**Date:** 09/21/2017

**To:** Dr. Dawit Zerom

**From:** Sanchit Singh

**Subject:** 55 or 65 mph Highway Report

To lessen the mishap, therein inflate traffic safety, & reduce greenhouse emissions, various environmental groups and politicians suggest a decrease in the speed limit on America’s highway from 65-miles-per-hour (mph) to 55 mph. On the contrary, Cameron Grinnell does not accept that this would boost the road safety, as a person traveling at 20 mph is as dangerous as a speedster. To put it differently, he harvests a small-scale analysis of speeds of 40 cars from two separate highways with two different speed limits, to exhibit his belief that lowering the speed limit would not surge traffic safety. Similarly, based on the different pace of vehicles, rather than the average speed as a whole, the road safety is measured individually. For this purpose, the table 1 (shown below) is created to showcase descriptive analysis.

The typical speed of cars on a 65 mph speed limit highway (Highway 2) was 66 mph, on the other hand, 56 mph for the cars on the highway with 55 mph speed limit (Highway 1). It shows that the drivers on the highway with higher speed limit are crossing the speed limit less than the drivers on a lesser speed limit. Since the sample is positively and negatively skewed (in this case, a few relatively slow & fast cars), the median score furnishes a better measure of central tendency.

The most common use of the Coefficient of Variation (COV) is to compare relative risk. The standard deviation of two variables cannot compare in any meaningful way. So by comparing the standard deviation and the mean, the COV, differentiates in a better overall indicator of relative risk, particularly among different levels of risk. Furthermore, the COV of Highway 1 is higher than Highway 2, thereupon indicating a high degree of risk on Highway 1.

Briefly, reducing the speed limit to 55 mph would not increase the safety as the interquartile range (IQR), and COV is higher for Highway 1. A small interquartile range (of Highway 2) means that the data are very consistent (most values lie close to each other) thus representing that all cars are traveling at a constant speed which is not the case with Highway 1. Consequently, Highway 1 has a larger variation in their speed as compared to Highway 2 which cannot be considered safe. Hence, it is likely to say that fall off speed will not proliferate safety on highways.

**Table 1: Summary measures for speed of 40 cars on 55 mph speed limit (Highway 1) and 65 mph speed limit (Highway 2)**

|  |  |  |
| --- | --- | --- |
|  | ***Highway 1 (55 mph)*** | ***Highway 2 (65 mph)*** |
| Mean | 56.6 | 66 |
| Median | 56 | 66 |
| Mode | 50 | 65 |
| Standard Deviation | 6.98276266 | 3.004270465 |
| Coefficient of Variation | 12.3370365 | 4.551924947 |
| Skewness | 0.355343443 | -0.286673264 |
| Range | 29 | 10 |
| Minimum | 45 | 60 |
| Maximum | 74 | 70 |
| 1st Quartile | 50 | 64 |
| 3rd Quartile | 62 | 68.25 |
| IQR | 12 | 4.25 |