

GDS

# Performance analysis

**GDS Advanced Analytics Reporting  
Techniques**

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## Advanced Reporting: Tracking links and downloads

Since Wednesday 12 August 2015 Google Analytics (GA) on GOV.UK has been counting clicks on external links and on downloadable assets - such as PDFs - hosted on GOV.UK.

### How this works

Downloads and external links are tracked as *events* within GA. When a link is clicked that action is passed to GA, which associates it with the time, session and page it took place on.

This means that we are counting clicks. Of course someone who clicks on a download doesn't necessarily go on to read that document or even complete the download.

### What is being recorded

#### Naming system

Events in GA have a **category**, an **action** and a **label**. These let us apply filters so we can just look at specific links/assets, types of assets, links to a particular domain or even distinguish between two links to the same external destination on the same page. The following details are used in the external links and downloads events:

Event Name	External links	Downloads
<b>event category</b>	External Link Clicked	Download Link Clicked
<b>event action</b>	[the external URL]	[the slug of the downloadable asset]
<b>event label</b>	[link text]	[link text]

The page on which the event was triggered (clicked) is associated with each event. And the context of each event is available. So we can identify the original external source of traffic to that event or the type of device being used or the international location of the user etc.

#### Levels of activity so far

In the first week of recording downloads and external we recorded:

- 1.9 million downloads
- 7.4 million clicks of external links
- that in 31% of visits to GOV.UK the user clicked on an external link
- in 6% of visits the user downloaded a document

Not surprisingly mobile users are far less likely to download documents. They are also less likely to click external links.

#### What's not being counted

As with all our metrics, GA doesn't count everything. Some users and behaviours will be missed. And sampling may be happening. For example:

- GA misses users who don't run javascript or who opt-out of being tracked

- certain actions, notably people right mouse clicking on links, are not recorded. (I haven't found any stats for right mouse clicking behaviours.)
- sometimes people move through pages before the GA tracking code has time to record them
- we are recording different browsers in different ways; it's possible that older browsers are being counted slightly less reliably. It's difficult to prove this
- GA sets some limits for recording events. If someone triggers too many events in a session or triggers too many per second they may not be recorded.
- There are currently a few external links which are not being tracked. Buttons on some transaction start pages (like [SORN](#)) are form submissions rather than links.

**The general rule is not to treat the metrics as definitive figures. Look at trends and relative popularity.**

### Only internal downloads are being counted

These metrics only count downloads when a user clicks on a download link on GOV.UK.

For some assets some of the visitors may be arriving directly from search engine results or from links in a website or from social media activity. Downloads from these sources are not being counted.

## Finding this data on Google Analytics

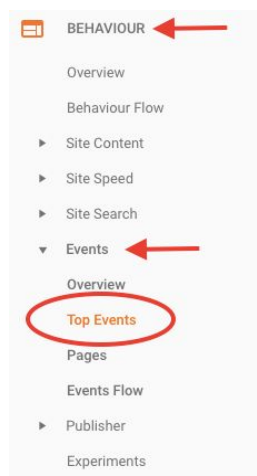
There are several ways in which you can access this data.

### 1. Normal GA interface

There are 2 main ways to approach the data; either by looking at a particular (or group of) links/downloads or by looking at a page(s) where the links/downloads were clicked.

Looking for specific downloads/external links

**a.** Events can be found in the main GA interface at **Behaviour > Events > Top Events**



b. All 30 or so events used on GOV.UK are visible there, so you need to select **External Link Clicked** or **Download Link Clicked**

Event Category ?
1. External Link Clicked
2. ScrollTo
3. Download Link Clicked
4. browser-check
5. user_satisfaction_survey

c. Clicking on these will take you to a list of **event actions** (the external URL or the slug of the downloadable asset) and the number of **total events** and **unique events** associated with it.

