

# December 2017

## Monthly Operations Report



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# INTRODUCTION

Pursuant to Schedule 6, Section 1.8.2(a) of the Concession Agreement, Plenary Roads Denver (“PRD”) is required to submit a monthly report covering all essential statistics related to the Managed Lanes. The following data covers the month of December 2017. Operationally, December was a positive month. Several routine maintenance tasks were completed, there were minimal incidents to maintained elements, and traffic volumes were consistent with expectations.

## 1.0 VOLUMES AND LANE USAGE

Over the last several months as more commuters use the transponders for either ExpressToll™ (AVI) or HOV travel, License Plate (LPT) transactions have consistently decreased as a percentage of total traffic volume. The total monthly gantry traffic volume for December 2017 in the I-25 Central and US 36 Managed Lanes was 240,178 and 1,058,146, respectively.

The table below provides the monthly summary for each Managed Lanes roadway, along with a detailed breakdown of weekday volumes. For reference, the AM Peak Period is considered to be weekdays from 6:45 am – 8:45 am. The PM Peak Period is considered to be, weekdays, from 4:15pm – 5:45pm. It should be noted, that the I-25 Managed Lane traffic reflects traffic counts from a single gantry and US 36 Managed Lane counts reflect fourteen gantries, seven gantries in each direction. Therefore, US 36 data will indicate far greater traffic counts that are not comparative to those of I-25.

The following charts depict the distribution of traffic by type (Figure 1) and the daily traffic counts (Figure 2) and for the month.

Traffic Summary (US 36)						
	AVI	LPT	HOV	Non-Rev & Hybrid	Total	Hybrid
<b>Total Monthly Traffic</b>	590,032	251,424	175,391	41,299	1,058,146	5,446
<b>Maximum Weekday Traffic</b>	35,944	14,449	7,321	2,148	59,725	330
<b>Average Weekday Traffic</b>	26,807	10,631	6,085	1,878	45,401	238
<b>Average Hourly AM Peak Traffic</b>	3,677	1,177	594	233	5,681	N/A
<b>Average Hourly PM Peak Traffic</b>	4,494	1,697	877	242	7,310	N/A

Traffic Summary (I-25C)						
	AVI	LPT	HOV	Non-Rev & Hybrid	Total	Hybrid
<b>Total Monthly Traffic</b>	110,292	74,875	42,497	12,514	240,178	1,563
<b>Maximum Weekday Traffic</b>	6,681	3,888	1,978	664	13,099	101
<b>Average Weekday Traffic</b>	5,066	3,360	1,645	569	10,071	73
<b>Average Hourly AM Peak Traffic</b>	709	490	225	75	1,424	N/A
<b>Average Hourly PM Peak Traffic</b>	640	386	209	83	1,235	N/A

