GREENWAY
Transportation Planning

Minnesota Distracted Driving Survey: 2015

RECEIVED AT _PEA_ MEETING ON _1/4/18_

(Councilmember Guzman)

3.2 Distraction Definitions

Drivers were recorded as distracted when any of the following behaviors were observed:

- Interacting with <u>Front</u> or <u>Back</u> passenger - Drivers were classified in this category if observed conversing or interacting with other vehicle occupants. Distraction due to other occupants in the vehicle was further divided by front or back seat passenger position. A baseline count of when passengers were present in the vehicle (whether distracting or not) was also taken.

- Cell phone handling - Drivers were classified in this category if observed holding a cell phone but not engaged in conversation (e.g., dialing, texting or viewing).

- Cell phone conversation - Drivers were classified in this category if observed utilizing cell phone for hand-held or hands-free conversation.

- Eating - Drivers were classified in this category if observed to be holding any open food or to have it on their lap accessible for immediate consumption.

- Smoking - Drivers were classified in this category if they were observed to be holding any smoking product/item.

- Reaching for object - Drivers were classified in this category if observed reaching for any objects that do not appear to be related to the control of the vehicle. This included reaching for items on the adjacent seats, floor, car exterior, pockets, etc..

- Drinking - As "Eating" above but for beverage container.

- Other - drivers were classified in this category if they were observed to be interacting with any distractor other than (those listed above). Some common examples were pre-programmed to be selectable from a pull-down list of "other" distractors, but the software also prompted the observers to identify the other distractor by typing into a text field on the form. Some definitions of other distractors include:

  o Control car console - if manipulating car dials e.g., audio, climate controls or in-vehicle information display.

  o Pets - if observed with a pet on their lap or actively engaging with pet inside vehicle.

  o Reading - if actively looking at any printed document.

Minisota

11,471

30%

Distracted

2.35% Smoking

- o Music - if distracted by loud music or playing musical instrument.

- o Grooming - if engaged in extended personal grooming (e.g., applying make-up, shaving).

- o Other electronic device - if actively interacting with all other electronic device other than a cell phone.

3.3 Distracted Driving Estimator

Segment AADT and daily vehicle miles traveled (DVMT) were used to estimate the distracted driver rate as follows:

Let the driver distraction status be:

$$y_{ghijklmn} = \begin{cases} 1, & \text{if distracted} \\ 0, & \text{otherwise} \end{cases}.$$

The distracted driver rate estimator is a ratio estimator:

$$p_{VMT} = \frac{\sum_g \sum_h \sum_i w_{ghi} VMT_{ghi} p_{ghi}}{\sum_{all\ jklmn\ in\ ghi} w_{jklm|ghi}}.$$

Here w_{ghi} is the road segment weight, VMT_{ghi}, is the road segment VMT. The road segment level distracted driver rate p_{ghi} is estimated by:

$$p_{ghi} = \frac{\sum_{all\ jklmn\ in\ ghi} w_{jklm|ghi} y_{ghijklmn}}{\sum_{all\ jklmn\ in\ ghi} w_{jklm|ghi}}.$$

Here weight $w_{jklm|ghi} = (\pi_{j|ghi}\pi_{k|ghij}\pi_{l|ghijk}\pi_{m|ghijkl})^{-1}$ is the subsequent vehicle selection probability after the site is selected. Case weights were only applied to the data gathered from the 170 free-flow observation sites where every n^{th} vehicle was observed. Data from the 31 red stage sites were excluded as there is no valid way to weight the cases from that methodology.

Further assuming that all vehicles observed at the same road segment *i* have the equal selection probabilities for the subsequent sampling after road segment selection, then all weights $w_{jklm|ghi}$ for the same road segment are equal and can be cancelled in the calculation of p_{ghi}. One example of this situation is treating the observed vehicles at the same site as a simple random sample of all vehicles passing that site. So p_{ghi} can be estimated by the sample mean.

The distracted driver rate estimator is a ratio estimator:

$$Pghi = \frac{1}{n_{ghi}} \sum_{all\ jklmn\ in\ ghi} y_{ghijklmn}$$