Event Action ?	Total Events ? ↓	Unique Events ?
	<b>1,157,028</b> <small>% of Total: 50.92% (2,272,063)</small>	<b>940,852</b> <small>% of Total: 30.05% (3,130,742)</small>
1. <a href="https://www.vehicletax.service.gov.uk">https://www.vehicletax.service.gov.uk</a>	<b>126,095</b> (10.90%)	<b>111,176</b> (10.91%)
2. <a href="https://www.student-finance.service.gov.uk/customer/home">https://www.student-finance.service.gov.uk/customer/home</a>	<b>77,524</b> (6.70%)	<b>69,120</b> (6.78%)
3. <a href="https://jobsearch.direct.gov.uk/FedHandler.ashx">https://jobsearch.direct.gov.uk/FedHandler.ashx</a>	<b>67,008</b> (5.79%)	<b>58,403</b> (5.73%)
4. <a href="https://www.viewdrivingrecord.service.gov.uk/driving-record/licence-number">https://www.viewdrivingrecord.service.gov.uk/driving-record/licence-number</a>	<b>47,269</b> (4.09%)	<b>40,433</b> (3.97%)

d. You could then filter the events being shown down to a specific link and apply **Page** as a secondary dimension to show where the link was clicked.

*Example:* You want to know which pages on GOV.UK are sending the most people to the external link <https://online.hmrc.gov.uk/login>. The event action being filtered by the URL and the secondary dimension shows which GOV.UK pages the click took place on:

Event Action ?	Page ?	Total Events ? ↓	Unique Events ?	Event V
		<b>3,403</b> <small>% of Total: 0.46% (734,124)</small>	<b>2,905</b> <small>% of Total: 0.26% (1,114,684)</small>	
1. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/log-in-file-self-assessment-tax-return	<b>2,000</b> (58.79%)	<b>1,736</b> (59.37%)	
2. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/guidance/hmrc-online-services-for-agents	<b>455</b> (13.37%)	<b>367</b> (12.55%)	
3. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/use-construction-industry-scheme-online	<b>154</b> (4.53%)	<b>132</b> (4.51%)	
4. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/claim-gift-aid-online	<b>92</b> (2.70%)	<b>69</b> (2.36%)	
5. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/sa302-tax-calculation	<b>91</b> (2.67%)	<b>80</b> (2.74%)	
6. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/log-in-register-hmrc-online-services/register	<b>77</b> (2.26%)	<b>74</b> (2.53%)	
7. <a href="https://online.hmrc.gov.uk/login">https://online.hmrc.gov.uk/login</a>	/pay-payee-tax/direct-debit	<b>64</b> (1.88%)	<b>58</b> (1.98%)	

**Focus on pages where the events took place**

Alternatively you could select **Behaviour** > **Events** > **Pages** and filter to see the page(s) you're interested in. Then choose **Event Action** as a secondary dimension to see what events took place on that page.

The screenshot shows the Google Analytics interface. A dropdown menu for 'Secondary dimension' is open, showing 'Event Action' selected. The table below displays event data for four pages.

Page	Total Events	Unique Events
1. /	2,272,063 % of Total: 100.00% (2,272,063)	1,570,479 % of Total: 50.16% (3,130,742)
2. /vel	186,851 (8.22%)	139,394 (8.04%)
3. /job	136,414 (6.00%)	117,892 (6.80%)
4. /student=finance=register=login	118,685 (5.22%)	91,318 (5.27%)
	81,188 (3.57%)	71,815 (4.14%)

## 2. Dashboard widgets

Custom dashboards in the main GA interface can include widgets with metrics on events. The example below would provide a table of the top 10 external links going to hmrc.gov.uk:

The 'Widget Settings' dialog box is shown with the following configuration:

- Widget title:** External links clicked to hmrc.gov.uk
- Standard:** TABLE
- Real time:** TABLE
- Display the following columns:** Event Action, Total Events, Unique Events
- Show a table with:** 10 rows
- Filter this data:**
  - Only show: Event Category, Regular Expression: External
  - Only show: Event Action, Regular Expression: hmrc.gov.uk
- Link to Report or URL:** (empty)
- Buttons:** Save, Cancel, Clone widget, Delete widget

### 3. Customised reports

This is the most flexible method because you can be precise about what data you want to see. The extra levels of filtering here means that some of the resulting data is likely to be sampled so you may need to order an unsampled report.

*Example:* You want to know which assets are being downloaded from DfT pages on GOV.UK. It filters on the DfT organisation code for the originating page and only includes downloads.

