

# How To Record Screen Capture Videos For Unity

By Matt Schell and Sam Dogantimur

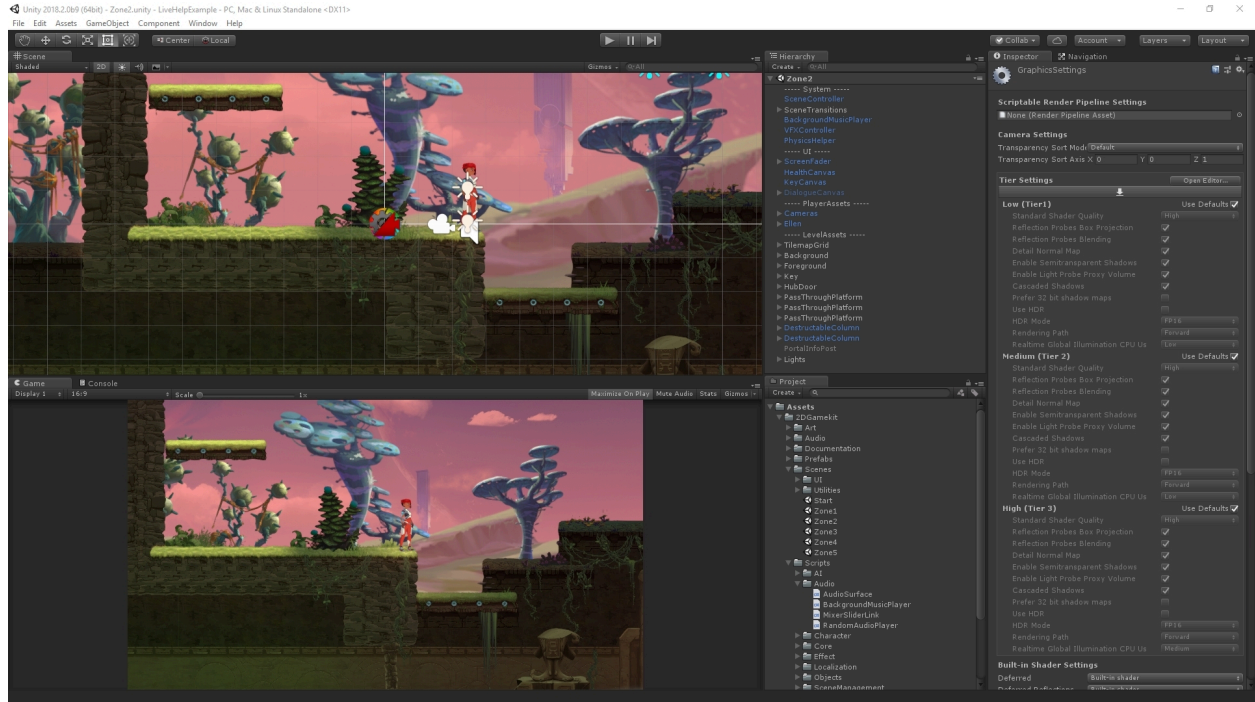
The goal of this document is to enable anyone who works at Unity to easily record high-quality videos of the Unity Editor and similar screen-based content using best practices developed by our internal video teams.

If you need video editing help, please contact myself @matts matts@unity3d.com or @samd samd@unity3d.com.

## Setting Up For Recording

- 1) Set the resolution of the display you are capturing to **1920x1080** via the system settings. This is important because most people watch the final videos at 1920x1080 or lower online, and it will make sure your onscreen text remains readable.
- 2) Minimize any distractions like extra toolbars, the OS dock, windows toolbar, notifications etc.
- 3) Make sure that the Unity Editor Console is not showing any unrelated errors or warnings. If necessary disable and clear the Console so they don't show up at the bottom of the editor.
- 4) The **Dark Unity Editor Theme** should always be used in public-facing content.
- 5) Choose an appropriate Unity Editor layout (see below).
- 6) If editing code, please use the latest available version of Visual Studio and **raise the font size to 125 or 150%** to make the code easily readable without zooming.
- 7) We use [OBS Studio](#), which works great on both Mac and PC and is free and open source. [See below](#) for more details on our recommended Software set up.

Our Recommended Unity Layout:



One column Project view, Scene view on top, Game view on the bottom, hierarchy on the right next to the scene view. Make sure that there's **no visible dock, taskbar or other unneeded on-screen icons taking up screen space**. The Game view should be in 16x9 aspect ratio. This layout is not required and certain presentations may need other layouts, but this is recommended generally.

## Presenting In An Edit Friendly Way

Mistakes can be cleaned up during the editing process. There are a few things which are unique to this process to remember when recording which will help the editor make a clean product, even when there are mistakes.

1) **Re-state speaking mistakes:** It's common to just stumble over a word while speaking, but without a clean re-statement the editor won't be able to help you and clean it up. Therefore, if you stumble over a phrase, give a short pause, say "Cut" to make it clear it's supposed to be cut out, and then just repeat the phrase again immediately afterward. Saying "Cut" helps the editor a lot as in some cases it sounds like the host finishes a sentence, which can create confusion in if the first phrase should be cut out or not. Try to use the same tone of voice and intonation so that it'll cut cleanly. Make sure that you back up a bit and re-say the full sentence or preceding statement for the same reason.

2) **Record voice over and screen separately:** For more live feeling stuff that doesn't have a full script, recording simultaneously may be fine. Generally however for more polished stuff we recommend recording voiceover and screen separately. I like to record the voiceover script first, often using an application like Audacity. I then clean that up, cutting out mistakes and get it ready to playback. I then play the voice over one section at a time and record the onscreen actions while listening to it to try to match the pacing. I usually record maybe one paragraph or group of actions at a time, then pause recording. Any mistakes or errors in pacing can be cleaned up in the video editing stage.