Table 1 – Monthly Traffic Summaries

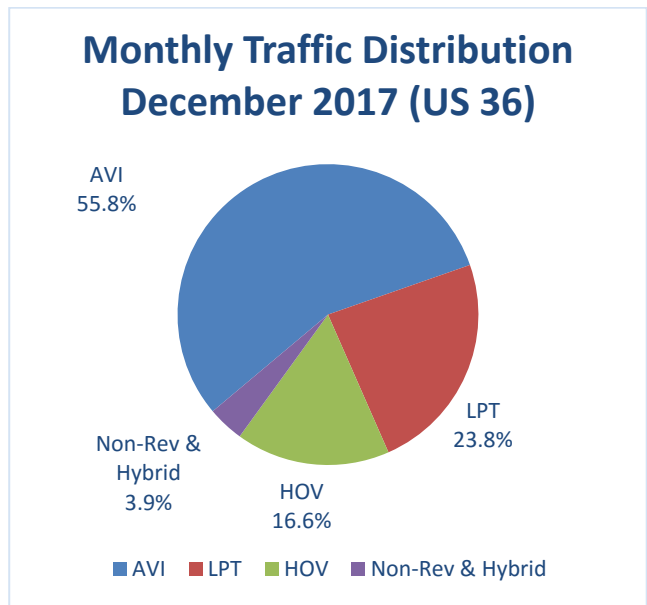
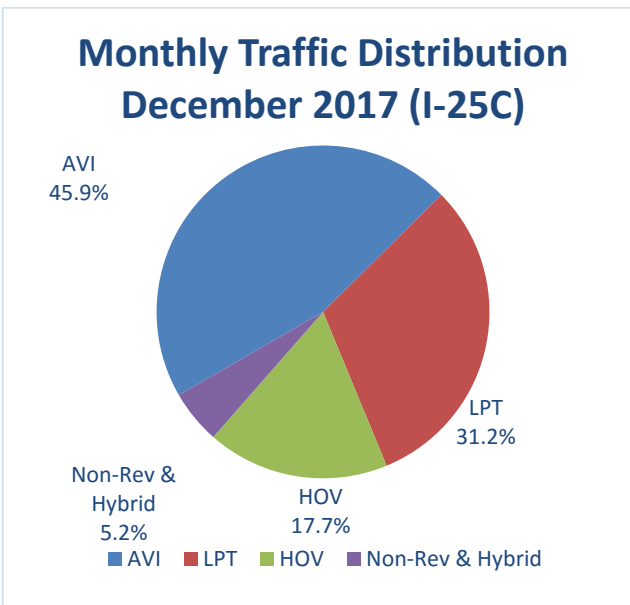
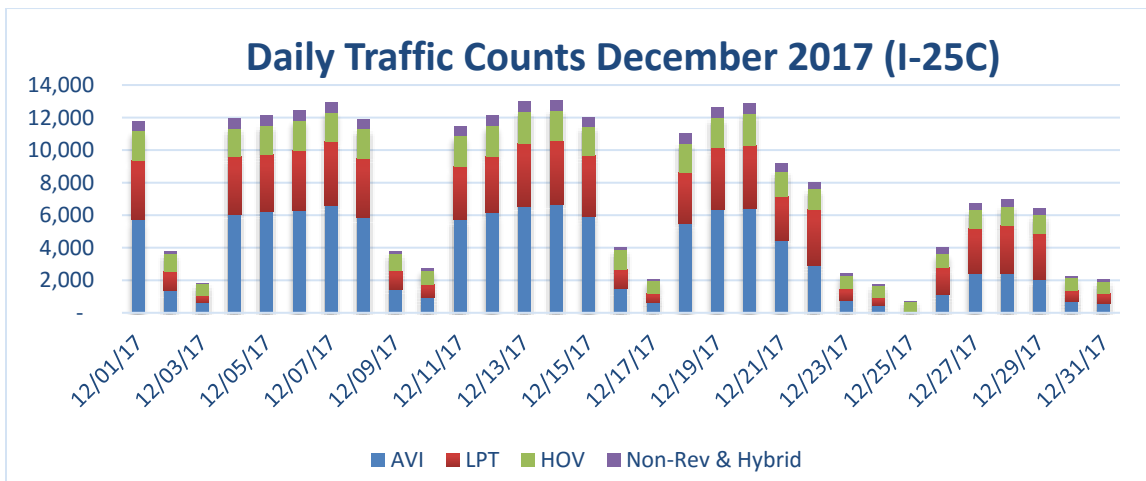


