

**Report of the Engineering Subcommittee to the Residential Neighborhood Traffic
Safety Committee**
06/30/04

General statement of purpose:

The City of Knoxville is committed to strengthen and protect its neighborhoods by improving the quality of life in residential areas. The desirability of Knoxville neighborhoods as places to live and raise a family is directly affected by local traffic conditions. Safety hazards and compromised enjoyment of one's community can be the result of unnecessary through traffic in these neighborhoods, or by motorists traveling at unsafe speeds on streets designed primarily for local community use.

Engineering Subcommittee recommendations:

In summary the committee's areas of discussion involved:

- a) arterial road network
- b) alternate transit options
- c) engineering –dependent structures, e.g. cobblestones, speed bumps, signage, road painting, etc.

Arterial road network

The engineering subcommittee recommends that a policy be adopted for improvement of the city's arterial and major collector roadway system effectively to channel extraneous traffic around neighborhoods. Such improvements could include improving capacity and flow of arterials by roadway widening; addition of needed turn lanes and other road improvements. Traffic flow should further be facilitated by an enforced access control policy and professional traffic engineering assessment of traffic signal placement.

The importance of the arterial road network is highlighted by the definition of neighborhood by the noted municipal planner, C. Perry (1929):

Neighborhood:

A distinctive pedestrian scale region characterized by the presence of predominantly residential structures and social interaction between residents and bounded by major streets, which set the limits thereof and give a clear identity in peoples' consciousness.

Alternate transit options

For downtown neighborhoods the committee recommends that transit options be evaluated to reduce the use of private vehicles. Successful implementation in the circumscribed downtown area hopefully will lead to effective plans to extend alternate transit options to outlying regions of the city.

Engineering –dependent structures: Traffic Control Measures

Traffic control in neighborhood traffic issues generally encompasses most of the Engineering side of the Education, Enforcement and Engineering triangle. Other

Engineering issues could include street and neighborhood design, traffic ordinances such as speed limits, etc.

Traffic control measures for neighborhoods include signing, marking and traffic calming.

Pavement Marking

Pavement marking can be used in certain situations such as the installation of cross-walks or painted islands to assist in pedestrian issues. There have also been a few cases where painting edgelines and centerlines on a very wide roadway (i.e., Coker between Broadway and Nadine) has been used to try to slow vehicle speeds by effectively narrowing the roadway.

However, edgelines and centerlines are usually discouraged on residential streets in Knoxville because they may encourage through traffic, speeding traffic and they legally remove parking from the street.

Another option may be some type of symbol that would be glued to the pavement indicating the driver is entering a neighborhood traffic area. This may help with informing the public and enforcing the speed laws.

Traffic Signs

Traffic signs have long been used as the primary source of traffic calming in Knoxville.

Speed Limit (30mph) signs have been placed with regularity on streets with speeding concerns and at entrances of neighborhoods. Some residents have argued that a much slower speed limit should be installed like 20 mph.

Of all traffic signs treatments for speeding, installation of an appropriate speed limit, such as 30 mph, along with requesting enforcement by the Police Department has been the primary means of dealing with speeding and through traffic concerns. The concerns most often voiced about this treatment is that the Police can offer too few man hours to handle this problem and that the enforcement tolerance (10 mph) is too high, allowing drivers to go 40 mph on a residential street before being cited.

The driving public will generally ignore speed limits that are unreasonably low. If the speed limits are reduced below what drivers will tolerate, it will make violators out of prudent and otherwise law-abiding citizens. It also may turn every residential street in Knoxville into a street with a speeding problem.

The common answer to drivers ignoring a low speed limit is to have the Police vigorously enforce it, however as violation rates go higher due to the lower limit, the Police resources to enforce that limit stay the same. Also, the lower limit may be difficult to uphold in court. If those tickets were thrown out, those officers would not be encouraged to continue enforcing that limit.

Another effect would be that some drivers would try to stay within the posted speed limits, which may cause a genuine safety problem because of the speed difference between faster and slower drivers.

Based on these engineering issues, the Engineering Subcommittee recommends the posting of a reasonable speed limit of 30 mph with a stricter enforcement on residential streets.