You can find an example of what our completed videos look like here:

Photogrammetry:

<https://www.youtube.com/watch?v=q2Z1oiFDKI0>

Nested Prefabs:

[https://www.youtube.com/watch?v=ibmdm\\_PoyMA](https://www.youtube.com/watch?v=ibmdm_PoyMA)

## Hardware Setup

If you are in San Francisco, Brighton or Copenhagen, we have purpose-built facilities for these types of recordings. Please contact IT and they will show you where they are. They are all configured with the same hardware, but in San Francisco, you need to bring your own computer as there is not one permanently installed there.

The recommended equipment list for screencasting is as follows:

1) **A powerful computer:** Streaming video and recording and encoding video in real-time puts an additional draw on your system resources. It's important to make sure that any demo that you're presenting can run and hit performance targets while your system is streaming and recording. We have seen cases, including with VR content, in which the stream cut out when the editor entered play mode due to computer performance limitations.

2) **A condenser microphone:** Not all microphones are the same, you want one designed to be spoken directly into that will capture audio in a narrow directional pattern. Additionally, we choose to use USB microphones to avoid additional equipment and variables to configure. The Rode Podcaster is our current microphone of choice. I also recommend getting a microphone arm with an integrated USB cable to avoid cable spaghetti. Please see the provided equipment list below.

3) **A pop filter:** A pop filter is designed to defuse and disperse the percussive mouth sounds from 'P' and 'B' sounds which can cause bassy air impacts on the mic, degrading audio quality.

If you don't have one and need to record, put a sock over the mic. Seriously, it's not glamorous, but it works.

4) **A shock mount:** Since the mic will be mounted to your desk, having the mic in a shock mount is needed to avoid unwanted vibration traveling up the mic arm and causing bassy noise to be picked up by the mic during typing, mouse operations and other movements by the presenter.

4) **A second monitor or second laptop:** This is important. You need to be able to see your notes if digital, broadcast software (OBS Studio) on a second screen. I think of my setup as 'onstage and backstage'. Placing the windows taskbar on a second screen (if on Windows) allows you to switch between applications without bringing up the ugly 'alt tab' application thumbnail graphic which is normally displayed when switching via keyboard shortcut.

## Hardware Purchase Links:

Here is a link to a package with a Rode podcaster, shock mount and arm all together for purchase:

[https://www.amazon.com/Rode-Podcaster-Studio-Custom-Kit/dp/B00KTGNC3M/ref=sr\\_1\\_3?ie=UTF8&qid=1509450237&sr=8-3&keywords=rode+podcaster+package](https://www.amazon.com/Rode-Podcaster-Studio-Custom-Kit/dp/B00KTGNC3M/ref=sr_1_3?ie=UTF8&qid=1509450237&sr=8-3&keywords=rode+podcaster+package)

Here's a link to a pop screen:

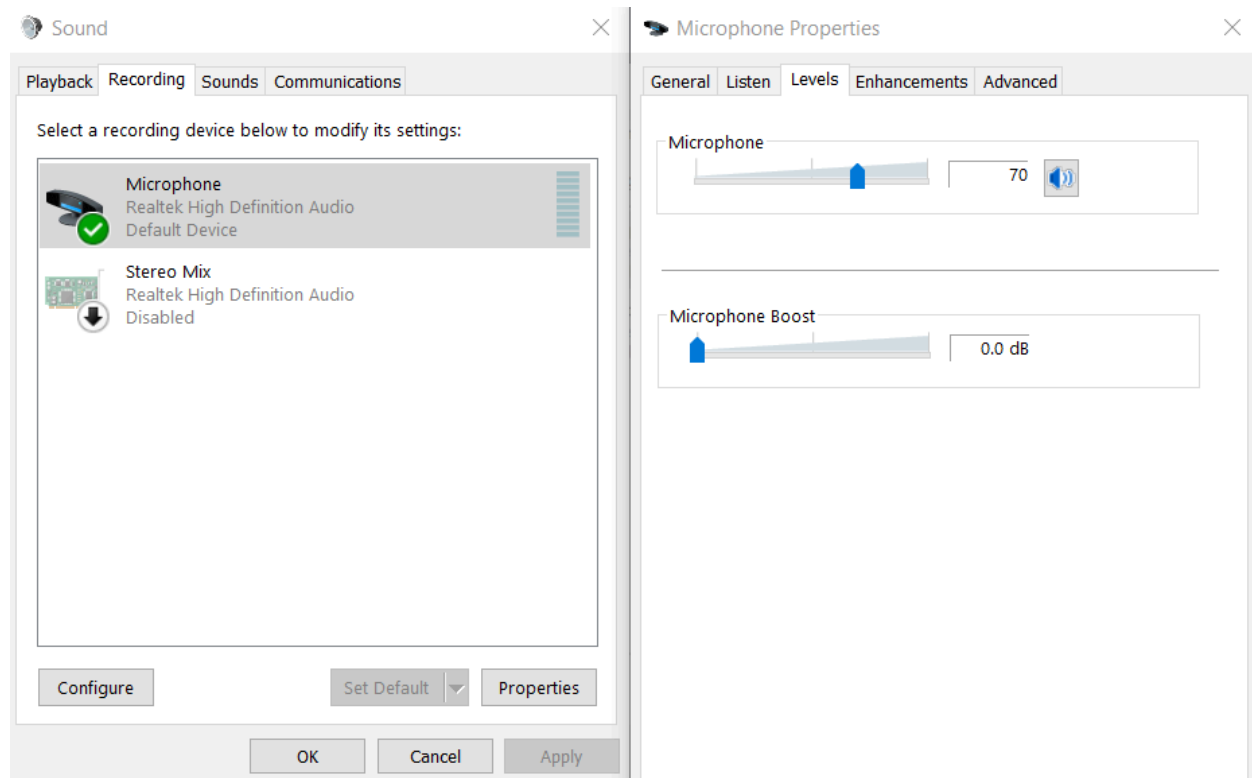
[https://www.amazon.com/Nady-MPF-6-Microphone-Gooseneck-Stabilizing/dp/B0002CZW0Y/ref=pepd\\_bxgy\\_267\\_img\\_2?encoding=UTF8&pvc=1&refRID=Q19VFD8QZYKDFB9EY1V9](https://www.amazon.com/Nady-MPF-6-Microphone-Gooseneck-Stabilizing/dp/B0002CZW0Y/ref=pepd_bxgy_267_img_2?encoding=UTF8&pvc=1&refRID=Q19VFD8QZYKDFB9EY1V9)

