

## Make a custom loop video virtual background for your Zoom video image

Learn the fundamentals of a video editor application

By John Krout, Potomac Area Technology and Computer Society (PATACS)

A still photo virtual background for your video image has been a part of the **Zoom** application for Windows and Macintosh for quite some time. Recent versions of **Zoom for Windows** have included one or two *videos* for virtual backgrounds as well. One of the two videos provided by **Zoom** for a virtual background as of March 2020 is a video of the Northern Lights. The other is a video of a palm tree on a beach, waving in the breeze. I have seen both of these used as virtual backgrounds by **Zoom** teleconference participants. The videos are short, and **Zoom** plays each video repeatedly.

**Illustration 1** shows me in a Zoom meeting, with a still image virtual background appearing behind me. Virtual backgrounds hide the visible clutter behind my computer desk; *it is easier to set up than to clean up*.

Virtual backgrounds can be nebulous, undistracting, which is important to instructors and speakers in Zoom meetings. The one shown here is an example of that. Also virtual backgrounds can display something important to you, perhaps a dynamic photo of your former employment or of a favorite vacation region.



**Illustration 1**

While watching the sample video virtual backgrounds provided by Zoom, I was struck that it is almost impossible to tell when each video ends and restarts. Perhaps, I thought, the last frame of each video must look exactly the same as, or very much like, the first frame. I call such videos *loop videos*.

Like any parent, I have owned a digital camcorder for a long time. I have quite a library of my own video recordings. Modern parents shoot abundant kid videos with their smart phones. Being an avid amateur photographer, sometimes I also shoot videos of just about any subject that interests me.

I realized there is at least one kind of video in my library of camcorder recordings that could become a loop video rather easily, so the end looks just like the beginning: Independence Day aerial fireworks in a black sky. The idea is to start and end the video on a black frame, with no fireworks. Those black frames are easily identified because even an expensive, massive big-city fireworks display has breaks, points at which the sky is black and clear for at least a second or two.

Then I figured out how a tree or flowers waving in the breeze, even in bright sun, can be used to accomplish the same thing: run the scene forward once, and then run the same scene *backwards* once.

### HOW A LOOP VIDEO WORKS

Consider this hypothetical example. A video contains countdown from five to one. Call that the first video segment; visualize it as 5 4 3 2 1. Then we create a second video segment by *reversing* the first video segment. The backwards version counts *up*, from one to five. Visualize the reversed segment as 1 2 3 4 5.

When the two segments are connected, using video editor software, the result looks like this:

5 4 3 2 1 1 2 3 4 5

Call it a **loop video** because, as a **Zoom** virtual background, the video plays continuously, and the video ends precisely where it begins. During repetition, no end or beginning is noticed by other **Zoom** teleconference participants.

Note that the start of the backwards video segment, the number 1 in 1 2 3 4 5, is at precisely the same video frame where the first video segment, 5 4 3 2 1, ends. Additionally, when the combination of the two segments is played repeatedly in a Zoom virtual background, the end of the combination is at exactly the same frame as the start of the combination: 5 and 5.

So, in a continuous loop as a **Zoom** virtual background, you would see four repetitions as:

5 4 3 2 1 1 2 3 4 5 5 4 3 2 1 1 2 3 4 5 5 4 3 2 1 1 2 3 4 5 5 4 3 2 1 1 2 3 4 5

To make this work with a real life video segment running backwards, the video segment must not give the human eye any clue about the proper direction of *time*.

For instance, a palm tree, waving in the breeze, looks the same when the video is played forwards or backwards.

There are at least two possible *flaws* in that palm tree scenario: a coconut falls, or waves are visible on the water. In the reversed video segment, the coconut would "un-fall", *flying up*, and the waves would move *away* from the shoreline. The sample virtual background video of a wind-blow palm tree does include waves, so I am convinced reversed video is not included in that sample video.

I looked for a source of free MP4 videos on the Web. I found one called **Pexels.com**. Some of the Pexels.com freebie MP4s are aerial drone videos. One drone video I especially liked was an aerial view looking straight down to traffic around a large traffic circle with a fountain in the middle. A reversed segment would show the traffic running *backwards*, spoiling its usefulness as a loop video.

On that site I also found a drone video where the drone is simply rising in the air to view a lake with many colorful canoes beached on the shoreline. That one worked well running both forwards and backwards. I have added that loop video to my own virtual backgrounds collection for Zoom.

If there were people walking around in the canoes video, then it would not work nearly so well, because in the reversed segment you would see the people walking backwards. I suspect that the video was recorded early in the morning.