#### Edit Custom Report

##### General Information

Title

##### Report Content

Report Tab

Name

Type

Dimensions

Metrics

##### Filters - optional

and

The result is a table like this:

Page ?	Event Action ?	Total Events ↓	Unique Events
1. <a href="/government/publications/the-highway-code-traffic-signs">/government/publications/the-highway-code-traffic-signs</a>	<a href="/government/uploads/system/uploads/attachment_data/file/442628/the-highway-code-signs-giving-orders.pdf">/government/uploads/system/uploads/attachment_data/file/442628/the-highway-code-signs-giving-orders.pdf</a>	127 (9.24%)	100 (8.36%)
2. <a href="/government/publications/the-highway-code-traffic-signs">/government/publications/the-highway-code-traffic-signs</a>	<a href="/government/uploads/system/uploads/attachment_data/file/442629/the-highway-code-warning-signs.pdf">/government/uploads/system/uploads/attachment_data/file/442629/the-highway-code-warning-signs.pdf</a>	83 (6.04%)	69 (5.77%)
3. <a href="/government/publications/the-highway-code-road-markings">/government/publications/the-highway-code-road-markings</a>	<a href="/government/uploads/system/uploads/attachment_data/file/312242/the-highway-code-road-markings.pdf">/government/uploads/system/uploads/attachment_data/file/312242/the-highway-code-road-markings.pdf</a>	58 (4.22%)	50 (4.18%)
4. <a href="/government/publications/the-highway-code-traffic-signs">/government/publications/the-highway-code-traffic-signs</a>	<a href="/government/uploads/system/uploads/attachment_data/file/442631/the-highway-code-information-signs.pdf">/government/uploads/system/uploads/attachment_data/file/442631/the-highway-code-information-signs.pdf</a>	58 (4.22%)	49 (4.10%)
5. <a href="/government/publications/the-highway-code-traffic-signs">/government/publications/the-highway-code-traffic-signs</a>	<a href="/government/uploads/system/uploads/attachment_data/file/442630/the-highway-code-direction-signs.pdf">/government/uploads/system/uploads/attachment_data/file/442630/the-highway-code-direction-signs.pdf</a>	57 (4.15%)	49 (4.10%)

## More about events

### Other events on GOV.UK

Events are used for various purposes on GOV.UK. For example there are currently events that look out for old browsers or report on javascript errors or count completions of smart answers or measure how far a user scrolls down a page.

To prevent these other events from complicating your reporting, you may want to filter the event category so that it only shows you 'External Link Clicked' and/or "Download Link Clicked".

### Total events vs unique events

Two metrics are available for events. It's important to understand the difference. It's similar to pageviews vs unique pageviews; **total events** is a raw count of the number of times that event was triggered. If someone clicks a link 5 times in a session total events will register 5 while **unique events** will only count a single event.

In this case it is a bit more complicated because there can be total and unique events at the level of all events, or for particular event categories, actions or labels. Unique events is usually the best option but you need to think through what 'unique' means in the context.

### The effect on bounce rates and time on page

Tracking external links and downloads affects some other metrics. A **bounce rate** is defined as the percentage of visits in which the person left the site from the entrance page *without interacting further* with the page. It's always been an ambiguous measure since it includes visits where the user has properly gone on to download an asset or click an external link.

We are designating a download or external link click as a positive interaction with the site. So a user who arrives on a page on GOV.UK and then clicks on an external link (or clicks on a PDF download) will no longer be counted as bouncing. On pages where the primary action is an external link or download - transaction start pages are the best example - we've seen bounce rates fall from 60-70% to 10-20%.

### Interaction and non-interaction events

Events in GA can be set as interaction or non-interaction. Non-interaction events tend to be passive ones, such as checking the user's browser or recording when they are shown a survey. Interaction events are those where the user chooses to do something positive on the site.

It will also affect the **time of page** metric. When someone bounces, GA does not know the time the person leaves the page on a single page visit, so it cannot calculate the time on page for bounced visits. Now the exit time will be set as the time that the external link or download event is triggered, so those visits *will* be counted and the average time on page



will be affected. The effect we've seen here is smaller and varied but it should mean that the time on page metric is more accurate.

## 4. Tracking clicks on email links

From late afternoon on Monday 22 February Google Analytics (GA) starting tracking users clicking on mailto: links on GOV.UK.

### Finding this data

To find this data go to the main reporting screen in Google Analytics and use:

**Behaviour > Events > Top Events** in the left hand navigation.

Then select the Event Category **Mailto Link Clicked**. (This is currently about the 15th most popular event category so doesn't show on the first page.)

