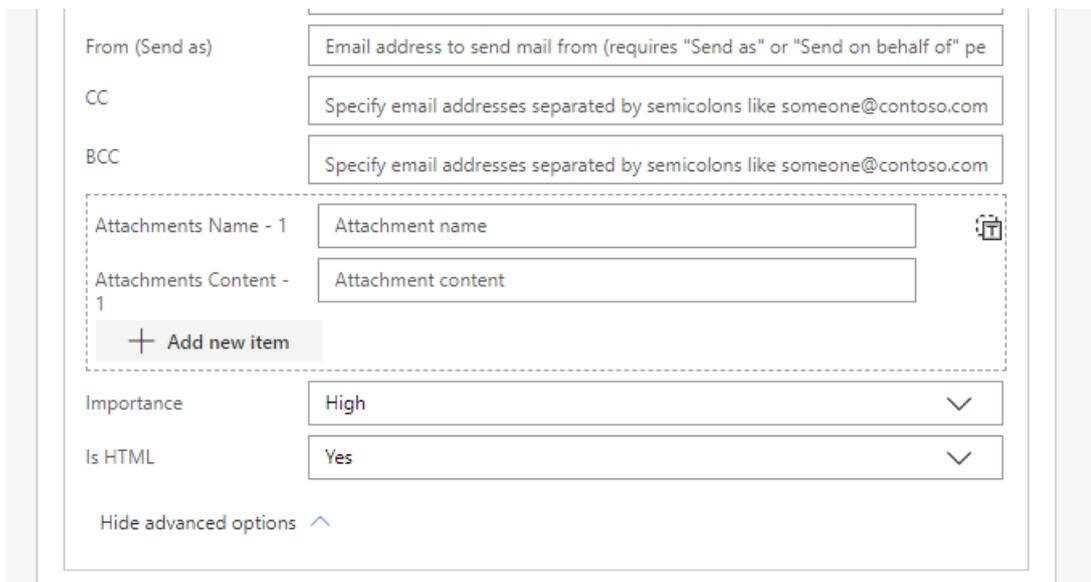


The screenshot shows the 'Send an email' step in a Power Automate flow. The 'To' field is populated with 'Kovacs, Zoltan' and the 'Subject' field is populated with 'Close call - General survey'. An arrow points to the 'To' field from the text above.

4. Compose the message

What formats and options do we have to include different content? By default, your message is sent as plain text - no hyperlinks or bold/coloured text, but you can include dynamic content like your converted time and values from your submitted survey data. What if you want more?

At the bottom left of the Send an email step, there is an option called **Show advanced options**. Hidden here you have the availability to switch your email format to HTML (and include **HTML formatting tags** to change the look of your email), send the email on behalf of someone else, add attachments, set CC and BCC recipients, set the importance of your message and so on.



The screenshot shows the 'Show advanced options' section of the 'Send an email' step. It includes fields for 'From (Send as)', 'CC', 'BCC', 'Attachments Name - 1', 'Attachments Content - 1', 'Importance' (set to High), and 'Is HTML' (set to Yes). There is also a 'Hide advanced options' link at the bottom.

That's general formatting out of the way, so we can now focus on including dynamic content in our message template. The following example will add a hyperlink to a web map that will show the location of the reported close call when it's clicked on. We will use a web map application that is shared with the relevant AGOL group(s), thus notified people can see the reported close call in a map.

The web map application to use may contain many other layers and we only want to show the one that contains the survey data and want to zoom in onto the close call location. How do we do this? Documentation to the rescue! The online help for Web AppBuilder for ArcGIS has a **section** about using URL parameters - we just need to have a look at the following sections:

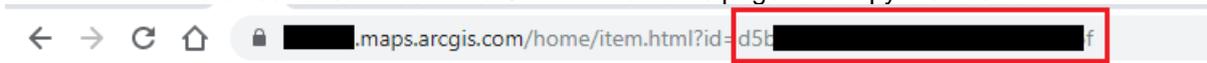
- Open a saved app
- Set layer's visibility
- Query a feature

Using the information from the help we can construct the url:

```
https://<your portal  
url>/apps/webappviewer/index.html?id=<itemId>&showLayers=<layerID>&query=<layerID>,  
<queryField>,<queryValue>
```

Where to find the values required?

- itemId: Open the item's page in AGOL and look at the end of the URL in your web browser or scroll down to URL on the item's page and copy the hash value.