All of this video exploration by me on an especially breezy spring day. I decided I could record a video of spring flowers waving in the breeze in my yard. That too could run forwards or backwards without seeming to do so, for the same reason that the palm tree looks fine running forwards or backwards.

I recorded about a minute of the flowers swaying in the spring breeze. I made a two-minute loop video. I added that to my collection of custom Zoom virtual backgrounds. By the way, two minutes makes a huge video file. I recommend shooting no more than say 15 seconds.

There is a wonderful scene in the movie ***Practical Magic***, starring Sandra Bullock and Nicole Kidman, in which Bullock's character appears to light a candle by blowing on it. That scene was filmed by having Bullock blow on the candle to *extinguish* the flame, and then was simply shown in reverse in the movie. Some special effects simply do not cost much.

## HOW TO MAKE A LOOP VIDEO

In early 2020, I upgraded the software I have used for many years to edit video, **Vegas Movie Studio**, to Vegas Movie Studio Platinum suite version 16.

Vegas Movie Studio 16 Platinum suite has the capability to *reverse a video segment*, so that the segment plays backwards. The version I bought is not the least expensive in the Vegas product line. Less expensive video editor products may also have

that capability; I suggest looking at the capabilities of Vegas Movie Studio (without the Platinum Suite) and Adobe Premiere Elements in particular, both of which are modestly priced. I have not researched those video editor products, so I cannot tell you with certainty that the reverse video feature is available in anything other than Vegas Movie Studio Platinum suite version 16. However, in the case of Vegas Movie Studio, the word Suite means that additional software is included, so I believe that the lowest-priced Vegas Movie Studio 16 will include the reverse video capability. You can contact the publisher and ask.

All video editor products I have tried or researched use the metaphor of a *timeline*. Time proceeds from left to right on the screen. The beginning of a video segment is always on the left, and the end of the segment is always on the right. To select and establish the sequence of several video segments, simply click and drag each video segment into a video track in the timeline. There are parallel tracks for audio, for superimposed text, for picture in picture, for music and for other image sources too, all arranged in a vertical stack. And you can add tracks if you decide more tracks will help you do your editing.

You can magnify the timeline, so that you can edit video precisely, displaying just a few seconds of video if you wish. You can de-magnify the timeline, so you can see all of the assembled media in the timeline, and move from one part to another rapidly.

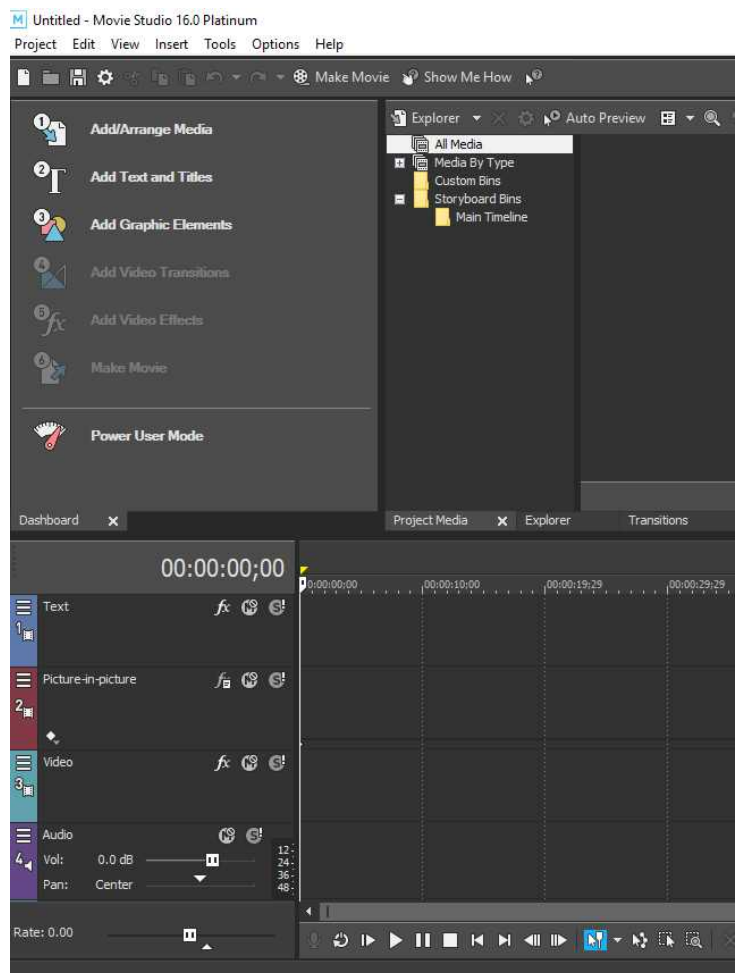
If you are not satisfied with the initial sequence of video segments, you can cut and paste video segments, just like moving sentences or paragraphs around in word processing software.