Please note that these specific pieces of equipment are not required, but some configuration that solves the same problems is strongly recommended.

## Software

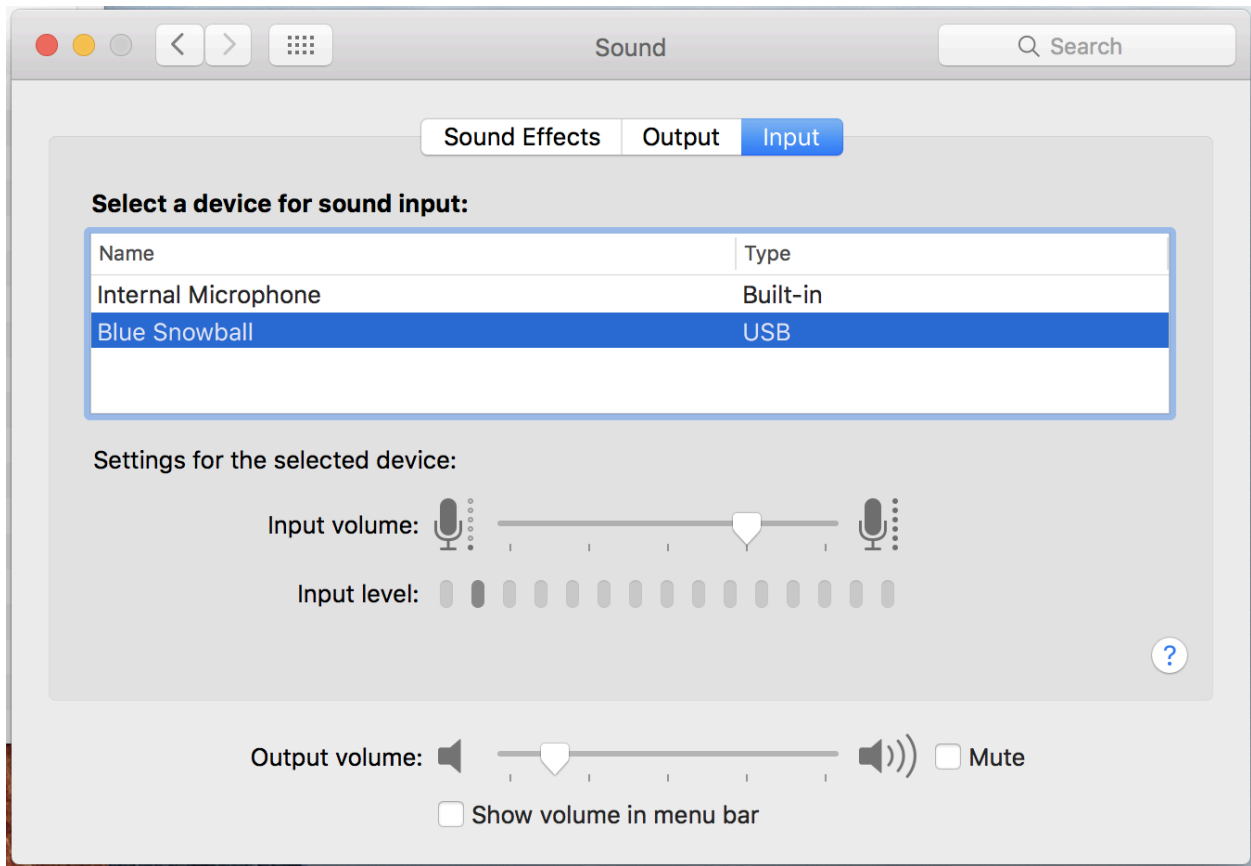
### Audio & Configuring Audio Input Levels

On Windows 10 right click on the speaker icon in the system tray and choose Recording Devices. Choose the Properties for your microphone and then the Levels tab. We want to lower the Microphone input gain at the system level to avoid overloading and distortion at the input stage. It's always possible to compress, limit and normalize a quiet signal and raise its volume but recovering clipped or distorted audio is much more difficult.



## Mac OS:

If you are recording on a Mac, navigate to the Sound control panel and set the Input Level as shown here:



These numbers should also be tested on your setup, do some test recordings and make sure that the audio is not overloading when you are speaking in the way you would when presenting AND when layered over game audio as well. Layered audio signals are additive so if you are speaking over loud in-game sound it's possible to distort the stream as well. Generally speaking, all in-game audio should be recorded very quietly.

