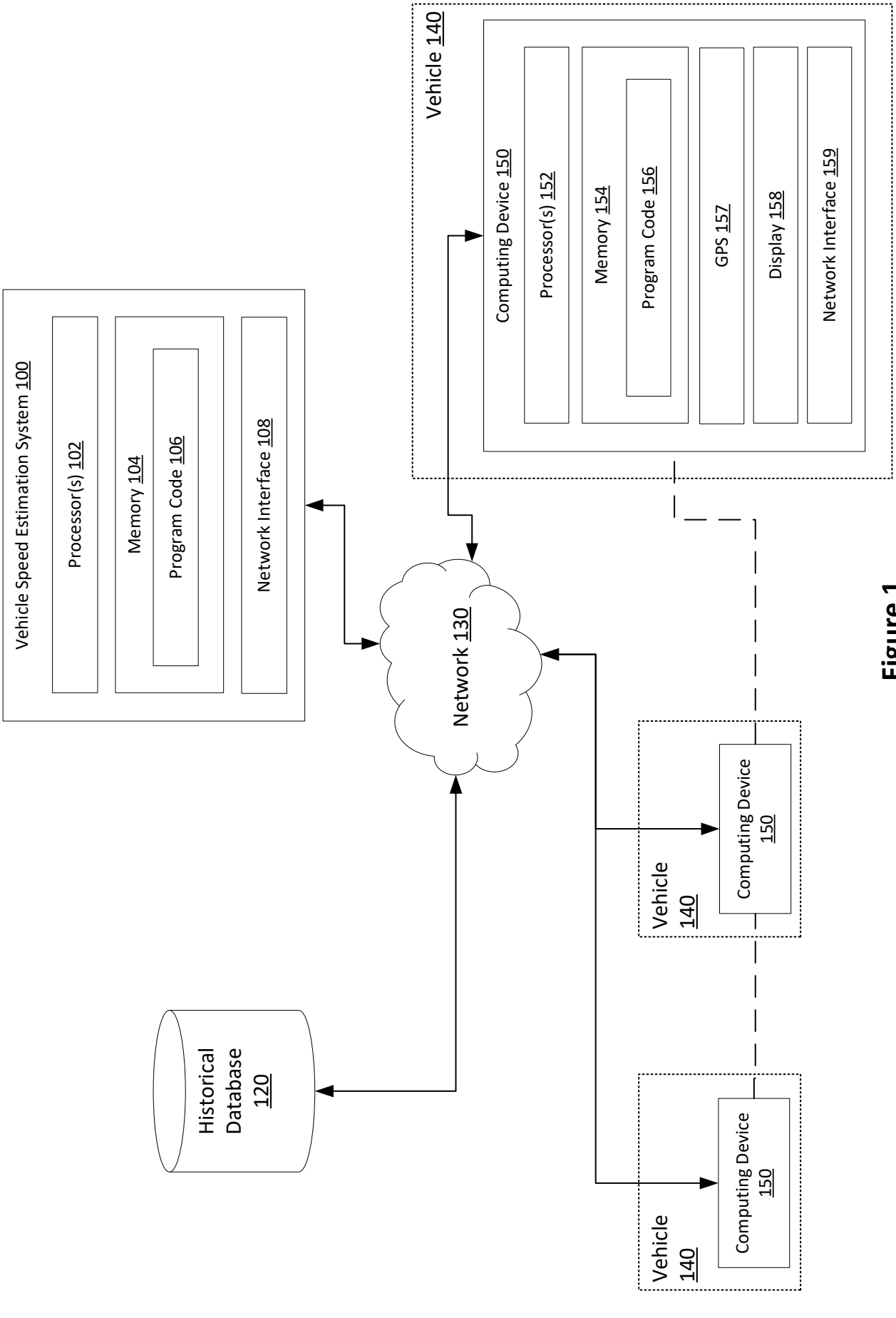

Vehicle Speed Estimation System 100
Processor(s) 102
Memory 104
Program Code 106
Network Interface 108
Network 130
Historical Database 120
Vehicle 140
Computing Device 150
Processor(s) 152
Memory 154
Program Code 156
GPS 157
Display 158
Network Interface 159
Vehicle 140
Computing Device 150
Vehicle 140
Computing Device 150

