

Cycle 3 Summary - March 2020



Regional Traffic Signal Program

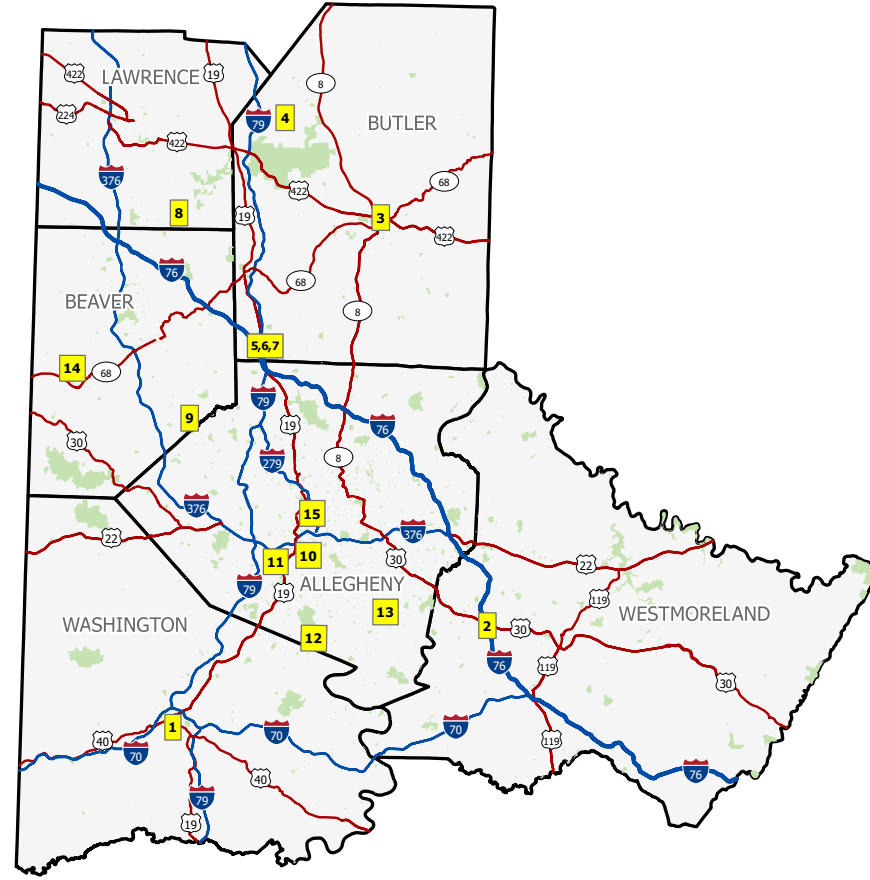


Third Cycle Projects

SPC's Regional Traffic Signal Program was established by SPC and its planning partners in 2008 to assist local governments with improving traffic signal operations by optimizing traffic signal timings and upgrading existing signal equipment. The overall goals of the program are to reduce congestion, reduce delay to motorists, reduce negative impact that idling traffic has on air quality, and improve pedestrian safety.

Nearly \$4 million in funding for the third cycle of the projects was made available through SPC via FHWA's Congestion Mitigation Air Quality Program (CMAQ) and participating local governments. Nationwide, these types of signal projects, on average, have yielded \$20 to \$40 of public benefit for every \$1 invested, making the most efficient use of the transportation infrastructure already in place. The third cycle of SPC's Regional Traffic Program yielded an overall average of \$23 of public benefit for every \$1 invested, which places this cycle in line with the national average for similar projects.

Projects completed in this third cycle of the program are shown here. In addition to retiming 148 intersections across 15 corridors, improvements included audible emergency vehicle preemption, signal controllers, new communication equipment and GPS units to facilitate signal coordination, and countdown pedestrian signals to increase pedestrian safety. Third cycle projects were substantially completed from Summer 2018 to Spring 2019.