**Illustration 2** shows the left half of the Vegas Movie Studio 16 window, with an empty timeline.

You can see some of the many parallel tracks in the timeline, in the bottom half of the image. The timeline can be scrolled up and down, just like a very long Web page, so you can see more tracks. The scroll bar is on the right side of the window, not depicted here.

Vegas also makes use of the concept of a **Project**. A project has many pieces, including a title, a selection of media to include in the project media set, the exact sequence of media placed in the timeline, and any specially effects and track control settings in the timeline.

The idea is that you can save a project quickly, to capture your work in progress precisely, so that you can return to that work in progress after a break.



**Illustration 2**

## LOOP VIDEO STEP BY STEP

The screen captures depicted in this article were collected on a Windows 10 personal computer with Vegas Movie Studio 16, part of the Vegas Platinum Suite.

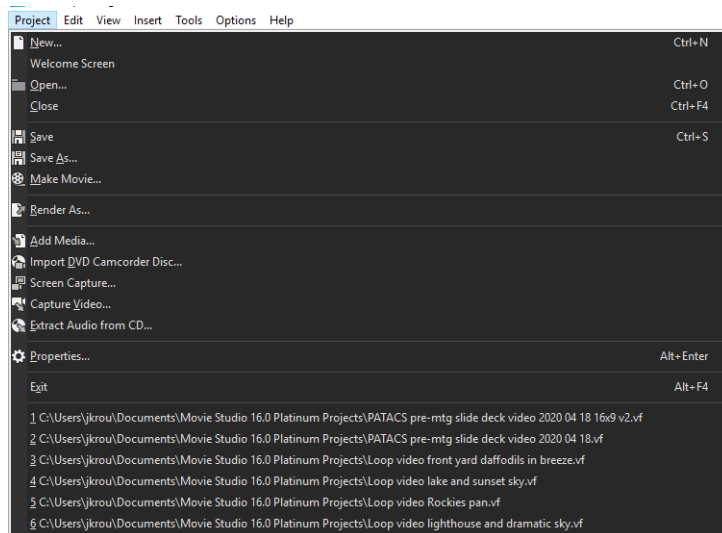
**STEP 1: Name your project.** This step enables you to save your project frequently, a vital habit to ward off the adverse effects of application or operating system failures. In the Vegas Movie Studio video editor, pull down the **Project** menu, and select **Save As**. The project menu is depicted in in **Illustration 3**.

Windows 10 displays the standard **Save** dialog box, enabling you to specify the name for the Project file. By default, Vegas Movie Studio 16 stores that Project file in Documents/Movie Studio 16.0 Platinum Projects. The sub-folder name may vary depending on the version of Vegas you choose to install.

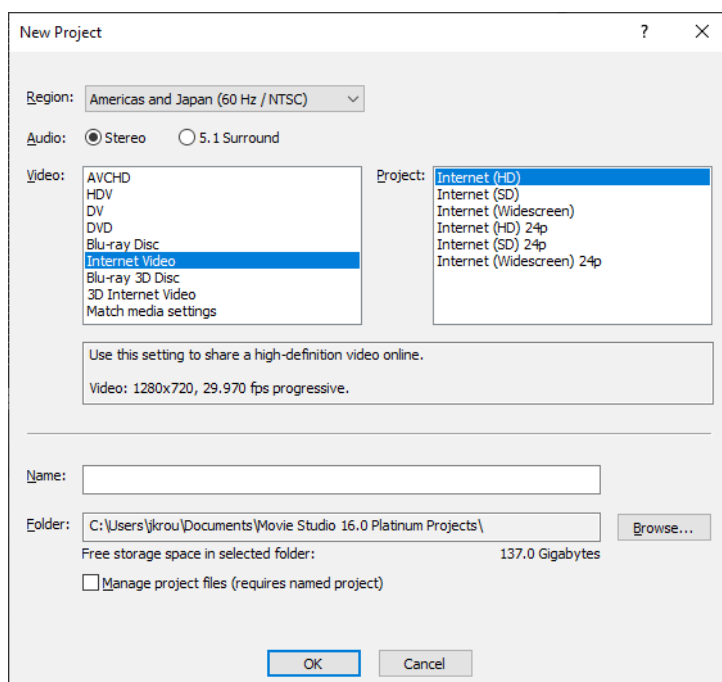
The project files are generally tiny, but the size depends on the total number of media files, transitions and special effects in use in the project timeline.

