

# LOS SYSTEMS

## 1. What is Measured

1.1 Intersection v/c  
  
 or  
 1.2 Intersection delay

OR

1.3 Arterial Corridor   
 Travel Time, Speed, Delay

OR

1.4 \$ Spent on CIP, Vehicle Trips permitted 

OR

1.5 Vehicle Miles of Travel

City of Ferndale uses a VMT based system but it did not seem applicable to Kirkland, so it is not considered further.

Notes on What

- V/C is more difficult to understand than is delay or speed.
- When V/C is used in an average, it is even more difficult to grasp.
- Delay based systems are difficult to calculate because they require the estimation of values for a number of parameters. V/C based systems are easiest to calculate.
- Intersection averaging is used because averaging acts as a surrogate for trip making activity. It attempts to describe what vehicles would experience as they move through the system. A corridor based system does this more explicitly.
- Corridor systems suffer from needing high precision data to measure changes in performance.
- Intersection delay is not suggested because it combines the difficulties of delay without the benefits of corridors.
- System 1.4 is the simplest to implement and it deals most directly with the two factors most in Kirkland's control. It has the major drawback of not explicitly taking performance into account.

## 2. Where is it Measured?

2.1 Individual intersections  
  
 or  
 2.2 Intersection Averages in Subareas  


2.3 All Corridors  
 or  
 2.4 Some Corridors  
  
 2.5 Subareas and Averages

 2.3 City Wide  
 or  
 2.4 Subareas

2.12.1 All Intersections  
  
 or  
 2.12.2 Some intersections  


Notes on Where

- Individual intersection based systems avoid complications of subareas and confusion associated with averaging.
- Individual Intersection systems tend to direct improvements to locations where the problems are.
- Averaging systems may allow improvements to be directed at "good" intersections.
- Corridor systems allow improvements to be made on a range of factors that improve speed, beyond signalized intersections, including operational aspects.
- Evaluating both directions of travel for all corridors would result in a relatively large number of items to be analyzed.
- Corridor delay and speed systems don't lend themselves to averaging because averaging tends to exacerbate the precision problems with corridor systems.
- Corridors have to be one or two miles long to be effective.
- Using key intersections in averaging systems is helpful in making sure that "good" intersections are not overly valued in decisions. It turns out that only some intersections are critical except under the light blue triangle system.

## 3. Standard for Measuring

3.1 One Value  


3.2 More than one value (e.g., subarea averages)  


3.3 Maximum Value (use with averages)  


3.4 Max number to exceed Average  

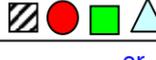

Notes on Standards

- The choice of standards is dependent upon the underlying 3 circles approach that is desired and decisions about where the level is set.
- Without running the numbers yet, we believe that adding an intersection maximum to the current system (the green box system) will have one of two effects, depending on where the level is set. It will either result in a maximum that is so high as to not be limiting, or it will act like a some intersection one-level system.

## 4. Extras

4.1 Weighting  
 and/or

4.2 AM, Midday  
 or

4.3 None  
  
 or

4.4 Police Enforcement

4.5 Multi-modal  
  
 and/or

4.6 Other refinements  


Notes on Extras

- Weighting can be used to counteract the effects of averaging systems that value "good" intersections too highly.
- We don't have the modeling capability to add AM and mid day measures, but we have heard they are desirable. Could be accomplished through SEPA. Total traffic is at a maximum in the PM.
- Police enforcement was suggested in the Plan amendment submitted by CHNA and could be added to any system.
- Corridor approaches lend themselves to multi-modal applications, for example travel speed along corridors for each mode could be considered.
- Other refinements include items such as which types of new intersections are added to average systems or the handling of WSDOT facilities.

**Legend**  
 Systems are defined by choices in one or more categories and are intended to be used with signalized intersections. Colored shapes denote choices in each category 1 through 4 that make up a system. Notes describe pluses and minuses of various choices. Elements within dashed boxes are considered infeasible.