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| **Topic ID** | **Topic** | **Research**  **Topic Area** | **Brief Description** |
|  | ***Applied Research Topics*** | | |
| 1 | **Driver behavior modeling as applies to safety** | Safety | Develop a prioritized list of predictive models that have high probability of being improved by including driver behavior. Consider presence of other modes, such as bicyclist and pedestrians and the changes in driver behavior/actions. Identify sub sample to focus on. |
| 2 | **Driver behavior modeling as applies to operations** | Operations | Develop a prioritized list of predictive models that have high probability of being improved by including driver behavior. Identify sub sample to focus on. |
| 3 | **Driver behavior modeling as applies to planning** | Planning | Develop a prioritized list of predictive models that have high probability of being improved by including driver behavior. Identify sub sample to focus on. |
| 4 | **Secondary crash incidents** | Safety, Operations | Can the NDS data be used to develop a means to capture secondary incidents and deal with the issue of risk? Within 30 minutes of a crash on the interstate, a second fatal crash is very likely. In addition, can the NDS be used to analyze secondary incidents around workzones and to improve workzone safety? |
| 5 | **Route choice: trip frequency; trip variation** | Planning | How does the distance affect trip frequency to discrete  destinations by drivers? How frequently do drivers' route choices vary by time of day, day of week, season and roadway conditions? |
| 6 | **Roundabouts: safety and operational evaluation** | Safety, Operations | Evaluation of safety and operational benefits of roundabouts and site specific design recommendations. Consider presence of other modes, such as bicyclist and pedestrians and the changes in driver behavior/actions. |
| 7 | **Effects of distracted driving on mobility/traffic flow** | Operations, Safety | Drivers looking at devices tend to slow earlier at a red light and to delay accelerating when the traffic starts to move – what is the magnitude of these mobility impacts? When drivers interact with devices or talk on the phone while driving, they often travel well below the prevailing traffic speed and cause delays – what is the magnitude of these impacts? How can risk be mitigated? |
| 8 | **AADT factors** | Planning | What AADT factors can be developed to account for seasonal trip patterns by NDS drivers? Can NDS data validate AADT estimates along low volume and rural roadways? |
| 9 | **Traffic performance evaluation/ improvement with the trip-based data.** | Operations | University Nevada/Reno has developed signal timing optimization methods based on floating-vehicle trajectories. Could these methods or similar be extended with the NDS/RID dataset? |
| 10 | **Influence of traffic signal coordination on drivers’ behavior.** | Operations, Safety | Coordination is significant for arterial operation, but its influence on traffic safety has not been well studied. This study could lead to recommendations for signal coordination design considering traffic safety. |
| 11 | **Traffic microsimulation model development, validation** | Operations,  Planning, Safety | Use of NDS data for traffic microsimulation models. |
| 12 | **CMFs and other design guidelines validation, updates, development** | Safety | Develop a prioritized list of CMFs and guidelines that have high probability of being developed, improved or validated (where there remains debate), identify sub sample to focus on. |
| 13 | **Congestion conditions and driver**  **behavior** | Planning,  Operations | How do NDS driver perceptions and behaviors change in  response to different congestion conditions? Consider presence of other modes, such as bicyclist and pedestrians and the changes in driver behavior/actions. |
| 14 | **Using near-crash data to enhance crash reporting/incident tracking** | Safety | There are about 7,000 near crashes in the NDS, as well as crash types that do not get captured by a police report. Can NDS non- reported crash and near crash data be used to develop an operational process that would enhance the safety data currently being collected?  For example, Nevada DOT is trying to develop an app that will help bicyclists report near misses or incidents directly to the agency (going beyond police reports). How could a similar tool be developed or enhanced for practitioners? Consider presence of other modes, such as bicyclist and pedestrians and the changes in driver behavior/actions. |
| 15 | **Deceleration lane design on freeways based on naturalistic driving speed and deceleration rates** | Safety, Planning | The objectives of this study are (1) to identify the impact of deceleration lane length on vehicles' speed and deceleration rates by utilizing NDS data; and (2) to develop a model to estimate the minimum and optimal length of freeway deceleration lanes when considering naturalistic driving speed and deceleration rates. |
| 16 | **Cooperative vehicle (C/AV) applications** | Safety,  Operations,  Planning | The NDS and RID provide a rich source of successful navigation in context (uneventful driving, where there is no crash or near crash). Is this information useful for C/AV research? For example, can the DAS be a surrogate for the Basic Safety Message? Can the NDS vehicles serve as probes that when conflated with other traffic data, operational models can be enhanced or developed to serve as a baseline for how the highway system currently operates? And if so, could these be used to help predict the impact of increasing adoption of C/AV? Can all that successful ‘good driving in context’ be used for algorithm development to teach automated vehicles how to anticipate human driver behavior as well as operate in a manner that human drivers are accustomed? |
| 17 | **Countermeasure effectiveness and cost/benefit analyses** | Safety,  Operations,  Planning | This project will review and compare the safety and operational benefits of select countermeasures and include cost/benefit analyses. |