Saving a project does not create a playable video file.

Vegas Movie Studio may also prompt you to choose initial frame rate and resolution settings, using the dialog box depicted in **Illustration 4**. I generally work in High Definition 1980P at 30 frames per second. As it happens, if you cannot find your desired resolution and frame rate, fear not. When you insert media into the Video track of the timeline, Vegas Movie Studio will prompt you to use the resolution and frame rate of that media instead of the choice determined in this dialog box.



**Illustration 3**



**Illustration 4**

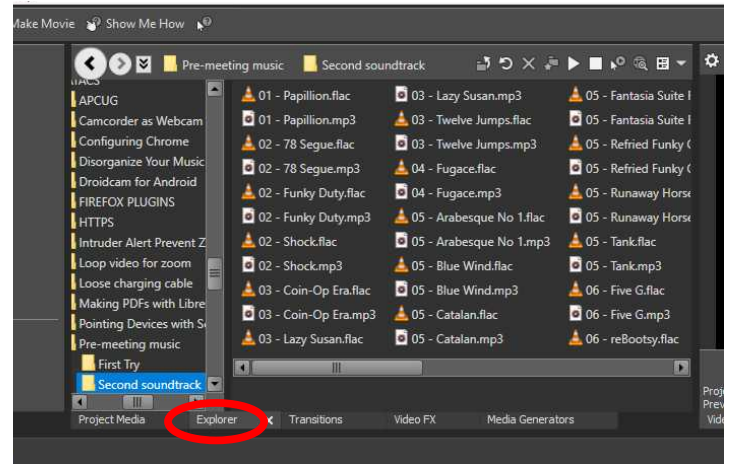
**STEP 2: Add project media.** Vegas includes a File Explorer like capability. Click on the **Explorer** button, and Vegas Movie Studio provides a folder tree view, displayed in the left window, and files in the current folder, displayed in the right window. See **Illustration 5**, with the **Explorer** button circled and examples of those windows above the button.

Browse to find a video file you want to include your project media.

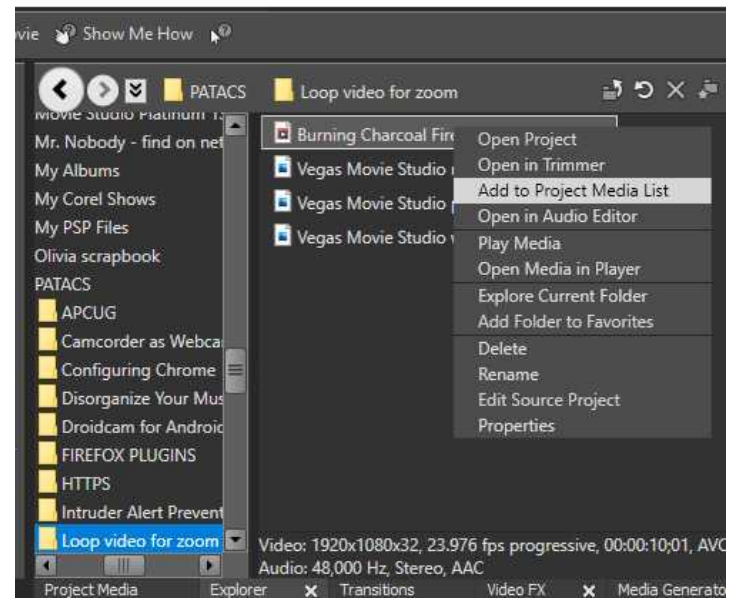
Make sure your mouse pointer is over the actual file name characters, and right-click. A menu appears, including a choice enabling you to **Add to Project Media List**, as depicted in **Illustration 6**. Select that menu choice.

You can also use this technique to add pre-recorded music to your project, though **Zoom** does not play audio from a video file used as a virtual background.

It is a good idea to **save** your project after adding two or three media files to your project.



