LOS System Description

V/C Averages

The existing system utilizes a volume to capacity (V/C) level of service standard. V/C ratios are calculated for all signalized intersections. The City is divided into four subareas and each subarea has its own V/C ratio standard. Concurrency requires that the subarea ***average*** V/C ratio for all signalized intersection within a subarea does exceed the subarea's adopted average V/C ratio. Furthermore, each subarea is allowed to have up to a maximum number of intersections exceed the adopted 2012 LOS standard. Currently, some WSDOT signalized ramp intersections are not included in the LOS calculation. Additional intersections are included in the calculation once they are signalized.

The V/C ratio is calculated using the planning method from the Circular 212. V/C ratio is determined by comparing the sum of the PM peak hour traffic volumes from all critical movements to the intersection's capacity. Critical movements are typically the conflicting movement and vary depending on the type of signal phasing. Traffic volumes used for testing concurrency are collected once a year in the Fall.

This methodology allows some intersections to operate poorly without mitigation because of averaging. The LOS standards are set to accommodate the level of anticipated growth and infrastructure needs.

This methodology is similar to the existing system but includes a third measure, one LOS standard for which no intersection can be allowed to exceed. This prevents any one intersection to fail miserably without mitigation. However, concurrency would most likely pivot around a few worse intersections.

This methodology would be the same as the existing system but will also include WSDOT's signalized ramp intersections. However, only intersections that are considered as system capacity related would be included in the LOS calculation (these are typically arterial-arterial intersections). This methodology forces mitigation to improve system capacity related intersections and eliminate adding signals to improve LOS result that has no real benefit to improving congestion.

V/C Intersection by Intersection

This methodology would use the Circular 212 to calculate LOS as in the existing system. However, there is no subarea averaging. Each intersection will have its own established standard for which the LOS must be maintained. This method requires impacted intersections to be mitigated.

This methodology would use the Circular 212 to calculate LOS as in the existing system. However, there is no subarea averaging and one common LOS standard is established for all intersections for which it must be maintained. The level of service would be consistent throughout the City. This method requires impacted intersections to be mitigated. However, concurrency would most likely pivot around a few worse intersections.

This is the methodology that was proposed at the April Commission meeting. It is an intersection based system, but would use only certain key intersections. A target would be set for each intersection. It's similar to the triangle system above , but uses only some of the intersections.

LOS System Description

Arterial Corridor

This methodology would either use corridor delay, average speed or travel time as the basis for LOS. This system could be developed for an established subarea or on a City-wide basis. The LOS standard could be established based on existing condition or relative to anticipated future land use conditions.

Data collection could include traffic counts, travel time measurements, traffic modeling or a combination of those data. A traffic model like Synchro/SimTraffic and/or EMME2 could be used to calculate LOS.

The Public can easily understand travel time and delay as a measure of LOS. In this method, small changes in the input could produce a large change in the resulting LOS. In addition, a lot of data about the future such as specific signal timing input that we may not know are required for the calculation. Thus, it may be hard to accurately test the future condition. With this method, impacted corridor(s) will require specific mitigation.

Land Use/CIP

This methodology is based on the concept that the two factors most under City control are the amount of trips permitted by Kirkland and the amount of money spent on capital improvements to improve capacity.

As a simple example, it could be set-up using the following steps:

1) Determine the number of trips to be allowed between now (2002) and the future design year (2012).
2) Determine the amount of CIP spending to be made between now and 2012.
3) Divide the answers to questions 1 and 2 by 10 (the number of years between the current and future years). These numbers represent the number of trips that can be allowed in a year and the number of dollars that must be spent on CIP improvements each year, respectively and form the level of service that would be in the Comprehensive Plan.
4) Concurrency is met as long as the number of trips allowed in a year are not exceeded and the amount of dollars to be spent in a year is exceeded.

Note that this system as described does not use the amount of congestion as a factor in deciding whether or not concurrency is exceeded. More complicated variations on this basic system could be designed.