# VTC User Manual

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## 0.1 Introduction

The main purpose of the VTC software is to automatically count vehicle movements in video footage. This includes counting turns at intersections or simply counting passing vehicles on a straight road.

VTC accepts various video sources:

- .mp4
- .wmv
- .avi
- live webcam
- live IP camera

### Target Users

Target users include anyone who performs traffic counts or desires to monitor the flow of traffic at a particular location. Applications include marketing surveys, real-time light control, evaluating intersections for light installation, etc.

## 0.2 System Requirements

VTC runs on a standard Windows PC. The main bottleneck is CPU; the maximum number of tracked objects is constrained by CPU speed.

- Processor: Intel CPU Core i5
- OS: Windows 7 or later
- Memory: 6 GB RAM
- Storage: 2 GB available space
- (Optional): USB webcam or IP camera

If an internet connection is available, the software can be configured to continuously broadcast traffic measurements to a logging server.

## 0.3 Setup

### Select Video Source

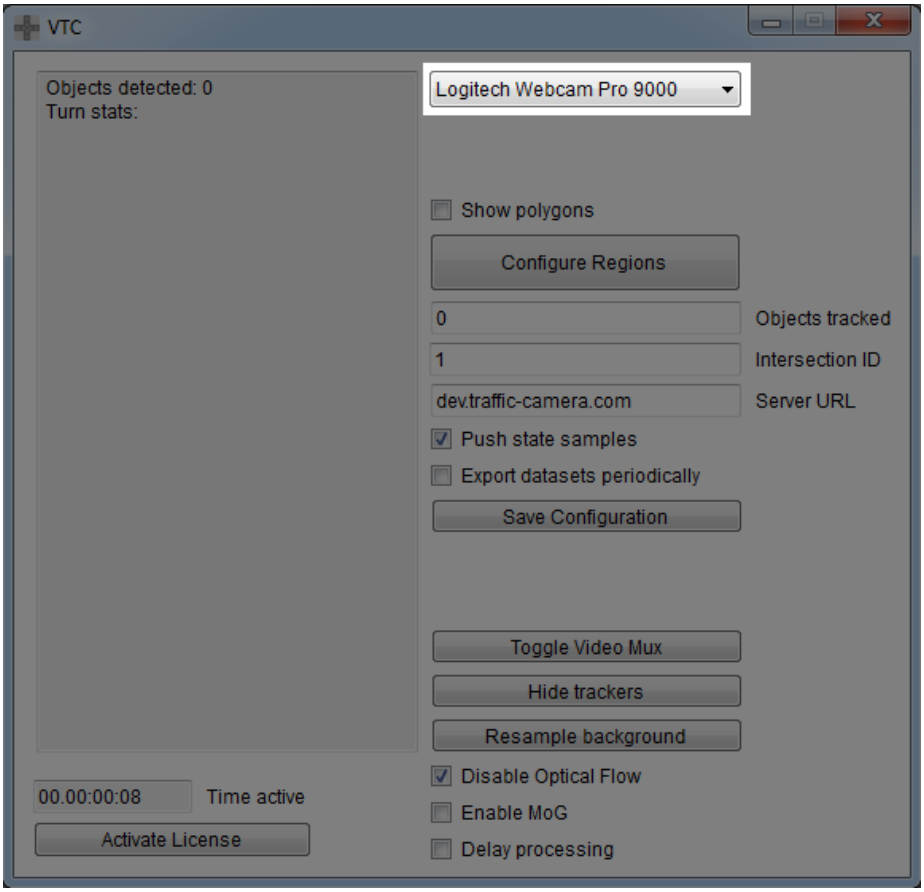
#### Existing Footage

Pass in the path to your footage using the command line:

```
>> TrafficCounter.exe "C:\footage\1.wmv"
```

