d) ISATe Outputs

Northbound: AM Peak Period, Existing Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		74.1	0.2	0.6	4.3	20.4	48.7
Estimated average crash freq. during Study Period, crashes/yr:		74.1	0.2	0.6	4.3	20.4	48.7
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	53.9	0.1	0.4	2.8	13.9	36.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	74.1	0.2	0.6	4.3	20.4	48.7
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2028						
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	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.3	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.8	0.0	0.1	0.5	2.0	3.3
	Rear-end crashes:	40.1	0.1	0.3	2.4	11.5	25.7
	Sideswipe crashes:	11.8	0.0	0.1	0.4	2.1	9.2
	Other multiple-vehicle crashes:	1.3	0.0	0.0	0.1	0.4	0.9
	Total multiple-vehicle crashes:	59.4	0.1	0.5	3.4	16.1	39.3
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	10.7	0.0	0.1	0.6	3.1	6.8
	Crashes with other object:	1.5	0.0	0.0	0.0	0.2	1.2
	Crashes with parked vehicle:	0.2	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	2.2	0.0	0.0	0.2	1.0	1.0
	Total single-vehicle crashes:	14.8	0.0	0.1	0.9	4.3	9.4
	Total crashes:	74.1	0.2	0.6	4.3	20.4	48.7

Northbound: PM Peak Period, Existing Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	98.3	0.2	0.8	5.3	25.6	66.4
Estimated average crash freq. during Study Period, crashes/yr:	98.3	0.2	0.8	5.3	25.6	66.4

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	78.0	0.2	0.5	3.8	19.1	54.4
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	98.3	0.2	0.8	5.3	25.6	66.4
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.3	0.0	0.1	0.5	2.1	3.6
	Rear-end crashes:	56.0	0.1	0.4	3.1	14.8	37.5
	Sideswipe crashes:	17.3	0.0	0.1	0.6	2.9	13.8
	Other multiple-vehicle crashes:	1.9	0.0	0.0	0.1	0.5	1.3
	Total multiple-vehicle crashes:	81.9	0.2	0.6	4.3	20.5	56.4
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	11.8	0.0	0.1	0.7	3.6	7.3
	Crashes with other object:	1.6	0.0	0.0	0.1	0.2	1.3
	Crashes with parked vehicle:	0.3	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	2.5	0.0	0.0	0.2	1.1	1.1
	Total single-vehicle crashes:	16.4	0.0	0.2	1.0	5.1	10.1
	Total crashes:	98.3	0.2	0.8	5.3	25.6	66.4

Northbound: OFF Peak Period, Existing Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	31.7	0.1	0.3	2.3	10.3	18.8
Estimated average crash freq. during Study Period, crashes/yr:	31.7	0.1	0.3	2.3	10.3	18.8

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	11.4	0.0	0.1	0.8	3.8	6.8
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	31.7	0.1	0.3	2.3	10.3	18.8
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.2	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.1	0.0	0.1	0.4	1.8	2.8
	Rear-end crashes:	15.7	0.0	0.2	1.2	5.5	8.8
	Sideswipe crashes:	3.4	0.0	0.0	0.1	0.6	2.6
	Other multiple-vehicle crashes:	0.5	0.0	0.0	0.0	0.1	0.3
	Total multiple-vehicle crashes:	24.9	0.0	0.3	1.8	8.0	14.7
Single vehicle	Crashes with animal:	0.1	0.0	0.0	0.0	0.0	0.1
	Crashes with fixed object:	5.0	0.0	0.0	0.3	1.6	3.0
	Crashes with other object:	0.6	0.0	0.0	0.0	0.1	0.5
	Crashes with parked vehicle:	0.1	0.0	0.0	0.0	0.0	0.1
	Other single-vehicle crashes	1.1	0.0	0.0	0.1	0.5	0.4
	Total single-vehicle crashes:	6.8	0.0	0.1	0.5	2.2	4.1
	Total crashes:	31.7	0.1	0.3	2.3	10.3	18.8

Northbound: AM Peak Period, Proposed Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	74.0	0.2	0.7	5.1	23.5	44.5
Estimated average crash freq. during Study Period, crashes/yr:	74.0	0.2	0.7	5.1	23.5	44.5

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	53.7	0.2	0.5	3.6	17.0	32.5
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	74.0	0.2	0.7	5.1	23.5	44.5
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.3	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.7	0.0	0.1	0.5	2.0	3.2
	Rear-end crashes:	36.4	0.1	0.3	2.4	11.0	22.6
	Sideswipe crashes:	10.5	0.0	0.1	0.4	2.0	8.0
	Other multiple-vehicle crashes:	1.2	0.0	0.0	0.1	0.3	0.8
	Total multiple-vehicle crashes:	54.1	0.1	0.5	3.4	15.4	34.7
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	14.3	0.1	0.2	1.2	5.8	7.1
	Crashes with other object:	1.8	0.0	0.0	0.1	0.4	1.3
	Crashes with parked vehicle:	0.3	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	3.2	0.0	0.1	0.4	1.7	1.0
	Total single-vehicle crashes:	19.9	0.1	0.2	1.7	8.0	9.8
	Total crashes:	74.0	0.2	0.7	5.1	23.5	44.5

Northbound: PM Peak Period, Proposed Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information					
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description				
Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		97.4	0.3	0.9	6.2	29.0	61.0
Estimated average crash freq. during Study Period, crashes/yr:		97.4	0.3	0.9	6.2	29.0	61.0
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	77.1	0.3	0.6	4.7	22.5	48.9
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	97.4	0.3	0.9	6.2	29.0	61.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.2	0.0	0.1	0.5	2.1	3.5
	Rear-end crashes:	50.3	0.1	0.4	3.1	14.1	32.6
	Sideswipe crashes:	15.2	0.0	0.1	0.6	2.7	11.9
	Other multiple-vehicle crashes:	1.7	0.0	0.0	0.1	0.5	1.1
	Total multiple-vehicle crashes:	73.8	0.2	0.6	4.2	19.6	49.2
Single vehicle	Crashes with animal:	0.3	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	17.0	0.1	0.2	1.4	6.7	8.6
	Crashes with other object:	2.1	0.0	0.0	0.1	0.5	1.5
	Crashes with parked vehicle:	0.4	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	3.8	0.0	0.1	0.4	2.0	1.3
	Total single-vehicle crashes:	23.6	0.1	0.3	2.0	9.4	11.8
	Total crashes:	97.4	0.3	0.9	6.2	29.0	61.0

Northbound: OFF Peak Period, Proposed Conditions, Existing Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	31.5	0.1	0.3	2.3	10.2	18.7
Estimated average crash freq. during Study Period, crashes/yr:	31.5	0.1	0.3	2.3	10.2	18.7

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	11.2	0.0	0.1	0.8	3.7	6.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	31.5	0.1	0.3	2.3	10.2	18.7
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.2	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.1	0.0	0.1	0.4	1.8	2.8
	Rear-end crashes:	15.7	0.0	0.2	1.2	5.5	8.8
	Sideswipe crashes:	3.4	0.0	0.0	0.1	0.6	2.6
	Other multiple-vehicle crashes:	0.5	0.0	0.0	0.0	0.1	0.3
	Total multiple-vehicle crashes:	24.8	0.0	0.3	1.8	8.1	14.7
Single vehicle	Crashes with animal:	0.1	0.0	0.0	0.0	0.0	0.1
	Crashes with fixed object:	4.9	0.0	0.0	0.3	1.5	3.0
	Crashes with other object:	0.6	0.0	0.0	0.0	0.1	0.4
	Crashes with parked vehicle:	0.1	0.0	0.0	0.0	0.0	0.1
	Other single-vehicle crashes	1.1	0.0	0.0	0.1	0.5	0.4
	Total single-vehicle crashes:	6.7	0.0	0.1	0.5	2.1	4.0
	Total crashes:	31.5	0.1	0.3	2.3	10.2	18.7

Northbound: AM Peak Period, Existing Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	81.0	0.2	0.7	4.6	21.8	53.7
Estimated average crash freq. during Study Period, crashes/yr:	81.0	0.2	0.7	4.6	21.8	53.7

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	60.7	0.2	0.4	3.1	15.3	41.7
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	81.0	0.2	0.7	4.6	21.8	53.7
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.3	0.0	0.0	0.0	0.2	0.1
	Right-angle crashes:	6.0	0.0	0.1	0.5	2.1	3.4
	Rear-end crashes:	44.2	0.1	0.4	2.6	12.4	28.8
	Sideswipe crashes:	13.3	0.0	0.1	0.5	2.3	10.4
	Other multiple-vehicle crashes:	1.5	0.0	0.0	0.1	0.4	1.0
	Total multiple-vehicle crashes:	65.3	0.1	0.5	3.6	17.3	43.7
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	11.3	0.0	0.1	0.7	3.2	7.3
	Crashes with other object:	1.6	0.0	0.0	0.0	0.2	1.3
	Crashes with parked vehicle:	0.3	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	2.3	0.0	0.0	0.2	1.0	1.1
	Total single-vehicle crashes:	15.7	0.0	0.1	0.9	4.5	10.0
	Total crashes:	81.0	0.2	0.7	4.6	21.8	53.7

Northbound: PM Peak Period, Existing Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	106.4	0.2	0.8	5.7	27.2	72.5
Estimated average crash freq. during Study Period, crashes/yr:	106.4	0.2	0.8	5.7	27.2	72.5

