

UTC Project Information	
Project Title	Influences on Bicyclists and Motor Vehicles Operating Speed within a Corridor
University	Texas A&M
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Funding Source(s) and Amounts Provided (by each agency or organization)	TTI – State of Texas matching funds (Non-Federal): \$78,228 TTI – Safe-D (Federal): = \$67,022
Total Project Cost	\$145,260
Agency ID or Contract Number	Grant No: 69A3551747115 Project TTI-01-04
Start and End Dates	3/1/2017-8/30/2018
Brief Description of Research Project	This research explored (1) the relationship between suburban vehicle operating speed and roadway characteristics, especially the presence of bicyclists and (2) whether crowdsourced speed data could be used to estimate the unconstrained speed for a location. Both vehicle volume per lane and bicycle volume were found to be influential in affecting average speed on lower speed urban arterial roadways. For 40.3 km/hr (25 mph) sites, an increase of 19 vehicles per 15-min period would decrease average speed by 1.6 km/hr (1 mph), and an increase of more than 39 bicyclists per 15-min period would decrease average vehicle speed by a similar amount. Because of the limited number of 15-min periods with bicycle counts greater than 1, the research team also developed a model using all available 15-min periods with on-road speed data. Speed and volume data in 15-min increments for 2 weeks at nine sites were obtained using on-road tubes and via a vendor of crowdsourced speed data. The difference between the tube data and the crowdsourced data was calculated and called TMCS as a representation of tube (T) minus (M) crowdsourced (CS). The geometric variables that had the greatest influence on TMCS were the number of signals and the number of driveways within a corridor. When only including non-congested periods, weekends (Saturday or Sunday) were associated with the smallest TMCS.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Education and Workforce Development Products These efforts included the following: <ul style="list-style-type: none"> • Provided the Texas A&M University Civil Engineering professors the results from this research for incorporation into their courses, as appropriate. • Presented the findings from the research at the Institute of Transportation Engineers Joint Meeting of the Western District and the Texas District in June 2018. • Three students assisted with this research: Manaswini Condor (graduate student, but did not use topic for

	<p>engineering paper), Marie Connie Rodriquez (undergraduate student), and Elizabeth Clark (summer intern).</p> <p>Technology Transfer Products</p> <p>The following papers were generated:</p> <p>Das, S., K. Fitzpatrick, M. C. (2018) "Effects of Bicyclists on Vehicle Operating Speed: A Study on urban Arterial Roadways," ITE Joint Meeting of the Western District and the Texas District.</p> <p>Das, S., and Fitzpatrick, K. (2019 anticipated) "Using Crowdsourced Data to Estimate Operating Speed on Suburban Arterials," Submitted for consideration for the publication in the <i>IATSS Research</i> journal.</p> <p>Fitzpatrick, K., S. Das (2020 hopeful) "Vehicle Operating Speed on Urban Arterial Roadways," submitted for consideration for the 6th International Symposium on Highway Geometric Design / 6th Urban Street Symposium.</p> <p>Data Products</p> <p>While similar data were used in both analyses, there were cases where data were only available for certain conditions; therefore, the research team created two databases that matched the two objectives. Links are provided below.</p>
Impacts/Benefits of Implementation (actual, not anticipated)	<p>Impacts/benefits:</p> <ul style="list-style-type: none"> • Knowledge of whether existing big datasets are currently usable to evaluate the impacts of roadway, traffic control devices, and/or traffic characteristics on vehicle operating speed. • Better understanding of the relationship(s) between bicyclist presence and vehicle operating speed on streets.
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>The research team created a project report which is housed on the Safe-D website, see: https://www.vtti.vt.edu/utc/safe-d/index.php/projects/influences-on-bicyclists-and-motor-vehicles-operating-speed-within-a-corridor/</p> <p>The research team created two databases that matched the two objectives.</p> <ul style="list-style-type: none"> • The Bike-Veh AnG7alysis database [https://doi.org/10.15787/VTT1/KCNRS7] is available via the Safe-D Collection on the VTTI Dataverse. It includes vehicle data, bicycle count data, temporal variables associated with the 15-min period such as time (hour), and site characteristics for 15 sites. • The Crowd Sourced Analysis database [https://doi.org/10.15787/VTT1/WXR1I0] is available via the Safe-D Collection on the VTTI Dataverse. It includes vehicle, temporal, and site characteristics data for nine sites.

