

Traffic Cameras with the Videstra® DOT Manager



Videstra DOT Camera Manager

Videstra's solution for Traffic cameras is flexibly designed so it can be implemented in a variety of ways based on how any given state or regional DOT authority grants access to their cameras. Unfortunately, there is no national standard for doing so and each state does things differently.

This means we must approach each state one-by-one. This is often successful, and sometimes, well, not so much. You're reading this white paper because you want to know how to access your state's DOT cameras. Let's review a few things:

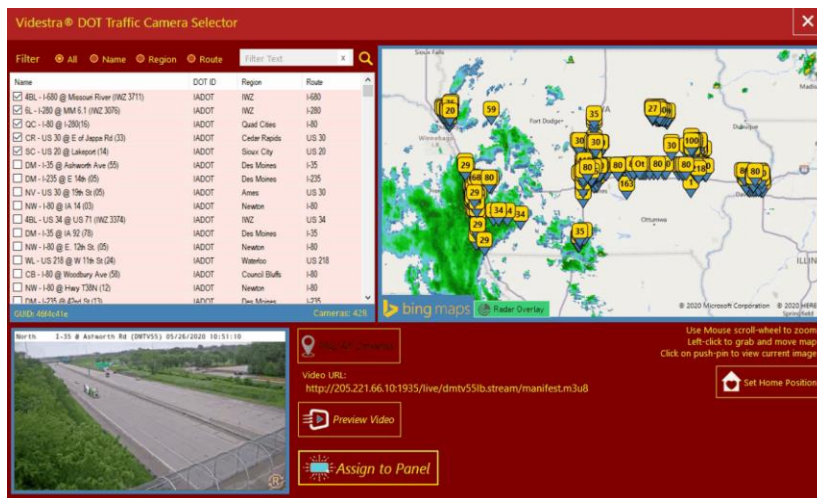
DOT Camera Access with Videstra

VestraView by Videstra can access DOT cameras using one of two types of system panels. A panel in Videstra is an interface to a specific camera type, or class of cameras. The two panel types in Videstra for accessing DOT cameras are

- DOT Selector Panel
- Flex Panel

DOT Selector Panel

Each DOT Selector Panel gives you access to all DOT Cameras. This is a powerful tool that gives you a wide, establishing shot of your states DOT camera collection including an interactive map view.



With the DOT Selector Panel, you can Search, Sort, Filter, Preview and Select any available DOT camera from either a table or map. You can also see current radar imagery.

The Videstra DOT Selector Panel can only be used where your DOT provides sufficient camera information (metadata) along with video streams and/or updating images via open protocols.

Flex Panel

The Videstra Flex Panel is dedicated to a specific camera – it can only look at a single source or camera at a time. For a Flex Panel you must have a specific streaming URL, and you will need to create one Flex Panel for each source or camera you intend to use on-air. Although not nearly as easy and comprehensive as the DOT Selector Panel, for DOTs that can provide only one, or a few streams this is the only method. Also – if sufficient metadata is not available this is the only method.

Metadata File

The DOT Selector for the DOT Panel in the Videstra system relies upon information provided by your DOT about the cameras. This is the metadata for your DOT cameras. It contains important information required to access and present the traffic camera images/video. Most states provide an XML or CSV type file containing this information. While some provide just the basics, some provide quite a bit. Below is a list of the most basic information Videstra requires to present traffic cameras in the DOT Selector.

- Camera Name
- Camera Description
- Camera Location (Latitude & Longitude)
- Highway/Road Name

Other pieces of camera information may also be provided, such as region or county – which is helpful for sorting and searching, but not strictly necessary.

This data will typically be provided as an XML or CSV file by your DOT. Either format is acceptable. Because each DOT maintains their own format and tag structure the file they provide will need to be processed by Videstra to be used by the DOT Selector Panel. Once Videstra has done this, updates can easily be accommodated whenever your DOT adds new cameras (or permanently removes some). These updates will be automatically applied to your Videstra system.

Still Images -vs- Video

Some states provide media access only to current still images or streaming video, or both. The Videstra system works with streaming video or still images. With still images you will get the equivalent of a still-frame for on-air use. This image will be updated by Videstra as often as every 5 seconds (30 seconds by default) – but only if the image is refreshed as often by the state DOT.

Video Options

There are two ways video can be presented to a broadcast facility for use on-air:

- Streaming (Which is the preferred and modern method)
- Legacy Baseband (legacy methodology)

Streaming Video Feeds

Streaming video feeds from the DOT come in a few different formats and protocols. They can also come via a private network or as a public one available over the Internet. Streaming video will be delivered via one of the following protocols:

- **RTSP**
- **HLS**
- **RTMP**

Streaming Video via Private Connection

Some states allow access to their camera streams only if you set up a direct network connection to their network. This can usually be done via a VPN. In this case the DOT will need to host a VPN service or router (either customer or DOT provided) that exposes the private address(es) to the broadcast facility through a VPN. It's best to get your IT department involved as VPNs can be difficult and tricky to set up for long-term reliability.