The events are labelled like this:

- Event Category: Mailto Link Clicked
- Event Action: the underlying link code, for example: <mailto:phishing@hmrc.gsi.gov.uk>
- Event Label: the visible text link, for example: [phishing@hmrc.gsi.gov.uk](mailto:phishing@hmrc.gsi.gov.uk)

GA records on which page an event takes place on so you could select Page as a secondary dimension or approach it by using **Behaviour > Events > Pages**, then selecting a page and finally drilling into the **Mailto Link Clicked** Event Category.

### What does this show?

As with the tracking of external links and downloads, events only count the number of times the link was clicked. It's an indication of intent; it cannot know what happens next.

There is a particular problem with mailto: links. The user's set-up will dictate what happens next. For example, clicking a mailto: link may launch a desktop email client like Outlook or Mail which the user doesn't use or hasn't even configured. Browsers and OSes can be set up to perform a preferred action when the click is made but many users will not know how to do this.


# Advance Reporting: Building custom funnels

Custom Funnels let you visualise the steps your users take to complete a task and quickly see how well they are succeeding or failing at each step.

## Part 1 - Create an 2 Stage Funnel

Custom Funnels appear as a tab in a custom report.

1. Select the **Customisation** menu.
2. Click **+New Custom Report** from the top of the table.
3. *If you don't see this option, select **Custom Reports > Overview** in the report navigation on the Left hand side.*
4. Select the **Funnel** tab.



The screenshot shows the 'Create Custom Report' interface. Under the 'General Information' section, the 'Title' field contains 'New Custom Report'. Under the 'Report Content' section, there is a 'Report Tab' button with an 'x' icon and a '+ add report tab' link. Below this, the 'Name' field contains 'Report Tab'. The 'Type' section has four buttons: 'Explorer', 'Flat Table', 'Map Overlay', and 'Funnel BETA'. The 'Funnel BETA' button is highlighted with a red circle.

Select **Advance Options** to edit the user scope

For this exercise the funnel is closed because we want to see how many users are going straight to the guide after reading the campaign page

1. Restrict the Funnel to be session-scoped by selecting **All stages must occur within a session.**
2. Funnel Type: Closed
3. Metric: Users
4. Subsequent stage should follow: Immediately after a stage

Analysis Type  Different stages can occur in different sessions.  
 All stages must occur within a session.

Advanced Options

Funnel Type

Closed – Users may only enter a stage from the beginning of the funnel or from the preceding stage.  
 Open – Users may enter into the funnel at any stage.

Metric

Users  
 Sessions

Subsequent stage should follow

At any time after a stage.  
 Immediately after a stage.  
 Let me decide individually for every stage.

## Building your Funnel

You can have up to 5 stages. The below example is a 2 stage funnel looking at how many users went on to a main stream guide linked on a *campaign page*.

Stage 1 of the funnel is your starting page

- Give the stage a name by editing the **label** field
- Click **+add filter** to add a new rule. Use the dimension drop-down menu to select the dimensions you want to use to define the stage. Rules can be inclusive or exclusive, and the values you provide can be matched exactly or you can use a regular expression.

1. From the **Dimensions drop down** - select **Page**
2. In the field box paste your URL e.g **/yourstatepension**

STAGE 1

Label

Start Page

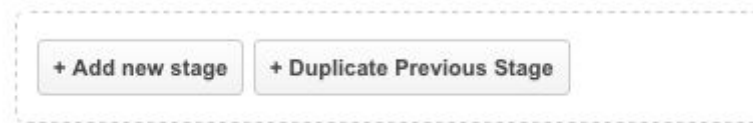
Stage Rules

Include Page Exact

and

+ add filter

Click **+add stage** to add a new stage to build up your Funnel stages



1. Edit the stage rules by adding the next page in your funnel. For Stage 2 add the following URL **e.g /new-state-pension/overview**
2. Once you have completed your 2 stages click **Save**

#### Filters - optional

Report level filters are not applicable when one of the tabs is a Custom Funnel Tab.

#### Views - optional

Reports with a funnel tab will only be visible in views under premium properties.