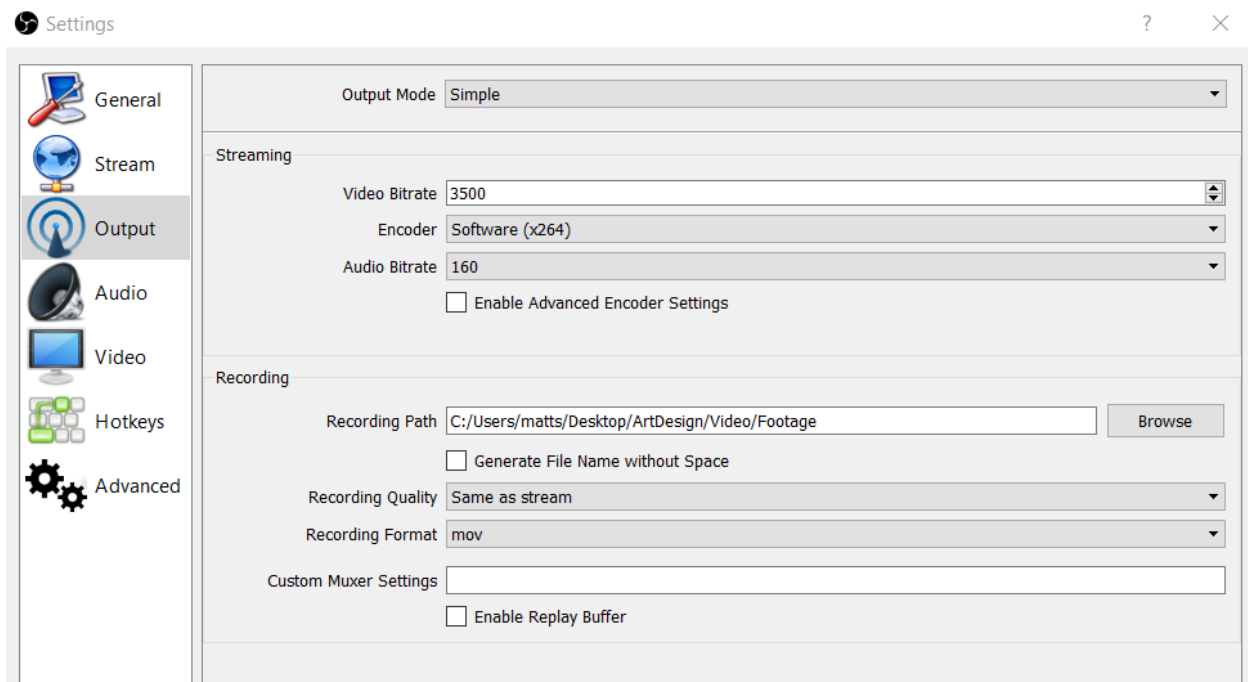
## Recording Application: OBS

We are currently using OBS Studio, which works great on both Mac and PC and is free and open source. There are other alternatives but we strongly recommend that you use OBS. As far as we've experienced it's the best available tool and if you choose it, we will be able to offer you support and guidance in getting a good result with it.

<https://obsproject.com/download>

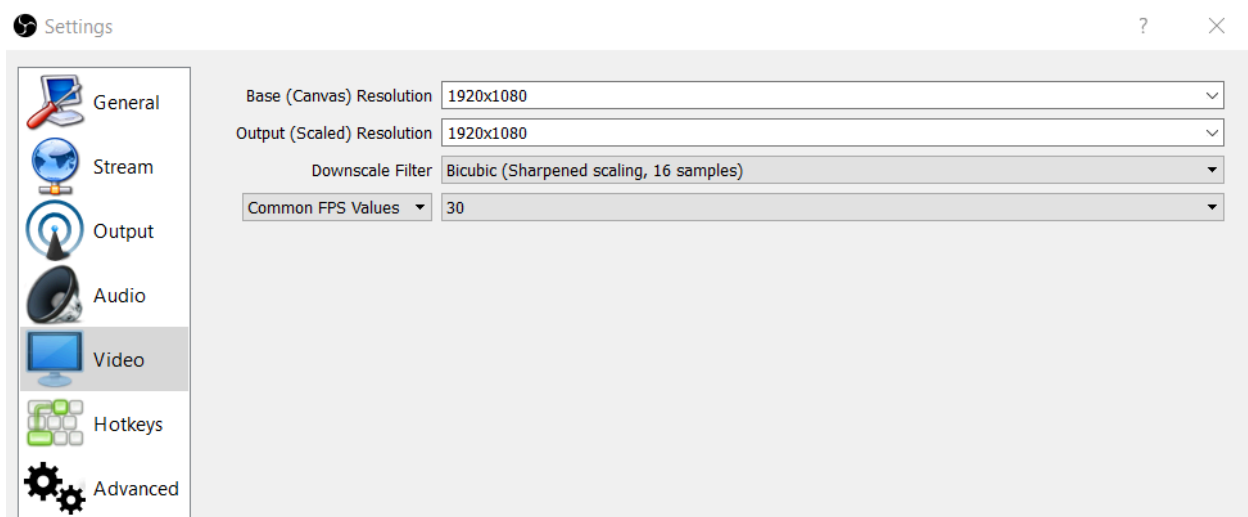
Configuring for streaming and capturing video and audio using OBS Studio

Configure the Output settings to match the settings below:



**Important!** Make sure that you don't encode to FLV. The quality is inferior and it's difficult to edit from. It's possible to recover footage recorded this way but it's a huge headache.

