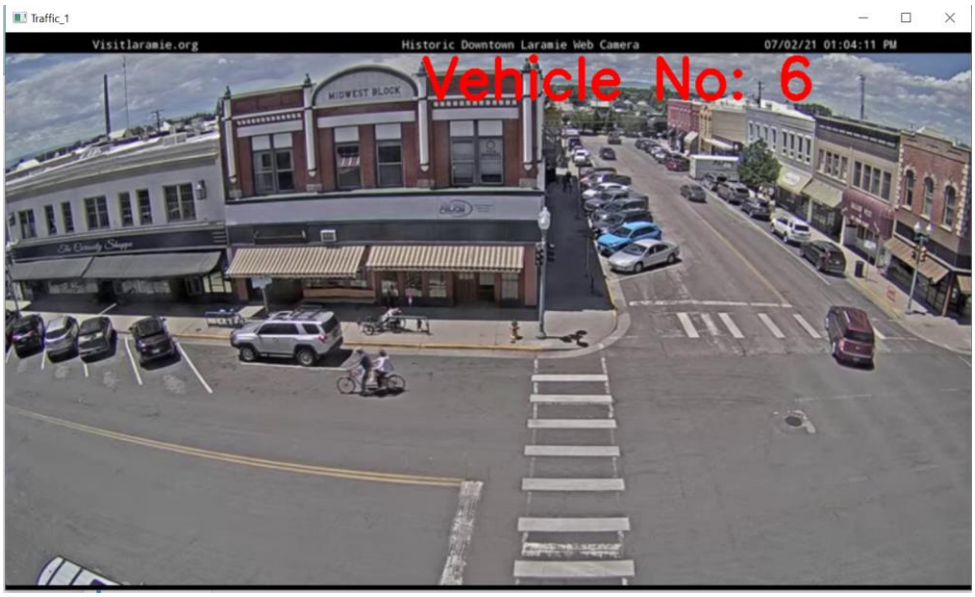
The table of Task 2

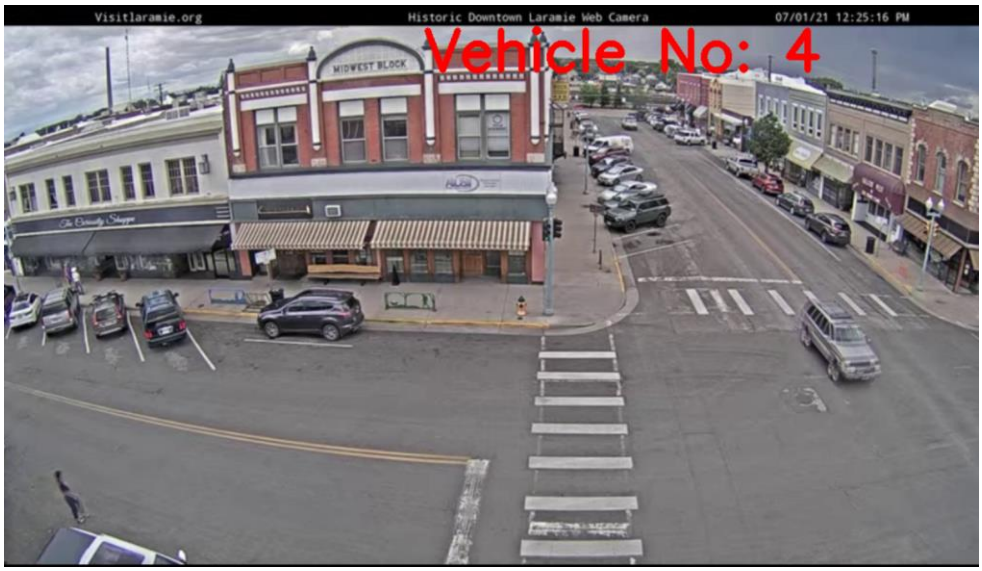
The written report includes the table od Task 2 and a brief analysis of the application.

	Total Number of cars	Cars per minute
Traffic_Laramie_1.mp4	6	2.03
Traffic_Laramie_2.mp4	4	3.79

Traffic_Laramie_1's vehicle count:



Traffic_Laramie_2's vehicle count:



A brief description of the frame differencing and background subtraction techniques

Background subtraction is used to create a foreground mask and helps to remove a background from an image. The static background is subtracted from the current frame. To do this, we can use the cv::BackgroundSubtractor class in OpenCV. A threshold is then applied to the result to obtain the foreground mask

Frame differencing a method used to check the difference between 2 frames in a video. If there is something moving in the 2 frames, change will be detected. For instance, I this exercise, the cars and the people were moving. So by doing frame differencing, we will be able to obtain real distinct movement. In this exercise, for frame differencing, I've used frame1 which reads the video. I've included a copy of the frame to exhibit the difference between the frames.