Figure 1 – Monthly Traffic Distribution



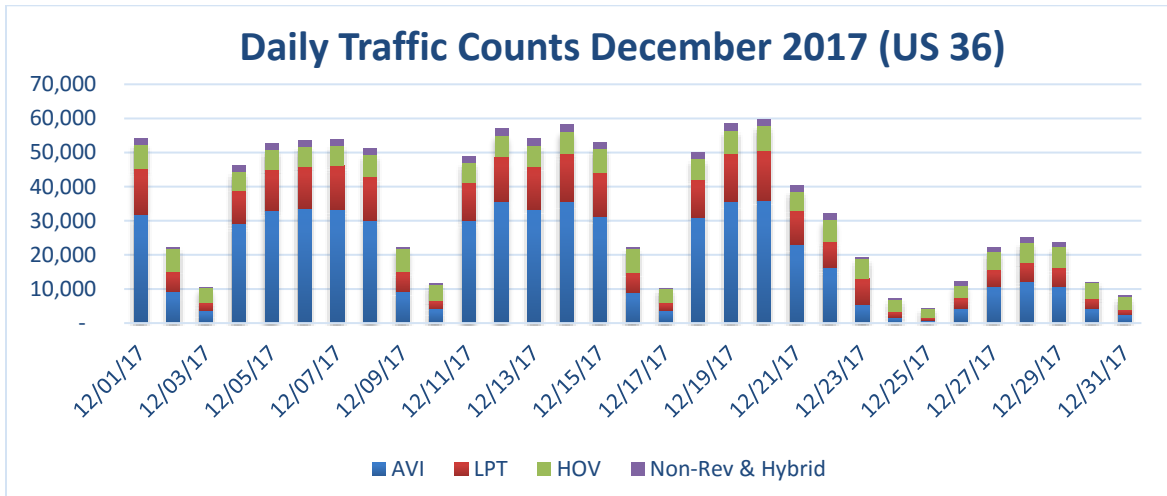


Figure 2 – Daily Traffic Counts

## 2.0 REVENUES

During the month of December 2017, PRD collected \$618,476 and \$584,948 from users of the I-25 Central and US36 Managed Lanes, respectively. For purposes of this report, revenues are recognized at the time of collection, which is typically sometime after they have been incurred for those customers who are billed based on their license plate. For example, if a single-occupant vehicle uses the lanes in October but pays in January, the associated revenue is attributed to January.

## 3.0 OPERATIONAL INCIDENTS, ISSUES, AND CLOSURES

The project had numerous routine debris removals, lighting incidents, guardrail incidents, sign incidents, and graffiti control during the month. The routine lighting, guardrail, roadway markings and sign incidents are all planned for repair within the allowable response period and several previously identified lighting incidents were repaired. All incidents were responded to and rectified within the allowable timeframes.

Date	Start	Stop	Duration
July 7, 2017	16:45	17:00	0:15
August 2, 2017	07:34	08:22	0:48
August 3, 2017	16:23	17:05	0:42
August 4, 2017	07:23	07:45	0:22
August 9, 2017	08:45	09:43	0:58
August 11, 2017	07:12	07:45	0:33
August 30, 2017	18:00	19:00	1:00

September 6, 2017	16:13	17:04	0:51
September 8, 2017	08:25	09:15	0:50
September 11, 2017	11:00	12:23	1:23
September 15, 2017	18:19	19:24	1:05
September 29, 2017	15:44	16:40	0:56
October 4, 2017	07:34	08:06	0:32
October 12, 2017	15:19	15:42	0:22
October 20, 2017	14:15	15:06	0:51
October 23, 2017	18:03	18:46	0:43
November 23, 2017	14:47	15:44	0:57
November 29, 2017	16:10	16:37	0:27
December 8, 2017	17:08	18:31	1:23
December 12, 2017	17:33	17:55	0:22
December 14, 2017	08:52	10:15	1:23
December 19, 2017	17:49	19:19	1:30
<b>Total</b>			<b>18 hours 13 minutes</b>
Remaining Closure Hours Available (Ref: CA 29.7)			0 hours 0 minutes

Table 2 – Managed Lanes Closures to Date

The table below provides a listing of ETCS items recorded this month, consistent with Appendix 6-2 of Schedule 6.

Element ID	Cat	Element	Performance Item	PRD Notified	Contractual Cure Period	Cure Achieved
None						

Table 3 – ETCS Issues per CA Schedule 6 Appendix 6-2

The table below provides a status of all Noncompliance categories in accordance with paragraph 1.2 of Schedule 10.