**Illustration 5**

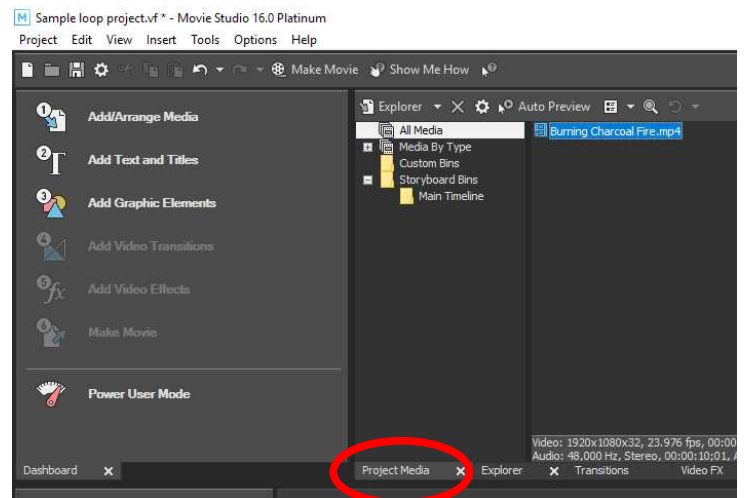


**Illustration 6**

**STEP 3: Confirm your selected project media.** Click on the **Project Media** button, to the left of the Explorer button, and the right window displays only the added media, no matter where you found each file.

In this example, I chose the **Burning Charcoal Fire** video file to add to my Project Media.

You can see the project media in **Illustration 7**. The right window shows only the Burning Charcoal Fire video file. The **Project Media** button is circled.



**Illustration 7**



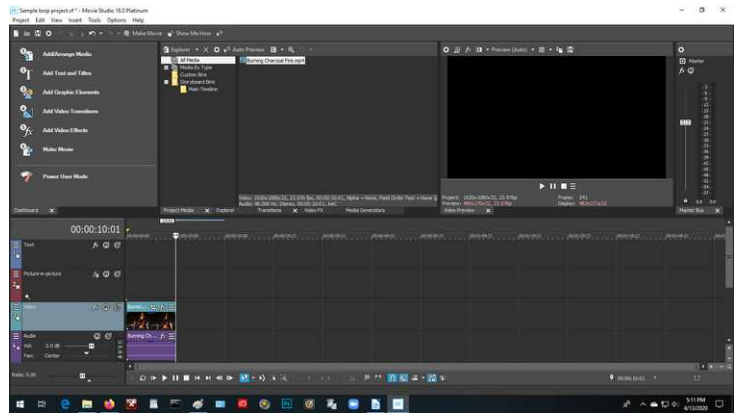
**STEP 4: Click and drag a media file to a track in the timeline.** Usually the first chosen video file or still photo is dragged to the start, the zero timepoint.

For a loop video, we will drag the same video file to the video track of the timeline **twice**.

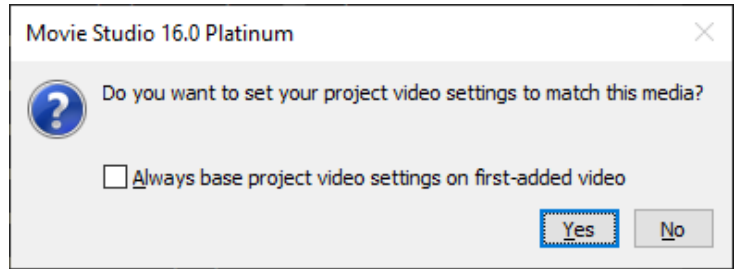
In **Illustration 8**, I dragged the Burning Charcoal Fire video to the leftmost position in the **Video track**. Since the video included audio, the audio is included in the same position of the **Audio track**. The vertical line appearing at the end of the added video is the **Vegas Movie Studio cursor**.

At this point, **Vegas Movie Studio** displays a dialog box asking if you want to switch to the resolution and frame rate of the video. I chose Yes. You can see that dialog box in **Illustration 9**.

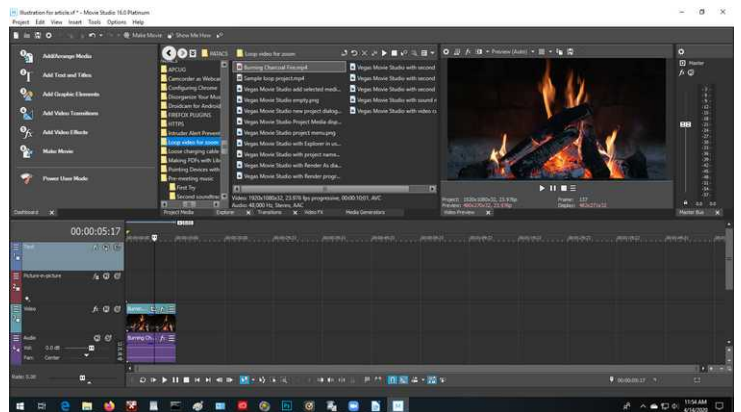
You can click and drag the line of the cursor left and right through the video; while you do that, each frame of the video over which the cursor hovers is displayed in the **Preview** screen in the upper right corner of the overall **Vegas Movie Studio** window. See an example in **Illustration 10**.



