

# Barberton Traffic Signal Optimization (TSO)

Various  
Clark County



## Project Goals:

- Improved county travel times
- Signal integration, upgrade and communication
- Replace failed in-ground traffic detectors
- Data collection and traffic surveillance

## Project Outcomes:

- Travel times have been reduced, improving county travel
- Radar detection installed, reducing delay
- Data collection and traffic surveillance equipment has been installed, are active 24/7 and capture real time data

## Project Information

**Federal Funding Program:** CMAQ Program

**RTC Awarded Funding:** \$707,300

**Total Project Cost:** \$958,000

**Project Type:** TSMO

**Project Length:** 3.06 miles

**Function Classification:** 16 Minor Arterial

**Daily Traffic Volume:** up to 17,850 ADT

## Project Description

Coordinated signal operation to improve traffic flow. Repaired and upgraded traffic detection for vehicles and bicycles. Added video cameras and permanent count stations at key locations and connected signals to central county monitoring center.

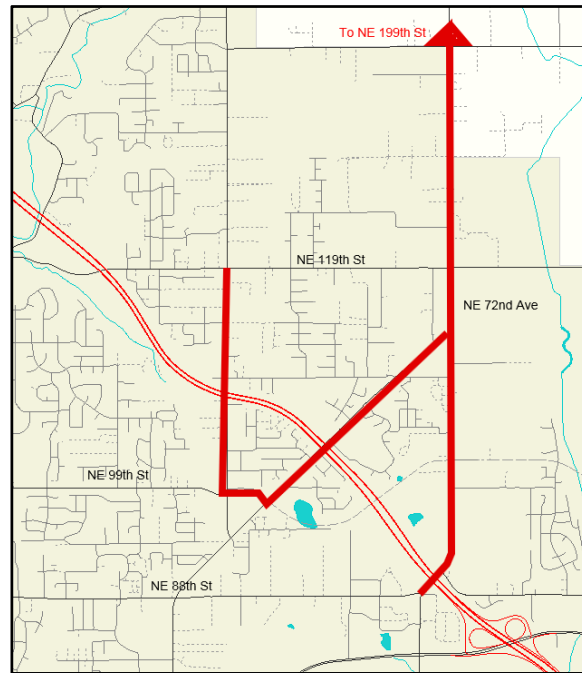
## Project Funding

Phase	Year	Federal Funds	Other	Total
PE	2012	\$75,000	\$12,000	\$87,000
ROW	N/A	\$0	\$0	\$0
CN	2014	\$632,000	\$222,200	\$871,000
Total		\$707,00	\$234,400	\$958,000

## Project Outcome Details

- Improved for county travel by reducing delay.
- Added left-turn flashing yellow arrows at the NE St. Johns Road/NE Lalonde Drive intersection to reduce delay.
- Replaced failed in-ground loop detectors with radar detection.
- Radar detection “sees” motorcycles and bicycles in addition to vehicles.
- Have the ability to capture 24/7 real time traffic data.
- Connected signals to central county monitoring center to allow remote operation.

## Project Map



### Travel times have been reduced, improving county travel.

The Barberton Traffic Signal Optimization (TSO) project replaced the failing copper communications cables connected to obsolete modems with new state of the art traffic signal controllers communicating to a central system via fiber optic Ethernet communications.

The old copper communication cables were unreliable at best. The on-street master controller had a bug which would randomly reset some of the signal controllers to a midnight function. Once reset, the signals on the corridor were unable to run in coordination, as the time clocks in the signals would be set to different times throughout the day. In many cases, a portion of the signals were running a completely different time of day/night plan based on the errors created by the outdated on-street master controller. Not being able to continuously coordinate the signals meant that vehicles had to stop at signals, instead of moving efficiently along the corridor. This stop and go created unnecessary delay and increased travel times across the county.

The signals on the system now communicate with the upgraded central server application once per second. The new server maintains effective and responsive signal coordination through central traffic responsive operation from the server. This means the signals within Barberton project area are adjusting their timings throughout the day based on the actual traffic volumes on the corridor.

The Barberton TSO project also installed multiple pan / tilt / zoom cameras that allow the traffic engineers and signal technicians to remotely monitor the signal operation and to see the entire corridor. This remote operation allows the engineers and technicians to judge how the traffic is progressing and to modify the signal operations to improve the traffic flow without having to physically go out to the signal.

The elimination of the unpredictableness of the old system, coupled with the combination of the new reliable effective, responsive, real-time operations of the signal system and the ability to remotely adjust signal operations keeps vehicles moving efficiently along the project corridor. This project provides reduced vehicular and freight delay by not having to randomly stop at signals and decreases travel times across the county.

### Radar detection installed, reducing delay.

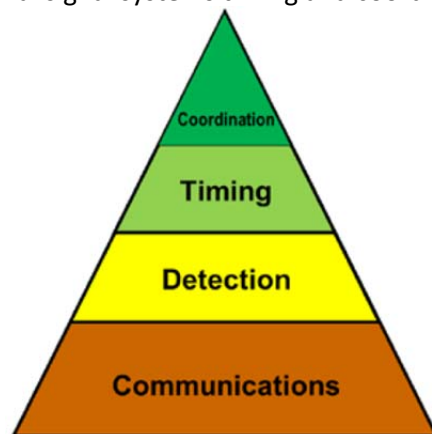
The Barberton TSO project replaced all failing in-ground vehicle detection with over-head radar detection systems. Prior to the project, the failed detection caused the signals to falsely “see” vehicles that did not exist for both left turns and side streets. The false calls caused traffic signals to provide a “green signal movement” that should have either been a shorter time or not at all during the signal cycle. The “false calls” create longer wait times, creating delay for vehicles during each signal cycle at multiple impacted intersections along the corridor.

Another challenge has been that Clark County Public Works has no way to maintain detection loops that are cut into the pavement. All work on the in-ground detection loops has to be contracted out. Also, the few detection loop contractors are exceptionally busy and the repair/replacement work is very weather dependent.

The new modern working detection systems allow the signals to work efficiently. The county has the equipment and capability to replace radar detection systems as needed. This means that the radar vehicle detection can be diagnosed and replaced / repaired without the use of contractor services. The radar detection systems are very flexible, which allows for easy changing of detection zones and inputs to the controller to accommodate the detection needs that have been required for projects following TSO, including Automated Traffic Signal Performance Measures and adaptive signal operation.

With the elimination of “false calls, the delay during signal cycles is reduced, not only for each individual signal, but at multiple signals along the project corridor.

The county is systematically moving toward a solid, highly effective and efficient county-wide signal system. The Traffic Signal Management Operations (TSMO) projects are building the firm footings of communications and detection needed for responsive, real-time, multi-jurisdictional signal systems timing and coordination as shown in the TSMO triangle.



**Traffic Signal Management Operations (TSMO) Triangle**

## Locations of all Barberton project installations