Non-compliance Location	Nature	Cause	Cure Date	Uncured Non-compliance Point	Unexpired Non-compliance Point	365 Day Expiration Date	1095 Day Expiration Date

Promenade West Toll Point	Incorrect toll schedule	Incorrect Toll Schedule was applied during a software update on 3/7/16	3/16/16 (Period II) Customer Accounts Corrected	0	3	3/16/17	3/16/19
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Table 4 – Status of Noncompliance Categories

#### 4.0 MEAN TIME BETWEEN FAILURE (MTBF) AND MEAN TIME TO REPAIR (MTTR)

Mean Time Between Failure (MTBF) and Mean Time To Repair (MTTR) data is provided in the table below. Only Maintained Elements that were repaired during the reporting period and had a failure type breakdown are listed in the table. We consider a breakdown to be a failure when the element cannot be used for its intended purpose until repaired.

Maintained Element	Mean Time Between Failure (MTBF) (Hours)	Mean Time To Repair (MTTR) (Hours)
None	N/A	N/A

Table 5 – Mean Time Between Failure & Mean Time To Repair

#### 5.0 HYBRID UTILIZATION

Total Hybrid Trips	
I-25 Central	1,563
US 36	5,446

Table 6 – Hybrid Utilization

Fuel-efficient “Hybrid” vehicles are permitted to access the Express Lanes free of charge, regardless of occupant numbers, provided that they have obtained a permit from CDOT, obtained a Hybrid transponder from E-470, and display an E-470 Hybrid decal on the vehicle’s windshield.

OPERATIONS AND  
MAINTENANCE  
MONTHLY REPORT  
DECEMBER 2017

US 36 and I-25 Express  
Lanes Project

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OPERATIONS AND MAINTENANCE – MONTHLY REPORT  
DECEMBER 2017  
*US 36 and I-25 Express Lanes Project*

Revision	Date	Approved
Rev. 0	01/08/2018	

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The information and analyses contained herein have been completed to a level of detail commensurate with the objectives of the assignment and in light of the information made available to Broadspectrum at the time of preparation. This report and its supporting documentation have been reviewed and/or checked for conformance with industry-accepted norms. To the best of the information and belief of Broadspectrum, the information presented in this report is accurate to within the limitations specified herein.

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The O&M Monthly Report contains all relevant information for the month of December 2017. Broadspectrum continues ongoing and preventive maintenance activities for the I-25 and US36 Managed Lanes Project.

## Broadspectrum's Commitment to Safety

Broadspectrum conducted weekly toolbox talk meetings during the month. The purpose of the tool box talks is to cover important safety items that relate to the project such as near misses, "better ways" as to how safety is conducted for the Project, and discussion on safety procedures for maintenance activities. In addition to the toolbox talks, Broadspectrum conducts a weekly progress meeting. This is a forum for feedback from staff on Operations, Incident Response, and Maintenance activities.

Toolbox Talks this month included:

- Knife Safety
- Hand Safety
- Equipment Safety
- Litter Collection – Best Practices
- Electrical Line Safety

## A. Summary of the Planned Maintenance Activities for the Upcoming Month – January 2018

Broadspectrum has identified the upcoming planned maintenance activities as described in Table 1.7.1.3 of The Maintenance Management Plan. These activities include preventative and routine maintenance in order to successfully operate and maintain the Project. A listing of the planned maintenance activities for the month of January 2018 is included below.

Fig. A-1 Planned Maintenance Activities for January 2018

X – Indicates the day the task is planned.