**Illustration 8**



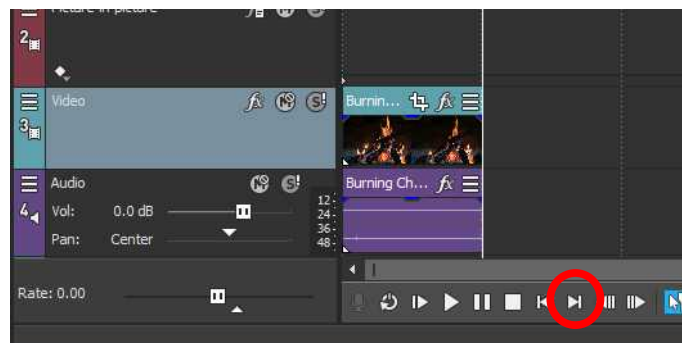
**Illustration 9**



**Illustration 10**

**STEP 5: Add the same video to the timeline again, immediately after the first.** To form a loop video requires dragging the same video into the timeline, placed immediately after the final frame of the first video, so that there is no gap between the two.

This is easy to do. First, tap the **End** button, circled in **Illustration 11**. That moves the Movie Studio video cursor to the end of all video already added. You can see that video cursor as a white vertical line in **Illustration 11**.

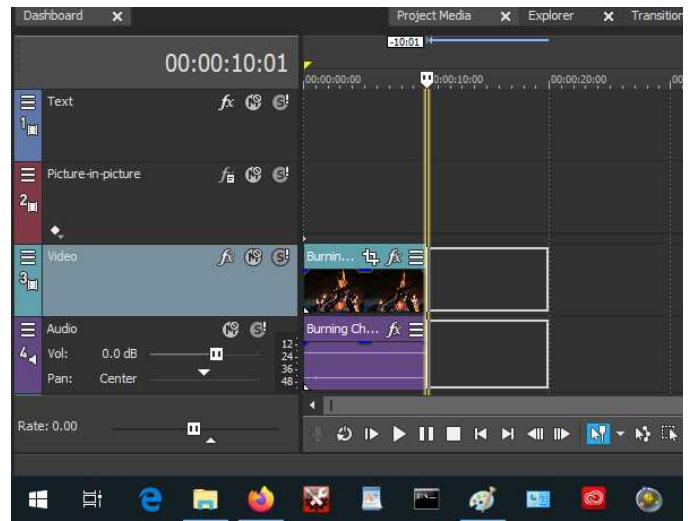


**Illustration 11**

Then click and drag the same video from **Project Media** so that it *begins* at the video cursor. When the video cursor *glows*, the second video is in the right place, and you can release the mouse button.

You can see that glowing cursor in **illustration 12**.

This is another good point at which you should **save** your project.

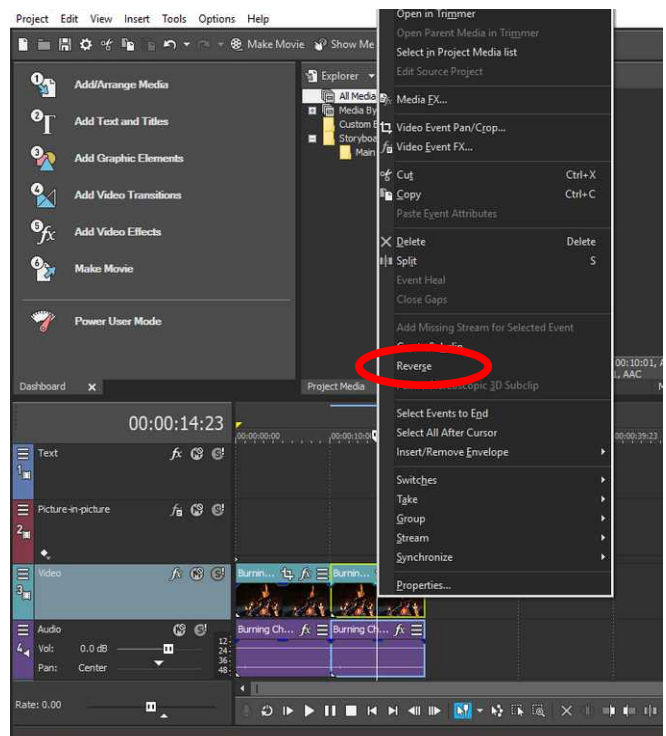


**Illustration 12**

**STEP 6: Reverse the second video in the timeline.** Right-click on the second video in the timeline. A menu appears, as depicted in **Illustration 13**.