Retiming Benefits

Total First Year Benefit (Operations) \$26,611,509 • Benefit Cost Ratio: 21:1

- **270,700** vehicles travel these corridors on an average day
- **1,320,281** reduced vehicle hours of travel
- **976,044** gallons reduced fuel consumption
- **68,137 kg** reduced total CO pollutant emissions
- **23,737 kg** reduced total NO pollutant emissions
- **15,806 kg** reduced total VOC pollutant emissions
- **\$20,210** LED upgrade savings (energy & maintenance)
- **18,466,469** reduced number of stops
- **\$1,265,744** total life cycle project cost

First Year Safety Benefits

Total First Year Benefit (Operations & Safety) \$29,593,877 • Benefit Cost Ratio: 23:1

The safety benefits to pedestrians included bringing 128 pedestrian phases at 79 intersections up to current standards by increasing the pedestrian interval, installing 12 Lead Pedestrian Intervals (LPI) to 8 downtown Pittsburgh intersections, and installing 168 countdown pedestrian signals. This can help reduce in-vehicle pedestrian related crashes by 70% (countdown signals) and 60% (LPI) to provide a 32:1 benefit to cost for pedestrians. 37 Audible Emergency Preemption Systems were also installed with this program, which helps reduce emergency response time by 14-23%.

Map Key	Description	PennDOT District	# of Total Signals	AADT (Veh. Per Day)	Delay Data		Stops Data		Fuel Consumption Data		Cumulative Emissions Data (CO, NO, VOC's)		Benefit-Cost Data							
					Delay Reduction (Hr)	Delay Reduction (%)	Stops Reduction (%)	Stops Reduction (%)	Fuel Consumption Reduction (gal)	Fuel Consumption Reduction (%)	Total Emissions Reduction (kg)	Total Emissions Reduction (%)	Annual LED Benefits (\$)	Annual Delay Benefits (\$)	Annual Stops Benefits (\$)	Annual Fuel Consumption Benefits (\$)	Annual Emission Benefits (\$)	Total Benefits including LED Upgrades (\$)	Total Cost (\$)	Benefit-Cost Ratio
1	Main St - City of Washington - SINC-UP	12-0	7	6,200	8,943	25%	806,218	20%	10,994	15%	1,010	14%	\$623	\$157,838	\$11,287	\$31,838	\$1,516	\$203,101	\$55,207	4:1
2	US 30 - North Huntingdon Township & Irwin Borough - SINC-UP	12-0	24	25,200	142,510	14%	5,062,260	7%	97,532	3%	9,736	3%	\$0	\$2,515,302	\$70,872	\$282,451	\$14,563	\$2,883,189	\$147,161	20:1
3	SR 356/68 & Hansen Ave - City of Butler & Butler Township - SINC-UP	10-0	18	19,400	235,668	25%	997,134	1%	176,087	7%	17,451	7%	\$0	\$4,159,543	\$13,960	\$509,947	\$26,062	\$4,709,511	\$202,551	23:1
4	SR 108 (Franklin St) & SR 173 (Main St) Slippery Rock Borough - SINC-UP	10-0	4	12,700	24,689	30%	672,479	11%	21,005	8%	2,069	8%	\$0	\$435,768	\$9,415	\$60,831	\$3,087	\$509,100	\$39,859	13:1
5	Rochester Road - Cranberry Township - SINC-UP	10-0	5	20,100	30,877	18%	534,318	4%	29,394	5%	2,867	5%	\$0	\$544,974	\$7,480	\$85,126	\$4,312	\$641,892	\$39,992	16:1
6	SR 228 & Freedom Road - Cranberry Twp, Adams Twp, & Seven Fields Boro - SINC-UP	10-0	20	34,600	222,956	23%	-4,447,552	-8%	67,587	3%	6,714	3%	\$623	\$3,935,179	-\$62,266	\$195,733	\$10,038	\$4,079,307	\$172,511	24:1
7	US 19 - Cranberry Twp & Marshall Twp - SINC-UP	10-0	15	34,700	233,487	26%	1,185,187	2%	178,313	8%	17,782	8%	\$0	\$4,121,043	\$16,593	\$516,394	\$26,576	\$4,680,606	\$113,958	41:1
8	Lawrence Ave & Fountain Ave - Borough of Ellwood City - SINC-UP	11-0	10	8,600	45,240	34%	2,825,360	17%	42,736	11%	4,263	11%	\$0	\$798,486	\$39,555	\$123,763	\$6,423	\$968,227	\$65,843	15:1
9	SR 989 (8th Street) & Merchant Street - Ambridge Borough - SINC-UP**	11-0	5	9,000	4,254	11%	-1,262,741	-19%	-3,020	-3%	-221	-2%	\$4,500	\$75,076	-\$17,678	-\$8,745	-\$247	\$52,906	\$32,041	2:1
10	Brownsville Road - Brentwood Borough - SINC-UP	11-0	2	16,400	15,625	34%	935,321	21%	15,599	11%	1,625	12%	\$0	\$275,785	\$13,094	\$45,176	\$2,453	\$336,509	\$36,936	9:1
11	SR 121 (Greentree Road) - Green Tree Borough - SINC-UP	11-0	9	24,500	253,752	39%	4,558,678	15%	239,300	20%	34,306	27%	\$0	\$4,478,717	\$63,821	\$693,012	\$93,336	\$5,328,887	\$104,603	51:1
12	McMurray Road - Bethel Park & Upper St. Clair Twp - SINC-UP	11-0	4	15,900	16,832	22%	485,675	10%	17,082	6%	1,773	6%	\$0	\$297,092	\$6,799	\$49,469	\$2,667	\$356,028	\$24,551	15:1
13	SR 148 (Walnut Street) - City of McKeesport - SINC-UP	11-0	7	26,900	13,329	16%	985,199	11%	17,116	5%	1,722	5%	\$1,462	\$235,250	\$13,793	\$49,569	\$2,565	\$302,640	\$42,339	7:1
14	SR 68 (Midland Avenue) - Midland Borough - SINC-UP	11-0	7	8,000	18,725	30%	1,624,368	18%	17,880	8%	1,936	9%	\$13,002	\$330,500	\$22,741	\$51,782	\$2,946	\$420,970	\$79,471	5:1
15	Liberty Avenue - City of Pittsburgh - SINC-UP*	11-0	11	8,500	53,394	9%	3,504,566	10%	48,438	7%	4,648	6%	\$0	\$942,397	\$49,064	\$140,276	\$6,899	\$1,138,636	\$108,722	10:1
Totals:			148	270,700	1,320,281	23%	18,466,469	5%	976,044	7%	107,680	7%	\$20,210	\$23,302,951	\$258,531	\$2,826,622	\$203,195	\$26,611,509	\$1,265,744	21:1