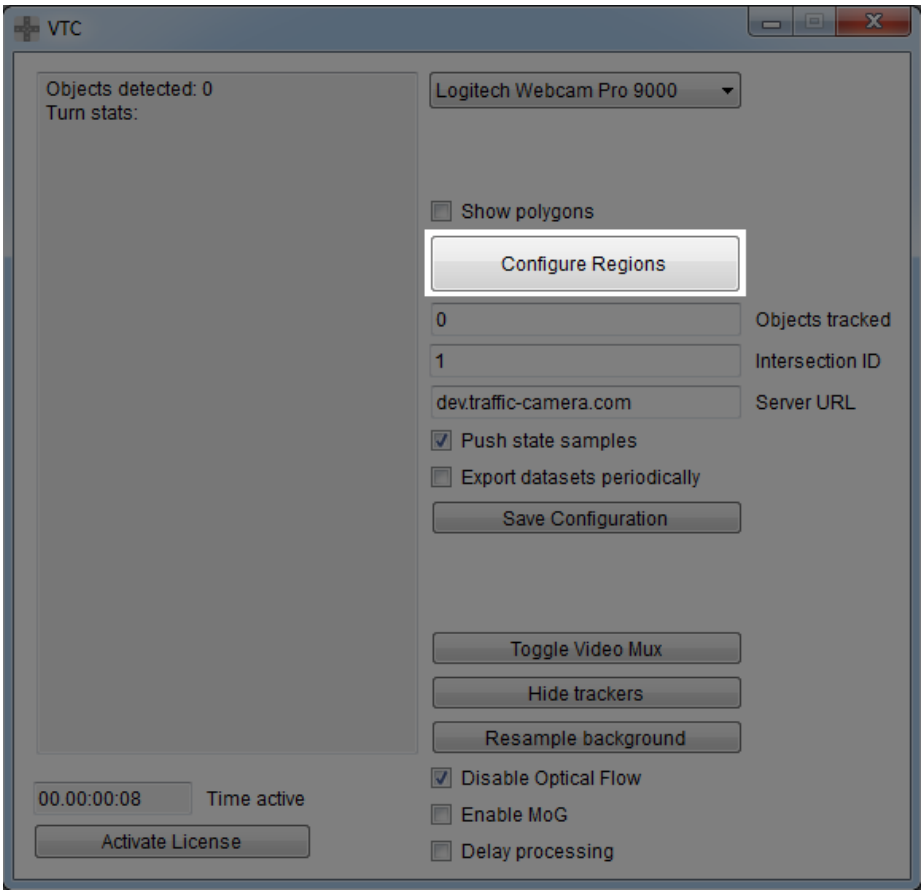
#### Live Video

Launch the software without any command-line argument. Select the appropriate video source from the drop-down list.



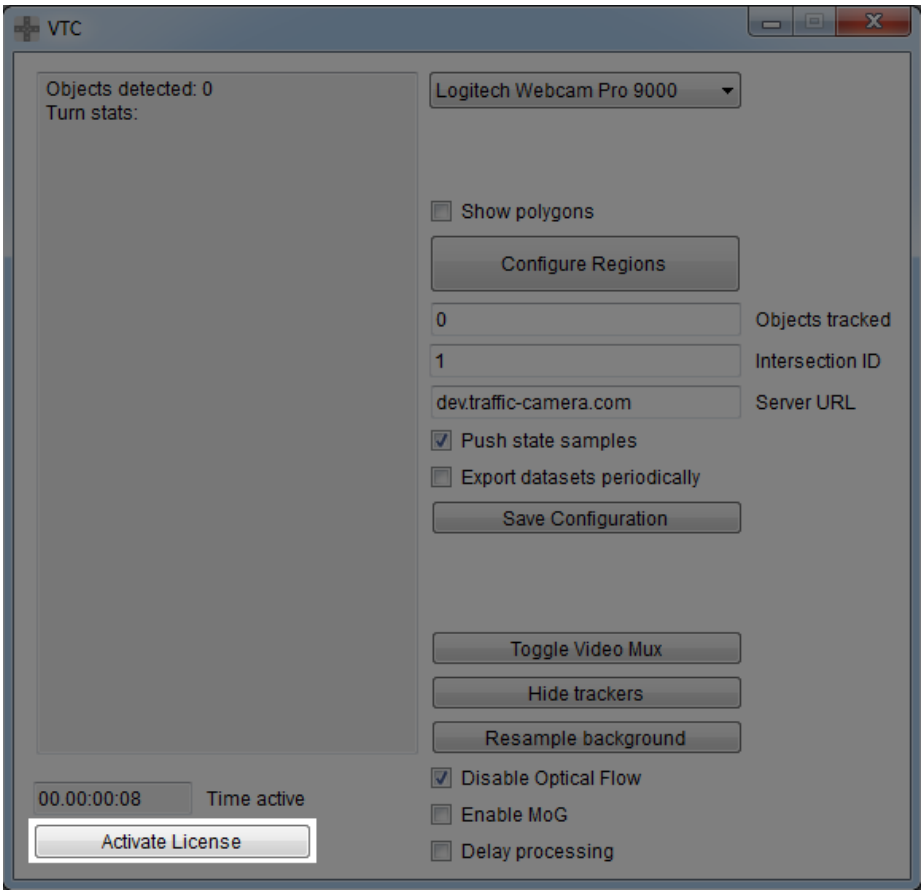

### Configure Regions

Launch the Configure Regions dialog and select the main Region of Interest.