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	86.1	0.2	0.6	4.2	20.7	60.5
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	106.4	0.2	0.8	5.7	27.2	72.5
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.5	0.0	0.1	0.5	2.2	3.7
	Rear-end crashes:	61.1	0.1	0.5	3.3	15.8	41.4
	Sideswipe crashes:	19.1	0.0	0.1	0.6	3.1	15.3
	Other multiple-vehicle crashes:	2.1	0.0	0.0	0.1	0.5	1.4
	Total multiple-vehicle crashes:	89.2	0.2	0.6	4.6	21.9	62.0
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	12.4	0.0	0.1	0.8	3.8	7.7
	Crashes with other object:	1.7	0.0	0.0	0.1	0.3	1.4
	Crashes with parked vehicle:	0.3	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	2.6	0.0	0.0	0.2	1.2	1.1
	Total single-vehicle crashes:	17.2	0.1	0.2	1.1	5.3	10.6
Total crashes:		106.4	0.2	0.8	5.7	27.2	72.5

Northbound: OFF Peak Period, Existing Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	33.5	0.1	0.3	2.4	10.8	20.0
Estimated average crash freq. during Study Period, crashes/yr:	33.5	0.1	0.3	2.4	10.8	20.0

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	13.2	0.0	0.1	0.9	4.3	8.0
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	33.5	0.1	0.3	2.4	10.8	20.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
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	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.2	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.1	0.0	0.1	0.4	1.8	2.9
	Rear-end crashes:	16.6	0.0	0.2	1.3	5.7	9.4
	Sideswipe crashes:	3.7	0.0	0.0	0.1	0.7	2.9
	Other multiple-vehicle crashes:	0.5	0.0	0.0	0.0	0.1	0.3
	Total multiple-vehicle crashes:	26.2	0.0	0.3	1.9	8.4	15.6
Single vehicle	Crashes with animal:	0.1	0.0	0.0	0.0	0.0	0.1
	Crashes with fixed object:	5.3	0.0	0.1	0.4	1.7	3.3
	Crashes with other object:	0.6	0.0	0.0	0.0	0.1	0.5
	Crashes with parked vehicle:	0.1	0.0	0.0	0.0	0.0	0.1
	Other single-vehicle crashes	1.2	0.0	0.0	0.1	0.5	0.5
	Total single-vehicle crashes:	7.3	0.0	0.1	0.5	2.4	4.4
	Total crashes:	33.5	0.1	0.3	2.4	10.8	20.0

Northbound: AM Peak Period, Proposed Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	80.3	0.3	0.7	5.4	25.0	48.9
Estimated average crash freq. during Study Period, crashes/yr:	80.3	0.3	0.7	5.4	25.0	48.9

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	60.0	0.2	0.5	3.9	18.5	36.8
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	80.3	0.3	0.7	5.4	25.0	48.9
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
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	2033						
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	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.3	0.0	0.0	0.0	0.2	0.1
	Right-angle crashes:	5.8	0.0	0.1	0.5	2.0	3.3
	Rear-end crashes:	40.0	0.1	0.4	2.6	11.8	25.2
	Sideswipe crashes:	11.7	0.0	0.1	0.5	2.2	9.0
	Other multiple-vehicle crashes:	1.4	0.0	0.0	0.1	0.4	0.9
	Total multiple-vehicle crashes:	59.3	0.1	0.5	3.6	16.6	38.5
Single vehicle	Crashes with animal:	0.2	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	15.1	0.1	0.2	1.3	6.1	7.5
	Crashes with other object:	1.9	0.0	0.0	0.1	0.4	1.4
	Crashes with parked vehicle:	0.3	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	3.4	0.0	0.1	0.4	1.8	1.1
	Total single-vehicle crashes:	21.0	0.1	0.2	1.8	8.5	10.4
	Total crashes:	80.3	0.3	0.7	5.4	25.0	48.9

Northbound: PM Peak Period, Proposed Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/12/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	104.8	0.3	0.9	6.6	30.7	66.3
Estimated average crash freq. during Study Period, crashes/yr:	104.8	0.3	0.9	6.6	30.7	66.3

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	84.5	0.3	0.7	5.1	24.2	54.3
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	104.8	0.3	0.9	6.6	30.7	66.3
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
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	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.3	0.0	0.1	0.5	2.2	3.6
	Rear-end crashes:	54.7	0.1	0.4	3.3	15.1	35.8
	Sideswipe crashes:	16.8	0.0	0.1	0.6	2.9	13.1
	Other multiple-vehicle crashes:	1.9	0.0	0.0	0.1	0.5	1.2
	Total multiple-vehicle crashes:	80.1	0.2	0.6	4.5	20.9	53.8
Single vehicle	Crashes with animal:	0.3	0.0	0.0	0.0	0.0	0.2
	Crashes with fixed object:	17.8	0.1	0.2	1.5	7.0	9.0
	Crashes with other object:	2.3	0.0	0.0	0.1	0.5	1.6
	Crashes with parked vehicle:	0.4	0.0	0.0	0.0	0.1	0.2
	Other single-vehicle crashes	4.0	0.0	0.1	0.4	2.1	1.3
	Total single-vehicle crashes:	24.7	0.1	0.3	2.1	9.8	12.4
	Total crashes:	104.8	0.3	0.9	6.6	30.7	66.3

Northbound: OFF Peak Period, Proposed Conditions, 2040 Volumes, MD 187 to Montrose Rd

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	33.3	0.1	0.3	2.4	10.7	19.8
Estimated average crash freq. during Study Period, crashes/yr:	33.3	0.1	0.3	2.4	10.7	19.8

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	4	13.0	0.1	0.1	0.9	4.2	7.8
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	33.3	0.1	0.3	2.4	10.7	19.8
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.2	0.0	0.0	0.0	0.1	0.1
	Right-angle crashes:	5.1	0.0	0.1	0.4	1.8	2.9
	Rear-end crashes:	16.6	0.0	0.2	1.3	5.7	9.4
	Sideswipe crashes:	3.7	0.0	0.0	0.1	0.7	2.9
	Other multiple-vehicle crashes:	0.5	0.0	0.0	0.0	0.1	0.3
	Total multiple-vehicle crashes:	26.1	0.0	0.3	1.9	8.4	15.5
Single vehicle	Crashes with animal:	0.1	0.0	0.0	0.0	0.0	0.1
	Crashes with fixed object:	5.2	0.0	0.1	0.3	1.6	3.2
	Crashes with other object:	0.6	0.0	0.0	0.0	0.1	0.5
	Crashes with parked vehicle:	0.1	0.0	0.0	0.0	0.0	0.1
	Other single-vehicle crashes	1.1	0.0	0.0	0.1	0.5	0.5
	Total single-vehicle crashes:	7.2	0.0	0.1	0.5	2.2	4.3
	Total crashes:	33.3	0.1	0.3	2.4	10.7	19.8

Northbound: AM Peak Period, Existing Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		364.3	1.2	3.5	21.6	99.4	238.6
Estimated average crash freq. during Study Period, crashes/yr:		364.3	1.2	3.5	21.6	99.4	238.6
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	344.0	1.2	3.3	20.1	92.9	226.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	364.3	1.2	3.5	21.6	99.4	238.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2031						
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	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						
Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.1	0.0	0.0	0.1	0.6	0.4
	Right-angle crashes:	10.3	0.0	0.1	0.8	3.6	5.7
	Rear-end crashes:	185.2	0.6	1.9	11.5	52.9	118.3
	Sideswipe crashes:	59.2	0.1	0.4	2.7	12.2	43.8
	Other multiple-vehicle crashes:	6.5	0.0	0.1	0.4	2.0	4.0
	Total multiple-vehicle crashes:	262.4	0.8	2.5	15.6	71.4	172.1
Single vehicle	Crashes with animal:	1.6	0.0	0.0	0.0	0.1	1.4
	Crashes with fixed object:	73.5	0.2	0.7	4.4	20.2	48.0
	Crashes with other object:	11.0	0.0	0.1	0.3	1.5	9.1
	Crashes with parked vehicle:	1.5	0.0	0.0	0.1	0.4	1.0
	Other single-vehicle crashes	14.4	0.1	0.2	1.3	5.9	6.9
	Total single-vehicle crashes:	101.9	0.3	1.0	6.1	28.0	66.5
	Total crashes:	364.3	1.2	3.5	21.6	99.4	238.6

Northbound: PM Peak Period, Existing Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		913.9	2.6	7.6	46.5	214.1	643.1
Estimated average crash freq. during Study Period, crashes/yr:		913.9	2.6	7.6	46.5	214.1	643.1
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	893.6	2.6	7.4	45.0	207.6	631.1
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	913.9	2.6	7.6	46.5	214.1	643.1
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
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	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						
Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	2.8	0.0	0.0	0.3	1.4	1.1
	Right-angle crashes:	20.4	0.1	0.2	1.5	6.6	12.0
	Rear-end crashes:	523.4	1.6	4.5	27.6	127.1	362.6
	Sideswipe crashes:	175.6	0.4	1.1	6.6	30.2	137.4
	Other multiple-vehicle crashes:	18.7	0.1	0.2	1.1	5.0	12.4
	Total multiple-vehicle crashes:	740.9	2.1	6.1	37.0	170.2	525.6
Single vehicle	Crashes with animal:	2.7	0.0	0.0	0.0	0.1	2.5
	Crashes with fixed object:	124.6	0.4	1.1	6.8	31.6	84.7
	Crashes with other object:	19.2	0.0	0.1	0.5	2.3	16.3
	Crashes with parked vehicle:	2.5	0.0	0.0	0.1	0.6	1.7
	Other single-vehicle crashes	23.9	0.1	0.3	2.0	9.2	12.2
	Total single-vehicle crashes:	173.0	0.5	1.5	9.5	43.9	117.5
	Total crashes:	913.9	2.6	7.6	46.5	214.1	643.1

