

SIGNAL PERFORMANCE ANALYTICS

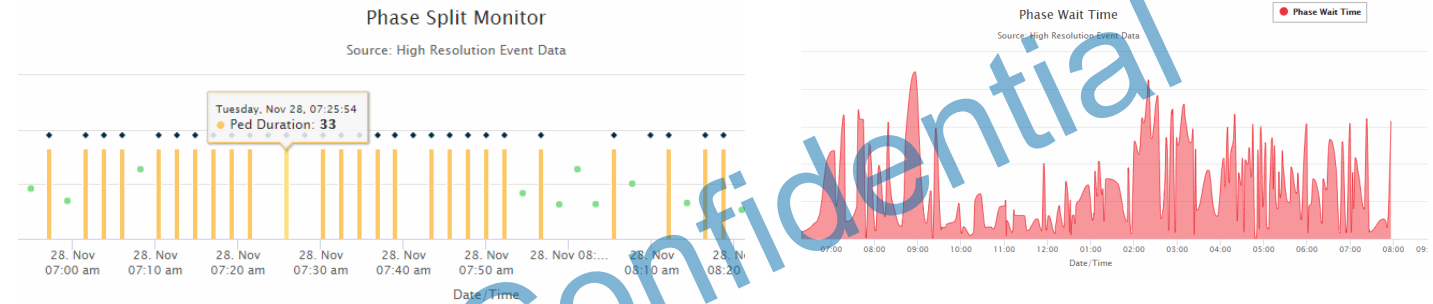
- Key Performance Measures
- Casa Grande Case Study
- Introducing KPIs and Dashboards

SIGNAL PERFORMANCE MEASURES

Key Performance Reports

Phase Split Monitor

- Wait time experienced by the first vehicle/ped to arrive on red before service of the green interval.
- Key Measure for non-coordinated movements

