



MEMORANDUM

TO: Systems Performance, Operations and Technology Subcommittee
FROM: Andrew Burke, Transportation Engineer
SUBJECT: DRAFT 2019 Traffic Signal Power Back-up and Traffic Signal Optimization Survey Findings
DATE: August 6, 2020

BACKGROUND

TPB staff conduct two traffic signal surveys, the Traffic Signal Optimization and the Traffic Signal Power Back-up surveys. The survey is self-reported by the State DOT's and local jurisdictions that are responsible for traffic signals in the region. The most recent survey was conducted in spring 2020 requesting the status of the two programs as of December 31, 2019. Staff is expecting a few more responses from member agencies and will incorporate their responses into the findings as received.

TRAFFIC SIGNAL OPTIMIZATION AND POWER BACKUP SURVEY RESULTS

The most recent survey results are compared to selected previous survey results. The results indicate that region continues to maintain signal optimization at 73% either through computers or other techniques over a three to five-year period since 2002 when the original program was conceived and tracked. Power backup of traffic signals either through a battery (40%) or being generator ready (77%) continues its upward trend since 2012.

Table 1. Signal Optimization Results

Survey Year	Signalized Intersections	Optimized	Optimized Signals Percentage
2013	5400	3600	67%
2017	5900	4300	73%
2019	5900	4300	73%

**numbers are approximate*

Table2. Signal Power backup Results

Survey Year	Signalized Intersections	Battery Based Backup	Generator Ready
2015	5500	1500 (27%)	3200 (58%)
2017	5900	2100 (35%)	4500 (77%)
2019	5900	2300 (40%)	4500 (77%)

**numbers are approximate*

SURVEYS

The surveys have evolved from a paper based to the recent online survey and questions have evolved over time. Since the numbers are self-reported and varying response rate, the numbers shown in the table are rounded up and are approximate.

TRAFFIC SIGNAL OPTIMIZATION

Signal optimization is a traffic engineering concept whereby traffic signals (often groups of signals in corridors and/or isolated systems) are (re-)timed to reduce delay for vehicles on the roadway system while ensuring safety. TPB staff have conducted 4 previous optimization surveys in 2005, 2009, 2013, and 2017. The survey was originally conceived as a Transportation Emissions Reduction Measure (TERM) in 2005.

TRAFFIC SIGNAL POWER BACK-UP

The first power back-up survey was conducted after being recommended in the 2011 Incident and Management and Response (IMR) action plan. Backup power for signals improve the resiliency and reliability of the signals and reduce the need for law enforcement to manually manage signals during power outages.

FINDINGS

- Optimized signals in the region is around 73% and signals are optimized every 3 to 5 years.
- Lack of funding mentioned more than once as impediment to more frequent optimization.
- Approximately 40% of signals in the region have battery-based backup up from 35%.
- Most agencies have their own generators, about 80% of respondents have access to other generators owned by other agencies and there are approximately 1000 portable generators.
- Approximately 1150 of signals in the TPB region can be maintained for over 24 hours without power.
- Currently waiting on a few more responses from member agencies, it is not expected that these will lower the findings.

FUTURE OUTLOOK

Traffic Signals play an important role in keeping traffic flowing on the regions network of roads safely. As technology advances it will be important to incorporate its use in future surveys. As the survey results have shown the region is moving ahead in ensuring signals will continue to work when

there are power issues and that they are timed to work at peak efficiency. Subsequent surveys will continue to give the region's leaders the understanding of not only where we are at but where we can make improvements in the future.