Northbound: OFF Peak Period, Existing Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		151.5	0.5	1.7	10.2	46.5	92.7
Estimated average crash freq. during Study Period, crashes/yr:		151.5	0.5	1.7	10.2	46.5	92.7
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	131.2	0.5	1.4	8.7	40.0	80.7
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	151.5	0.5	1.7	10.2	46.5	92.7
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						
Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.5	0.0	0.0	0.1	0.3	0.2
	Right-angle crashes:	6.6	0.0	0.1	0.5	2.4	3.6
	Rear-end crashes:	66.0	0.2	0.8	4.7	21.5	38.8
	Sideswipe crashes:	19.4	0.1	0.2	1.0	4.6	13.6
	Other multiple-vehicle crashes:	2.2	0.0	0.0	0.2	0.8	1.3
	Total multiple-vehicle crashes:	94.8	0.3	1.1	6.5	29.5	57.4
Single vehicle	Crashes with animal:	0.8	0.0	0.0	0.0	0.1	0.8
	Crashes with fixed object:	41.0	0.1	0.4	2.6	12.2	25.5
	Crashes with other object:	5.9	0.0	0.0	0.2	0.9	4.8
	Crashes with parked vehicle:	0.8	0.0	0.0	0.1	0.2	0.5
	Other single-vehicle crashes	8.2	0.0	0.1	0.8	3.6	3.7
	Total single-vehicle crashes:	56.8	0.2	0.6	3.7	17.0	35.3
	Total crashes:	151.5	0.5	1.7	10.2	46.5	92.7

Northbound: AM Peak Period, Proposed Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		340.4	1.4	3.3	21.5	94.6	219.5
Estimated average crash freq. during Study Period, crashes/yr:		340.4	1.4	3.3	21.5	94.6	219.5
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	320.1	1.4	3.1	20.0	88.2	207.4
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	340.4	1.4	3.3	21.5	94.6	219.5
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						
Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.1	0.0	0.0	0.1	0.6	0.4
	Right-angle crashes:	9.9	0.0	0.1	0.8	3.5	5.4
	Rear-end crashes:	173.2	0.8	1.8	11.5	50.4	108.8
	Sideswipe crashes:	55.0	0.2	0.4	2.6	11.6	40.2
	Other multiple-vehicle crashes:	6.1	0.0	0.1	0.4	1.9	3.7
	Total multiple-vehicle crashes:	245.4	1.0	2.4	15.5	68.0	158.5
Single vehicle	Crashes with animal:	1.4	0.0	0.0	0.0	0.1	1.3
	Crashes with fixed object:	68.5	0.3	0.7	4.3	19.2	44.0
	Crashes with other object:	10.1	0.0	0.0	0.3	1.4	8.4
	Crashes with parked vehicle:	1.4	0.0	0.0	0.1	0.4	0.9
	Other single-vehicle crashes	13.5	0.1	0.2	1.3	5.6	6.4
	Total single-vehicle crashes:	95.0	0.4	0.9	6.0	26.6	61.0
	Total crashes:	340.4	1.4	3.3	21.5	94.6	219.5

Northbound: PM Peak Period, Proposed Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				

Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		897.0	3.6	8.1	51.8	227.5	606.0
Estimated average crash freq. during Study Period, crashes/yr:		897.0	3.6	8.1	51.8	227.5	606.0
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	876.7	3.6	7.9	50.3	221.0	593.9
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	897.0	3.6	8.1	51.8	227.5	606.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
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	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	2.8	0.0	0.0	0.3	1.4	1.0
	Right-angle crashes:	19.7	0.1	0.2	1.5	6.7	11.2
	Rear-end crashes:	496.7	2.1	4.7	29.6	129.7	330.7
	Sideswipe crashes:	164.1	0.5	1.1	7.0	30.8	124.6
	Other multiple-vehicle crashes:	17.8	0.1	0.2	1.2	5.1	11.3
	Total multiple-vehicle crashes:	701.1	2.8	6.2	39.6	173.7	478.8
Single vehicle	Crashes with animal:	3.0	0.0	0.0	0.0	0.2	2.8
	Crashes with fixed object:	141.3	0.6	1.4	8.8	38.8	91.8
	Crashes with other object:	21.2	0.0	0.1	0.6	2.8	17.6
	Crashes with parked vehicle:	2.8	0.0	0.0	0.2	0.7	1.9
	Other single-vehicle crashes	27.6	0.2	0.4	2.5	11.3	13.3
	Total single-vehicle crashes:	195.9	0.9	1.9	12.2	53.8	127.2
	Total crashes:	897.0	3.6	8.1	51.8	227.5	606.0

Northbound: OFF Peak Period, Proposed Conditions, Existing Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp segments	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Ramp terminals	Segment crash data available?	No	First year of crash data:				
	Project-level crash data available?	No	Last year of crash data:				
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		149.2	0.7	1.6	10.5	46.1	90.3
Estimated average crash freq. during Study Period, crashes/yr:		149.2	0.7	1.6	10.5	46.1	90.3
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	129.0	0.6	1.4	9.0	39.7	78.2
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	149.2	0.7	1.6	10.5	46.1	90.3
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						
Distribution of Crashes for Entire Facility							
Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.5	0.0	0.0	0.1	0.3	0.2
	Right-angle crashes:	6.6	0.0	0.1	0.5	2.4	3.6
	Rear-end crashes:	65.1	0.3	0.8	4.9	21.4	37.8
	Sideswipe crashes:	19.0	0.1	0.2	1.0	4.5	13.2
	Other multiple-vehicle crashes:	2.2	0.0	0.0	0.2	0.7	1.3
	Total multiple-vehicle crashes:	93.5	0.4	1.0	6.7	29.3	56.0
Single vehicle	Crashes with animal:	0.8	0.0	0.0	0.0	0.1	0.7
	Crashes with fixed object:	40.3	0.2	0.4	2.8	12.1	24.8
	Crashes with other object:	5.7	0.0	0.0	0.2	0.9	4.6
	Crashes with parked vehicle:	0.8	0.0	0.0	0.1	0.2	0.5
	Other single-vehicle crashes	8.1	0.1	0.1	0.8	3.6	3.6
	Total single-vehicle crashes:	55.8	0.3	0.6	3.8	16.8	34.3
	Total crashes:	149.2	0.7	1.6	10.5	46.1	90.3

Northbound: AM Peak Period, Existing Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	438.7	1.4	4.1	25.3	116.3	291.6
Estimated average crash freq. during Study Period, crashes/yr:	438.7	1.4	4.1	25.3	116.3	291.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	418.4	1.4	3.9	23.8	109.8	279.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	438.7	1.4	4.1	25.3	116.3	291.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.4	0.0	0.0	0.2	0.7	0.5
	Right-angle crashes:	11.6	0.0	0.1	0.9	4.1	6.5
	Rear-end crashes:	229.3	0.8	2.3	13.8	63.5	149.0
	Sideswipe crashes:	74.2	0.2	0.5	3.2	14.8	55.5
	Other multiple-vehicle crashes:	8.1	0.0	0.1	0.5	2.4	5.0
	Total multiple-vehicle crashes:	324.6	1.0	3.0	18.6	85.4	216.5
Single vehicle	Crashes with animal:	1.8	0.0	0.0	0.0	0.1	1.6
	Crashes with fixed object:	82.3	0.3	0.8	4.8	22.2	54.3
	Crashes with other object:	12.4	0.0	0.1	0.3	1.6	10.3
	Crashes with parked vehicle:	1.7	0.0	0.0	0.1	0.4	1.1
	Other single-vehicle crashes	16.0	0.1	0.2	1.4	6.5	7.8
	Total single-vehicle crashes:	114.1	0.4	1.1	6.7	30.8	75.2
Total crashes:		438.7	1.4	4.1	25.3	116.3	291.6

Northbound: PM Peak Period, Existing Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	1110.8	3.1	8.9	54.3	250.2	794.4
Estimated average crash freq. during Study Period, crashes/yr:	1110.8	3.1	8.9	54.3	250.2	794.4