All views associated with this account

1. GOV.UK (Entire site - Filtered) ▾

Save Cancel

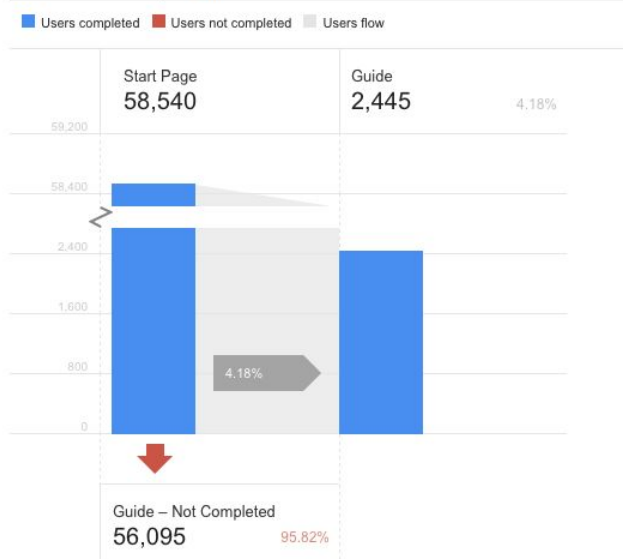
## Funnel Graph

The Custom Funnel graph depicts each stage in the funnel and shows the numbers of users who completed the stage and moved on, as well as those who did not complete each stage and dropped out.

Custom funnels are retroactive, meaning you apply them to data that's already been collected and processed.

Use the **Date Range** controls in the report to look at different dates.

#### Closed Funnel Analysis BETA

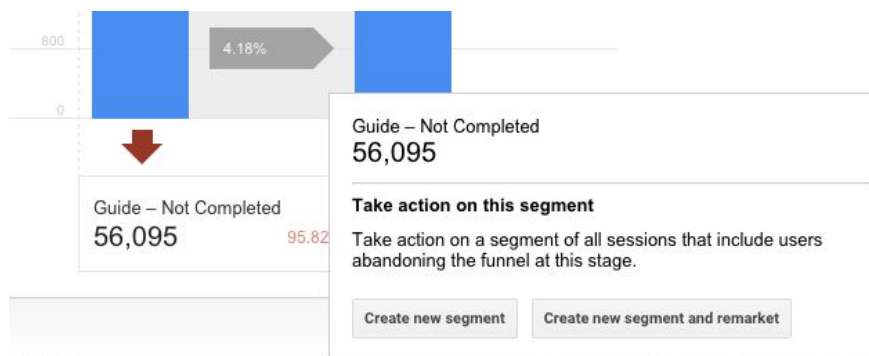


## Part 2 - Using the Funnel Data

You can click any **completed** or **not completed stage** in the Custom Funnels graph to create a new Segment based on the criteria of that stage.

You can then apply this Segment throughout Google Analytics to better understand what caused the behavior demonstrated in the stage.

1 . Click over the **not completed stage** and to get the **'Create new segment' window**, then click **Create new segment**



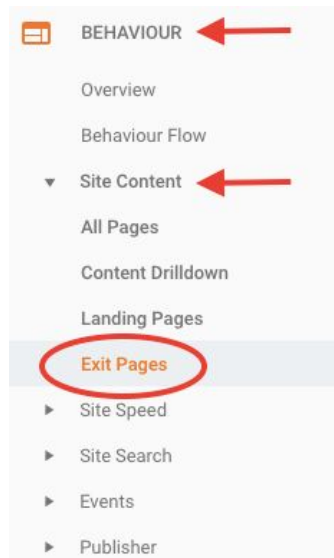
2. Then name your new segment and click create

The screenshot shows the 'Create a funnel segment' dialog box. It has a blue circular icon with a bar chart. The title is 'Create a funnel segment'. There is a 'Name' field with the text 'My Segment'. Below that are 'Enable Views' options: 'Any View' (unselected) and 'Current View' (selected). At the bottom, there is a 'Segment definition: Report Tab - Guide - Not Completed' and two buttons: 'Create Segment' and 'Cancel'.

You can then go to the Reporting interface and use the segment to see their journeys of the users who **did not complete** for example:

Look at their exit pages (*Behaviours > All Pages > Exit Pages*) or where they came from by looking at their referral source (*Acquisitions > All Traffic > Referral Source*)

