

### Reducing Speed and Improving Safety in Residential Areas

Currently, there is a 30 mph posted speed limit in residential areas in Rutland, which the municipality would like to reduce to 25 mph without conducting an engineering and traffic investigation in order to improve safety. This report will discuss the varying characteristics that define a residential area, steps for changing local speed limits in Vermont, methods for reducing through traffic and driver speed, and correlations between street design and crime reduction.

#### Defining Residential Areas

In the words of the Institute of Transportation Engineers “[r]esidential neighborhoods exist in every context, from rural to the highest intensity urban core,” and because people reside in these neighborhoods, it is important that residential street design is approached with livability in mind. <sup>1</sup> Additionally, residential areas are defined by a variety of characteristics, which specifics differ depending on the state or municipality defining the area. Some factors defining residential areas are predominant building type, population size, prevailing use of space, speed limit, and space between dwellings.

A residential area must consist of primarily residential buildings. The U.S. Census Bureau defines a residential building as “a building consisting primarily of housing units,” even if the building as n5(s)2(,)2.( astenUb)JTJfitoriMC sJne9eg units,”



U.S. Department of Transportation, has developed “context intensity gradations—called context zones—to distinguish the urban built environment adjacent to and surrounding thoroughfares.”

According to a Vermont Department of Health report, “Complete Streets: A guide for Vermont communities,” the Vermont Department of Transportation describes a variety of place types with different design considerations: city, village, suburban and rural.<sup>9</sup> Thus, the Complete Streets Guide has developed using context zones to match transportation design with the context of a project location (see Table 1 and Figure 1). The context zones C-3 and C4 can be considered residential areas in Vermont, for the purposes of this report.

Conclusively, a residential area is one that consists primarily residential buildings and activities. However, since a statewide definition of residential area or district does not exist in Vermont, the municipality can determine specific defining “residential” qualities individually.

Figure 1: Urban to Rural Transect according to the Institute of Transportation Engineers

Source: Institute of Transportation Engineers, "Designing Avenues and Streets in Residential Areas," January 1, 2011, accessed February 11, 2015.  
<http://library.ite.org/pub/e1cfdc96-2354-d714-5167-79f3d6719128>.

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<sup>9</sup> Vermont Department of Health, “Complete Streets: A guide for Vermont Towns,” September 2012, accessed Feb 11 2015,  
[http://healthvermont.gov/family/fit/documents/Complete\\_streets\\_guide\\_for\\_VhJ2\\_Vcmpm2\(u\)40st Vft14](http://healthvermont.gov/family/fit/documents/Complete_streets_guide_for_VhJ2_Vcmpm2(u)40st Vft14)

Table 1: Context Zone Characteristics

Source: Institute of Transportation Engineers, "Designing Walkable Urban Thoroughfares: A Context Sensitive Approach," 2010, accessed February 10, 2012  
<http://library.ite.org/pub/e1cff43c-2354-d714-51d9-d82b39d4dbad>

## How to Change the Speed Limit in Vermont

According to Title 23 V.S.A. Section 1007, a municipality has the authority to change speed limits after conducting an engineering and traffic investigation. The only exception listed which the municipality does not have to conduct an investigation is if the road is unpaved.<sup>10</sup>

### Conducting an Engineering and Traffic Investigation

“Setting Speed Limits– A Guide for Vermont Towns” provides guidelines for Vermont officials to adjust speed limits in their municipalities, and includes the steps for conducting a traffic investigation.<sup>11</sup> The guide stresses that the speed limit must be “reasonable and safe.” There are a few central considerations when setting speed limits: protecting the public, reducing unreasonable behavior, and creating a law that will be effective and enforceable. The recommended practice for determining speed limits is to conduct an engineering and traffic investigation. A professional engineer is not required—anyone may collect the information. In order to conduct an engineering and traffic investigation, one will need to have a vehicle, be able to date their time, print the documentation provided in the guide, and acquire a speedometer and a slope meter (although both are optional). Steps for conducting an engineering and traffic investigation:

1. Consider the characteristics of the road, such as travel surface number of lanes, width of lanes and shoulders, presence of passing zones, steepness, and curvature of the road. Record all data on the “Traffic Engineering Report” form provided by the guide.
2. Monitor the speeds of at least 100 vehicles traveling on the road, and record all speeds on the Spot Speed Study Field Data Sheet, provided in the manual. Indicate the speed that 85% of vehicles are traveling. On low volume roads the Vermont Agency of Transportation suggests that instead of collecting a sample, which may be too time consuming, the researcher should conduct several time runs and estimate the speed.
3. Consider all characteristics of the road itself and the surrounding area. For instance, is the area residential or urban? Is the surrounding area farmland or a school zone?
4. Determine a safe speed for curves and other hazardous areas by driving along the curve in a conventional car for multiple passes, increasing speed by 5mph with each pass. If the driver leans in his seat while going around the curve, he is going too fast. A slope meter can also be used to determine safe speeds around curves, which costs \$200.
5. Record parking practices and residential/pedestrian activity.

6. Record accident activity for the past 12 months, including accidents that are weather related, DUI associated, and primarily caused by intersections.
7. Once data has been collected, the official can then determine an appropriate speed limit for the area. After a speed limit has been determined, an ordinance is then proposed to the municipality.<sup>12</sup>

The key to setting a new speed limit is determining the 85<sup>th</sup> percentile, which is the 10mph band of speed within which most drivers travel.<sup>13</sup> If speed limits are set lower than the 85<sup>th</sup> percentile, what most drivers feel to be safe, the municipality runs the risk of reducing driver respect for the speed limit in question and possibly other posted speed limits.<sup>14</sup> Similarly, the Main Road Speed Limit Study conducted in Huntington Vermont references the study "Effects of Raising and Lowering Speed Limits on Selected Roadway Sections," stating that "drivers do not generally comply with changes (lowered or raised) in posted speed limits on nonfreeways in rural or urban areas, especially in speed zones posted at 40 mph or lower."<sup>15</sup>

#### Cut Through Traffic in Relation to Speed Reduction

limited reduction is most effective when used in conjunction with education and enforcement.<sup>17</sup>

According to the Institute for Transportation Engineers' "Residential Traffic Calming Guide," a local residential street is one "that provides direct access to abutting residences and serves only to provide mobility within the neighborhood." Additionally the traffic on local residential streets is "expected to be entering or exiting from the residences." An increase in through traffic in residential areas becomes problematic when motorists who are not entering or exiting the neighborhood choose to use the street as a way of passage, ultimately increasing the volume of traffic and often the speed of the overall flow of traffic.<sup>19</sup>





primarily attributed to an improved sense of community and increased “natural surveillance,” because more pedestrians were out and about in the neighborhood.

Beyond reduction in speed limit, alternative treatment plans do exist to decrease crime rate in a given area. The National Crime Prevention Council (NCPC), on behalf of the U.S. Department of Justice’s Community Capacity Development Office, has developed a treatment plan with the goal to reduce the number of crimes and improve the overall quality of life in communities. Thus far the NCPC has served ten communities with this action plan. The NCPC treatment plan is known as “Crime Prevention through Environmental Design” (CPTED). This comprehensive treatment plan encompasses four main principles; access control, territorial reinforcement, maintenance and surveillance. Both access control and territorial reinforcement highlight the importance of sidewalks being present in the area.<sup>28</sup>

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