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	1090.5	3.0	8.6	52.8	243.7	782.4
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	1110.8	3.1	8.9	54.3	250.2	794.4
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	3.4	0.0	0.1	0.3	1.6	1.4
	Right-angle crashes:	24.1	0.1	0.3	1.7	7.6	14.5
	Rear-end crashes:	649.5	1.9	5.4	32.9	151.3	458.1
	Sideswipe crashes:	219.6	0.4	1.3	7.8	36.0	174.0
	Other multiple-vehicle crashes:	23.2	0.1	0.2	1.3	6.0	15.7
	Total multiple-vehicle crashes:	919.8	2.5	7.2	44.0	202.5	663.7
Single vehicle	Crashes with animal:	3.0	0.0	0.0	0.0	0.2	2.8
	Crashes with fixed object:	137.7	0.4	1.2	7.4	34.3	94.3
	Crashes with other object:	21.3	0.0	0.1	0.5	2.5	18.1
	Crashes with parked vehicle:	2.8	0.0	0.0	0.1	0.7	1.9
	Other single-vehicle crashes	26.3	0.1	0.4	2.2	10.0	13.6
	Total single-vehicle crashes:	191.0	0.6	1.7	10.3	47.7	130.7
Total crashes:		1110.8	3.1	8.9	54.3	250.2	794.4

Northbound: OFF Peak Period, Existing Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	177.4	0.6	1.9	11.7	53.3	110.0
Estimated average crash freq. during Study Period, crashes/yr:	177.4	0.6	1.9	11.7	53.3	110.0

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	157.2	0.6	1.7	10.2	46.8	98.0
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	177.4	0.6	1.9	11.7	53.3	110.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.6	0.0	0.0	0.1	0.3	0.2
	Right-angle crashes:	7.0	0.0	0.1	0.6	2.5	3.8
	Rear-end crashes:	79.8	0.3	0.9	5.6	25.4	47.6
	Sideswipe crashes:	23.9	0.1	0.2	1.2	5.5	16.9
	Other multiple-vehicle crashes:	2.7	0.0	0.0	0.2	0.9	1.6
	Total multiple-vehicle crashes:	114.0	0.4	1.2	7.6	34.6	70.1
Single vehicle	Crashes with animal:	0.9	0.0	0.0	0.0	0.1	0.9
	Crashes with fixed object:	45.8	0.2	0.5	2.9	13.4	28.9
	Crashes with other object:	6.6	0.0	0.0	0.2	1.0	5.4
	Crashes with parked vehicle:	0.9	0.0	0.0	0.1	0.3	0.6
	Other single-vehicle crashes	9.1	0.0	0.1	0.9	3.9	4.2
	Total single-vehicle crashes:	63.5	0.2	0.7	4.0	18.6	39.9
Total crashes:		177.4	0.6	1.9	11.7	53.3	110.0

Northbound: AM Peak Period, Proposed Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	409.4	1.7	3.9	25.1	110.6	268.0
Estimated average crash freq. during Study Period, crashes/yr:	409.4	1.7	3.9	25.1	110.6	268.0

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	389.1	1.7	3.7	23.6	104.1	255.9
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	409.4	1.7	3.9	25.1	110.6	268.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
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	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.3	0.0	0.0	0.1	0.7	0.5
	Right-angle crashes:	11.2	0.0	0.1	0.9	3.9	6.2
	Rear-end crashes:	214.2	0.9	2.1	13.8	60.4	136.9
	Sideswipe crashes:	68.9	0.2	0.5	3.2	14.0	50.9
	Other multiple-vehicle crashes:	7.6	0.0	0.1	0.5	2.3	4.6
	Total multiple-vehicle crashes:	303.1	1.2	2.9	18.5	81.3	199.1
Single vehicle	Crashes with animal:	1.6	0.0	0.0	0.0	0.1	1.5
	Crashes with fixed object:	76.7	0.3	0.7	4.8	21.1	49.7
	Crashes with other object:	11.4	0.0	0.1	0.3	1.5	9.5
	Crashes with parked vehicle:	1.5	0.0	0.0	0.1	0.4	1.0
	Other single-vehicle crashes	15.1	0.1	0.2	1.4	6.2	7.2
	Total single-vehicle crashes:	106.3	0.5	1.0	6.6	29.3	68.9
	Total crashes:	409.4	1.7	3.9	25.1	110.6	268.0

Northbound: PM Peak Period, Proposed Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	1036.4	4.1	9.2	58.5	256.4	708.2
Estimated average crash freq. during Study Period, crashes/yr:	1036.4	4.1	9.2	58.5	256.4	708.2

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	1016.1	4.1	9.0	57.0	249.9	696.1
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	1036.4	4.1	9.2	58.5	256.4	708.2
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	3.2	0.0	0.1	0.4	1.6	1.2
	Right-angle crashes:	22.3	0.1	0.3	1.7	7.5	12.8
	Rear-end crashes:	584.0	2.4	5.4	34.0	148.6	393.6
	Sideswipe crashes:	194.0	0.6	1.3	8.1	35.4	148.6
	Other multiple-vehicle crashes:	20.9	0.1	0.2	1.3	5.9	13.4
	Total multiple-vehicle crashes:	824.5	3.2	7.2	45.5	199.0	569.6
Single vehicle	Crashes with animal:	3.3	0.0	0.0	0.0	0.2	3.0
	Crashes with fixed object:	152.8	0.7	1.5	9.4	41.4	100.0
	Crashes with other object:	23.0	0.0	0.1	0.7	3.0	19.1
	Crashes with parked vehicle:	3.0	0.0	0.0	0.2	0.8	2.0
	Other single-vehicle crashes	29.8	0.2	0.4	2.7	12.0	14.4
	Total single-vehicle crashes:	211.9	0.9	2.0	13.0	57.4	138.6
	Total crashes:	1036.4	4.1	9.2	58.5	256.4	708.2

Northbound: OFF Peak Period, Proposed Conditions, 2040 Volumes, Montrose Rd to MD 121

Output Summary							
General Information							
Project description:	Interstate 270 Innovative Congestion Management Project (PTC 1)						
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban		
First year of analysis:	2016						
Last year of analysis:	2016						
Crash Data Description							
Freeway segments	Segment crash data available?		No	First year of crash data:			
	Project-level crash data available?		No	Last year of crash data:			
Ramp segments	Segment crash data available?		No	First year of crash data:			
	Project-level crash data available?		No	Last year of crash data:			
Ramp terminals	Segment crash data available?		No	First year of crash data:			
	Project-level crash data available?		No	Last year of crash data:			
Estimated Crash Statistics							
Crashes for Entire Facility		**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:		174.7	0.8	1.9	12.1	52.9	107.1
Estimated average crash freq. during Study Period, crashes/yr:		174.7	0.8	1.9	12.1	52.9	107.1
Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	20	154.4	0.8	1.7	10.6	46.4	95.0
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9
Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	174.7	0.8	1.9	12.1	52.9	107.1
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.6	0.0	0.0	0.1	0.3	0.2
	Right-angle crashes:	7.0	0.0	0.1	0.6	2.5	3.8
	Rear-end crashes:	78.6	0.4	0.9	5.8	25.2	46.4
	Sideswipe crashes:	23.4	0.1	0.2	1.3	5.5	16.4
	Other multiple-vehicle crashes:	2.7	0.0	0.0	0.2	0.9	1.6
	Total multiple-vehicle crashes:	112.3	0.5	1.2	7.9	34.4	68.3
Single vehicle	Crashes with animal:	0.9	0.0	0.0	0.0	0.1	0.8
	Crashes with fixed object:	45.0	0.2	0.5	3.0	13.3	28.0
	Crashes with other object:	6.5	0.0	0.0	0.2	0.9	5.2
	Crashes with parked vehicle:	0.9	0.0	0.0	0.1	0.3	0.6
	Other single-vehicle crashes	9.0	0.1	0.1	0.9	3.9	4.1
	Total single-vehicle crashes:	62.4	0.3	0.7	4.2	18.5	38.7
Total crashes:		174.7	0.8	1.9	12.1	52.9	107.1

Southbound: AM Peak Period, Existing Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	568.9	1.5	4.4	29.1	138.3	395.6
Estimated average crash freq. during Study Period, crashes/yr:	568.9	1.5	4.4	29.1	138.3	395.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	548.6	1.5	4.2	27.5	131.8	383.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	568.9	1.5	4.4	29.1	138.3	395.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.8	0.0	0.0	0.2	0.9	0.7
	Right-angle crashes:	14.4	0.0	0.2	1.0	4.8	8.4
	Rear-end crashes:	321.7	0.9	2.6	16.9	80.2	221.2
	Sideswipe crashes:	108.1	0.2	0.6	3.9	18.7	84.6
	Other multiple-vehicle crashes:	11.5	0.0	0.1	0.7	3.1	7.6
	Total multiple-vehicle crashes:	457.4	1.2	3.5	22.7	107.7	322.5
Single vehicle	Crashes with animal:	1.7	0.0	0.0	0.0	0.1	1.6
	Crashes with fixed object:	80.1	0.2	0.7	4.6	22.0	52.6
	Crashes with other object:	12.2	0.0	0.1	0.3	1.6	10.2
	Crashes with parked vehicle:	1.7	0.0	0.0	0.1	0.4	1.1
	Other single-vehicle crashes	15.8	0.1	0.2	1.4	6.5	7.7
	Total single-vehicle crashes:	111.4	0.3	1.0	6.4	30.6	73.1
	Total crashes:	568.9	1.5	4.4	29.1	138.3	395.6