**Behaviour > Site Content > Exit Pages**

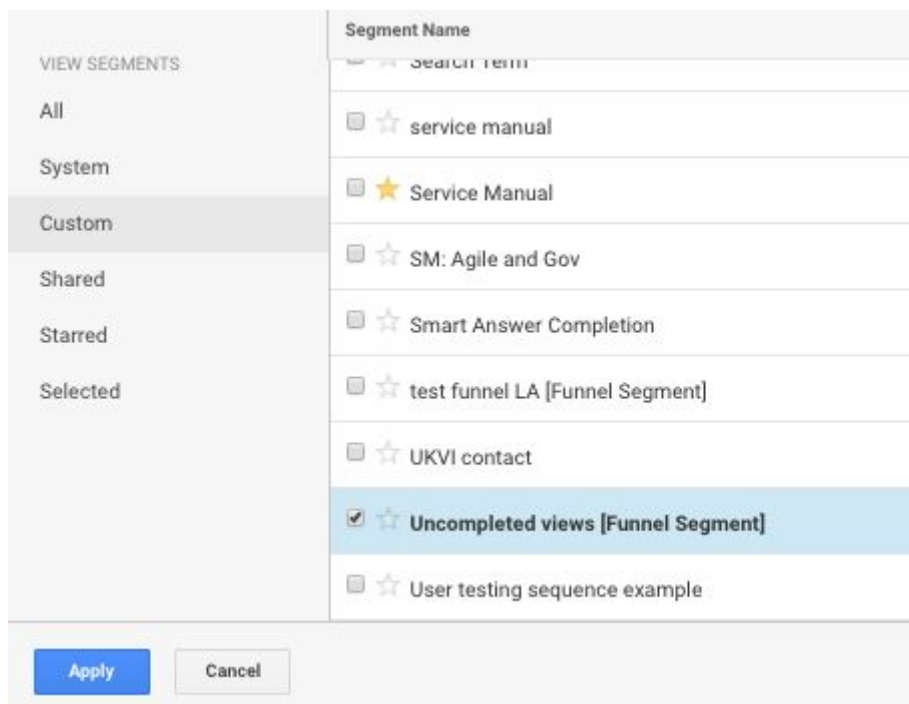


Once in the right reporting area select your segment by clicking **+Add Segment**

