The vehicle is a means of transportation that was widely used in the 19-20th century. Due to the increasing number of vehicles, road management must be arranged so that vehicle traffic can be well organized. Roads must also be maintained to remain good and not exceed the existing capacity. Therefore, the load of passing vehicles must continuously be monitored so that the roads remain in prime condition. In this paper, we use the Initial Measurement Unit (IMU), which contains accelerometer and gyroscope sensors to determine the classification of the vehicle that passing by on the road. We use Machine Learning in this paper to process the data obtained from the IMU to determine the types of passing vehicles. There are several machine learning algorithm that we can use for classification such as KNN, Rainforest, and Naïve Bayes but in this paper we use SVM Machine Learning algorithm to classify the vehicle.