Southbound: PM Peak Period, Existing Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	383.4	1.1	3.2	21.1	100.5	257.6
Estimated average crash freq. during Study Period, crashes/yr:	383.4	1.1	3.2	21.1	100.5	257.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	363.2	1.0	3.0	19.6	94.0	245.5
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	383.4	1.1	3.2	21.1	100.5	257.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.2	0.0	0.0	0.1	0.6	0.5
	Right-angle crashes:	10.9	0.0	0.1	0.8	3.8	6.2
	Rear-end crashes:	206.0	0.6	1.8	11.7	55.7	136.2
	Sideswipe crashes:	67.9	0.1	0.4	2.7	12.8	51.9
	Other multiple-vehicle crashes:	7.3	0.0	0.1	0.4	2.1	4.6
	Total multiple-vehicle crashes:	293.4	0.8	2.4	15.8	75.0	199.4
Single vehicle	Crashes with animal:	1.3	0.0	0.0	0.0	0.1	1.2
	Crashes with fixed object:	64.7	0.2	0.6	3.8	18.3	41.8
	Crashes with other object:	9.8	0.0	0.0	0.3	1.3	8.1
	Crashes with parked vehicle:	1.4	0.0	0.0	0.1	0.4	0.9
	Other single-vehicle crashes	12.9	0.1	0.2	1.1	5.4	6.1
	Total single-vehicle crashes:	90.0	0.3	0.8	5.3	25.5	58.1
	Total crashes:	383.4	1.1	3.2	21.1	100.5	257.6

Southbound: OFF Peak Period, Existing Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	113.7	0.3	1.1	7.6	35.8	68.8
Estimated average crash freq. during Study Period, crashes/yr:	113.7	0.3	1.1	7.6	35.8	68.8

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	93.4	0.3	0.9	6.1	29.3	56.8
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	113.7	0.3	1.1	7.6	35.8	68.8
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2031						
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	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.1
	Right-angle crashes:	6.2	0.0	0.1	0.5	2.2	3.4
	Rear-end crashes:	49.8	0.1	0.5	3.5	16.5	29.1
	Sideswipe crashes:	14.6	0.0	0.1	0.7	3.3	10.4
	Other multiple-vehicle crashes:	1.7	0.0	0.0	0.1	0.6	1.0
	Total multiple-vehicle crashes:	72.6	0.2	0.7	4.9	22.8	44.0
Single vehicle	Crashes with animal:	0.6	0.0	0.0	0.0	0.0	0.5
	Crashes with fixed object:	29.6	0.1	0.3	1.9	9.3	17.9
	Crashes with other object:	4.2	0.0	0.0	0.1	0.7	3.4
	Crashes with parked vehicle:	0.6	0.0	0.0	0.0	0.2	0.4
	Other single-vehicle crashes	6.1	0.0	0.1	0.6	2.8	2.6
	Total single-vehicle crashes:	41.0	0.1	0.4	2.7	13.0	24.8
	Total crashes:	113.7	0.3	1.1	7.6	35.8	68.8

Southbound: AM Peak Period, Proposed Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	534.3	1.9	4.4	30.4	138.7	358.8
Estimated average crash freq. during Study Period, crashes/yr:	534.3	1.9	4.4	30.4	138.7	358.8

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	514.0	1.9	4.2	28.9	132.2	346.7
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	534.3	1.9	4.4	30.4	138.7	358.8
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.6	0.0	0.0	0.2	0.8	0.6
	Right-angle crashes:	13.5	0.0	0.1	1.0	4.6	7.7
	Rear-end crashes:	289.0	1.1	2.4	16.7	76.0	192.8
	Sideswipe crashes:	95.9	0.3	0.6	3.9	17.7	73.5
	Other multiple-vehicle crashes:	10.3	0.0	0.1	0.6	2.9	6.6
	Total multiple-vehicle crashes:	410.3	1.4	3.3	22.4	102.0	281.1
Single vehicle	Crashes with animal:	1.8	0.0	0.0	0.0	0.1	1.7
	Crashes with fixed object:	89.1	0.4	0.8	5.7	26.3	55.9
	Crashes with other object:	13.2	0.0	0.1	0.4	1.9	10.8
	Crashes with parked vehicle:	1.9	0.0	0.0	0.1	0.5	1.2
	Other single-vehicle crashes	17.9	0.1	0.2	1.7	7.7	8.1
	Total single-vehicle crashes:	124.0	0.5	1.2	8.0	36.6	77.7
	Total crashes:	534.3	1.9	4.4	30.4	138.7	358.8

Southbound: PM Peak Period, Proposed Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	365.4	1.4	3.2	22.3	101.9	236.6
Estimated average crash freq. during Study Period, crashes/yr:	365.4	1.4	3.2	22.3	101.9	236.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	345.2	1.4	3.0	20.8	95.4	224.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	365.4	1.4	3.2	22.3	101.9	236.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2031						
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	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.1	0.0	0.0	0.1	0.6	0.4
	Right-angle crashes:	10.4	0.0	0.1	0.8	3.7	5.7
	Rear-end crashes:	186.3	0.7	1.7	11.6	52.9	119.5
	Sideswipe crashes:	60.6	0.2	0.4	2.6	12.1	45.3
	Other multiple-vehicle crashes:	6.6	0.0	0.1	0.4	2.0	4.1
	Total multiple-vehicle crashes:	265.0	1.0	2.3	15.6	71.2	174.9
Single vehicle	Crashes with animal:	1.4	0.0	0.0	0.0	0.1	1.3
	Crashes with fixed object:	72.2	0.3	0.7	4.8	22.0	44.4
	Crashes with other object:	10.6	0.0	0.0	0.3	1.6	8.6
	Crashes with parked vehicle:	1.5	0.0	0.0	0.1	0.4	1.0
	Other single-vehicle crashes	14.7	0.1	0.2	1.4	6.5	6.5
	Total single-vehicle crashes:	100.4	0.4	1.0	6.7	30.7	61.7
	Total crashes:	365.4	1.4	3.2	22.3	101.9	236.6

Southbound: OFF Peak Period, Proposed Conditions, Existing Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	106.0	0.4	1.1	7.5	33.8	63.2
Estimated average crash freq. during Study Period, crashes/yr:	106.0	0.4	1.1	7.5	33.8	63.2

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	85.7	0.4	0.9	6.0	27.3	51.2
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	106.0	0.4	1.1	7.5	33.8	63.2
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.1
	Right-angle crashes:	6.1	0.0	0.1	0.5	2.2	3.3
	Rear-end crashes:	46.7	0.2	0.5	3.5	15.7	26.9
	Sideswipe crashes:	13.5	0.0	0.1	0.7	3.1	9.5
	Other multiple-vehicle crashes:	1.6	0.0	0.0	0.1	0.5	0.9
	Total multiple-vehicle crashes:	68.2	0.2	0.7	4.8	21.7	40.8
Single vehicle	Crashes with animal:	0.5	0.0	0.0	0.0	0.0	0.5
	Crashes with fixed object:	27.3	0.1	0.3	1.9	8.7	16.2
	Crashes with other object:	3.8	0.0	0.0	0.1	0.6	3.0
	Crashes with parked vehicle:	0.6	0.0	0.0	0.0	0.2	0.4
	Other single-vehicle crashes	5.6	0.0	0.1	0.6	2.6	2.4
	Total single-vehicle crashes:	37.8	0.2	0.4	2.7	12.2	22.4
	Total crashes:	106.0	0.4	1.1	7.5	33.8	63.2

Southbound: AM Peak Period, Existing Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	605.8	1.6	4.7	30.6	145.9	423.0
Estimated average crash freq. during Study Period, crashes/yr:	605.8	1.6	4.7	30.6	145.9	423.0

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	585.5	1.6	4.4	29.1	139.4	411.0
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	605.8	1.6	4.7	30.6	145.9	423.0
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
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	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.9	0.0	0.0	0.2	0.9	0.7
	Right-angle crashes:	15.1	0.0	0.2	1.1	5.0	8.9
	Rear-end crashes:	344.9	0.9	2.7	17.9	85.1	238.3
	Sideswipe crashes:	116.4	0.2	0.6	4.2	19.9	91.5
	Other multiple-vehicle crashes:	12.3	0.0	0.1	0.7	3.3	8.1
	Total multiple-vehicle crashes:	490.6	1.2	3.7	24.0	114.1	347.6
Single vehicle	Crashes with animal:	1.7	0.0	0.0	0.0	0.1	1.6
	Crashes with fixed object:	82.7	0.3	0.7	4.8	22.8	54.2
	Crashes with other object:	12.7	0.0	0.1	0.4	1.7	10.6
	Crashes with parked vehicle:	1.7	0.0	0.0	0.1	0.5	1.2
	Other single-vehicle crashes	16.3	0.1	0.2	1.4	6.8	7.9
	Total single-vehicle crashes:	115.3	0.4	1.0	6.6	31.8	75.5
	Total crashes:	605.8	1.6	4.7	30.6	145.9	423.0