Performance Standard Identification Number (Table 6.1)	Work Activity-Description	Frequency	Jan-18																														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
			M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W
ML-1	MAINTENANCE PATROL	Daily		X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X
ML-2	DRAINAGE (PIPE/CULVERT) OBSERVE / CLEAN / RPR	F-12				X						X								X							X						
ML-5.1	GUARDRAIL, SAFETY BARRIER					X					X																						
ML 5.2	IMPACT ATTENUATORS																										X						
ML-6	SIGN CLEANING	F-1								X																							
ML-6	SIGN OBSERVATION / REPAIR	F-52			X							X								X							X						X
ML-8	STREET LIGHTING OBSERVATION / REPAIR	F-52			X																												
ML-12	GRAFFITI OBSERVATION / REMOVAL	F-52								X							X							X							X		
ML-14	MECHANICAL ROAD SWEEPING	F-12															X	X	X														
ML-14	LITTER OBSERVATION / REMOVAL	Daily		X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X
	REVERSIBLE LANE OPERATIONS	Daily		X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X	X			X	X	X
	GATE MAINTENANCE & REPAIR									X							X							X							X		

Frequency of Activity:

- Daily – Daily Activity
- F-4 – Quarterly Activity
- F-52 – Weekly Activity
- F-2 – Semi-Annual Activity
- F-12 – Monthly Activity
- F-1 – Annual Activity

## B. Summary of Performed and Completed Maintenance Activities

Fig. B-1 Performed and Complete Maintenance Activities for December 2017,

X Indicates the day of the month that the task was completed.

Performance Standard Identification Number (Table 6.1)	Work Activity-Description	Frequency	Dec-17																														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
			F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
ML-1	MAINTENANCE PATROL	Daily	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X	X					X	X	X		
ML-1	FLEXIBLE PAVEMENT OBSERVATION / REPAIR	F-52							X					X									X										
ML-1	RIGID PAVEMENT OBSERVATION / REPAIR	F-52							X					X									X								X		
ML-4	DELINEATORS & MARKERS OBSERVE / CLEAN / REPAIR	F-12					X						X																				
ML-2	DRAINAGE (INLET) OBSERVE/ CLEAN / REPAIR	F-12						X						X																			
ML-6	SIGN OBSERVATION / REPAIR	F-52				X							X							X									X				
ML-8	STREET LIGHTING OBSERVATION / REPAIR	F-52					X						X									X							X				
ML-8	ELECTRICAL SUPPLY INSPECTION / REPAIR	F-12							X																								
ML-8	ACCESS PANEL OBSERVATION / REPAIR	F-12							X																								
ML-10	HERBICIDE & WEED CONTROL MAINTENANCE	F-52						X						X									X							X			
ML-12	GRAFFITI OBSERVATION / REMOVAL	F-52				X							X							X									X				
ML-14	MECHANICAL ROAD SWEEPING	F-12																		X	X	X											
ML-14	LITTER OBSERVATION / REMOVAL	Daily	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X						X	X	X		
	REVERSIBLE LANE OPERATIONS	Daily	X			X	X	X	X	X			X	X	X	X	X			X	X	X	X					X	X	X	X		

Fig. B-2 Work Accomplished This Month

Activity	Actual Work
153 Concrete Pavement Surface Rpr (YD2)	1.5
202 Clean Drainage Structures (EA)	73
216 Fence Maint (LF)	1,150
218 Debris in Roadway (HR)	2
218 Litter Barrel Trash Cleanup (YD3)	38.5
220 Sweeping (Mech) (MI)	108
222 Sweeping - Hand (HR)	14
301 Misc Sign Maint (EA)	13
304 Del Post Maint (EA)	105
307 Directional Gate Maint (EA)	1
314 Reversible Lane Ops (HR)	162
329 Courtesy Assistance (HR)	409.5
402 Snow Plowing & Materials (MI)	660
540 Graffiti Removal (SF)	368
601 Incident Management (HR)	21

### C. Summary of Planned Maintenance that was Not Completed for the Month

Broadspectrum completed all scheduled maintenance activities for the period of December, 2017. Frequencies and/or actual date of the month of some activities may have been adjusted based on actual conditions.

