



## Street Department

901 N. Nelson  
Spokane, WA 99202

Informational Handouts

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# Traffic Engineering

## WHAT IS TRAFFIC ENGINEERING?

Traffic Engineering is that phase of engineering which deals with the planning, geometric design and traffic operations of roads, streets, and highways, their networks, terminals, abutting lands and relationships with other modes of transportation for the achievement of safe, efficient, and convenient movement of persons and goods.

Traffic Engineering applies engineering principles to help solve transportation problems, and brings into play a knowledge of psychology and habits of users of the transportation systems.

## WHY IS TRAFFIC ENGINEERING ESSENTIAL?

Many persons still wonder why a traffic problem is so difficult that an engineer should be called upon for a solution. Why not just install a traffic signal, or lower the speed limit, or erect more signs?

One of the greatest obstacles a professional traffic engineer faces in applying sound principles of traffic engineering is the fact that "everyone is a traffic expert!" The unfortunate result of this attitude of expertise is the creation of traffic hazards when false theories of individuals or groups are put into effect.

Whenever unnecessary or excessive traffic controls are installed, hazardous traffic conditions usually result.

## HOW DOES THE TRAFFIC ENGINEER SOLVE TRAFFIC PROBLEMS?

The role of the traffic engineer may be compared to that of the medical profession in protecting the public. As a trained professional he (or she) looks at the symptoms, and in order to make a competent diagnosis he performs traffic counts, analyzes collision statistics, studies speed data, examines roadway conditions, conducts research, and studies what other professionals are doing and the results they have achieved.

Just as the doctor's decision is accepted in matters regarding health, even though the medicine may be bitter or the needle painful, so should the decision of the professional traffic engineer be given the prime consideration.

## HOW DOES THE TRAFFIC ENGINEER PROMOTE SAFER TRAFFIC OPERATION?



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By providing roadway conditions that contribute to smooth and efficient traffic flow. Experience has shown that safety goes hand in hand with smooth traffic operation. Disrupting the smooth flow of traffic increases the probability of collisions.

Erratic traffic operation may be caused by vehicles stopping or slowing in the roadway, passing and weaving maneuvers, or driver surprise elements. For example, unwarranted traffic signals, unreasonably low speed limits, and too many signs may cause driver confusion and indecision.

Slower speed does not necessarily mean safer traffic operation. The chances of a driver becoming involved in an collision are least when they are traveling at the average speed of traffic.

### **WHAT ARE TRAFFIC CONTROL DEVICES?**

Traffic Control devices are all signs, signals, markings, and devices placed on, or adjacent to, a street or highway by a public body having authority to regulate, warn, or guide traffic.

### **WHAT IS MEANT BY UNIFORMITY OF TRAFFIC CONTROL DEVICES?**

Uniformity means treating similar situations in the same way. This simplifies the task of the driver because it aids in instant recognition and understanding. Uniformity aids police, courts and road users by giving everyone the same interpretation. It aids public highway officials through economy in manufacture, installation, maintenance, and administration.

The "Manual on Uniform Traffic Control Devices" is the publication that sets forth the basic principles which govern the design and usage of traffic control devices. The Manual was prepared by a National Committee which included state, county, and municipal representation. The standards in this Manual, with certain exceptions, apply to all streets and highways regardless of the governmental agency having jurisdiction.

### **HOW ARE SPEED LIMITS DETERMINED?**

Legal speed limits are established by law and may be changed only when justified on the basis of an engineering study.

A widely accepted principle is to set speed limits as near as practicable to the speed below which 85% of the vehicles are traveling on the highway. Experience has shown that approximately 85% of the motorists drive at a speed that is reasonable and prudent. Speed limits thus established encourage voluntary compliance because they appear reasonable to the public. Those 15% of drivers who will not comply with reasonable speed limits are the drivers who are subject to enforcement action.



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### **WHAT EFFECT DO POSTED SPEED LIMITS HAVE ON ACTUAL TRAFFIC SPEEDS?**

Very little effect. There is a common belief among laymen, and even by some officials, that the mere posting of speed limit signs will cause drivers to react accordingly. This is not true and is why posted speed limits must be realistic to receive compliance.

Unrealistically low speed limits will invite violation by responsible drivers. Enforcement of unreasonably low limits sets up the so-called "speed trap," which results in poor public relations. The posting of proper speed limits has the beneficial effects of smoothing traffic flow and aiding effective law enforcement.

### **WHEN SHOULD TRAFFIC SIGNAL LIGHTS BE INSTALLED?**

Traffic signals should be installed when they will alleviate more problems than they will create. This must be determined on the basis of an engineering study.

A warranted traffic signal which is properly located and operated may provide for more orderly movement of traffic, and may reduce the occurrence of certain types of collisions. On the other hand, an unwarranted traffic signal can result in increased delay, congestion, and collisions.

Many people seem to believe that traffic signals are the answer to all traffic problems at intersections. If this were true, no traffic engineer in his right mind would deny a request for a signal.

However, a traffic signal only functions by stopping traffic, and any time a motor vehicle is stopped in the road a collision potential is created. It does not matter whether the stop is caused by a flat tire, a left turn into a driveway, or by a traffic signal - the possibility exists that a following motorist will not notice the stopped vehicle until it is too late.

As a matter of statistics, the highest collision locations in the City of Spokane are at signalized intersections.

What traveler has not experienced that sickening feeling that occurs when a traffic signal suddenly turns amber a few hundred feet in front of him? Who has not experienced the aggravating hopelessness of waiting in a long line of cars for a traffic signal to change, moving ahead a few feet, and then having the signal turn red again?

### **WHAT IS THE PRIMARY PURPOSE OF GUIDE SIGNS?**



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The principal purpose of guide signs is to direct travelers to their destinations by the best route. However, it is not feasible to install signs listing all of the possible destinations that may be reached from the highway. Drivers must be expected to make reasonable preparation for locating their destination and to have information that is readily available on road maps.

If you have any questions about Traffic Engineering, please contact the City of Spokane, Traffic Operations Division at (509) 232-8800.