Since the original video was 10 seconds long, this combination of the video and the reversed video is 20 seconds long.

In the menu, select **Reverse**, which is circled in **Illustration 13**. The menu disappears.

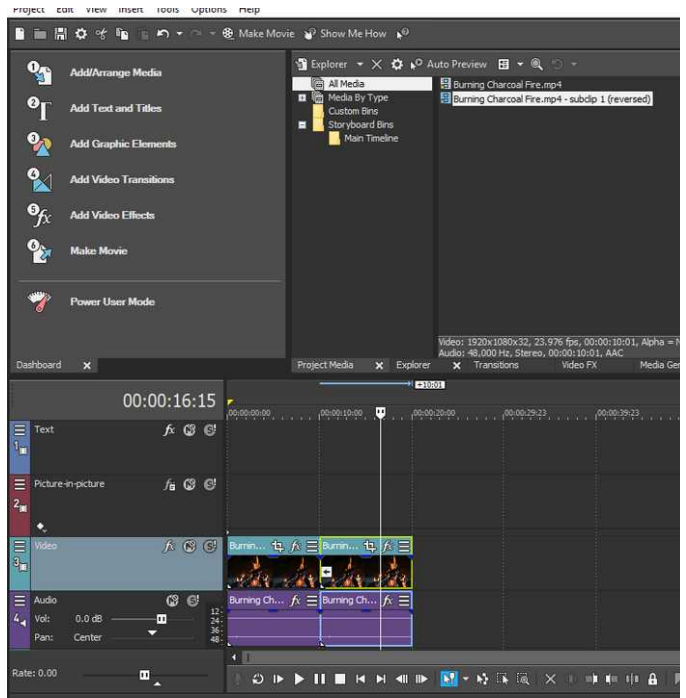


**Illustration 13**

**Vegas Movie Studio** provides two different indicators that the second video in the timeline is reversed. The first is that the video itself in the video track timeline shows a left-arrow at its beginning. The second is that the Project Media window shows a second video, ending with the word Reversed.

You can see both in **Illustration 14**.

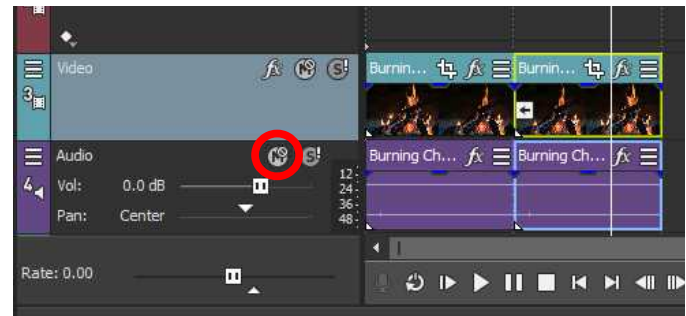
This is yet another very good moment to **save** your project.



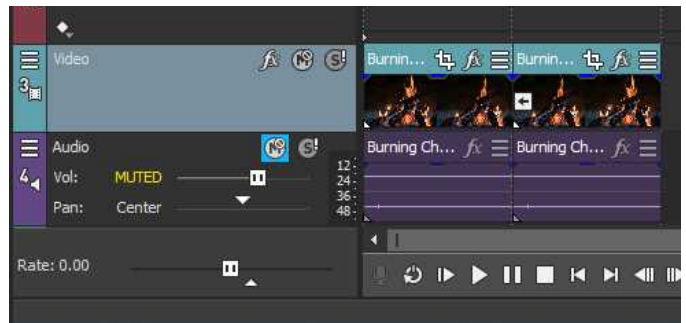
**Illustration 14**

**STEP 7. Disable sound for your loop video.** Zoom does not play audio in a video virtual background, so we need not include it in the loop video. To the left of the Audio track, click on the circled M icon shown in **Illustration 15**.

That icon is a toggle switch to mute or unmute audio. When muted, the icon is encompassed by a blue box, and the word MUTED appears to the left of the audio volume slider control. You can see both of those indicators in **Illustration 16**.