Southbound: PM Peak Period, Existing Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	432.9	1.2	3.5	23.3	111.2	293.6
Estimated average crash freq. during Study Period, crashes/yr:	432.9	1.2	3.5	23.3	111.2	293.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	412.6	1.2	3.3	21.8	104.7	281.6
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	432.9	1.2	3.5	23.3	111.2	293.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.4	0.0	0.0	0.1	0.7	0.5
	Right-angle crashes:	11.9	0.0	0.1	0.9	4.0	6.8
	Rear-end crashes:	236.5	0.7	2.0	13.1	62.5	158.2
	Sideswipe crashes:	78.7	0.2	0.5	3.0	14.4	60.6
	Other multiple-vehicle crashes:	8.4	0.0	0.1	0.5	2.4	5.4
	Total multiple-vehicle crashes:	336.7	0.9	2.7	17.7	84.1	231.4
Single vehicle	Crashes with animal:	1.4	0.0	0.0	0.0	0.1	1.3
	Crashes with fixed object:	69.0	0.2	0.6	4.1	19.5	44.7
	Crashes with other object:	10.5	0.0	0.0	0.3	1.4	8.7
	Crashes with parked vehicle:	1.5	0.0	0.0	0.1	0.4	1.0
	Other single-vehicle crashes	13.7	0.1	0.2	1.2	5.8	6.5
	Total single-vehicle crashes:	96.1	0.3	0.9	5.7	27.2	62.2
	Total crashes:	432.9	1.2	3.5	23.3	111.2	293.6

Southbound: OFF Peak Period, Existing Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	127.0	0.4	1.3	8.3	39.3	77.7
Estimated average crash freq. during Study Period, crashes/yr:	127.0	0.4	1.3	8.3	39.3	77.7

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	106.7	0.4	1.0	6.8	32.8	65.7
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	127.0	0.4	1.3	8.3	39.3	77.7
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.4	0.0	0.1	0.5	2.3	3.5
	Rear-end crashes:	57.1	0.2	0.6	4.0	18.6	33.8
	Sideswipe crashes:	17.1	0.0	0.1	0.8	3.8	12.3
	Other multiple-vehicle crashes:	1.9	0.0	0.0	0.1	0.6	1.1
	Total multiple-vehicle crashes:	82.9	0.2	0.8	5.4	25.5	50.9
Single vehicle	Crashes with animal:	0.6	0.0	0.0	0.0	0.0	0.6
	Crashes with fixed object:	31.8	0.1	0.3	2.1	9.9	19.3
	Crashes with other object:	4.6	0.0	0.0	0.1	0.7	3.7
	Crashes with parked vehicle:	0.7	0.0	0.0	0.0	0.2	0.4
	Other single-vehicle crashes	6.5	0.0	0.1	0.6	2.9	2.8
	Total single-vehicle crashes:	44.1	0.2	0.4	2.9	13.8	26.8
	Total crashes:	127.0	0.4	1.3	8.3	39.3	77.7

Southbound: AM Peak Period, Proposed Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	567.4	2.0	4.6	32.0	145.8	382.9
Estimated average crash freq. during Study Period, crashes/yr:	567.4	2.0	4.6	32.0	145.8	382.9

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	547.1	2.0	4.4	30.5	139.3	370.8
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	567.4	2.0	4.6	32.0	145.8	382.9
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
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	2033						
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	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.7	0.0	0.0	0.2	0.9	0.7
	Right-angle crashes:	14.1	0.0	0.2	1.1	4.8	8.1
	Rear-end crashes:	309.6	1.1	2.6	17.7	80.5	207.7
	Sideswipe crashes:	103.3	0.3	0.6	4.1	18.8	79.5
	Other multiple-vehicle crashes:	11.0	0.0	0.1	0.7	3.1	7.1
	Total multiple-vehicle crashes:	439.7	1.5	3.5	23.7	108.0	302.9
Single vehicle	Crashes with animal:	1.9	0.0	0.0	0.0	0.1	1.7
	Crashes with fixed object:	91.8	0.4	0.9	5.9	27.1	57.5
	Crashes with other object:	13.7	0.0	0.1	0.4	2.0	11.2
	Crashes with parked vehicle:	1.9	0.0	0.0	0.1	0.5	1.2
	Other single-vehicle crashes	18.5	0.1	0.3	1.7	8.0	8.4
	Total single-vehicle crashes:	127.7	0.5	1.2	8.2	37.8	80.0
	Total crashes:	567.4	2.0	4.6	32.0	145.8	382.9

Southbound: PM Peak Period, Proposed Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	410.3	1.5	3.6	24.5	112.1	268.6
Estimated average crash freq. during Study Period, crashes/yr:	410.3	1.5	3.6	24.5	112.1	268.6

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	390.0	1.5	3.3	23.0	105.6	256.5
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	410.3	1.5	3.6	24.5	112.1	268.6
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	1.3	0.0	0.0	0.1	0.6	0.5
	Right-angle crashes:	11.2	0.0	0.1	0.9	3.9	6.2
	Rear-end crashes:	213.4	0.8	1.9	13.0	59.2	138.5
	Sideswipe crashes:	70.1	0.2	0.4	3.0	13.7	52.8
	Other multiple-vehicle crashes:	7.6	0.0	0.1	0.5	2.3	4.7
	Total multiple-vehicle crashes:	303.5	1.1	2.5	17.5	79.7	202.7
Single vehicle	Crashes with animal:	1.5	0.0	0.0	0.0	0.1	1.4
	Crashes with fixed object:	76.8	0.3	0.7	5.1	23.3	47.4
	Crashes with other object:	11.3	0.0	0.1	0.4	1.7	9.2
	Crashes with parked vehicle:	1.6	0.0	0.0	0.1	0.5	1.0
	Other single-vehicle crashes	15.6	0.1	0.2	1.5	6.9	6.9
	Total single-vehicle crashes:	106.8	0.5	1.0	7.1	32.4	65.9
	Total crashes:	410.3	1.5	3.6	24.5	112.1	268.6

Southbound: OFF Peak Period, Proposed Conditions, 2040 Volumes

Output Summary

General Information

Project description:	Interstate 270 Innovative Congestion Management Project (PTC 10)				
Analyst:	MDP	Date:	1/13/2017	Area type:	Urban
First year of analysis:	2016				
Last year of analysis:	2016				

Crash Data Description

Freeway segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp segments	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	
Ramp terminals	Segment crash data available?	No	First year of crash data:	
	Project-level crash data available?	No	Last year of crash data:	

Estimated Crash Statistics

Crashes for Entire Facility	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during Study Period, crashes:	118.2	0.5	1.2	8.2	37.1	71.2
Estimated average crash freq. during Study Period, crashes/yr:	118.2	0.5	1.2	8.2	37.1	71.2

Crashes by Facility Component	**Nbr. Sites**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Freeway segments, crashes:	13	97.9	0.4	1.0	6.7	30.7	59.2
Ramp segments, crashes:	6	0.3	0.0	0.0	0.0	0.1	0.2
Crossroad ramp terminals, crashes:	6	20.0	0.0	0.2	1.5	6.4	11.9

Crashes for Entire Facility by Year	**Year**	**Total**	**K**	**A**	**B**	**C**	**PDO**
Estimated number of crashes during the Study Period, crashes:	2016	118.2	0.5	1.2	8.2	37.1	71.2
	2017						
	2018						
	2019						
	2020						
	2021						
	2022						
	2023						
	2024						
	2025						
	2026						
	2027						
	2028						
	2029						
	2030						
	2031						
	2032						
	2033						
	2034						
	2035						
	2036						
	2037						
	2038						
	2039						

Distribution of Crashes for Entire Facility

Crash Type	**Crash Type Category**	**Estimated Number of Crashes During the Study Period**					
		Total	**K**	**A**	**B**	**C**	**PDO**
Multiple vehicle	Head-on crashes:	0.4	0.0	0.0	0.0	0.2	0.2
	Right-angle crashes:	6.3	0.0	0.1	0.5	2.2	3.4
	Rear-end crashes:	53.3	0.2	0.6	3.9	17.6	31.1
	Sideswipe crashes:	15.8	0.0	0.1	0.8	3.6	11.2
	Other multiple-vehicle crashes:	1.8	0.0	0.0	0.1	0.6	1.0
	Total multiple-vehicle crashes:	77.6	0.3	0.8	5.4	24.2	47.0
Single vehicle	Crashes with animal:	0.6	0.0	0.0	0.0	0.0	0.5
	Crashes with fixed object:	29.3	0.1	0.3	2.0	9.3	17.5
	Crashes with other object:	4.1	0.0	0.0	0.1	0.7	3.3
	Crashes with parked vehicle:	0.6	0.0	0.0	0.0	0.2	0.4
	Other single-vehicle crashes	6.0	0.0	0.1	0.6	2.8	2.5
	Total single-vehicle crashes:	40.6	0.2	0.4	2.8	12.9	24.3
	Total crashes:	118.2	0.5	1.2	8.2	37.1	71.2