SINC-UP projects include retiming of traffic signals as well as equipment upgrades. SINC projects include signal retiming only. *For the Liberty Avenue-City of Pittsburgh project, results are projected. ** Two Signals were removed on this project

2008-2019 Program Benefit-Cost Ratio: 51:1

SPC has now completed three cycles of this important regional program. Together the three cycles have invested nearly \$11 million to improve 649 signalized intersections across 77 municipalities in our region. Through the first three cycles of this program, results have yielded \$51 of public benefit for every \$1 spent in terms of reduced delay, reduced vehicular stops, and reduced fuel consumption and emissions.

Third Cycle Project Partners

Federal Highway Administration • Southwestern PA Commission and Planning Partners
PennDOT Central Office • Whitman, Requardt & Associates Consultant Team

PennDOT District 10-0

Butler County
Adams Township
Butler Township
City of Butler
Cranberry Township
Seven Fields Borough
Slippery Rock Borough

PennDOT District 11-0

Allegheny County
Beaver County
Lawrence County
Ambridge Borough
Borough of Ellwood City
Brentwood Borough
City of McKeesport
City of Pittsburgh
Green Tree Borough
Marshall Township
Midland Borough
Municipality of Bethel Park
Upper St. Clair Township

PennDOT District 12-0

Washington County
Westmoreland County
City of Washington
Irwin Borough
North Huntingdon Township