### D. Summary of the Maintenance Activities and Results Performed for the Month Beyond Planned Maintenance

A summary of unplanned maintenance activities provided below:

Snow and Ice Control:

Precipitation Event Start		Equipment Deployed		Precipitation Event End		Service Level "A" Achieved in ML		Service Level "B" Achieved in GP	
12/14/2017	00:45	12/14/2017	23:30	12/14/2017	07:50	12/14/2017	06:10	12/14/2017	06:10
12/21/2017	03:30	12/21/2017	03:05	12/21/2017	14:46	12/21/2017	12:23	12/21/2017	14:45
12/23/2017	18:05	12/23/2017	16:40	12/24/2017	04:10	12/24/2017	10:50	12/24/2017	09:40

Courtesy Patrol: None

Hazardous Materials Incidents: None

## E. Operating Contractor's Incident Response Logs Related to Maintenance Activities

This section provides a summary of Broadspectrum's performance related to the Performance and Measurement Criteria listed in Appendix 6-1.1 of the Operating Contract.

The table below provides a listing of items recorded this month:

Element Category	Description	Location	BRS Notified	Response to Defects		
				Category 1		Category 2
				Hazard Mitigation	Permanent Remedy	Permanent Repair
GP 5.2	Attenuator (Impact Damage)	US36 MP 54.64 EB	9/18/2017 23:50:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
GP5.1	Guardrail (Impact Damage)	US36 MP 39.55 EB	11/20/2017 22:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
GP12.1	Graffiti (Removed Graffiti from Back of Sign)	US36 MP 51.80 WB	11/29/2017 13:30:00	N/A	Reqd: 10 Days Respnd: 12/6/2017 07:00 Actual: 6.72 Days	N/A
ML 8.1	Lighting (West Bulb Out)	040-U36-LHT-0240, MP 56.78	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (All Bulbs Out)	040-I25-LHT-0050, MP 214.73	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North Bulb Out)	040-U36-LHT-0220, MP 56.66	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North & South Bulb Out)	040-U36-LHT-0130, MP 56.11	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North Bulb Out)	040-I25-LHT-0030, MP 214.62	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North Bulb Out)	040-U36-LHT-0010, MP 55.41	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (West Bulb Out)	040-U36-LHT-0250, MP 56.84	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North Bulb Out)	040-I25-LHT-0100, MP 215.02	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
ML 8.1	Lighting (North Bulb Out)	040-U36-LHT-0200, MP 56.53	11/30/2017 10:00:00	N/A	N/A	Reqd: 6 Months Respnd: -- Actual: In Progress
GP13.1	Incident Response (Cleared Debris, Placed Cones)	US36 MP 51.4 WB	12/3/2017 22:54:00	Reqd: 1 Hours Respnd: 12/3/2017 23:27 Actual: 0.54 Hours	N/A	N/A
GP9.2	Fence (Repaired Fence)	US36 MP 51.40 WB	12/3/2017 22:54:00	N/A	N/A	Reqd: 6 Months Respnd: 12/27/2017 19:00 Actual: 0.79 Months
GP12.1	Graffiti (Removed Graffiti From Sign)	US36 MP 57.24 WB	12/4/2017 20:30:00	N/A	Reqd: 10 Days Respnd: 12/4/2017 21:00 Actual: 0.02 Days	N/A
GP12.1	Graffiti (Removed Graffiti From Sign)	US36 MP 57.18 WB	12/4/2017 16:00:00	N/A	Reqd: 10 Days Respnd: 12/5/2017 07:00 Actual: 0.62 Days	N/A
GP12.1	Graffiti (Removed Graffiti From Sign)	US36 MP 54.87 WB	12/4/2017 18:30:00	N/A	Reqd: 10 Days Respnd: 12/4/2017 19:00 Actual: 0.02 Days	N/A
GP12.1	Graffiti (Removed Graffiti From Barrier)	US36 MP 57.72 WB	12/4/2017 19:30:00	N/A	Reqd: 10 Days Respnd: 12/4/2017 19:40 Actual: 0.00 Days	N/A
GP1.1	Debris (Cleared Sheet Metal from Lanes)	US36 MP 51.20 WB	12/5/2017 16:35:00	Reqd: 1 Hours Respnd: 12/5/2017 16:54 Actual: 0.31 Hours	N/A	N/A