e) I-270 Off Ramp at MD 124 HCM Outputs

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	915	885	0	0	0
Future Volume (vph)	0	915	885	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.88	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2787	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2787	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	995	962	0	0	0
RTOR Reduction (vph)	0	67	0	0	0	0
Lane Group Flow (vph)	0	928	962	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		51.9	67.4			
Effective Green, g (s)		51.9	67.4			
Actuated g/C Ratio		0.38	0.50			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1069	2533			
v/s Ratio Prot		c0.33	c0.19			
v/s Ratio Perm						
v/c Ratio		0.87	0.38			
Uniform Delay, d1		38.5	21.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		7.6	0.4			
Delay (s)		46.2	21.4			
Level of Service		D	C			
Approach Delay (s)	46.2		21.4		0.0	
Approach LOS	D		C		A	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	135.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	915	885	0	0	0
Future Volume (vph)	0	915	885	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.76	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	995	962	0	0	0
RTOR Reduction (vph)	0	96	0	0	0	0
Lane Group Flow (vph)	0	899	962	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		38.0	67.2			
Effective Green, g (s)		38.0	67.2			
Actuated g/C Ratio		0.31	0.55			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1131	2819			
v/s Ratio Prot		c0.25	c0.19			
v/s Ratio Perm						
v/c Ratio		0.79	0.34			
Uniform Delay, d1		38.0	14.8			
Progression Factor		1.00	1.00			
Incremental Delay, d2		3.9	0.3			
Delay (s)		42.0	15.2			
Level of Service		D	B			
Approach Delay (s)	42.0		15.2		0.0	
Approach LOS	D		B		A	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	121.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	780	945	0	0	0
Future Volume (vph)	0	780	945	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.88	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2787	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2787	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	848	1027	0	0	0
RTOR Reduction (vph)	0	58	0	0	0	0
Lane Group Flow (vph)	0	790	1027	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		42.3	67.3			
Effective Green, g (s)		42.3	67.3			
Actuated g/C Ratio		0.34	0.54			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		938	2724			
v/s Ratio Prot		c0.28	c0.20			
v/s Ratio Perm						
v/c Ratio		0.84	0.38			
Uniform Delay, d1		38.6	17.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		6.9	0.4			
Delay (s)		45.5	17.4			
Level of Service		D	B			
Approach Delay (s)	45.5		17.4		0.0	
Approach LOS	D		B		A	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	125.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	780	945	0	0	0
Future Volume (vph)	0	780	945	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.76	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	848	1027	0	0	0
RTOR Reduction (vph)	0	83	0	0	0	0
Lane Group Flow (vph)	0	765	1027	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		31.4	67.2			
Effective Green, g (s)		31.4	67.2			
Actuated g/C Ratio		0.27	0.59			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		989	2981			
v/s Ratio Prot		c0.21	c0.20			
v/s Ratio Perm						
v/c Ratio		0.77	0.34			
Uniform Delay, d1		38.3	12.3			
Progression Factor		1.00	1.00			
Incremental Delay, d2		3.8	0.3			
Delay (s)		42.2	12.6			
Level of Service		D	B			
Approach Delay (s)	42.2		12.6		0.0	
Approach LOS	D		B		A	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	2070	1910	0	0	0
Future Volume (vph)	0	2070	1910	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.88	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2787	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2787	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2250	2076	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	0	2249	2076	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		72.0	62.0			
Effective Green, g (s)		72.0	62.0			
Actuated g/C Ratio		0.48	0.41			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1337	2101			
v/s Ratio Prot		c0.81	c0.41			
v/s Ratio Perm						
v/c Ratio		1.68	0.99			
Uniform Delay, d1		39.0	43.6			
Progression Factor		1.00	1.00			
Incremental Delay, d2		310.2	17.0			
Delay (s)		349.2	60.7			
Level of Service		F	E			
Approach Delay (s)	349.2		60.7		0.0	
Approach LOS	F		E		A	

Intersection Summary			
HCM 2000 Control Delay	210.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	122.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	2070	1910	0	0	0
Future Volume (vph)	0	2070	1910	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.76	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2250	2076	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	0	2249	2076	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		72.0	62.0			
Effective Green, g (s)		72.0	62.0			
Actuated g/C Ratio		0.48	0.41			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1732	2101			
v/s Ratio Prot		c0.62	c0.41			
v/s Ratio Perm						
v/c Ratio		1.30	0.99			
Uniform Delay, d1		39.0	43.6			
Progression Factor		1.00	1.00			
Incremental Delay, d2		138.7	17.0			
Delay (s)		177.7	60.7			
Level of Service		F	E			
Approach Delay (s)	177.7		60.7		0.0	
Approach LOS	F		E		A	

Intersection Summary			
HCM 2000 Control Delay	121.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	1875	1990	0	0	0
Future Volume (vph)	0	1875	1990	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.88	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2787	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2787	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2038	2163	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	0	2037	2163	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		72.0	62.0			
Effective Green, g (s)		72.0	62.0			
Actuated g/C Ratio		0.48	0.41			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1337	2101			
v/s Ratio Prot		c0.73	c0.43			
v/s Ratio Perm						
v/c Ratio		1.52	1.03			
Uniform Delay, d1		39.0	44.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		239.6	27.6			
Delay (s)		278.6	71.6			
Level of Service		F	E			
Approach Delay (s)	278.6		71.6		0.0	
Approach LOS	F		E		A	

Intersection Summary			
HCM 2000 Control Delay	172.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	0	1875	1990	0	0	0
Future Volume (vph)	0	1875	1990	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0			
Lane Util. Factor		0.76	0.91			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	5085			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	5085			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2038	2163	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	0	2037	2163	0	0	0
Turn Type		Prot	NA			
Protected Phases		5	4			
Permitted Phases						
Actuated Green, G (s)		72.0	62.0			
Effective Green, g (s)		72.0	62.0			
Actuated g/C Ratio		0.48	0.41			
Clearance Time (s)		8.0	8.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1732	2101			
v/s Ratio Prot		c0.56	c0.43			
v/s Ratio Perm						
v/c Ratio		1.18	1.03			
Uniform Delay, d1		39.0	44.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		85.8	27.6			
Delay (s)		124.8	71.6			
Level of Service		F	E			
Approach Delay (s)	124.8		71.6		0.0	
Approach LOS	F		E		A	

Intersection Summary			
HCM 2000 Control Delay	97.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX IV
LIST OF UTILITY OWNERS WITHIN THE LIMITS OF "THE PROJECT"

List of Utility Owners along the IS-270 corridor within the limits of The Project

Department/Agency	Typical Data Provided	Contact Information		
		Name	Phone	Email
Montgomery County Planning Department	GIS	Chris McGovern	301-650-5600	Christopher.McGovern @montgomeryplanning.org
City of Rockville GIS	GIS	Andrew Oldham	240-314-8518	AOldham@rockvillemd.gov
WSSC GIS	GIS	Pedro Flores	301-206-8354	pFlores@wsscwater.com
Montgomery County Stormwater Division	GIS	William Whelan	240-777-7727	William.Whelan @montgomerycountymd.gov
	As-Builts			
City of Rockville DPW	Storm Drain As-Builts	Joel Karpas	240-314-8500	JKarpas@rockvillemd.gov
City of Rockville DPW		Rebecca Torma	240-314-8527	rtorma@rockvillemd.gov
City of Gaithersburg Storm Water Division	As-Builts	Greg Ryberg	301-258-6370	gryberg@gaithersburgmd.gov
WSSC Water	Access to As-Builts	Magda El-khawalka	301-206-8753	melkhaw@wsscwater.com
WSSC Sewer	Access to As-Builts			
MCI (Verizon Business)	As-Builts	Adam Rice	703-391-5767	Adam.rice@verizon.com
Verizon of MD (Bell Atlantic)	As-Builts	Kenneth Barnhart	301-282-3562	Kenneth.l.barnhart@oneverizon.com
Fibertech Networks	As-Builts	Darren Lindsay	585-490-8904	dlindsay@fibertech.com
Crown Castle	As-Builts	John Marinello	734-231-8989	John.marinello@crowncastle.com
Crown Castle		Branden Woodward	724-416-2537	Branden.woodward@crowncastle.com
Level 3 Communications	As-Builts	Matt Crome	571-225-7014	Matt.crome@Level3.com
AT&T Transmission	As-Builts	Gary Wigfield	301-874-1180	gwigfield@att.com
AT&T	As-Builts	Joe Pang	908-705-5319	
PEPCO	Screenshots of GIS	Michael Brown	301-548-4342	mlbrown@pepco.com
PEPCO		Keith Schumacher	301-548-4313	Kschumacher@pepco.com
Comcast	Screenshots of GIS	Dwayne Douty	410-456-8957	Dwayne_douty2@cable.comcast.com
Washington Gas	Screenshots of GIS	Andrew King	703-750-4793	andrewking@washgas.com
Zayo Fibergate (Fibergate, Inc)	Screenshots	Brad Leatherman	703-928-0649	Bradley.leatherman@zayo.com
Star Power/RCN	Screenshots	Eddison Fraser	301-531-2991	Eddison.Fraser@rcn.net
Williams Natural Gas Pipeline (Transco)	Screenshots	Tim Rich & Stan Tolman	410-465-7459 & 434-964-2123	Tim.O.Rich@Williams.com & Stanley.tolman@williams.com

APPENDIX V
PRELIMINARY PAVEMENT ANALYSIS

AECOM
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Memorandum

Subject: Pavement Design Analysis

PTC-1 and 10 relate to the use of a Hard Running Shoulder for use as an HOV lane. In light of the need for additional structural capacity and with a goal of leaving the underlying granular materials in-tact, AECOM has performed an analysis of the required flexible pavement section (asphalt). The analysis was performed to optimize the cost of adding the structural capacity while minimizing the potential need for storm water management and mitigation which may be required with full depth reconstruction of the hard running shoulder proposed in PTC-1 Revised.

The designs which have been developed are based on AASHTO DARWin 3.1 layered elastic design methods using assumed inputs for the traffic and existing structure documents (soil borings, pavement cores, and GPR) that the Administration provided as RFP Appendices and as analyzed by AECOM traffic and pavement engineers.