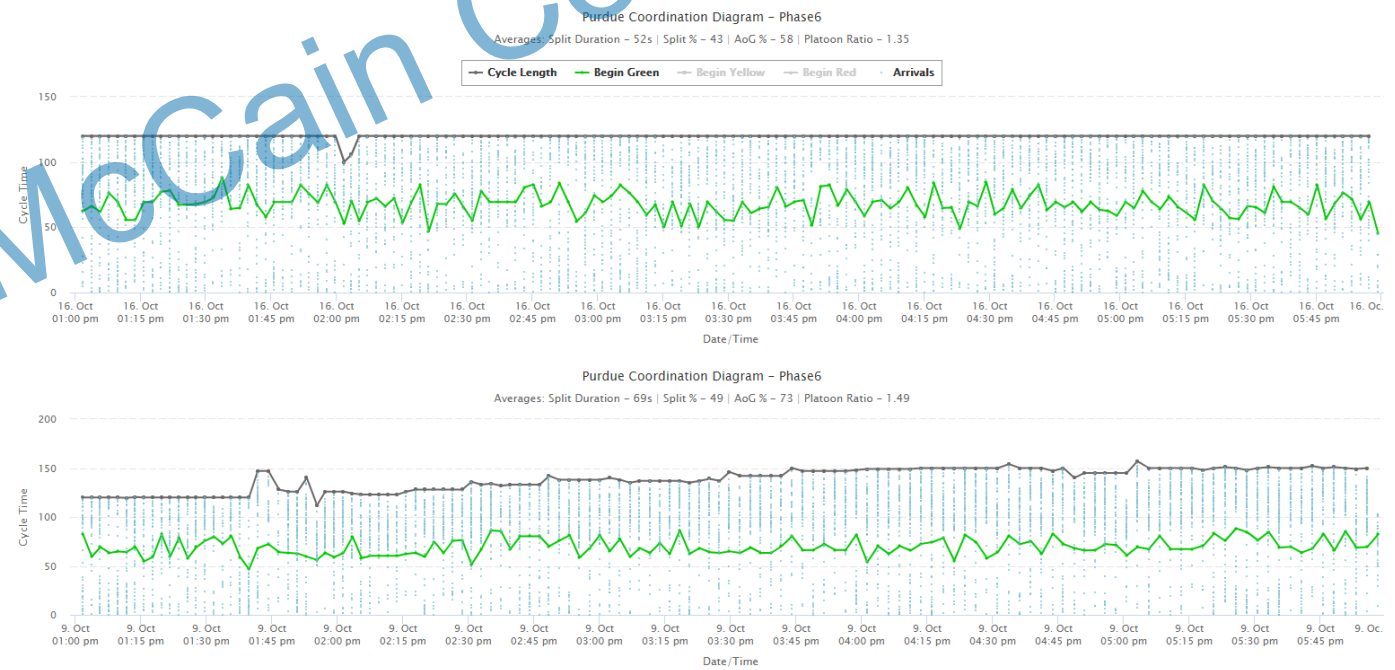


Wait Time / Idle Time

- Phase duration, reason for termination, pedestrian activity, phase failures.
- Key Measure for non-coordinated movements

Purdue Coordination Diagram

- Phase Illustrates Progression
- Arrivals on Green, Platoon Ratio
- Key Measure for coordinated phases

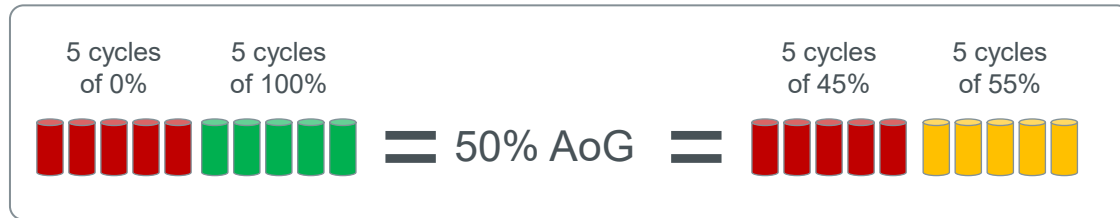


SIGNAL PERFORMANCE MEASURES

Performance Monitoring

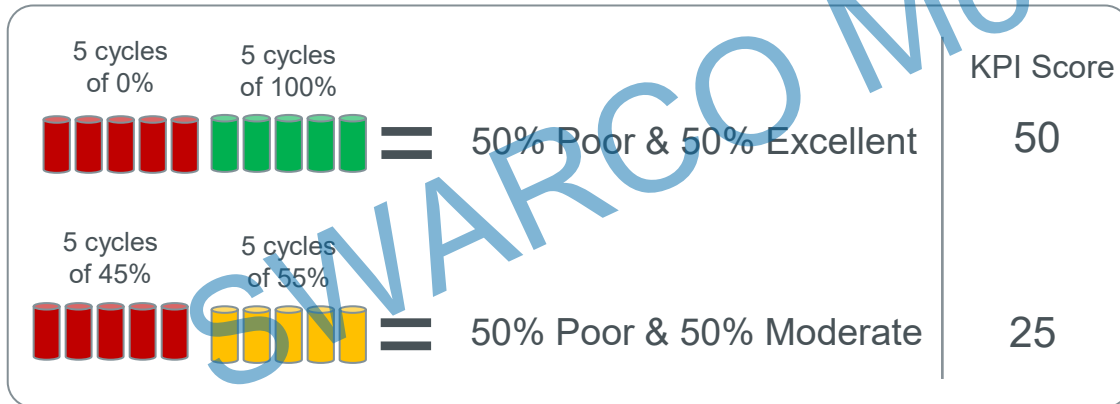
What's wrong with standard performance measures?

Average AoG% doesn't reveal the characteristics of performance.



How do we resolve this issue?