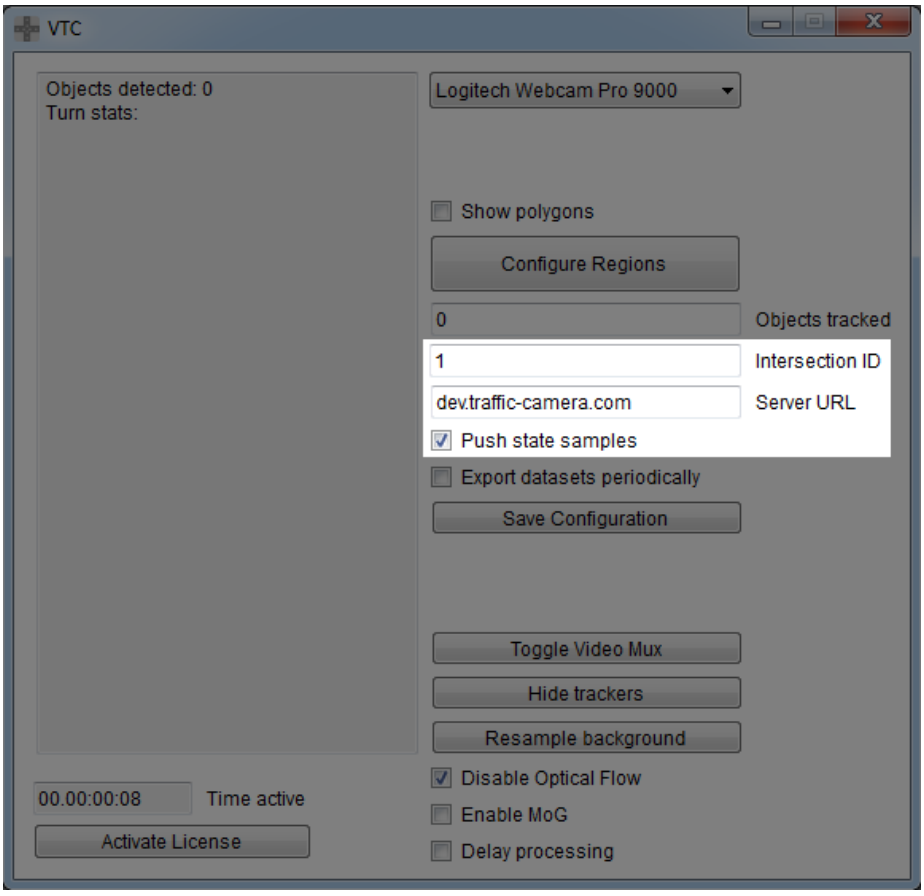

## Activate License

Launch the "Activate License" dialog and enter your license key.




## (Optional) Configure Server

Enter the URL and intersection ID for your server and location. VTC transmits HTML POST requests at periodic intervals, containing the position and location of tracked vehicles. Additionally, VTC transmits HTML POST requests whenever a completed movement is counted (left-turning, right-turning or straight-through vehicles).




Contact VTC support to provide a logging server for your intersection.

## 0.4 Detailed Configuration

The following parameters can be configured in the application configuration file `TrafficCountere.exe.config`:

| FTPpassword | TBD |
|---|---|
| FTPusername | TBD |
| server_url | TBD |
| RoiMaskPath | TBD |
| RegionConfig | TBD |
| FRAME_UPLOAD_INTERVAL_MINUTES | TBD |
| FrameWidth | TBD |
| FrameHeight | TBD |
| ClassifierSubframeWidth | TBD |
| ClassifierSubframeHeight | TBD |
| VelocityFieldResolution | TBD |
| MoGUpdateDownsampling | TBD |
| state_upload_interval_ms | TBD |
| ClientSettingsProvider.ServiceUri | TBD |
| Alpha | TBD |
| PerCarMinimum | TBD |
| ColorThreshold | TBD |
| PruningRatio | TBD |
| Q_position | TBD |
| Q_color | TBD |
| R_position | TBD |
| R_color | TBD |
| VehicleInitialCovX | TBD |
| VehicleInitialCovVX | TBD |
| VehicleInitialCovY | TBD |
| VehicleInitialCovVY | TBD |
| VehicleInitialCovR | TBD |
| VehicleInitialCovG | TBD |
| VehicleInitialCovB | TBD |
| CompensationGain | TBD |
| Timestep | TBD |
| MaxObjCount | TBD |
| CarRadius | TBD |
| MinObjectSize | TBD |
| PerCarMin | TBD |
| NoiseMass | TBD |
| MissThreshold | TBD |
| MaxHypTreeDepth | TBD |
| MaxTargets | TBD |
| KHypotheses | TBD |
| ValRegDeviation | TBD |
| LambdaX | TBD |
| LambdaF | TBD |
| LambdaN | TBD |
| Pd | TBD |
| Px | TBD |
| class_Car | TBD |
| class_Bus | TBD |
| class_Pedestrian | TBD |
| class_TrafficLight | TBD |
| class_Other | TBD |
| UnitTestDll | TBD |

## 0.5 Troubleshooting

### Vehicles aren't being tracked

Check region polygon. Ensure that the main Region of Interest occupies the correct area.

### Vehicles are tracked but turns are not counted

Check entry/exit polygons. If entry and exit polygons are correct, try slightly shrinking the main Region of Interest so that it does not extend to the edge of the image.

### Tracking accuracy is poor

This can have several causes. It may be necessary to contact VTC support for detailed troubleshooting.

Start by checking the camera position. Ideal mounting positions are high above the area of interest (several stories above ground if possible), facing straight down. A mounting position near ground-level will result in poor tracking accuracy.

### Processing is lagging/slow

One possible way to alleviate performance issues is reducing the Region of Interest. Limiting the number of vehicles being tracked simultaneously reduces demands on the computer.

Alternatively, the maximum number of tracked vehicles can be explicitly configured in the application settings file.