All-Way Stops have been used to slow traffic along particular routes for many, many years, not just the recent past. Residents often feel that even if traffic does not come to a complete stop, traffic rolling through these stop signs is preferable to speeding through the neighborhood.

All-Way Stops can be used as a positive traffic control where vehicle and / or pedestrian volumes justify that all legs of an intersection need to come to stop before entering the intersection. National Standards set minimum thresholds on the volume of traffic that must enter the intersection from both the main and side streets. That threshold is 500 vehicles or pedestrians entering the intersection per hour for eight hours of a 24 hour day and of that 500 vehicles or pedestrians per hour, 200 vehicles or pedestrians per hour must enter from the side street.

These thresholds are much higher than most of our residential All-Way Stops would ever meet, with good reason. The great majority of All-Way Stops on residential streets is believed by Engineering to cause safety problems, possibly increasing crashes. Just as in a very low speed limit, All-Way Stops for speed control encourage violations. Drivers stopping at these stop signs rarely see vehicles or pedestrians on the cross streets and quickly tire of stopping just for the sake of stopping. They begin to roll through or in some cases ignore the stop and this can cause crashes when there is an expectation from drivers and pedestrians on the side street that they will stop.

Engineering studies have shown an increase in crashes at locations where traffic volumes do not meet minimum levels. Based on this the Engineering Division does not recommend All-Way Stops be used as a speed control device. Of those that are in place, we recommend as funding becomes available, they be replaced with a more suitable traffic calming device such as a traffic circle or raised intersection. The current location of Stop Signs is a convenient indicator of already identified problem intersections which should receive priority attention.

Slow - Children at Play signs are another sign frequently requested, however the City does not install these signs. Residents frequently request this sign because of the concerns of children playing in front yards and in the street in the presence of speeding traffic.

Slow – Children At Play signs are frequently requested with the intention it would protect neighborhood children. However, no evidence exists that these signs reduce speed or protect children and quite a bit of evidence exists that these signs do not reduce speeds.

Children live on every residential street in Knoxville and so these signs would be required on every street. However, warning signs are used to inform motorists of uncommon hazards normally unapparent to drivers. Signs in residential or other areas used to “warn” drivers of normal conditions have been shown to not improve safety.

In addition, these signs can be seen to designate streets as playgrounds and cause children and parents to believe these signs give them added protection, when in fact they have been shown not to reduce speeds. This creates a more dangerous situation than if the signs were never installed.

Based on this the Engineering Division recommends Slow – Children at Play sign continued to not be installed and be removed from City streets if seen.

Traffic Calming

Traffic Calming is the construction of physical devices in the roadway to slow speeding traffic to a reasonable rate of speed or divert excessive through traffic onto more appropriate routes. It also can encourage other modes of travel such as biking and walking, due to reduced interference from vehicular traffic or added bike or pedestrian amenities.

Traffic Calming does not require Police enforcement in order to be effective and could actually decrease the need to spend KPD resources in this area. Traffic Calming devices and their prices are included in the Neighborhood Safety Committee notebook given to all committee members. However, it too has its disadvantages.

Traffic Calming can be expensive with ballpark cost of approximately \$100,000 per neighborhood. It also involves a lengthy public involvement process to produce a traffic calming plan that has neighborhood buy-in and is not controversial.

However, it is the best engineering answer to the speeding and through traffic issue available at the current time. The Engineering Division recommends maintaining the current Traffic Calming program and neighborhood approval process for all traffic calming projects and that those projects approved by their neighborhoods be considered for funding, with particular note being paid to the comments regarding intersections currently controlled by All-Way Stop Signs.

The Engineering Subcommittee also recommends that new subdivisions under review have a traffic calming assessment done as part of the plans review process so that needed devices can be incorporated into the design plans for new subdivisions as they are built.

Appendix A - Related Traffic Ordinances – Knoxville City Code

The 85th percentile speed is the speed used by Engineers to set speed limits and the one implied in City Ordinance 17-263 Alteration of maximum limits when conducting an engineering study to set speed limits.