Characterize the AoG performance with the use of a KPI



SIGNAL PERFORMANCE MEASURES

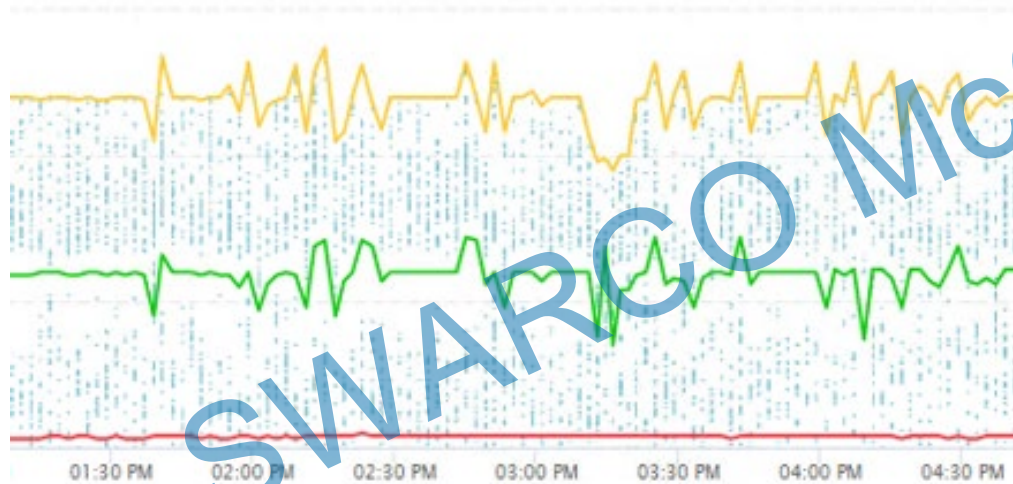
Performance Monitoring

What's wrong with standard performance measures?
Individual measures do not provide an accurate picture of progression.

Without considering the Platoon Ratio, AoG% can be misleading

Purdue Coordination Diagram - Phase 6

Averages: Split Duration - 61.79s | Split % - 51.56% | AoG % - 56.82% | Platoon Ratio - 1.10



Purdue Coordination Diagram - Phase 6

Averages: Split Duration - 72.51s | Split % - 52.00% | AoG % - 65.54% | Platoon Ratio - 1.26