- layerID: You can retrieve the layer ID from the content of the web map item:

```
https://<your portal  
url>/sharing/rest/content/items/<webmapItemID>/data/?f=pjson
```

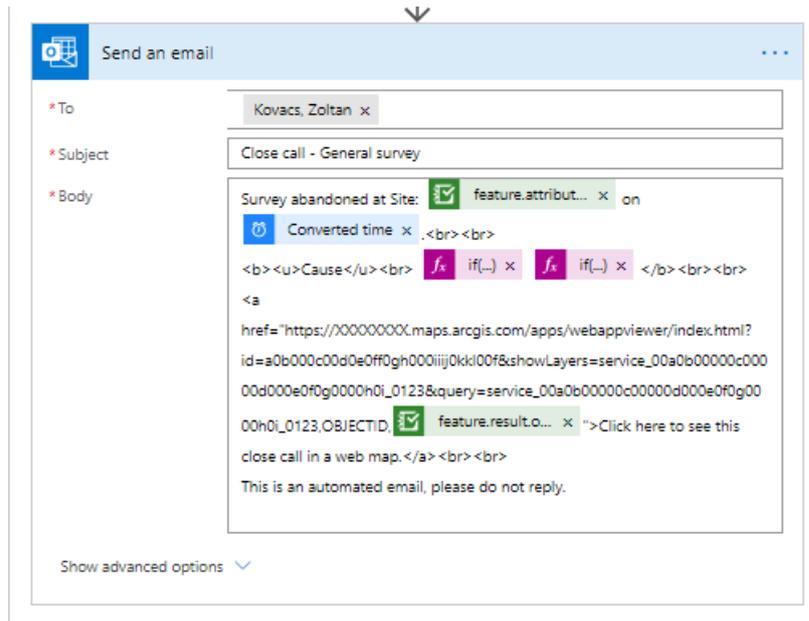
(Layer names are also acceptable, but they can be changed which would break the link.) *Tip: If you cannot access the service url (because the API is restricted by your AGOL admin in your organisation), you can use the [ArcGIS Online Assistant](#) to view the JSON of your web map and find the layer ID.*

- queryField: this is the field from your layer to use for the query. (We use the OBJECTID in our example.)
- queryValue: value coming from your survey data, so your link is dynamic and will work with any close calls. (For testing purposes, you can use a static value.)

It is highly recommended to test your URL in a web browser to make sure your web map application loads with the layers you need and shows the queried feature. It would look something like this:

```
https://XXXXXXXXX.maps.arcgis.com/apps/webappviewer/index.html?id=a0b00c00d0e0ff0gh  
000iij0kk100f&showLayers=service_00a0b00000c00000d000e0f0g0000h0i_0123&query=servi  
ce_00a0b00000c00000d000e0f0g0000h0i_0123,OBJECTID,95
```

Once the URL is tested and you are happy with the results, it can go into the email message with the rest of the dynamic content (change to 'Yes' under *Is HTML* first in advanced options). An example can be seen below.



The sent email would look like this:

 This message was sent with High importance.

Survey abandoned at Site: Site C on Friday, September 6, 2019 11:54:00 AM.

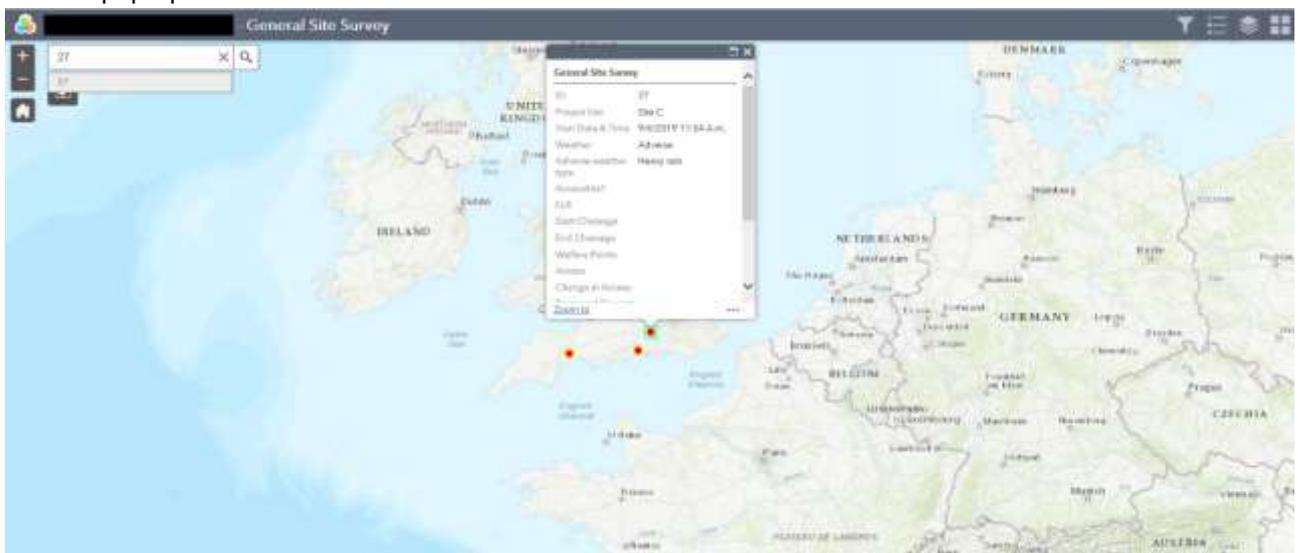
Cause

Adverse weather: Heavy rain

[Click here to see this close call in a web map.](#)

This is an automated email, please do not reply.