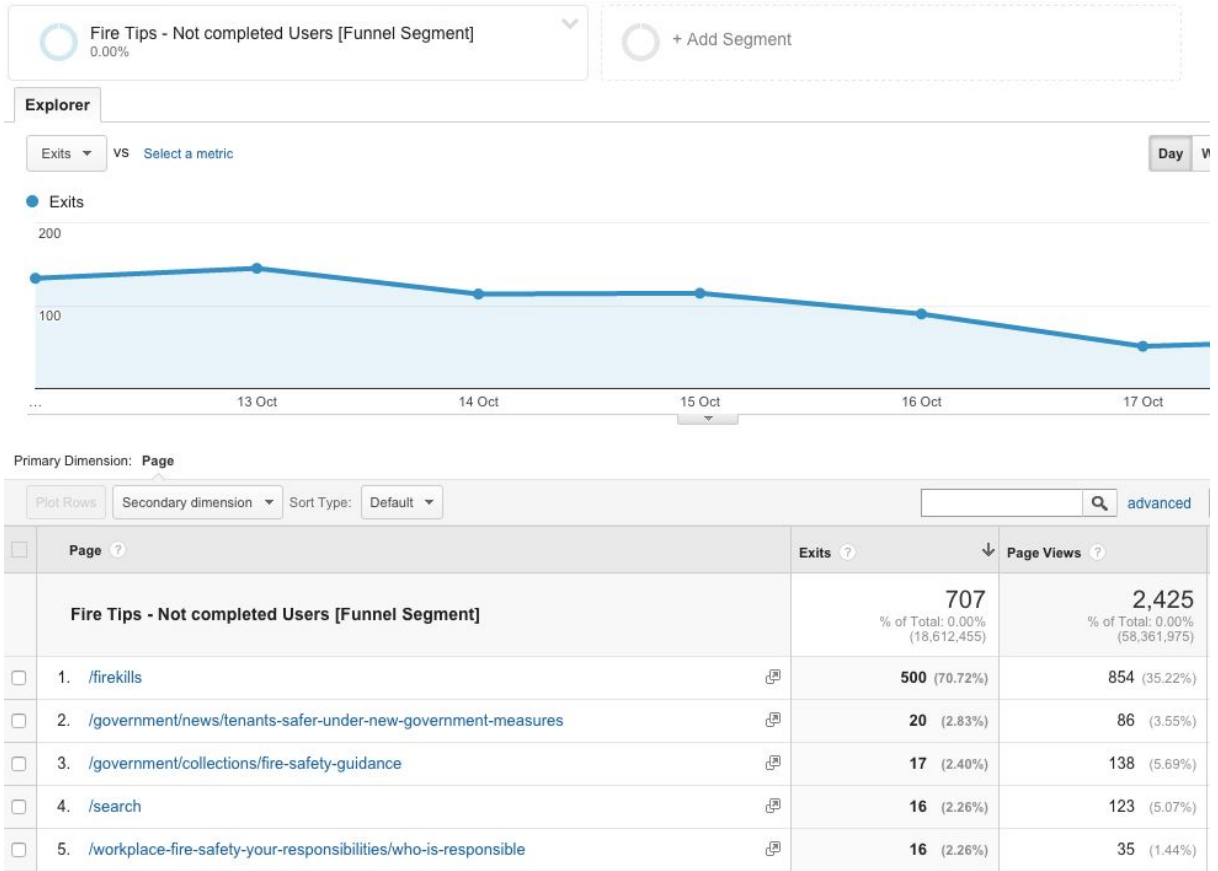


Your new segment can be found under **Custom**

Select your new segment from the list by 'checking' the box next to it. Then click **Apply**.



### Example of Segment of users who did not complete - Exit pages



## Advance Reporting: How to use Google Analytics add-on in Google Sheets

Link to the **Quick page Analytics** Google sheet.

[https://docs.google.com/spreadsheets/d/1ix\\_QY-OivdWHYUv0Rf6UuvP9aUICO6d9jvfUyINOHtl/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1ix_QY-OivdWHYUv0Rf6UuvP9aUICO6d9jvfUyINOHtl/edit?usp=sharing)

### How to use:

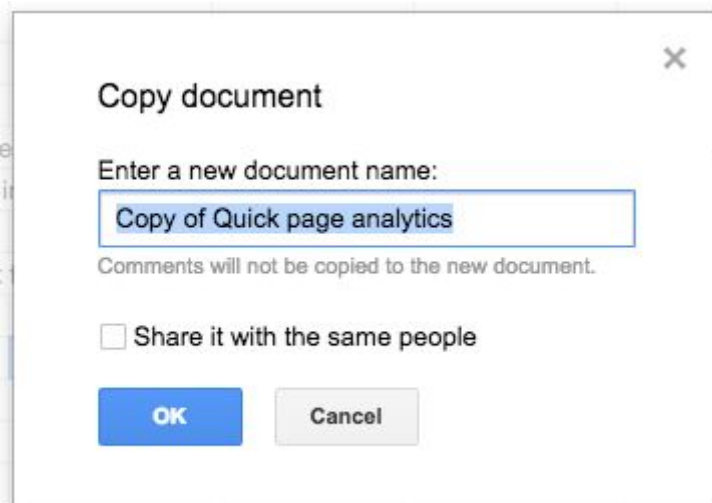
Go to the link above and then sign into your Google Analytics account - top right



**DO NOT edit directly on to the version at the link above, you will need to make a copy.**

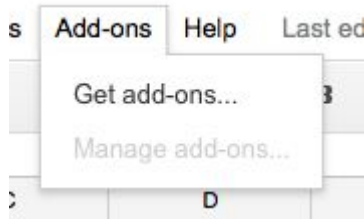
Go to **File > Make a copy** - You will be prompted to rename a new version of the file.