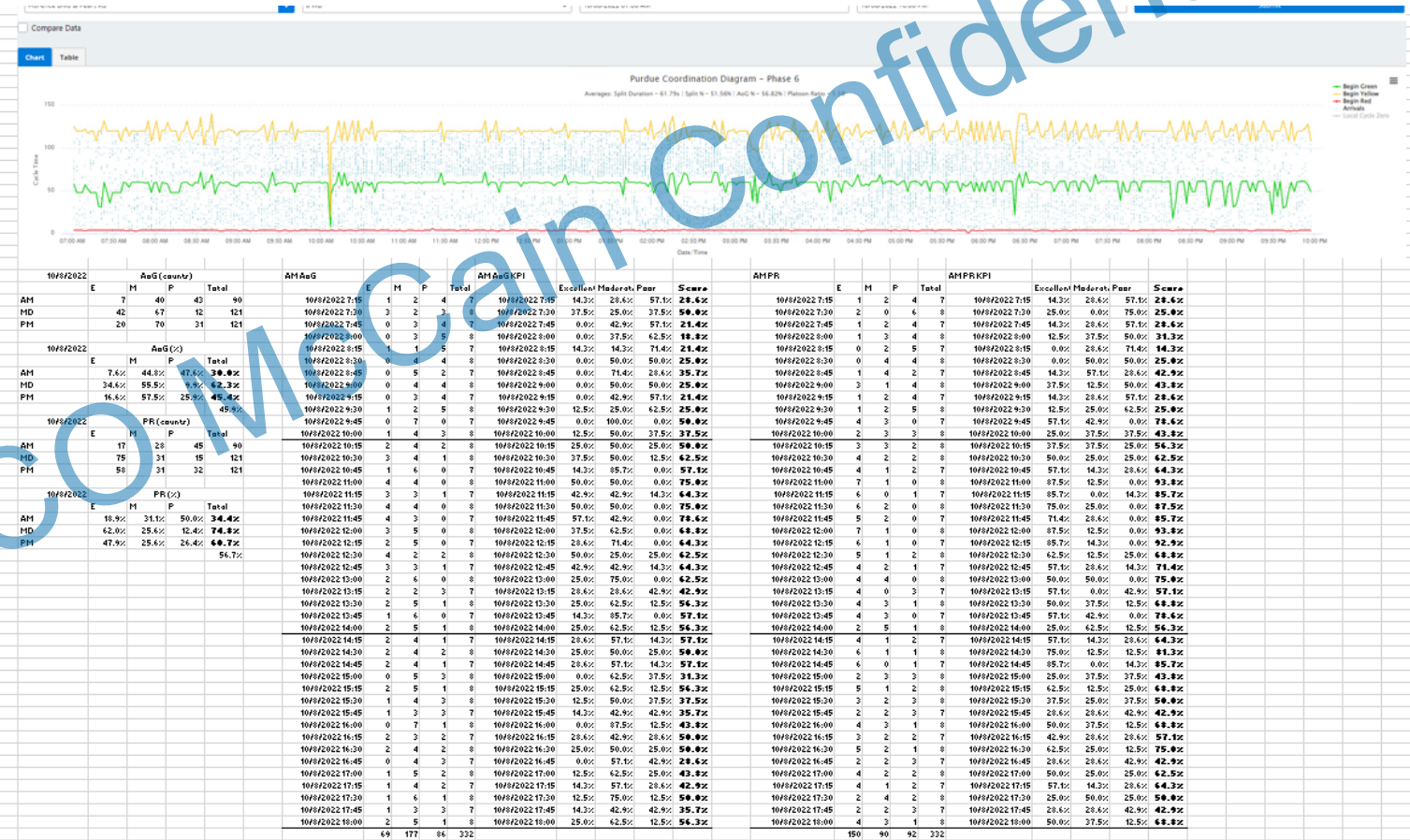
SIGNAL PERFORMANCE MEASURES

Casa Grande, AZ – Adaptive Case Study

Why do our customers need Signal Performance Analytics vs ATSPM Reports?

There's too much data to efficiently analyze for each approach and intersection.

