

March 3, 1998

TRAFFIC SIGNAL TROUBLESHOOTING

How good are you at traffic signal troubleshooting? Here's a 7 question quiz to help you find out. The answers are provided at the end of the article. Keep in mind that, although only one answer is given, some of you may be able to come up with an alternate explanation for some of the problems I describe.

1. At 11:15 PM on Saturday June 3rd you receive a trouble call from the dispatcher that the signal at Jackman and Laskey is out. When you pull up to the intersection you observe that all of the signal heads are dark. At first you suspect a power outage but then you notice that the surrounding businesses have their lights on. Nothing lights up when you open the controller cabinet and not a sound is heard from inside. You notice beer bottles scattered about the area. What's causing the problem?
2. At 1:05 in the afternoon on Tuesday February 9th you receive a trouble call from the dispatcher that the signal at Reynolds and Hill just went on flash. This signal is part of a time-based coordinated system along Reynolds. When you open the controller cabinet everything inside appears to be fine, except that the conflict monitor reads CVM fail. When you try resetting the conflict monitor it will not come out of flash. You then check all the flash toggle switches in the cabinet and the police panel and find that they are all in the correct position. Looking at the written repair log kept inside the cabinet you see that the "night owl" technician swapped in a new controller at 9:00 PM last night. What's the problem compadre?
3. At 4:35 PM on Tuesday August 9th you receive a trouble call from the dispatcher that the signal is stuck at Alexis and Monroe, a location where a signal contractor has been adding pedestrian features to an existing signal. When you pull up to the intersection you observe that a queue of approximately 30 vehicles has accumulated on the side street. After opening the controller cabinet you note that everything inside appears to be fine; all of the detectors are functioning properly and the detector for the side street has a constant call on it. The through movement turns red to service the main street left turn but, for some reason, ignores the side street demand. You don't see any chewing tobacco stains on the controller keypad so you know the contractor hasn't been fooling with the controller. What did that bozo contractor do to your signal?
4. At 11:00 AM on Sunday November 30th you receive a trouble call from the dispatcher that the signal is stuck at Central and Talmadge. Central is a 6-lane arterial with a wide median while Talmadge is a 2-lane road and has no median. Protected-only left turn phasing is provided on both approaches of Central and a full set of pedestrian features exist at the intersection. When you pull up to the intersection everything seems fine and when you open the cabinet all the equipment appears to be working properly. Then you notice that the vehicles on Central wait a very long time while the green indication is displayed to Talmadge for a total of 32 seconds each cycle. This happens even though there are very few vehicles using Talmadge. You check the max green time programmed in the controller and find that Talmadge is only suppose to get 20 seconds of green. What the heck is going on here?

5. At 6:00 PM on Thursday July 4th you receive a trouble call from the dispatcher that there is a red out in the eastbound curb lane of the Heatherdowns/Byrne intersection. This is an eight-phase intersection with protected/permissive left turns on all approaches. The signal heads are supported by a diagonal span-wire with each head wired through its own 12-terminal disconnect. You replace the red bulb but the indication doesn't light up. You then replace the whole head and still no luck. Then you notice that the end cap is missing on the disconnect. When you reach inside the disconnect to see if the cap somehow slipped inside, something quite unexpected greets your hand. What Alfred Hitchcock movie have you stumbled into?
6. At 12:35 on the Sunday afternoon of October 14th you receive a trouble call from the dispatcher that the signal on Front Street that serves the main driveway of the First Baptist Church is stuck. When you pull up to the intersection you observe that a queue of approximately 50 vehicles in each direction has accumulated on Front Street. The signal appears to be stuck on green for the church driveway. After opening the controller cabinet you note that all detectors are working fine and that the detector test switches are in their proper location. However, the controller doesn't seem to be cycling at all with the front panel indications seemingly "frozen" in time. Suspecting a defective controller, you quickly put the intersection on flash, program up a spare controller from the truck, and then replace the controller. To your surprise, the same thing happens to the new controller. What in the name of Jerry Falwell is going on here?
7. At 7:30 AM on Monday April 5th you receive a trouble call from the dispatcher that the signal at Lewis and Eleanor is malfunctioning. When you arrive at the intersection traffic is backed-up on all approaches. Opening the controller cabinet (amidst the jeers of angry motorists) everything seems to be working properly, including the Transyt 1880E controller. You know that this intersection is part of a coordinated system on Lewis and that it usually operates just fine, but today the signal doesn't seem to be letting enough vehicles through. You check the cycle length using your stop watch and notice that it is 90 seconds long, which doesn't jive with the timing documentation in the cabinet that indicates the AM peak plan (which starts at 7:00 AM) has a 150 second cycle. What went wrong?

If you scored 6 or 7 you're a crack troubleshooter - go ask your boss for a raise.

If you scored 4 or 5 you're night owl material - I hope you like going to sleep when the sun comes up.

If you scored 2 or 3 you obtained this magazine by mistake - give it back to its rightful owner.

If you scored less than 2 you have trouble sorting out real world problems in a logical manner and may want to switch careers - have you considered being a lawyer?

ANSWERS:

1. Some rowdy kids have turned off the main circuit breaker of the electrical disconnect.
2. When installing the new controller, the night owl technician programmed in 9:00 for the time of day rather than 21:00. Consequently, at 1:00 PM on Friday, the controller thinks it's 1:00 AM and starts its late night flash routine.

3. While toggling the pedestrian test switches on, he accidentally toggled the side street detector test switch off. Oops!
4. One of your side street pedestrian buttons is shorting-out (causing 7 seconds of WALK time and 25 seconds of flashing DON'T WALK time to be displayed each cycle).
5. "The birds." By nesting, pecking, and crapping in your disconnect, these lovely little creatures have caused an open circuit to the red indication.
6. The cop who was manually controlling the signal when the church let out forgot to take the intersection out of manual control before heading to the donut shop.
7. Someone forgot to update the week at which the daylight savings time shift is to occur. Consequently, the controller did not "spring forward" and it still thinks it's 6:30 AM and is running the 90 second early morning timing plan rather than the 150 second AM peak plan.