Clicking on the hyperlink opens the web map application, pans to the feature and displays a pop-up:



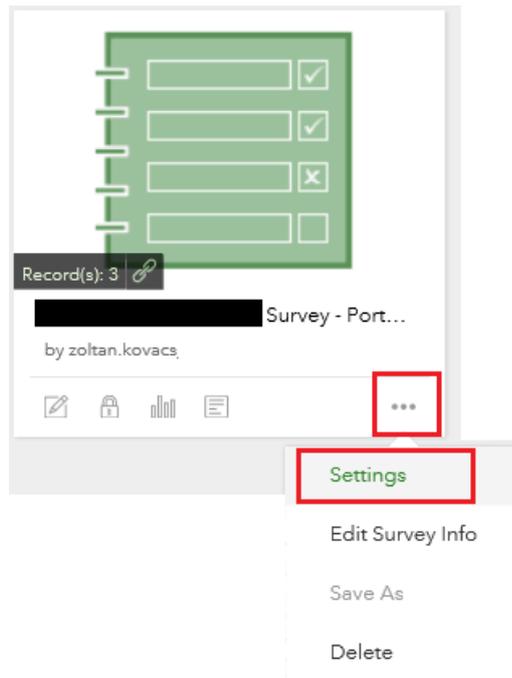
With using dynamic content in custom functions in the body of your message you can create a template that could be dynamically updated with the correct close call reason for example:



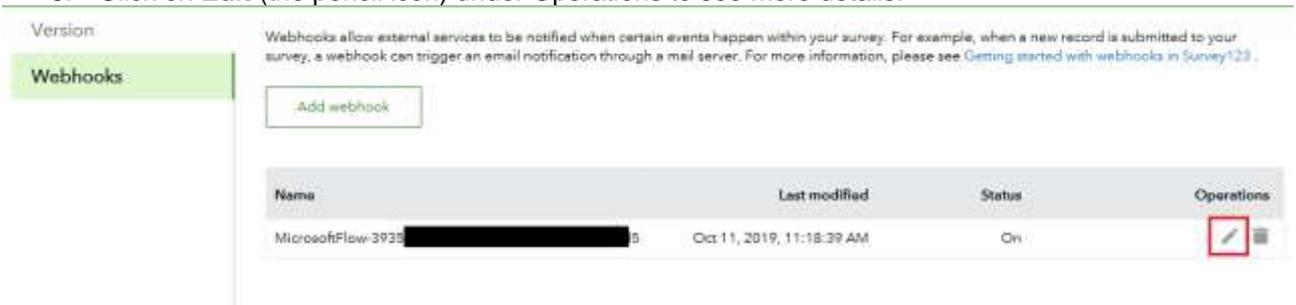
Additional webhook settings on the Survey123 website

Most of your webhook settings can be controlled in your Power Automate (aka MS Flow) account, but there are a few settings that can only be accessed on the Survey123 website.

1. Open a web browser and go to <http://survey123.arcgis.com/>.
2. Login with your AGOL account details and click on 'My Surveys' (if the site doesn't load it automatically).
3. Locate the survey in question on the list and click on the ellipsis button (...) in tile then select Settings.



4. Click on **Webhooks** on the left-hand side list on the next page.
5. Click on **Edit** (the pencil icon) under Operations to see more details.



6. On the next page, you can make changes to your webhook:
 - Edit its name
 - Change when it should be triggered: new records submitted; existing records edited
 - Event data: information included in the payload. Hover over the grey '?' icon after each item to see the information they include
 - Turn the webhook off or back on

Version

Webhooks

Edit webhook

A POST request will be sent to the payload URL below with selected details of any subscribed events.

Name *

MicrosoftFlow-3938-5

Payload URL *

https://prod-84-westus.logic.azure.com/workflows/3938-5/triggers/When_a_survey_response_is_submitted/versions/0

Trigger events

New record submitted Existing record edited

Event data

Include following information in the payload:

Survey info ⓘ Server response ⓘ Submitted record ⓘ

User info ⓘ Portal info ⓘ

Status

On

Save Cancel

Make sure you click on **Save** after you modified any of the details.

NB: Changing the payload URL can break your webhook, only do it if you are sure you know what you're doing.

Tip: If you add new or delete existing webhooks, you need to delete and re-download the survey in the Survey123 app to get the changes applied in your survey form.