Figure 1

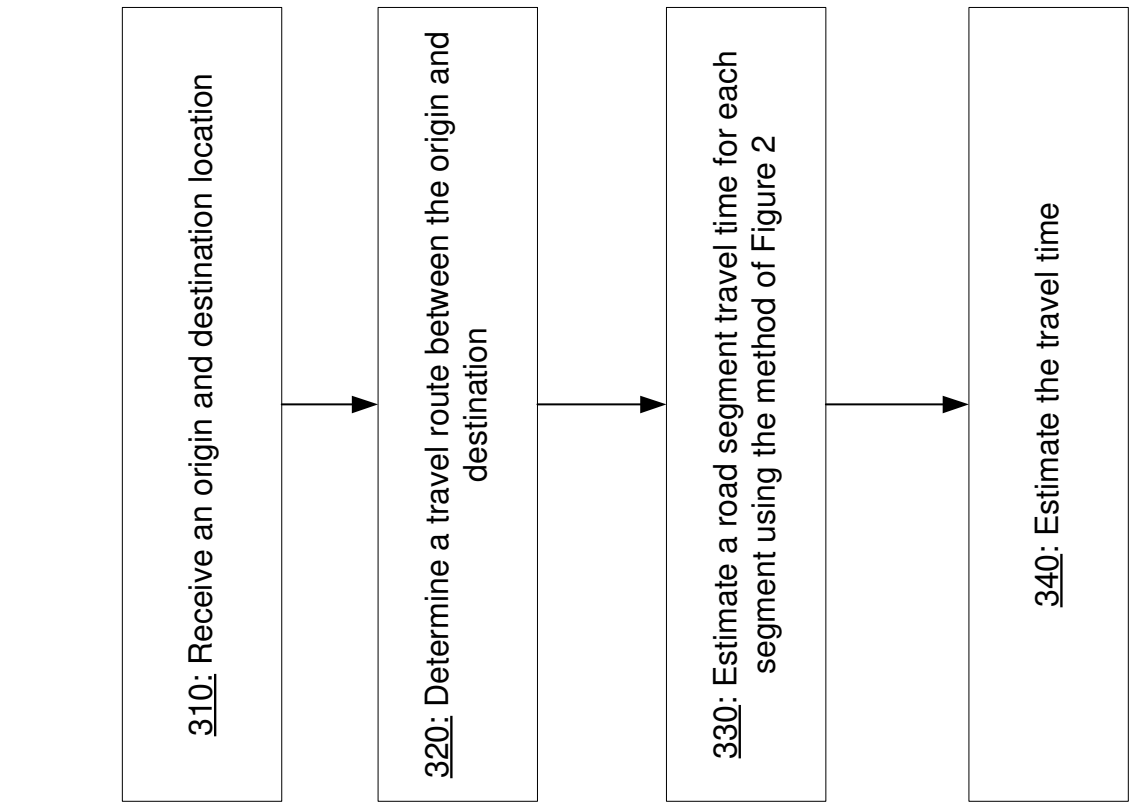


Figure 3

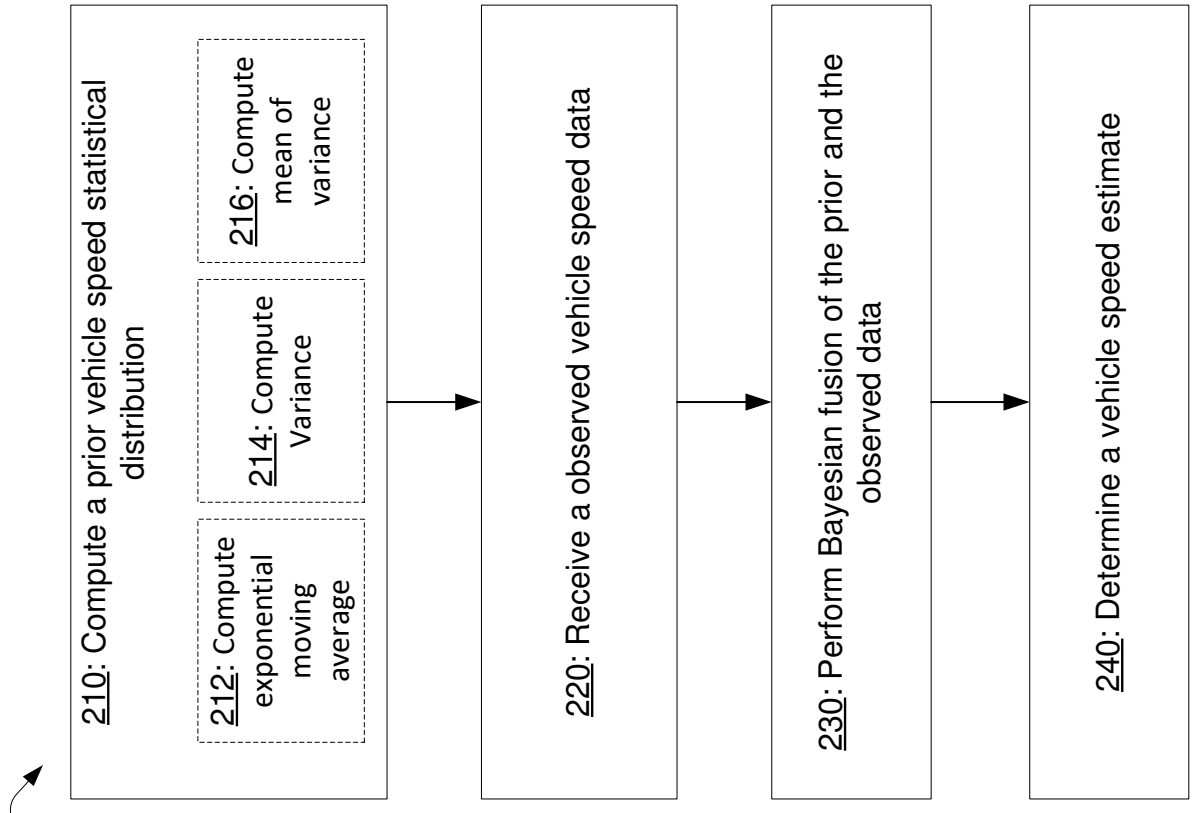


Figure 2

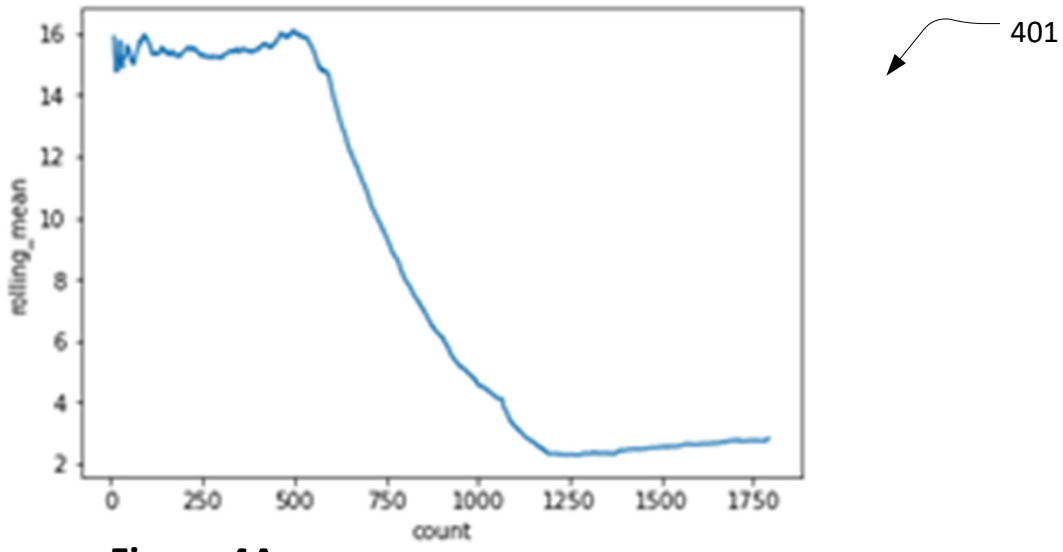


Figure 4A

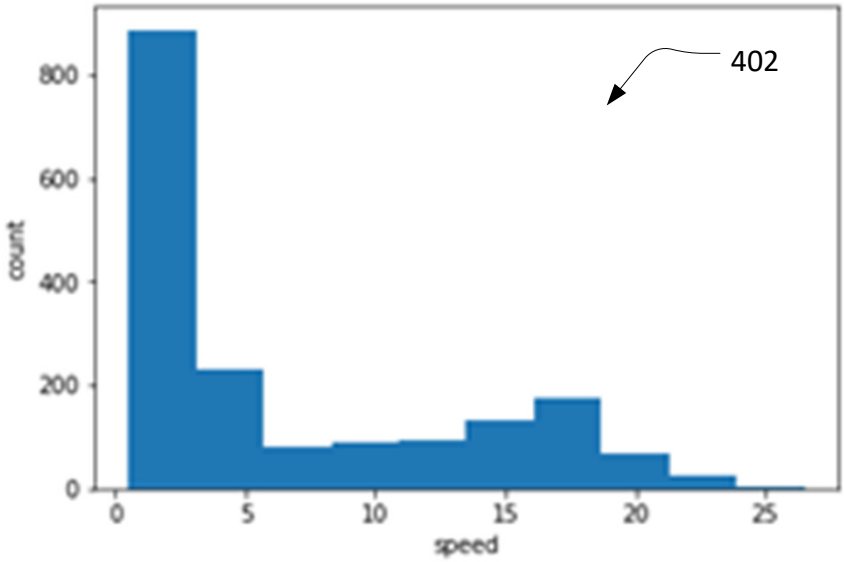


Figure 4B