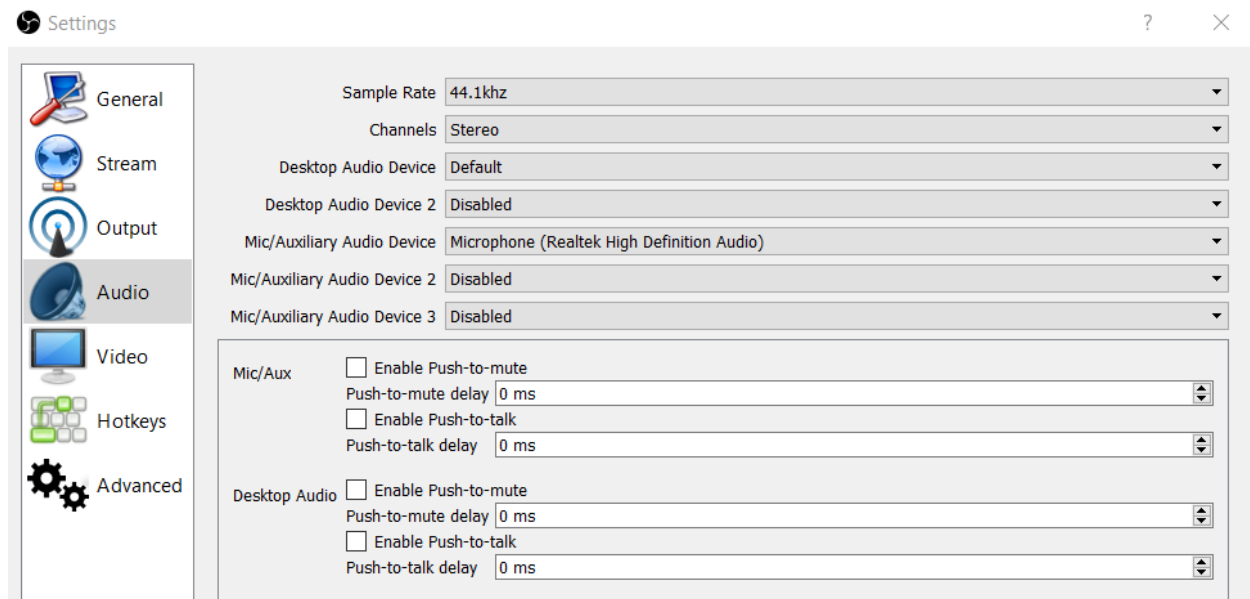
Configure the video panel to match the settings below:



## OBS Audio:

Generally, unless the core focus of the presentation is audio I will mute the in-game audio or make it very quiet. That's because it is distracting from the voice over and can cause problems with editing as well.

Configure the audio panel to match the below settings replacing 'Realtek High Definition Audio' with your microphone.



This is only important if you are recording audio and video simultaneously: If your presentation features audio heavily, in order to capture multiple audio channels to a single video recording, you need to configure the audio as follows:

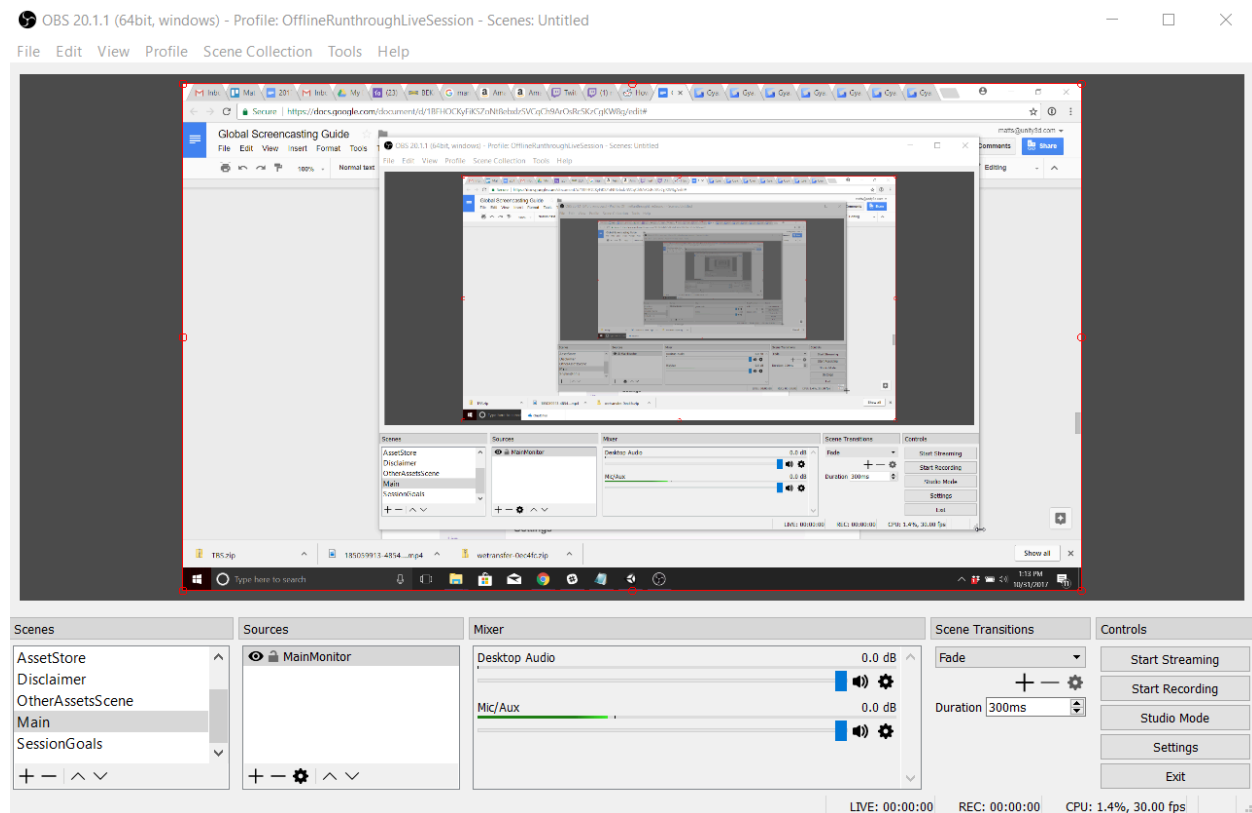
<https://obsproject.com/forum/resources/obs-studio-high-quality-recording-and-multiple-audio-tracks.221/>

## Configuring For Presentation

In the 'Scenes' area in the lower right of the OBS window click the '+' button to create a new scene for each view you want to present. Create any number of sources in the Sources area to the left of Scenes by clicking the '+' button and adding sources. This scene contains a single



source for the main monitor, which we will present action in Unity from.



