APPROACH

1. Cv2 from opencv library is used to detect vehicles.
2. Numpy library is imported to do the mathematical
3. Cap is defined to read frames from the video.
4. To find the centre of the box of object detected we defined a function get\_centre()
5. object\_detector variable is used to detect the moving objects from a stable camera.
6. History parameter makes sure of any changes that happen due to movement of camera, and varThreshold parameter is used with a high value to detect more precise results and less false signals.
7. While loop is used to get one frame of video at a time.
8. To get the frame one after another we defined a variable frame.
9. To find how big the entire frame is we defined frame.shape function to extract width and height of the frame.
10. roi (region of interest) is defined to focus on the area on which road is build (single lane).
11. The goal of the mask is to make the objects that we do not want black (the background) and the objects we want white (vehicles). This is applied on the roi frame.
12. From the mask we extracted the contours of the white objects.
13. To clean the mask means to detect images which are white in color and leaving remaining other gray elements we are using threshold function.
14. We defined a small matrix called function for processing the frames.
15. Dilation and erosion techniques are used to connect nearest regions in order to have a region per object.
16. From the resulted images we need to extract the coordinates of the objects, so we used cv2.findContours to find the boundaries of the white objects.
17. A line is drawn on the frame so that we can count the numbers of vehicles crossing it.
18. With the help of for loop we are extracting the x-y coordinates and the width and height of the rectangular frame which should be greater than certain value.
19. Then we are drawing the rectangles and centre, by calling the get\_centre function, on the objects detected.
20. After that we are counting the number of vehicles that are crossing a horizontal line.
21. Then we are showing the number of vehicles count on the frame and the frame itself.
22. If we press esc then the loop is broken.
23. Cap.release() method is used to close the video files
24. destroyAllWindows function is used to destroy the windows which were created by imshow meathod.

Why the model OpenCV:

Because it is easy to use and read. In OpenCV, images are converted into multi-dimensional arrays, which greatly simplifies their manipulation.

Other models that can be used:

1. YOLO
2. R-CNN

Why current model is better than other model:

Because if you use OpenCV, you’ll have access to implementations of what the computer vision community has found to be the most critical algorithms, methods, and models. You don’t have to have a large training dataset. With OpenCV you can perform face detection using pre-trained deep learning face detector model which is shipped with the library.