Note: Always make sure any VPN equipment will automatically re-establish connection following a power cycle.

If the IP Addresses used to access the streaming video are all private addresses in one of the following ranges:

- **10.0.0.0 – 10.255.255.255**
- **172.16.0.0 – 172.31.255.255**
- **192.168.0.0 – 192.168.255.255**

then your IT Department will need to make them available to the subnet on which your V-Manager and V-Streamer live. Your IT Department will have their preferred strategy for making this happen – either through a V-Lan, ACL or some other method they support. It's important to follow their guidelines for this – but it will be required. Private addresses cannot be resolved for the streaming video feeds the way public addresses (any address outside of the above table) can. Your default gateway takes care of accessing public addresses seamlessly.

Streaming Video via Public Addresses

This is the simplest and easiest method. DOTs like the Iowa DOT support this in an elegant and highly efficient model (The Iowa DOT is, in our opinion, the Best Practices model). In this case all cameras are located on public IP Addresses and are delivered to the station via a simple Internet connection.

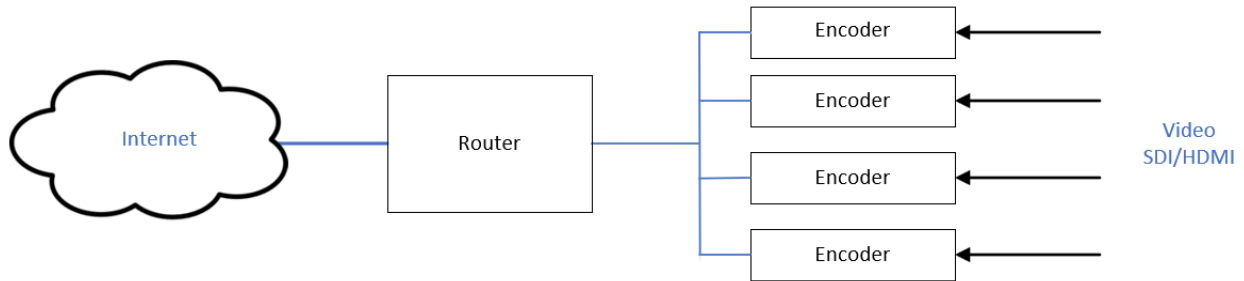
Multicast Access to Cameras

All streaming connections described above are *unicast* TCP/IP connections. However, in some rare cases DOT cameras may only be available via multicast. In this case the IP Address(es) will be within the following range: **224.0.0.0 to 239.255.255.255**. Because this is a limited range multicast streams can only be done via a private connection. There are additional complications when it comes to multicast capability and additional consultation will be required with Videstra before a multicast DOT interface can be established.

Baseband

Although they are rapidly disappearing some states only give you access to baseband video streams. To get those into your facility you must invest in a method to get those baseband stream(s) to your broadcast facility. The best way to do this is to drop an internet connection through an ISP into the DOT

facility and then place one or more h.264 encoders at the DOT. This allows you to connect baseband stream(s) (SDI, HDMI) to the encoder(s). If only one stream is available from your DOT, this is a simple solution. If multiple streams are available, it gets a bit more complicated. With multiple streams you will want to include a router that lets you set up port forwarding so that you can set up a unique port for each encoder you install at the DOT.



This method is practical for a limited number of baseband DOT camera sources. You will require an encoder for each baseband source. These sources may be fixed or dynamic. Since most DOTs have more than just a few traffic cameras, the baseband sources will likely be dynamic. If they are dynamic, there may be a method your DOT requires to select which cameras are assigned to the encoder(s). This can be via a web page (provided by the DOT), or you may have to make a telephone call.

Working with Your DOT

The relationship with your DOT is one that exists between you, the broadcaster, and your state's DOT. Videstra will be happy to help facilitate arrangements and technology discussions, however we do not "get in the middle" of you and your DOT. We have considerable experience dealing with DOT technology managers and can speak their language without an accent. Involving us in those conversations can be very helpful – however a broadcaster within a DOT region will usually have greater pull and influence when cooperation is key.

Be aware that, in nearly all cases, DOTs reserve the right to blackout any camera at any time either for maintenance, privacy or security. For example, it is standard protocol to blackout feeds any time a presidential entourage is expected. DOT's will also blackout cameras to the media if there is a particularly gory accident. This is by policy or law.