Timestamp	Reference Count	Success or Error	AvgC	Cycle Length	Split Duration	Split %	Phase Ratio
10/10/2022 7:14:15.4 AM	15	15	12.58	125	87	55.58	1.17
10/10/2022 7:15:15.4 AM	12	5	18.00	120	72	60.00	0.83
10/10/2022 7:16:15.4 AM	14	5	42.65	120	72	60.00	0.71
10/10/2022 7:17:15.4 AM	15	4	48.00	120	72	60.00	0.67
10/10/2022 7:18:15.4 AM	15	3	25.00	122	85	59.29	0.45
10/10/2022 7:19:15.4 AM	7	5	27.43	117	85	55.56	0.23
10/10/2022 7:20:15.4 AM	24	13	15.58	120	72	60.00	0.83
10/10/2022 7:21:15.4 AM	12	7	18.75	120	72	60.00	0.87
10/10/2022 7:22:15.4 AM	5	2	48.00	100	60	55.56	0.72
10/10/2022 7:23:15.4 AM	15	15	100.00	120	87	72.50	1.00
10/10/2022 7:24:15.4 AM	18	13	72.52	120	88	75.00	0.88
10/10/2022 7:25:15.4 AM	18	7	38.00	102	72	54.25	0.71
10/10/2022 7:26:15.4 AM	5	2	38.00	120	72	60.00	0.50
10/10/2022 7:27:15.4 AM	16	12	82.71	120	88	83.37	1.24
10/10/2022 7:28:15.4 AM	16	3	56.25	120	72	60.00	0.94
10/10/2022 7:29:15.4 AM	15	15	12.58	120	72	60.00	1.04
10/10/2022 7:30:15.4 AM	18	3	18.00	120	72	60.00	0.83
10/10/2022 7:31:15.4 AM	24	14	12.57	100	60	55.56	1.00
10/10/2022 7:32:15.4 AM	15	5	48.00	120	68	56.66	0.88
10/10/2022 7:33:15.4 AM	14	8	52.14	124	85	52.42	0.85
10/10/2022 7:34:15.4 AM	15	5	51.58	114	68	52.53	0.88
10/10/2022 7:35:15.4 AM	27	8	47.82	120	68	56.66	0.94
10/10/2022 7:36:15.4 AM	22	13	58.83	120	68	56.66	1.08
10/10/2022 7:37:15.4 AM	24	12	58.88	110	55	45.58	1.01
10/10/2022 7:38:15.4 AM	16	5	25.00	120	68	56.66	0.88
10/10/2022 7:39:15.4 AM	22	18	45.45	120	68	56.66	0.91
10/10/2022 7:40:15.4 AM	15	12	58.76	120	64	58.88	1.24
10/10/2022 7:41:15.4 AM	23	15	55.22	102	72	54.55	1.04
10/10/2022 7:42:15.4 AM	28	3	52.14	100	68	55.56	0.88
10/10/2022 7:43:15.4 AM	15	5	46.15	120	64	58.88	0.91
10/10/2022 8:14:15.4 AM	23	11	42.83	102	72	54.55	0.88
10/10/2022 8:15:15.4 AM	15	4	58.25	100	68	55.56	0.92
10/10/2022 8:16:15.4 AM	14	3	25.43	121	64	58.41	0.45
10/10/2022 8:17:15.4 AM	17	5	25.41	120	64	58.88	0.58
10/10/2022 8:18:15.4 AM	24	15	12.58	100	72	55.50	1.15
10/10/2022 8:19:15.4 AM	17	8	47.82	120	72	60.00	0.79
10/10/2022 8:20:15.4 AM	17	13	79.57	120	72	60.00	0.87
10/10/2022 8:21:15.4 AM	17	5	52.94	120	72	60.00	0.88
10/10/2022 8:22:15.4 AM	16	8	58.00	100	68	55.56	0.88
10/10/2022 8:23:15.4 AM	21	3	42.86	110	68	58.42	0.85
10/10/2022 8:24:15.4 AM	24	13	58.17	120	68	56.66	1.00
10/10/2022 8:25:15.4 AM	23	13	58.22	102	72	54.55	1.04
10/10/2022 8:26:15.4 AM	25	13	52.00	110	64	55.56	0.81
10/10/2022 8:27:15.4 AM	16	8	58.00	110	68	48.18	1.04
10/10/2022 8:28:15.4 AM	12	4	59.59	120	68	56.66	0.87
10/10/2022 8:29:15.4 AM	13	3	42.31	110	68	58.42	0.84
10/10/2022 8:30:15.4 AM	17	10	58.82	100	64	47.80	0.95
10/10/2022 8:31:15.4 AM	17	5	52.94	100	64	45.51	0.87
10/10/2022 8:32:15.4 AM	27	15	55.56	100	68	58.88	1.11
10/10/2022 8:33:15.4 AM	21	8	58.18	120	68	56.66	0.76
10/10/2022 8:34:15.4 AM	18	11	58.89	100	74	58.71	1.14
10/10/2022 8:35:15.4 AM	17	11	64.71	100	57	55.54	0.97
10/10/2022 8:36:15.4 AM	23	15	55.22	115	68	52.17	1.25
10/10/2022 8:37:15.4 AM	28	11	55.22	120	68	56.66	0.79
10/10/2022 8:38:15.4 AM	15	11	55.54	110	68	58.18	1.00
10/10/2022 8:39:15.4 AM	15	5	57.58	120	68	56.66	0.75
10/10/2022 8:40:15.4 AM	21	14	66.67	122	82	58.82	0.91
10/10/2022 8:41:15.4 AM	25	11	44.88	121	83	52.87	0.85
10/10/2022 8:42:15.4 AM	18	17	58.67	120	64	53.33	0.86
10/10/2022 8:43:15.4 AM	28	18	58.00	110	55	51.58	0.87



