Charlotte, NC, USA is one city that has been extensively using USLIMITS2, an expert systems approach to setting speed limits, for the last 10 years. The city of Charlotte, which was experiencing a significant percentage of fatalities attributed to speeding, adopted USLIMITS2 as their standard method for determining speed limits on city-maintained roads.

Upon requests from citizens and other groups to lower the speed limit for a given road, city staff will undertake an engineering speed limit study. Speeds on the selected road section are collected by either tube counts for at least a 24-hour period or LIDAR taken over approximately one hour to collect enough reading depending on traffic volume to determine the 85th percentile. The analysts will also submit additional required data required, including 85th and 50th percentile, annual average daily traffic (AADT), adverse alignment, statutory speed, transition zone, roadside rating, divided/undivided, number of through lanes, and pedestrian/bicycle presence.

Having accurate and comprehensive crash data to input in USLIMITS2 is one of the most critical data points cities can have to obtain a recommended speed limit. The crash module portion of USLIMITS2 asks for data on crash history duration, AADT, total number of crashes, and total number of injury and fatal crashes. Charlotte has its own comprehensive crash database, from which the necessary crash data can be extracted. If a city cannot provide crash data, Highway Safety Information System (HSIS) data will be used.

Where there are pedestrian/bicyclist present and/or where there is either pedestrian/bicycle infrastructure, such as a sidewalk or bicycle lane, the analyst will select high volume. The city will select the speed limit recommendation from the program, but for streets in urban areas, the city will compare the USLIMITS2 results with those from the A Model for Setting Credible Speed Limits in Urban Areas point system based table published by Dr. Lynda Bellalite. The engineer will then use engineering judgment to determine the safest speed limit given the expert and safe systems approaches.

According to Angela Berry, the city’s traffic safety engineer responsible for conducting speed studies, the city feels the USLIMITS2 program is a good approach for determining the appropriate speed limit. The expert system takes many factors into consideration. Also, following the guidelines of the program, a 50th percentile can be selected if the crash rate is higher than normal for study section and/or if there is a high volume of pedestrians and/or bicyclist. An example of this guidance
can be seen in the USLIMITS2 Speed Zoning Report for Old Plank Road in Charlotte. For this project, the USLIMITS2 program recommended reducing the speed limit from 35 mph to 30 mph. The city implemented this recommendation because the section crash rate was above the critical rate, and injury crash rate was above the average for similar roads. The use of this speed limit procedure has been accepted by city officials and citizens. USLIMITS 2 will also make note of high crash rates, and suggestion further crash study to identify geometry changes in addition to reduced speed limits.

As part of their Vision Zero program, Charlotte plans to evaluate how speed limit reductions have changed their rate of fatalities and severe injuries. Evaluating such changes and how data influences speed limit setting can help more cities plan for speed management programs, ultimately improving the safety of our roads and communities for all users. In addition to using USLIMITS2 as the primary way the city of Charlotte sets speed limits, the city also has a comprehensive traffic calming program as part of their speed management work.

### Additional Information

USLIMITS2 is a free web-based program developed and maintained by Federal Highway Administration (FHWA) that uses decision rules developed by transportation professionals to recommend a speed limit. USLIMITS2 is an expert systems approach to speed limit setting. USLIMITS2 was made available by the Federal Highway Administration in 2003 with subsequent updates in 2007 and 2012. While easily accessible, USLIMITS2 has not been adopted widely by states and local agencies as a method of setting speed limits. FHWA offers Roadway Safety Professional Capacity Building technical assistance to jurisdictions that want to learn more about using USLIMITS2 to inform speed limits.

Exported Speed Zoning Report done by City of Charlotte staff in USLIMITS2 for Old Plank Road. Source: FHWA Courtesy: City of Charlotte, NC.
professionals can learn more about USLIMITS2 on the FHWA fact sheet.