**Illustration 15**



**Illustration 16**



**STEP 8. Render your project as a video MP4 file.** Once again, display the Project menu. This time, select the **Render As** choice.

Vegas Movie Studio opens a dialog window to let you select the File format, resolution and frame rate. That dialog box is depicted in **Illustration 17**. It displays the current resolution and frame rate as the default. For virtual background videos, I recommend using MAGIX AVC/AAC MP4. Since the project had defaulted to the resolution and frame rate of the video I used in the timeline, 1080P and 29.97 frames per second, those became the defaults. The dialog box also displays a default file name for the MP4 file, which is the same as the project name. You can of course change that file name, as well as the folder in which the MP4 file will be stored.

To be frank, I would like to render at a lower frame rate of say 15 frames per second. Zoom, even on my 300 megabit internet connection, cannot transmit 29.97 frames per second. However, a significantly lower frame rate option is not supported in Vegas Movie Studio 16.

The depicted 25 frame per second options are primarily intended for European audiences where that is the standard broadcast frame rate. The 24 frame per second option is primarily intended for movie audiences; that was the standard frame rate for physical projectors and reels of movie film.

Make sure that your hard drive has room to record the file. The **estimated file size** appears in the lower right corner of the dialog box, above the **Render** button.

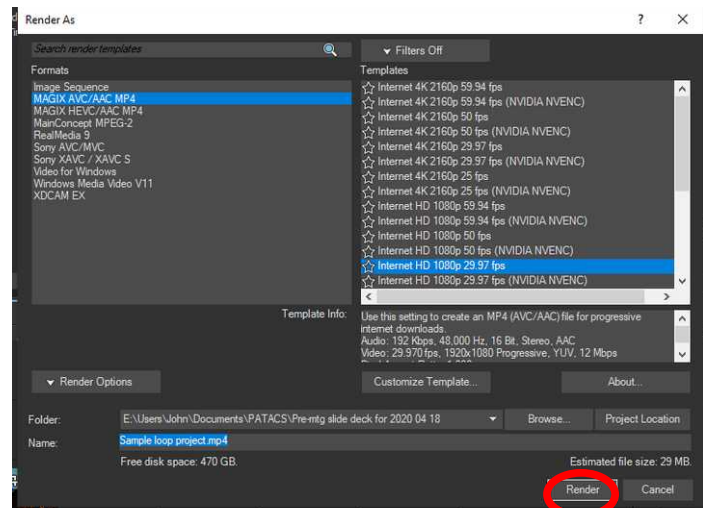
Click the **Render** button at the bottom right when satisfied with the choices and the file name.

**STEP 9. Take a break.** Rendering takes time. Fortunately, on a recently purchased computer with a good graphics processing unit, the required time for rendering is only slightly more than the runtime of the MP4 file, which in this case is 20 seconds.

When the MP4 file is completely recorded, Vegas Movie Studio will display a small dialog box informing you of that, and giving you the option to watch it, or open the hard drive folder in which the MP4 file is located.

Here's a tip: you can speed up the rendering process by rendering the video file onto a hard drive **other than the one on which your project media is located**. Using that approach, rendering can take **less** time than the runtime of the MP4 file.

Incidentally, I saved the project file yet again after rendering was completed. The project file size was 17 kilobytes. The rendered MP4 file size was 30 megabytes.



**Illustration 17**

## **IS THIS BURNING FIRE VIDEO A GOOD LOOP CANDIDATE?**

This particular video has minimal examples of one giveaway for the direction of time: *flying sparks*. During the reverse video portion, a few sparks fly *into* the fire, not out of it. Had it been hundreds, I would never use it as a Zoom virtual background. However, there were fewer than 8.

Overall I think the campfire video is a good addition to my collection of loop videos for Zoom virtual backgrounds.

## **OTHER POSSIBLE VIDEO VIRTUAL BACKGROUNDS**

My son told me of one he found. A creative guy shot a video of the real scene behind his computer desk, which included a closed door for entering the room. He set up the camcorder pointed in the direction of that door, just like his webcam. He started recording, then exited the room, closed the door, waited, opened the door, walked in and pretended to realize that someone was using his computer for a Zoom meeting. So he looked embarrassed, and then left the room and closed the door.

He trimmed the video, removing the first several seconds, so that the edited video began with the closed door, and then the door opened to reveal his entry.

Imagine how people would react when the same person, the same face, was in the foreground with that video as the virtual background.

So there is another way to think of a virtual background: entertainment for your colleagues and acquaintances. Have fun with it.