Element Category	Description	Location	BRS Notified	Response to Defects		
				Category 1		Category 2
				Hazard Mitigation	Permanent Remedy	Permanent Repair
ML5.1	Barrier (Impact Damage)	US36 MP 41.20	12/5/2017 15:10:00	N/A	N/A	Reqd: 6 Months Resp: -- Actual: In Progress
ML13.1	Incident Response (Cleared Debris, Placed Cones)	US36 MP 40.2	12/5/2017 15:10:00	Reqd: 1 Hours Resp: 12/5/2017 16:22 Actual: 0.85 Hours	N/A	N/A
GP1.1	Debris (Cleared Glass from Lanes)	US36 MP 52.30 EB	12/6/2017 14:13:00	Reqd: 1 Hours Resp: 12/6/2017 14:45 Actual: 0.53 Hours	N/A	N/A
GP1.1	Debris (Cleared Ladder from Lanes)	US36 MP 52.65 WB	12/6/2017 01:55:00	Reqd: 1 Hours Resp: 12/6/2017 02:20 Actual: 0.41 Hours	N/A	N/A
GP1.1	Debris (Cleared Truck Bed Liner from Lanes)	US36 MP 46.80 EB	12/7/2017 16:08:00	Reqd: 1 Hours Resp: 12/7/2017 16:31 Actual: 0.38 Hours	N/A	N/A
GP1.1	Debris (Cleared Ladder from Lanes)	US36 MP 57.30 WB	12/10/2017 14:58:00	Reqd: 1 Hours Resp: 12/10/2017 15:25 Actual: 0.44 Hours	N/A	N/A
GP13.1	Incident Response (Cleared Debris, Placed Cones)	US36 MP 41.50	12/12/2017 19:33:00	Reqd: 24 Hours Resp: 12/12/2017 20:11 Actual: 0.63 Hours	N/A	N/A
GP1.1	Debris (Debris Reported, Nothing Found)	US36 MP 42.10 EB	12/17/2017 14:08:00	Reqd: 1 Hours Resp: 12/17/2017 15:01 Actual: 0.88 Hours	N/A	N/A
GP9.2	Fence (Repaired Fence)	US36 MP 49.60 WB	12/18/2017 13:25:00	N/A	N/A	Reqd: 6 Months Resp: 12/18/2017 22:30 Actual: 0.01 Months
GP9.2	Fence (Repaired Fence)	US36 MP 43.80 WB	12/18/2017 15:10:00	N/A	N/A	Reqd: 6 Months Resp: 12/18/2017 18:30 Actual: 0.00 Months
ML5.1	Guardrail (Impact Damage)	US36 MP 47.20 EB	12/20/2017 11:05:00	N/A	N/A	Reqd: 6 Months Resp: -- Actual: In Progress
ML13.1	Incident Response (Cleared Debris, Placed Cones)	US36 MP 47.20	12/21/2017 05:05:00	Reqd: 24 Hours Resp: 12/21/2017 05:32 Actual: 0.45 Hours	N/A	N/A
GP 8.1	Lighting (Impact Damage)	040-U36-LHT-026, MP 39.30	12/31/2017 12:45:00	N/A	N/A	Reqd: 6 Months Resp: -- Actual: In Progress

All items were completed within the required response time. Items that are *In Progress* are still within the allowed response time.

## F. Detailed Results of All Inspections, Assessments, and Testing Activities

During this reporting period there were no special inspections, assessments, or testing results outside normal operating condition.

## G. Monthly Toll System Performance Reports

Toll system operated within proposed parameters per Broadspectrum's observations.

## H. Preventative Maintenance Plan and Progress

Preventative Maintenance work is contingent on Initial Works Package implementation.

## I, J. Mean Time between Failure (MTBF), Mean Time To Repair (MTTR)

No Maintained Elements experienced a failure type breakdown this month. Broadspectrum considers a breakdown to be a failure when the element cannot be used for its intended purpose until repaired.