A copy will then open in a new window or tab

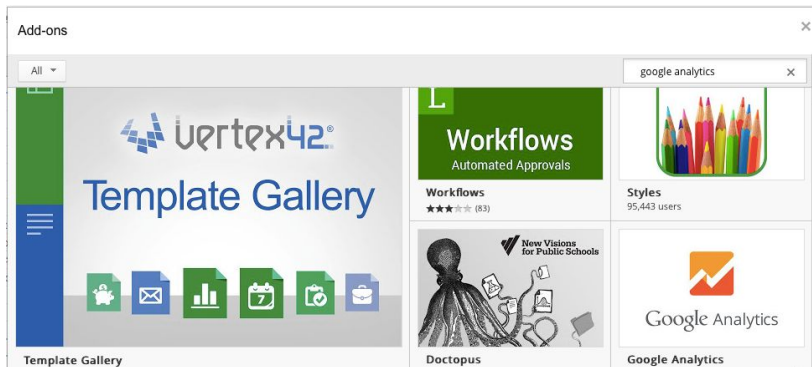


Next go to the **Add-ons** menu and select **Get add-ons...**



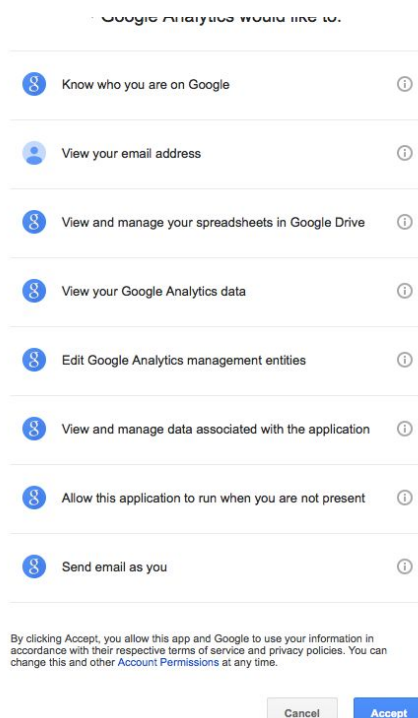


## Search for **Google Analytics**



Once found click on the 'Free' button and then 'Accept' in the permissions window. Once added you will not need to repeat these steps again.

**NB: This is a web-based application and so nothing gets installed onto your computer but in Google Sheets.**



Finally, follow the instructions from bullet point no 2 on the 'Report request' tab on the Google Sheet.

Your Google sheets are auto saved into your Google Drive: <https://drive.google.com>

Every time you want to make a new report for a new website page you will need to make a new copy of the Google Sheet.

**Useful link:**

Dimensions & Metrics Reference guide to use with Google sheets and the Google Analytics add-on:

<https://developers.google.com/analytics/devguides/reporting/core/dimsmets>

## Advance Reporting: Regular expression glossary

### Useful website:

[www.ohow.co/regular-expressions-regex-google-analytics](http://www.ohow.co/regular-expressions-regex-google-analytics)

\ Backslash	<p><i>Turns special RegEx characters into everyday, plain characters.</i></p> <p><i>Example:</i> /folder?pid=123</p> <p><i>RegEx:</i> /folder\?pid=123</p>
Pipe	<p>Means OR</p> <p>Example: Car Vehicle</p>
? Question Mark	<p>A question mark means, “The last item (which, for now, we’ll assume is the last character) is optional.”</p> <p>Use to capture different spellings of words example: Robbin and Robin</p> <p>RegEx: Robb?in</p>
() Parentheses	<p>Use for grouping</p>
[] Square brackets	<p>Use to make lists</p> <p>Example: So <b>p[aiu]n</b> will match <b>pan, pin and pun</b>. <b>But it will not match pain</b>, because that would require us to use two items from the [aiu] list, and that is not allowed in this simple example.</p>
\$ Dollar sign	<p>Must end (URL must end with)</p> <p>Example: /government/statistics/water\$</p>
^ Caret	<p>Must begin (URL must start with)</p> <p>Example: ^/government/publications</p>
. Dot	<p>The dot matches any character (letter, number or symbol)</p>
.* Dot Asterisk (star)	<p>Matches anything</p> <p>Example: /government/statistics/water.*</p>

# Useful Links and Resources

## Key learning resources

Google Analytics online help guide and support:

- <https://support.google.com/analytics>

## Beginners Level

Google Analytics tutorial (Digital Analytics Fundamentals) learn the basics of Google Analytics which you can use in conjunction with this starter guide.

You should only do Units 2, 3 and 5

- <https://analyticsacademy.withgoogle.com/course/1>

## Intermediate Level

Useful links when deciding on building campaigns

- URL Builder:  
<https://support.google.com/analytics/answer/1033867?hl=en>
- Related blog post:  
<https://gdsdata.blog.gov.uk/2015/03/25/evaluating-an-e-bulletin-with-google-analytics/>

Explore Google trending search topics with Google Trends:

- <https://www.google.co.uk/trends/>

## Advance Level

Good guides on understanding Regular Expressions for Google Analytics:

- <http://www.lunametrics.com/regex-book/Regular-Expressions-Google-Analytics.pdf>
- <https://www.ohow.co/regular-expressions-regex-google-analytics/>

Dimensions & Metrics Reference guide to use with Google sheets and the Google Analytics add-on:

- <https://developers.google.com/analytics/devguides/reporting/core/dimsmets>

Webmaster tools

- <https://www.google.com/webmasters/tools/home?hl=en>