

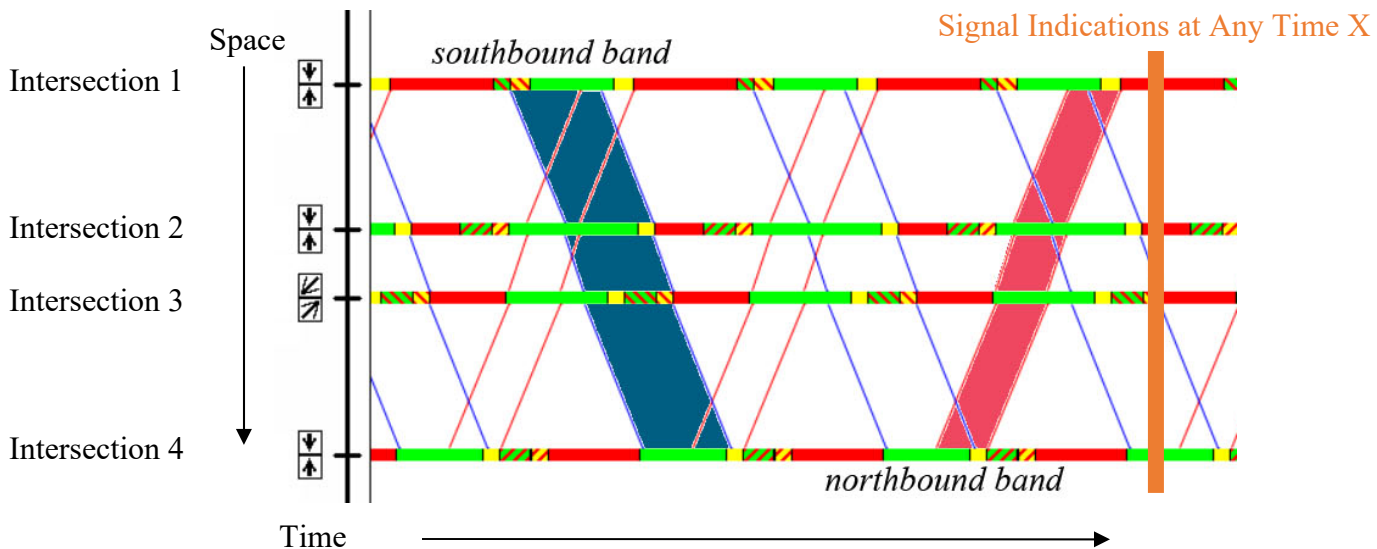
## Basics of Time-Based Signal Coordination

Traffic signal coordination is the process of designing traffic signal corridors so that traffic can efficiently progress from one end of the corridor to the other with minimal delays and/or stops. Coordination can be accomplished using a few methodologies, however the most prevalent is time-based coordination.

Time-based coordination achieves coordination by systematically offsetting the green indication for the coordinated phase(s). In order to ensure consistent operations all of the traffic signals within a time-based coordinated corridor need to have the same cycle length, where cycle length is the amount of time between sequential yellow indications for the coordinated phase. It is vital that the clocks within the controllers are synced with one another as any drift in the clock time will have a negative effect on the quality of the progression.

The coordinated phase is placed under maximum recall to ensure that the coordinated platoon of vehicles will receive a green indication when they arrive at the intersection. Additionally, the maximum recall for the coordinated phase accounts for the requirement of a fixed cycle length as the coordinated phase can be extended if the other phases are terminated or skipped due to a lack of adequate demand on the detectors. Once a common cycle length is set then the start time for the cycle is offset for each controller. This is to account for the travel time of the platoon of vehicles between intersections. Commonly this offset is calculated based on the posted speed limit or the 85<sup>th</sup> percentile speed and then adjusted to match field conditions.

The coordinated phase on maximum recall combined with the cycle offset creates a window of time at each intersection where the platoon is expected to traverse the intersection. These windows are then projected to adjacent intersections to determine the effective coordinated band of platooned vehicles that can progress from one intersection to the next. The diagram below shows a Time-Space diagram for a coordinated corridor with 4 traffic signals that has been designed with coordinated bands in both the northbound and southbound directions. As can be seen, if a vehicle enters the top most intersection heading south anywhere within the blue shaded region, then it is expected that they can progress through the entire corridor without stopping.



C.Thompson