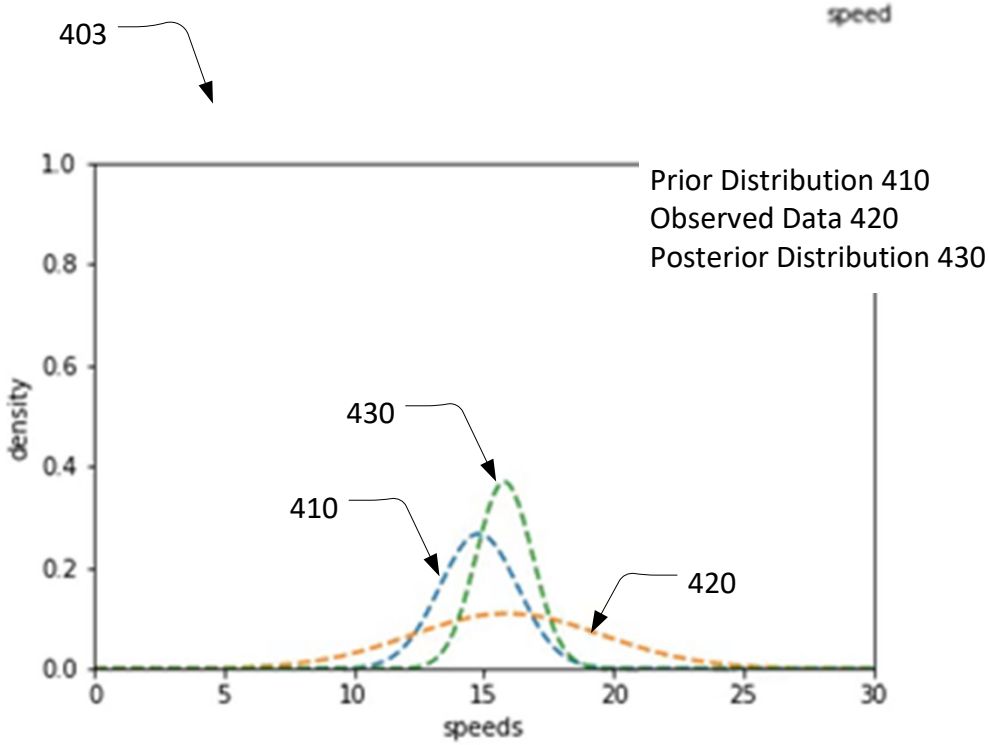


Figure 4C

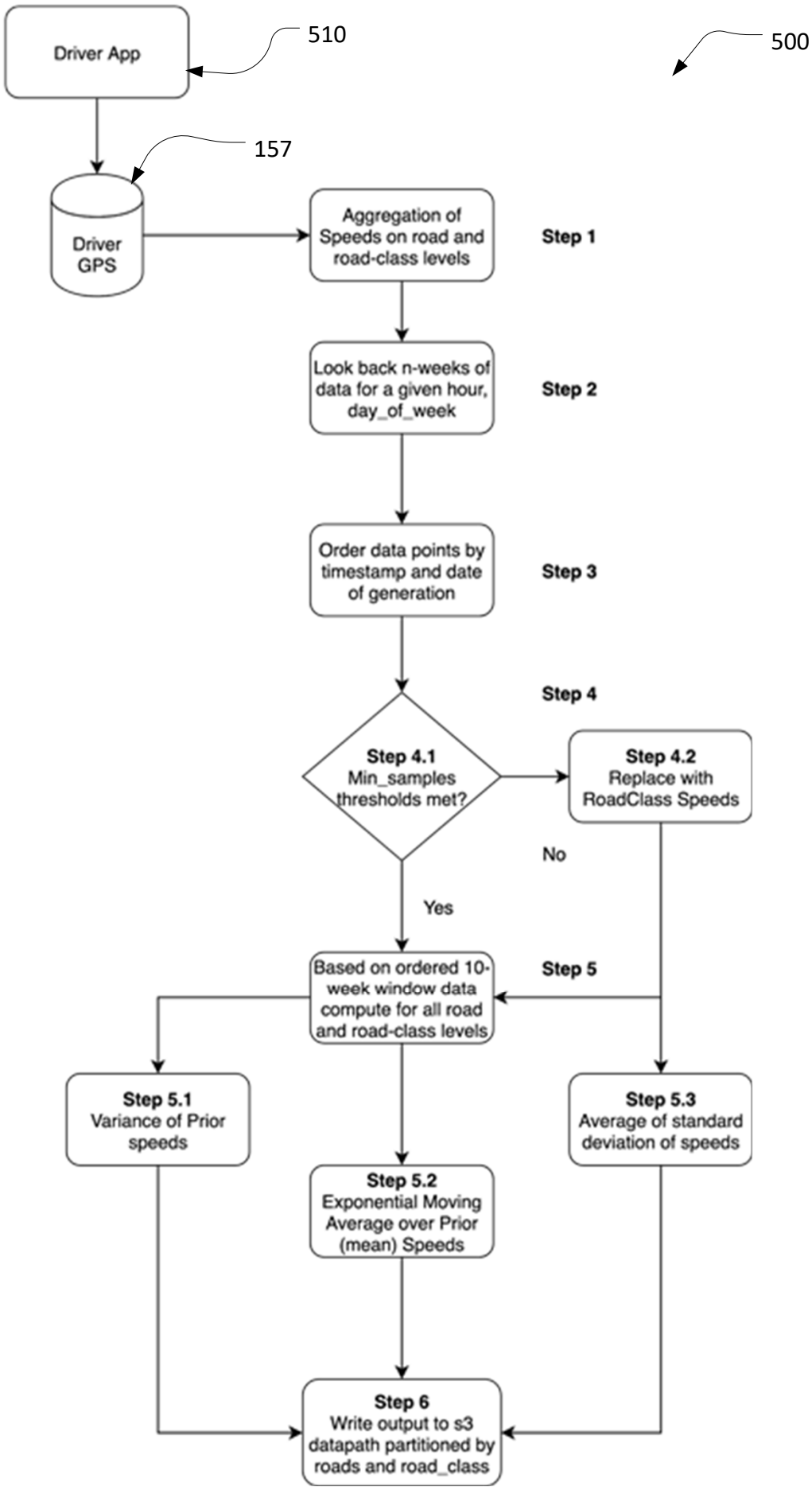

Driver App
510
500
157
Driver GPS
Aggregation of Speeds on road and road-class levels
Step 1
Look back n-weeks of data for a given hour, day_of_week
Step 2
Order data points by timestamp and date of generation
Step 3
Step 4
Step 4.1 Min_samples thresholds met?
Step 4.2 Replace with RoadClass Speeds
No
Yes
Based on ordered 10-week window data compute for all road and road-class levels
Step 5
Step 5.1 Variance of Prior speeds
Step 5.2 Exponential Moving Average over Prior (mean) Speeds
Step 5.3 Average of standard deviation of speeds
Step 6 Write output to s3 datapath partitioned by roads and road_class

Figure 5