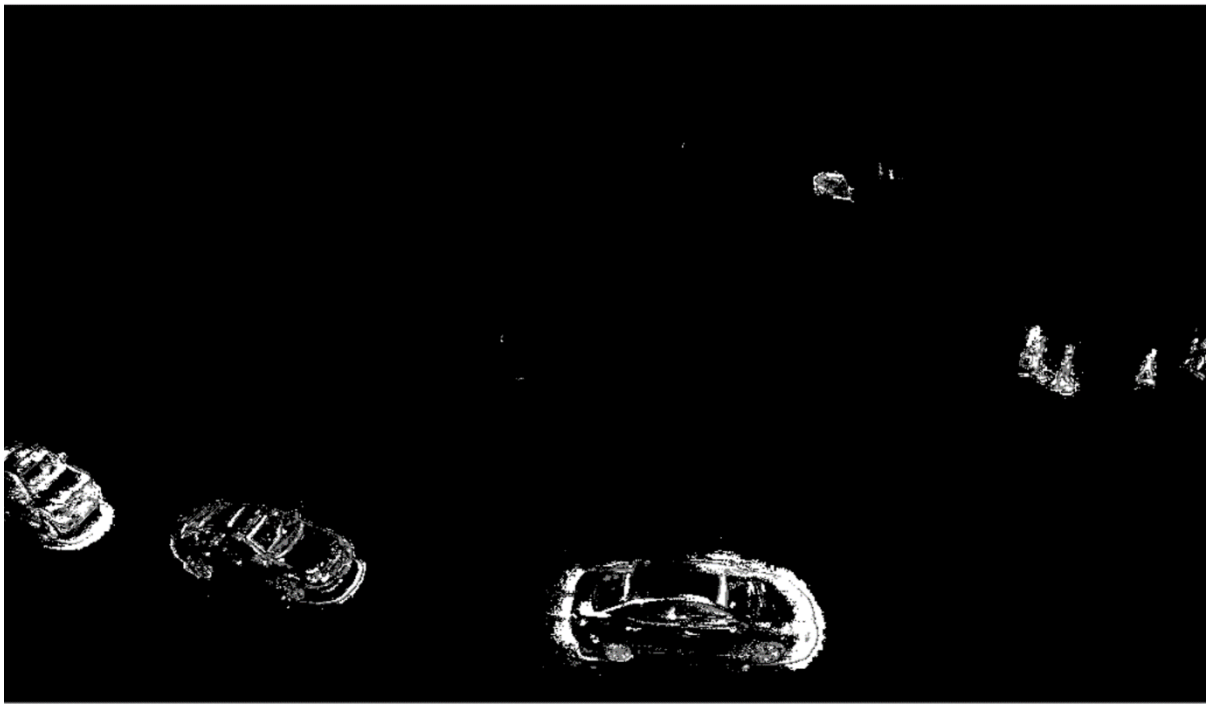
A brief analysis of the application.

Exercise 1.1

First, I used the createBackgroundSubtractorMOG2 object found in the OpenCV Python library to perform background subtraction. This helps to find the difference between the current frame of the video and the static part of the background model. The threshold is applied to the resultant value so that the foreground mask is obtained. It helps to remove noises.

I had frame1 to read in the video file. I made a copy of the frame. This is the frame differencing part.

After Background subtraction and frame differencing

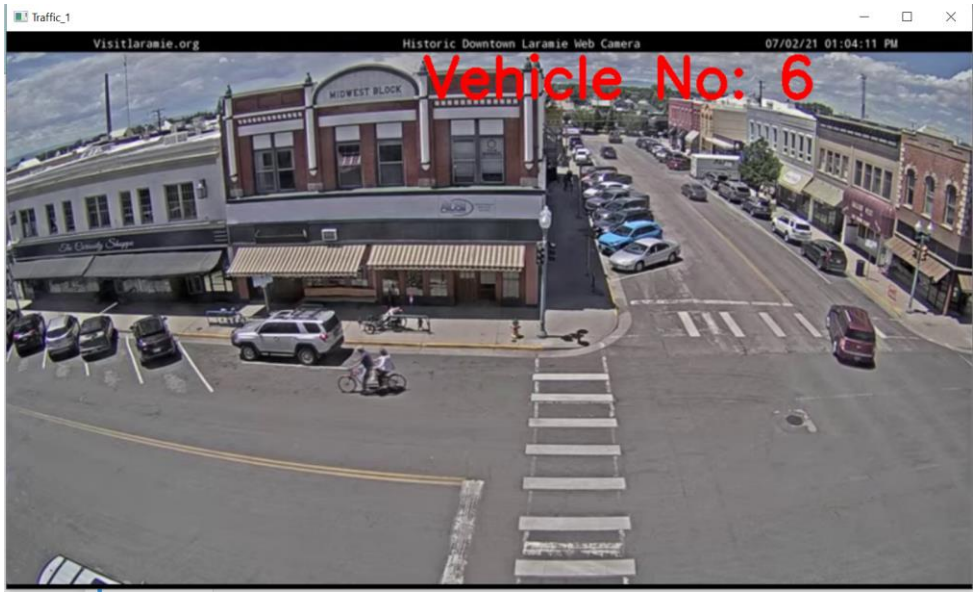


The function findContours was used to find the white objects (objects which are moving) from the black background. Then I looped through all the white objects and if the white objects had a contour area less then 4500, the program continues. The boundingRect function was applied to find the relevant white objects (cars on the main street) and a green rectangle is drawn over the moving cars in the main street.

Exercise 1.2

The background subtraction and frame differencing part are similar to exercise 1.1. The boundingRect function was also used to take in relevant cars . I calculated the mid value of x and y.

For traffic 1, if the mid value of x is within 460 and 465, the objects going to city center will be detected and the vehicle counter increase by 1



For traffic 2, if the mid value of x is within 460 and 465, the objects going to city center will be detected and the vehicle counter increase by 1