This study looks at all factors associated with bicycle safety and activity at intersections. Factors such as exposure (bicycle and vehicle volumes), existing facilities (bike lanes, sidewalks, shared-use paths), geometric design (# of lanes, speed limit, medians, legs, roadway conditions), and land-use were collected and evaluated using Poisson, Zero-Inflated Poisson, and Negative Binomial models in SAS 9.4 software. These results were analyzed and recommendations were given. This study intends to look at bicycle safety and activity at intersections because an increased bicycle ride share can have positive lasting effects on personal health, the environment, as well as traffic flows with less vehicles on the road. The biggest deterrents for people to ride more are a lack of facilities and most importantly, safety. Florida has consistently been a national leader in bicyclist deaths, which made this area a great candidate to study. Vehicle and bicycle volumes for 159 intersections in Orlando, Florida were collected and compared with crash data that was obtained. All existing facilities, geometric design properties, and land-uses for each intersection were collected. The results showed that an increase of motor-vehicles and bicyclists will increase the risk of a crash at an intersection. The presence of keyhole lane (bike lane in-between a through and exclusive right turn lane), was shown to be statistically significant, and although it still had a positive correlation with injury risk, it had a much lower risk of crash than a typical bike lane at intersections. The presence of a far shared path (more than 4 feet from the edge of curb) was shown to be statistically significant in decreasing the risk of crashes between bicycles and motor-vehicles. Institutional, agricultural, residential, government, and school land uses had positive correlations and were statistically significant with increasing activity of bicyclists at intersections. This study is unique because it uses actual bicycle volume as an exposure to determine the effects of bicycle safety and activity at intersections and not many studies have done this. It is important for transportation planners and designers to use this information to design better complete streets in the future.

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Approved for distribution by Mohamed Abdel-Aty, Committee Chair, on September 14, 2018.

The public is welcome to attend.