**Important Note:** Always capture the entire monitor as a source, **not** the individual application. When capturing an individual application, like the Unity editor for example, menus and dialog boxes are **not captured** which renders the footage unusable.

## Editing

In most cases, the best thing to do is to just send your raw material to myself or Sam Dogantimur for editing. If you would like to edit yourself or are one of our contractors who provides editing, here are our guidelines.

**Software:** We recommend using Adobe Premiere for editing since that's what we use internally. Other applications are fine but then we may be less able to help with questions or issues.

## Style and Pace

These are tutorial, instructional videos so it is more important that they are clean and clear than that they are short. They should not feel rushed or be confusing because they are edited too quickly. That being said we do not want dead air or excessive pausing, there is such a thing as too slow, but if the video is running long but you feel that it needs to in order to convey the information, that's OK.

Generally, we want a roughly two second pause between concepts or paragraphs in the script. If we are shifting to a new phase or concept, pause and let the viewer digest. If there is a change in the editor configuration or view, fade to black, then back to the new image, 10 frames down and 10 frames up. This can help to serve as a break and help people understand we're moving to a new idea. It also avoids jarring jump cuts if windows move around or content changes.

## Video End

We always leave 10 full seconds of black after the video ends. This is for videos going to YouTube, so that we can put up the end graphics, show the next video etc over the black.

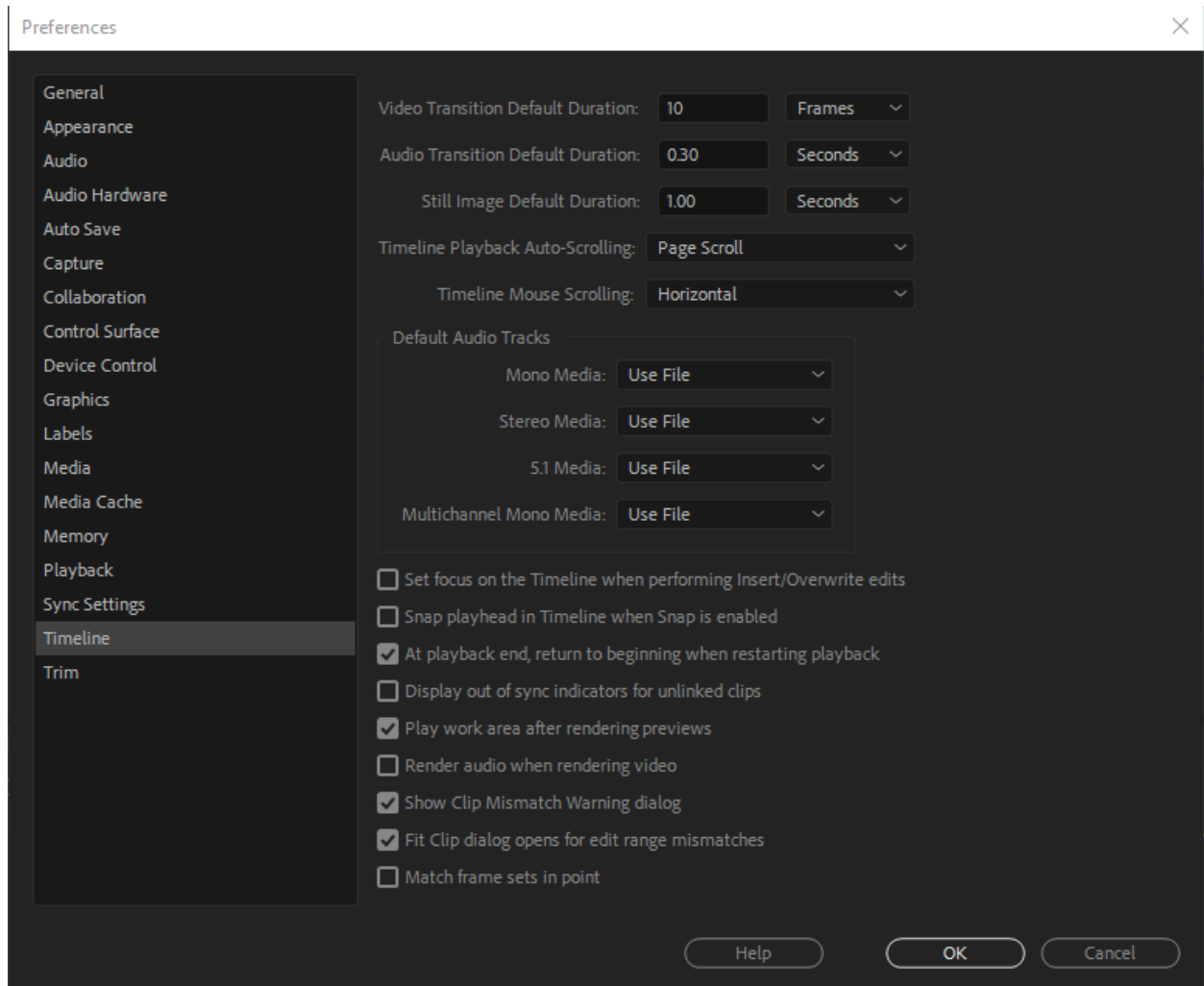
## Transitions

The only transition used should be a Cross Dissolve.