City Ordinances

Sec. 17-262. Maximum limits established

Except when a special hazard exists that requires lower speed for compliance with section 17-261, the limits specified in this section or established as authorized in this division shall be maximum lawful speeds, and no person shall drive a vehicle at a speed in excess of such maximum limits:

- (1) Fifteen (15) miles per hour during a recess period or during a period of forty (40) minutes before the opening hour of a school or a period of forty (40) minutes after the closing hour of a school, while children are actually going to or leaving school.
- (2) Fifteen (15) miles per hour in alleys
- (3) Thirty (30) miles per hour on all streets within the city except those covered by subsection (4) of this section
- (4) Fifty-five (55) miles per hour on all highways of the national system of interstate and defense highways and other highways which incorporate similar design and access control features

(Code 1962, § 26-501)

Sec. 17-263. Alteration of maximum limits

- (a) Whenever the division of engineering determines on the basis of an engineering and traffic investigation* that the maximum speed permitted under section 17-262 is greater or less than is reasonable and safe under the conditions found to exist upon a street or highway, or part of such street or highway, the division may determine and declare a reasonable and safe maximum limit thereon which:

- (1) Increases the limit set forth in subsection 17-262(3), but to not more than fifty-five (55) miles per hour.
- (2) Decreases the limit set forth in subsection 17-262(4), but to not less than fifty (50) miles per hour. Such limits shall not be effective until the division has received the written concurrence of the state department of transportation.
- (3) Decreases the limit set forth in subsection 17-262(3), but to not less than twenty-five (25) miles per hour, except within parks, where the limit may be decreased to not less than fifteen (15) miles per hour.

(b) Any altered limit established as authorized in this section shall be effective at all times, or during hours of darkness, or at other times as may be determined when appropriate signs giving notice thereof are erected upon such street or highway

(c) Not more than six (6) such alterations as authorized in this section shall be made per mile along a street or highway, and the difference between adjacent limits shall be not more than ten (10) miles per hour unless signs are erected giving advance notice of a larger change in the limit
(Code 1962, § 26-502)

Commercial Vehicle Restrictions

Below is the City Ordinance having to do with the prohibition of trucks on certain streets. The sign most commonly used to show a truck prohibition is “NO TRUCKS OVER 7000 LBS EMPTY WEIGHT”. This sign prohibits trucks larger than a common bread truck or UPS / Fed Ex delivery truck from using the street. However, these signs are subject to local zoning ordinances so that even when all the provisions of the ordinance have been met, the signs can not be installed on streets so they prohibit trucks on the only access to commercially or industrially zoned property.

Sec. 17-419. Maximum vehicle weight on designated streets.

- (a) The department of engineering is authorized to prohibit the operation of trucks or other vehicles, or may impose limitations as to the weight thereof on specific streets where based on traffic and engineering studies, it is determined that such action is necessary to ensure against undue damage to the road foundations, surfaces or structures. Such prohibitions and limitations shall only be effective when designated by appropriate traffic control signs or devices placed on such streets.
- (b) No person shall drive any truck or vehicle in excess of seven thousand (7,000) pounds empty weight upon any street owned and maintained by the city where the engineering department has posted traffic control signs prohibiting said vehicles. This subsection shall not apply to buses, emergency vehicles, or vehicles in excess of seven thousand (7,000) pounds empty weight upon any street for the purpose of construction in the restricted area, making a service call, a delivery, or the actual loading or unloading of goods, wares, or merchandise in the restricted area, provided, however, that the vehicle shall remain in the restricted area only for the actual time necessary for such operation.
- (c) This section is not applicable to state and federal highway systems
- (d) It shall be presumed that the person or persons owning and/or operating any vehicle, truck or trailer which is driven on a city street or is found parked, standing, or unoccupied on private or public property within the city limits in violation of this section, is responsible for the violation of this section.

(Code 1962, § 26-105; Ord. No. O-146-97, § 1, 4-8-97)

By and large the trucks are allowed on collector and arterial streets. Part of the traffic calming effort could be to establish a commercial vehicle and bus route network that allows for efficient transit and goods movement that encourages economic development, while at the same time protecting neighborhoods from commercial traffic.

Appendix B – Functional Classification and Layout of Urban Roads

Appendix C – Traffic Control and Speeding, City of Phoenix, AZ