

Neighborhood Traffic Calming Part 2 – Defining the Problem

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Defining the problem typically will be the work of the traffic engineer. They will need all of the complaints, preferably written down as a starting point. They may be the professional, but they haven't lived in the neighborhood for years, so the individual complaints can provide a starting point. On the other hand, their profession perspective will allow them to see things clearly and their years of experience and training will help them define the actual problem instead of just symptoms.

The first thing the traffic engineer should do is familiarize him or herself with the area and the complaints. They can start with talking with the board representative on the phone while viewing the area on Google Earth. If the complaints are available electronically, it is a good idea to email them to the engineer. Next is a visit to the neighborhood to see the actual conditions on the ground. Google Earth is a great tool, but nothing beats being there in person. If the complaints revolve around a time sensitive issue, like cut-through traffic that only occurs during rush hours, the visit should take place during that time of day. The engineer may take photos at this time.

After the visit, a scope of work and schedule should be drawn out by the traffic engineer. If an engineering consultant is involved, there should also be a fee proposal prepared. Traffic engineering fees range from \$100 to \$150 per hour with technician fees ranging from \$50 to \$100 per hour. The hard part is figuring out how many hours the work will take. There will also be direct expenses involved for travel and possibly equipment charges, although most build the equipment charges into their hourly rates. Fees can be specified either as hourly with expenses, or as a lump sum. Some proposals may have multiple parts or phases itemized. The proposal should also come with terms and conditions so there is a clear working arrangement.

The next step after the scope of work is established data collection. Most data collection will fall into one of three categories, traffic flow data (number of vehicles by hour, type of vehicles, and speeds), physical features such as geometrics and traffic control, and crash records.

Traffic flow data can be collected using automatic traffic data collectors that are typically rubber tube, magnetic, radar or video based. Each has their pros and cons, but the decision on the appropriate type should be left up to the traffic engineer. Origin and destination data is rather difficult, and therefore, expensive to collect, so it is typically estimated unless the problem is severe.

The physical survey will likely start with an airphoto and if available, a neighborhood site plan from the development of the neighborhood. Some local agencies may have access to Graphical Information Systems (GIS) that can provide good base mapping as well. Photos or video of the neighborhood should be taken as well as field measurements of critical items.

Crash data is available from local or state governmental agencies and may involve a fee per record. Getting the actual crash report instead of a summary is very helpful because the summaries tend to leave out important details, or show conflicts in the data. For example, the accident location or vehicle maneuvers immediately preceding the accident may not be accurately portrayed in the summary. Some may report accidents at an intersection, when they actually occurred in a parking lot or driveway.

Once the data is collected, it should be analyzed and compared to accepted norms. Suspicions of cut-through should be checked against traffic estimates for the same facility based on the number of houses and amenities within the neighborhood.

Speeds are analyzed by the data collection software. The 85th percentile speed (speed which 15% are exceeding) should be checked against the posted speed limit and existing conditions. Complaints may be localized with the person issuing the complaint having unrealistic expectations that motorist should

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drive 15 MPH in front of their home, while at the same time, that person may feel it is ok for them to drive 35 MPH in the rest of the neighborhood. Most motorists don't realize the difference between driving 20 and 30 MPH, but it can have a very significant impact on their ability to stop before a crash and the severity of a crash. For example, a car hitting a pedestrian at 20 MPH has a 5% chance of being fatal, while at 30 MPH the probability raises to 45% and at 40 MPH there is an 85% chance the impact will be fatal. **Speed does not kill; the impact of a speeding car on the pedestrian does!** Force is a function of acceleration and the pedestrian going from zero to 20 MPH is much different than going from zero to 30 or 40 MPH. That is why cars can safely go 55 – 70 MPH on freeways, but when pedestrians are present, high speeds are not appropriate due to the likelihood and consequences of an impact.

Crash data should be analyzed by the traffic engineer. Crash rates and severity are indicators of potential problems, but because humans are involved, some crashes should be expected. As the saying goes, "To error is human." A single crash may be the sole result of human error despite all efforts to avoid it. This type of crash can truly be called an accident whereas other crashes may be due to negligence. On the other hand, more than one accident per million vehicles entering an intersection indicates a potential problem. There is also a big difference between several low speed fender benders and fewer severe injury crashes. Patterns should be identified, such as all of the accidents being northbound cars impacting eastbound cars turning left from a stop sign.

After documenting what is happening, the next question to address is why is it happening? The traffic engineer should lead this section, and may require a modification to the scope of work or permission from the board to move to a subsequent phase or option in the agreement if the board hires an engineering consultant. Trying to move to solutions before answering the why question can lead to unforeseen consequences where the tried solution may fail or cause other problems.

Finally a report should be written documenting the findings of the problem definition step. At this point it may only be part of a full report since appropriate solutions to the have not yet been identified. The report may be as formal or informal as appropriate for the situation.