These should all be 10 frames long.

It's possible to set this as default by right clicking on the Cross Dissolve under the Effects tab and choosing "Set As Default Transition".

In the Preferences under Timeline you can set up your transition defaults, as well as Still Image defaults. We recommend 10 frames, .30 seconds, 1.00 second



## Graphics and Overlays

### Unity Graphics

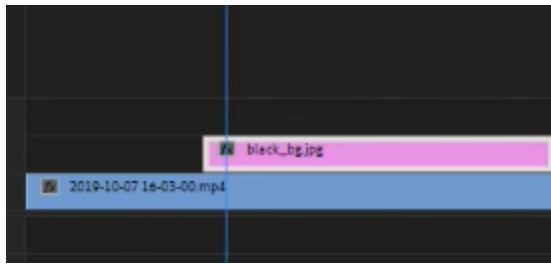
This link contains the latest Unity lower thirds and intro titles in After Effects format. To use them effectively import them as “Essential Graphics Templates” or .mogrt files

[https://drive.google.com/file/d/1\\_58Q0CUL2xtMjU2nak6qcLW64x8BwnFd/view](https://drive.google.com/file/d/1_58Q0CUL2xtMjU2nak6qcLW64x8BwnFd/view)

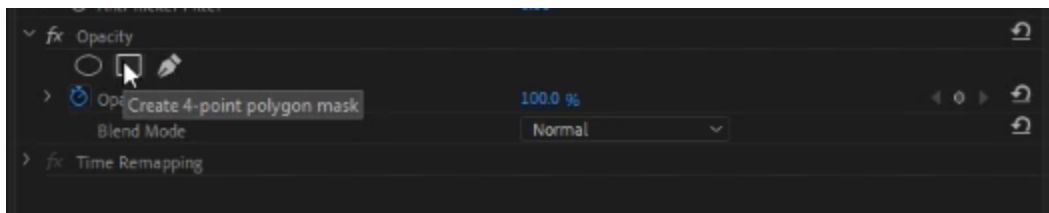
This will allow you to edit the type in the title from Premiere without loading up AfterEffects. There's a [tutorial here](#) on how to import them.

[Sometimes to make something more visible, we'll highlight it with a black image overlay.:](#)

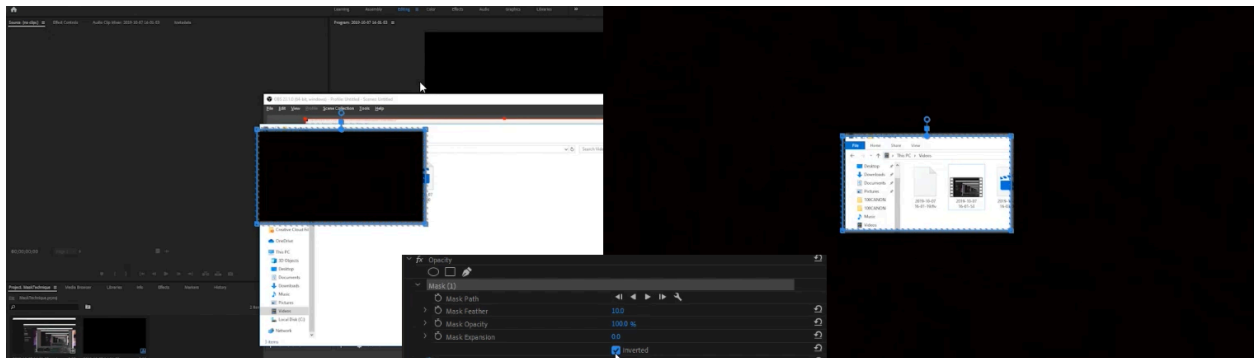
Use a 1920x1080 image or shape that covers the whole screen - you can do this by inserting the image one layer above the main footage.



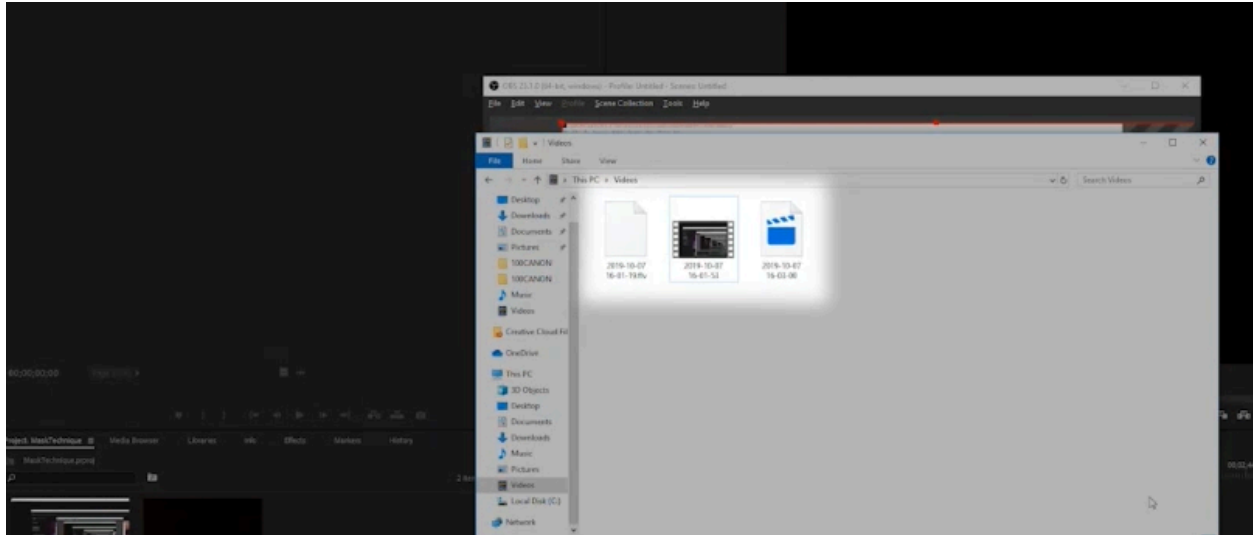
Then - click on the overlay image and go to the Effects panel. On the Opacity dropdown - click on the square icon to create a 4 point polygon mask.



