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CHECKING RELATIVE OFFSETS

After a set of coordinated timing plans have been implemented along a corridor it is important to make sure that the plans are functioning as anticipated. One such quality control measure is referred to as an "offset check". An offset check is made by recording the actual time between yellow indications for the various signals along the corridor and then comparing these times to the expected time between yellows as found on the corresponding time-space diagram.

Figure 1 provides an example for a simple 3 signal system. From this time-space diagram we can see that, during the weekday AM peak period, main street yellow is supposed to be displayed at Oak Street 8 seconds before it is displayed at Elm Street, and 20 seconds before it is displayed at Ash Street. If our field measurements do not match these values then something is probably wrong with the timing plan. Potential problems could include:

- An incorrect cycle length setting in one or more of the controllers,
- An incorrect offset setting in one or more of the controllers,
- Drifting of one or more of the controller time clocks (a problem only with time-based system, not interconnected systems), or
- Implementation of the wrong timing plan (for example, the PM peak period plan being run during the AM peak period).

The beginning of the main street yellow period (also referred to as the "end of main street green") should be used to perform these offset checks, not the beginning of main street green since, in an actuated signal system, the beginning of main street green can vary from cycle to cycle depending on the amount of side street demand.

When making these offset checks, two cautionary points should be kept in mind:

1. Make sure that the offset checks are not made during a transition period between timing plans. For example, if the AM peak plan begins at 7:00 am, the checks should probably not be made until after 7:15 am to make sure that all signals have settled into their final offset for that period.

2. When making the offset checks, one should verify that there is side street demand in advance of the offset being reached. In other words, vehicles should be waiting on the side street before the time is reached when the main street is supposed to turn yellow. If there is no side street demand when the main street is supposed to turn yellow, then a vehicle arriving at the side street shortly thereafter (within the permissive period), could cause a "late yellow" to be displayed. This will confuse the offset check results and could make a properly functioning system appear to be off.

By using the time-space diagrams as a quality control tool and checking the yellow offsets, one can have confidence that the intended operation is actually being achieved. It is also a good idea to repeat these checks every 6 months or so to ensure that the various coordinated timing plans (AM peak plan, PM peak plan, Off-Peak plan, Saturday plan, Sunday plan, etc.) are still operating as expected. Field offset checks are an extremely valuable tool that should be a standard feature of all system timing endeavors.

FIGURE 1
MAIN STREET CORRIDOR