Recommendations for a smooth stream			
1. use a dedicated laptop or broadcasting hardware			
2. use the same method every sunday. if any changes are made to setup then do a private stream as a test run			
3. if slow internet try OBS broadcasting software for better live stream performance (can record backup to computer while streaming)			
4. if want higher quality stream as well as performance then invest in dedicated broadcast software along with pay as you go usb cell phone modems			
PreRecorded	**VS**	**Livestream**	
easy to include at home members of the congregation in the service for scripture readings		shared viewing experience	
options for greater complexity and creativity (ie synchronized choir singing from home)		possibility for interactivity (prayer time)	
can experience your technical difficulties in private		facebook promotes live video over pre recorded so may help reach new members	
allows for the possibility of a more polished look and multiple camera angles		lower expectations of quality for those who don't want to be be a film editor / minister	
more time to craft a structural arc for the service		may be less time intensive (%!#@ it we'll do it live)	
internet speed less of a bottleneck		when things go back to normal system already will be in place for reaching new members or remote members easily	
	Middle Ground: Watch Party		
	Can play back a pre recorded sermon on Zoom or Facebook		
	Allows for parts of the service to be live such as prayers or sermon		
	how to prevent getting zoom bombed	https://www.pcmag.com/how-to/how-to-prevent-zoom-bombing	
	How to speak to camera		
	https://www.youtube.com/watch?v=UyLeB6VtFVE		

Live Streaming: How to Upgrade Computer Webcam Setup

		Setup Description	Recommendations	Equipment	Total Price Range	
	Audio	internal computer microphone	sound quality is tinny and low quality			
		audio interface into computer using existing church microphone system	preaching from the pulpit? connect pulpit podium microphone to your computer. prefer to move around? connect wireless church microphones to computer. preaching from home or outside? take a church podium microphone home	Focusrite Scarlett Solo USB Audio Interface $100, 25 foot or 100 foot XLR cable $25, if have shure laveles will need RPM626 $80	$125-$205	
		audio interface into computer using speciality microphone	large diaphragm microphones sound the closest to what people are used to when watching professional content. Disadvantage: might not be hidden due to their large size, will feedback if used in church PA system	Focusrite Scarlett Solo USB Audio Interface $100, 25 foot or 100 foot XLR cable $25, Mic Stand $25, AT2035 $150, AKG214 $400	$275-$525	
			podium gooseneck microphone. second best sounding. easy to swivel just out of frame	Focusrite Scarlett Solo USB Audio Interface $100, 25 foot or 100 foot XLR cable $25, Shure MX418D $288, Countryman M4CP5RF24E IsoMax with AT8699 $328, DPA 4098 with DM6000 $859	$413-$984	
			lavalier microphone. easiest to hide and can be clipped on clothing	Focusrite Scarlett Solo USB Audio Interface $100, 25 foot or 100 foot XLR cable $25, Countryman H6 Omnidirectional Earset with RPM626 $550, Rode smartLav+ $90, DPA 4061 with microdot xlr $600	$215-$725	
	Video	internal computer webcam	often no better than cell phone video quality			
		external computer webcam	cheapest upgrade external webcam with stand: can adjust height just above head level	Logitech C920S HD Pro $80, Lightweight Mini Webcam Tripod for Smartphone $13, Magnus VT-4000 Tripod $110	$80-$213	
		external zoom camera	quality increases as commensurate with price. depending on internet speed expensive might not be worth it	Canon VIXIA HF R80 $189, Sony PXW-Z150 $2900, Canon XA11 $845, Panasonic HC-x1000 $1600, Canon VIXIA HF G21 $1000, Panasonic Ag-UX90 $1500, Sony PXW-x70 $1800	$189-$2900	
			connect camcorder into computer over SDI cable and then SDI to HDMI adapter and HDMI to USB adapter at computer end, equipment depends on camera model and proximity to computer	Magewell USB Capture SDI $300 or Pengo Technology HDMI to USB $90 or Blackmagic Intensity Shuttle $200, Blackmagic Design UltraStudio Mini Recorder $60, Blackmagic HDMI to SDI $55, 100ft sdi cable $55	$260-$470	
		multiple external zoom camcorders	switcher system required	Atem Mini $300	$300	
		PTZ permanent install camera	plug and play. simplest solution though won't look the best. could be used in conjunction with a camcorder and switcher. remote control. various zoom lengths (12x, 20x, 30x) what's best depends on camera position and size of room, can move between preset shots, controllable with $9 phone app	PTZOptics 30X-SDI Gen 2 Live Streaming $1800, some churches have 3-4 of these cameras mounted on opposite sides	$1,800	

	Streaming Interface	facebook live	Facebook's web interface defaults to high definition video that isn't possible in many rural areas		free
		dedicated broadcasting software	can lower the quality to make the video stream consistent with the internet speed limitations	Dedicated Broadcasting Software (Open Broadcaster Software)	free
		dedicated broadcasting hardware	if don't want to use a laptop. can use wifi in conjunction with cellular modems for added resiliency and image quality	Teradek VidiU Go HDMI Unit $1100, LiveU Solo HDMI $1,000, USB cell phone 4g Card	$1,000-$1,100