TRAFFIC SIGNAL TIMING AND COORDINATION FAQ'S

The City of Laguna Niguel owns and operates about 80 traffic signals. Below are responses to some of the more frequently asked questions we get about this topic:

What is Traffic Signal Coordination?

The basic goal of traffic signal coordination is to take a group of fairly closely spaced vehicles (called a platoon) traveling in the same direction through a series of intersections at a speed at/near the speed limit. The "optimal progression speed" never exceeds the speed limit, but is usually set within 5 M.P.H. of the speed limit.

What is the best way/method for getting through the most signals without stopping?

Keep your speed at or slightly below the speed limit and you will have a far better chance of making most of the lights. If you drive too slow or too fast, you will be outside the green band (green band - is about a 30 second window that covers the cars in the platoon – the first car is at the one (1) second mark and the last car in the group is at the thirty (30) second mark).

Even if I drive at the speed limit I don't seem to make it through all the lights. Why?

Many people refer to old downtown areas in large cities where there are one-way streets spaced exactly at ¼ mile intervals as an example of where you can drive a set speed and get through every light. This is the simplest form of coordination. Throw in unevenly spaced signals, variations in signals (some have protected left turns some do not) long pedestrians times (many times coordination is based on no pedestrian crossings – when they occur it throws the signals out of step) and other conditions and you can see why modern streets systems do not lend themselves to "perfect coordination".

Which traffic signals are coordinated?

Generally, only the ones on the major streets that are designed to carry large volumes of traffic over longer distances are part of a coordinated system. In Laguna Niguel, this includes Alicia Parkway, Crown Valley Parkway and Moulton/Golden Lantern and Pacific Park Drive.

When are they coordinated?

This can vary depending on the street and other traffic factors, but generally they are always coordinated weekdays in the morning and afternoon peak periods. With some of the more recent coordination timing updates, we have now included some mid-day coordination and even some Saturday coordination.

Are signals coordinated in both directions?

The updated coordination uses a specialty program known as SYNCRO which tries to coordinate in both directions, but in reality coordination generally favors the primary direction that is carrying the

highest percentage of the volume. Since much of the traffic on our major arterials is very directional during the am and pm peak, we generally see better coordination in these directions. For example, northbound Moulton Parkway/Golden Lantern has about 70% of the traffic going northbound in the morning and about 70% going southbound in the afternoon. For those streets where we use mid-day or Saturday coordination, the volumes are more balanced and so we have tried to provide more balance in the coordination.

Does coordination "break" at major intersections because the cross street volume is also very high?

Generally, coordination can continue through major intersections, but sometimes there is a break along a street if there is a large distance between signalized intersections. Long distances between signals usually mean that the platoon starts to spread out too much and can no longer be seen as a defined group of cars. Cars are then gathered back into a group at the next signal (usually at a red light) and then sent out as a group again.

Sometimes I have to wait almost 1-½ minutes (but can seem like 5 minutes) to get a green on a side street or a left turn even when there seems to gaps in traffic. Why?

The coordination for the major streets is "time based". What this means is that there is no constant video detection or a person watching traffic in a room controlling traffic. Basically, there are calculations made taking into account distance, speed and direction and then the controllers at each location turn the coordinated direction green in sequence as the platoon is supposed to arrive.

For time based systems there is a background cycle length of usually 120 seconds. During this 2 minute time frame every movement is assigned a specific amount of maximum time and the movements are served in a specific fixed order. So if you picture a clock with two minutes there is only one time in that 2 minute period where the controller will "look" at the side streets and left turns to see if there are any vehicles waiting. If so, then it will give them a green. If not, then it will give that extra green time to the coordinated movements and "look" at the next movement in the sequence. So if you are the first car at a side street or left turn and you happen to get there just after the controller "looks" to see if there was anyone there (and there wasn't one second before you got there), then it will not look again for about 2 minutes. This can lead to the belief that the signal is not working properly.

Coordination is designed to move large groups of vehicles over long distances with minimal stops. This helps make up for the "extra" time you might have spent waiting on the side street and if you stay on that street for a reasonable amount of time, you will actually be ahead time-wise, gas-wise, frustration-wise and vehicle wear and tear-wise.

Why don't you coordinate all the time?

The highest benefit from coordination comes when large groups of cars travel in the same direction in a short time frame over relatively long distances (think commuters not shoppers). During the non-peak times, there are fewer cars and shorter trips and therefore less benefit from coordination to the

overall driving public (in fact so much less in some cases that coordination could actually result in longer drive times on average for the drivers on the road during that time). In addition, drivers are less willing to accept (have less patience for) the side street and left turn delays that are part of coordination during quieter/lower volume times of the day.

How do the signals operate when you don't coordinate?

When signals are not running as part of a coordinated system, they are set to run in a "free mode". When this happens, each intersection operates independently and responds to the individual traffic demands at the intersection. The signal will rest in green for the major street if there is no other activity at the intersection. This operation is actually the most efficient when there is low volume, because it can minimize delays for minor movements and quickly get back to the green for the major street.

Additional Information

Hopefully you found this information useful and informative. If you still have additional questions on this topic, please feel free to contact the Public Works Department at 949.362.4337 or through CityHallDirect.