Then you just need to invert the mask



Move the vertices around to the area you want to focus - then increase the mask feather by around 35 and also turn down the opacity to 50%.



Generally, when action is focused on a single area of the screen for more than a few seconds it's a good idea to zoom in and focus the viewer's attention on it.

The scale value when zoomed should be 160%. The animation to zoom in should be 10 frames long.

Do not zoom in if the cursor will shortly move from one area of the screen to another, in cases like this where attention is needed for a short time, use the blue box method above.

The cursor should never go offscreen when zoomed, and menus being shown should remain on-screen as well.

Here is one workflow to do zooms that works:

Open Effect Controls

Choose the frame for your zoom to start and position the playhead there.

Mark a keyframe for Position and Scale at 100 and 960,540 respectively.

Tap the arrow keys on your keyboard ten times to advance 10 frames.

Set Scale to 160 and adjust Position to focus viewers attention on the relevant portion of the zoomed footage.

Stay in the zoom as long as action is happening there.

When it's time to zoom back out, copy the two previously created keyframes. Advance the playhead to the start of the zoom out. Paste the keyframe. Now click and drag the start keyframe 20 frames later, then select and drag both frames 20 frames back. This is a quick technique to reverse and reposition an animation in Premiere.

## Timing Screencast Footage

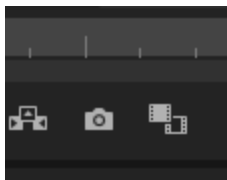
It is important that when editing to the voiceover narrating a sequence of actions, that the voice over and action match as closely as possible. If for some reason they need to be slightly out of sync the voice over should always say what happens *before* it happens on screen. This allows the viewer to hear what's going to happen, then see it. But ideally they should always be happening more or less simultaneously.

There are two very useful tools to make this possible:

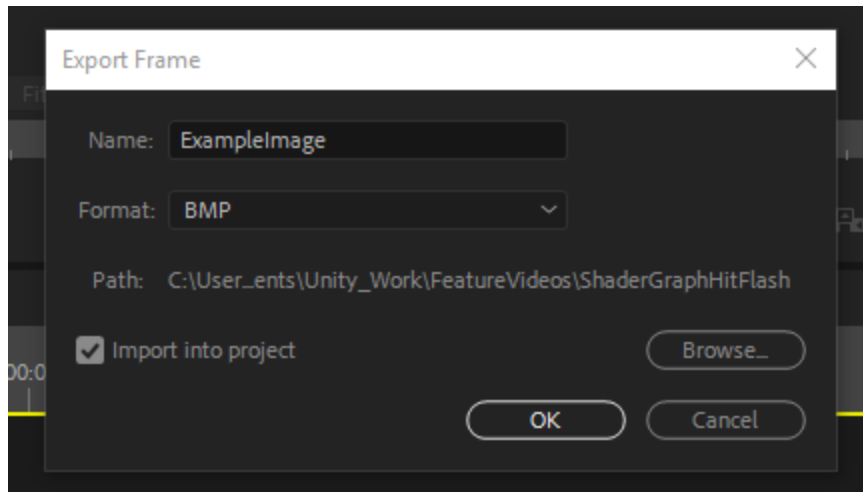
### Still Images

The first is extensive use of freeze frames or still images for situations in which you don't have enough footage to fill the time needed. Because we are dealing with software, most of the time we are effectively looking at a still image. So in order to adjust or control timing, we frequently use still images in our edits.

Position the playhead over the place in the sequence you want to extend time. Create a still by clicking the Camera shaped button in the Program view or pressing Ctrl-Shift-E:



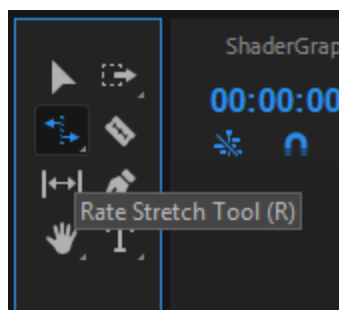
Make sure that the image is being saved in an appropriate location (with your project media!!) and that "Import Into This Project" is checked. Give it a meaningful name as well. The default BMP format is fine.



Now split the clip you want to add time to, you can extend the still as long as you want, and then resume the footage afterward. Even with the mouse in the middle of a move this works nicely and can allow you a high degree of timing control over the presentation.

## Rate Stretch Tool

The next useful tool here is the Rate Stretch Tool. This is useful when you have too much footage that you need to fit cleanly into a short time.



The Rate Stretch Tool is accessed using the R key. It allows you to click and drag a clips in or out point and speed it up or slow it down. It's great for speeding up footage, for example of someone typing a line of code, that we need to fit into a certain amount of time in our cut.

Generally speaking if there are boring, repetitive actions in the cut like long stretches of typing, or dragging and dropping multiple objects into the same slots, we should speed that up to around 800% in order to not have dead air or lose viewer interest.