SIGNAL PERFORMANCE MEASURES

Casa Grande, AZ – Adaptive Case Study

Eastbound

Coordination

Friday 10/07/22				Saturday 10/08/22				Sunday 10/09/22				Monday 10/10/22			
KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	37.5%	AoG	25.0%	36.8%	28.1%	AoG	28.9%	27.9%	25.8%	AoG	18.3%	34.6%	35.5%
PR	no data	no data	52.1%	PR	25.3%	47.9%	31.8%	PR	26.1%	29.4%	28.8%	PR	16.1%	44.6%	43.2%

Adaptive

Friday 10/14/22				Saturday 10/15/22				Sunday 10/16/22				Monday 10/17/22			
KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	55.4%	AoG	31.6%	58.1%	63.4%	AoG	40.4%	50.0%	58.3%	AoG	31.5%	48.1%	54.1%
PR	no data	no data	76.0%	PR	41.4%	74.7%	76.3%	PR	38.2%	77.4%	86.5%	PR	57.1%	79.2%	63.9%

Change

KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	47.7% ↑	AoG	26.4% ↑	57.9% ↑	125% ↑	AoG	39.8% ↑	72.2% ↑	126% ↑	AoG	72.1% ↑	39.0% ↑	52.4% ↑
PR	no data	no data	45.9% ↑	PR	63.6% ↑	55.9% ↑	140% ↑	PR	46.3% ↑	163% ↑	200% ↑	PR	255% ↑	77.6% ↑	47.9% ↑

Avg. AoG Performance Improvement: 65.85% ↑

Avg. GT Efficiency Improvement: 109.52% ↑

SIGNAL PERFORMANCE MEASURES

Casa Grande, AZ – Adaptive Case Study

Westbound

Coordination

Friday 10/07/22				Saturday 10/08/22				Sunday 10/09/22				Monday 10/10/22			
KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	54.6%	AoG	30.0%	62.4%	45.5%	AoG	29.4%	43.3%	40.0%	AoG	32.2%	54.0%	60.3%
PR	no data	no data	73.3%	PR	33.7%	74.4%	59.4%	PR	26.4%	51.3%	49.2%	PR	35.8%	76.2%	78.2%

Adaptive

Friday 10/14/22				Saturday 10/15/22				Sunday 10/16/22				Monday 10/17/22			
KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	78.7%	AoG	51.1%	74.2%	71.1%	AoG	46.6%	53.4%	53.9%	AoG	45.2%	63.4%	72.4%
PR	no data	no data	91.9%	PR	61.3%	86.1%	80.2%	PR	47.7%	87.1%	80.2%	PR	79.3%	94.0%	87.1%

Change

KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM	KPI	AM	MD	PM
AoG	no data	no data	44.1% ↑	AoG	70.3% ↑	18.9% ↑	56.3% ↑	AoG	58.5% ↑	23.3% ↑	34.7% ↑	AoG	40.4% ↑	17.4% ↑	20.0% ↑
PR	no data	no data	25.4% ↑	PR	81.9% ↑	15.7% ↑	35.0% ↑	PR	80.7% ↑	69.8% ↑	63.0% ↑	PR	121% ↑	23.3% ↑	11.4% ↑

Avg. AoG Performance Improvement: 38.39% ↑

Avg. GT Efficiency Improvement: 52.72% ↑

SIGNAL PERFORMANCE MEASURES

SPA Dashboards

Intersection Signal Performance



Intersection Signal Performance