SCOPE / BACKGROUND

The purpose of this memorandum is to present the findings of a brief structural analysis of the existing pavement structure in terms of existing structural capacity and/or means to improve structural capacity to accommodate the expected future design traffic on HSR. The proposed capacity improvements include use of the existing NB outside/right shoulder lane between Rockledge Drive and Montrose Road and both the Northbound and Southbound median shoulders as HOV lanes on HSR.

SUMMARY OF RESULTS

Design analysis

- Results indicate both Northbound and Southbound median shoulders have sufficient residual structural capacity to be used as proposed HOV lanes on HSR – without need for any structural strengthening.
- The Northbound outside/right shoulder between Rockledge Drive and Montrose Road will require minimal additional structural strengthening (approximately ⅜ inch AC overlay) to accommodate the anticipated additional traffic while operational.

Structural Number Review			
Location	*Required SN*	*Actual SN*	*AC overlay thickness required (inch)*
Northbound HOV lane on HSR	4.92	5.09	*None*
Southbound HOV lane on HSR (PTC 10)	4.92	4.91	*None*
Northbound right/outside shoulder	6.54	6.39	*⅜*

Potential risks and/or areas where structural deficiencies may exist

Potential areas of risk are areas where GPR results indicate existing AC layer thicknesses is less than the design input values. These areas may require additional mitigating structural improvements are summarized in the Table below.

			Percentage of section length		
	From	To	*Potentially structurally inadequate*	*Likely structurally inadequate*	*Area of concern - structurally inadequate*
Northbound HOV lane on HSR	Montrose i/c	Watkins Mill Rd i/c	8%	1%	1%
	MD 124	Middelbrook Rd i/c	20%	5%	2%
Southbound HOV lane on HSR (PTC 10)	Montrose i/c	I-370 i/c	2%	0%	0%
	Middelbrook Rd i/c	I-370 i/c	6%	2%	1%
Northbound right/outside shoulder	I-270Y Ramp C		8%	4%	2%

Results indicate the following:

- Areas flagged as a "concern – structurally inadequate" indicate instances that may require substantial structural strengthening, i.e. would require AC overlay of approximately 5 to 6 inches to attain required SN. This could also be achieved through means of full-depth patching (removal of existing AC and/or GAB (full or partially) and replacing with suitable HMA of approximately 9.5 – 10 inches, i.e. suitable layers to add SN of 4.27, to maintain existing levels. (*Note : limited in extent and confined to localized areas)*.
- Areas flagged as "likely structurally inadequate", indicate instances that may require some structural strengthening in the form of an additional AC overlay (typically 2.0 to 4.0 inches).
- Areas flagged as "potentially structurally inadequate", indicate instances that may require some minor structural strengthening in the form of an additional AC overlay (typically 1.0 – 2.0 inches).

TRAFFIC ANALYSIS:

Assumptions

From detail traffic studies done by the DB team as part of the overall I-270 improvements project, the following assumptions pertaining to anticipated traffic volumes and traffic composition were provided and subsequently used in the pavement design traffic calculations.

North & Southbound Median shoulder / HOV lanes on HSR

a. No General Purpose (GP) use outside of HOV hours
b. Vehicle classes - only 1 to 4; cars and busses; full truck exclusion
c. AADT = 2,000 vph @ 10 hr/day for 7 day use
d. 30 busses per hour @ 10 hr/day = 1.5%
e. Buses will be considered FULL Wt. 100% capacity
f. Growth in AADT = 1.0%.
g. ESAL factors will be based on SHA if available.
h. Design analysis period = 20 year design

Northbound outside / Right shoulder on HSR

i. No General Purpose (GP) use outside of HOV hours

j. All vehicles including trucks

k. MD SHA heavy traffic data percentages on IS 270 to be used in calculations.

(average of 5.13% shown for single unit trucks and 2.23 for combination units)

l. AADT = 2000 vph/lane @ 10 hrs/day

m. Growth in AADT = 1%.

n. ESAL factors will be based on SHA if available.

o. Design analysis period = 20 year design

ESAL Factors

Due to lack of any available SHA weigh-in-motion and/or Truck Factor (TF) data, typical ESAL factors for various traffic classes, as defined by FHWA, were used (FHWA, WSDOT, Pennsylvania DOT and Virginia DOT) and averaged for each class to facilitate calculation of future design ESAL's over the design period. The AASHTO DARWin program used for the structural analysis only facilitates input for 3 broad traffic classes, i.e. Light (FHWA Classes 1 to 3), Single Units (FHWA Classes 4 to 7) and Combination units (FHWA Classes 8 to 13). The corresponding ESAL values used for each of these classes were as follows:

ESALs used for calculations on North & Southbound Median shoulder / HOV lane on HSR

Class	Description	Average ESAL
1	Light/passenger vehicles	0.00*
2	Busses	0.48

***Note**: LEF factors for light/passenger vehicles typically are = 0.002 and hence, FHWA recommended design ESAL for this traffic class ≈ 0.000.*

Note, for design and analysis of the North & Southbound Median shoulder / HOV lane on HSR, only buses and light passenger vehicles would be allowed to travel in this lane and hence, an ESAL/bus of 0.48 was used.

ESALs used for calculations on Northbound outside/right shoulder

Class	Description	Average ESAL
1	Light/passenger vehicles	0.00
2	Single Units	0.68
3	Combination Units	1.10

***Note**: LEF factors for light/passenger vehicles typically are = 0.002 and hence, FHWA recommended design ESAL for this traffic class ≈ 0.000.*

Calculated Design Traffic

Based on the above outlined and discussed data and assumptions, the expected future design traffic for each of the proposed HOV lanes on HSR are as follows :

- North & Southbound HOV Lanes on HSR = **1.16×10^6 ESALs**
- Northbound Outside / Right shoulder = **9.56×10^6 ESALs**

EXISTING PAVEMENT STRUCTURE:

Available soil boring logs (limited), GPR data and pavement coring log data (limited) were evaluated and analyzed to determine the existing pavement structure. GPR data only included results for AC layer thicknesses, whilst soil boring logs contained layer thicknesses for all pavement layers. Subsequently, data sets needed to be combined to derive pavement structural information for input into design analysis. Although some variation in layer thickness of the existing AC wearing course was evident from the different data sets, the data in general provides the following existing pavement structures:

a) Northbound HOV Lane on HSR:

Data from :	Existing pavement layer thicknesses	AC wearing course thickness *(inch)*	Stone base thickness *(inch)*	Sandy silt in situ subgrade *(inch)*
Soil Boring Logs	*Average layer thickness*	*9.5*	*4.5*	*32.3*
	Std Dev	*2.2*	*1.7*	*3.7*
GPR data	*Average layer thickness*	*9.3*	*n/a*	*n/a*
	Std Dev	*1.7*	*n/a*	*n/a*
	Values used for design input to DARWin	***9.3***	***4.5***	***32.3***

b) Southbound HOV Lane on HSR:

Data from :	Existing pavement layer thicknesses	AC wearing course thickness *(inch)*	Stone base thickness *(inch)*	Sandy silt in situ subgrade *(inch)*
Soil Boring Logs	*Average layer thickness*	*9.5*	*4.5*	*32.3*
	Std Dev	*2.2*	*1.7*	*3.7*
GPR data	*Average layer thickness*	*8.9*	*n/a*	*n/a*
	Std Dev	*2.0*	*n/a*	*n/a*
	Values used for design input to DARWin	***8.9***	***4.5***	***32.3***

c) Northbound Outside / Right shoulder:

Data from :	Existing pavement layer thicknesses	AC wearing course thickness *(inch)*	Stone base thickness *(inch)*	Sandy silt in situ subgrade *(inch)*
Soil Boring Logs	*Average layer thickness*	*10.2*	*5.3*	*31.5*
	Std Dev	*1.5*	*1.5*	*2.7*
GPR data	*Average layer thickness*	*12.2*	*n/a*	*n/a*
	Std Dev	*0.77*	*n/a*	*n/a*
	Values used for design input to DARWin	***12.2***	***5.3***	***31.5***

PAVEMENT DESIGN:

1993 AASHTO Pavement Design : DARWin Pavement Design and Analysis inputs

a) Design input parameters for North and Southbound Median HSR

Structural Number for Future Traffic

Future 18-kip ESALs Over Design Period	1,158,112
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.44
Subgrade Resilient Modulus	3,000 psi
Calculated Structural Number for Future Traffic	4.92 in

Effective Pavement Thickness - Component Analysis Method

Layer	Material Description	Structural Coefficient	Drainage Coefficient	Thickness (in)
1	Existing HMA Surface Layer	0.44	1	4.5
2	Existing HMA Intermediate Layer	0.4	1	4.8
3	Graded Stone Base	0.12	1	4.5
4	Mica Sitlt with some Gravel	0.05	0.4	32.3

b) Design input parameters for Northbound Outside / Right shoulder

Structural Number for Future Traffic

Future 18-kip ESALs Over Design Period	9,556,672
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.44
Subgrade Resilient Modulus	3,000 psi
Calculated Structural Number for Future Traffic	6.54 in

Effective Pavement Thickness - Component Analysis Method

Layer	Material Description	Structural Coefficient	Drainage Coefficient	Thickness (in)
1	Existing HMA Surface Layer	0.44	1	6
2	Existing HMA Intermediate Layer	0.4	1	6.2
3	Graded Stone Base	0.12	1	5.3
4	Mica Sitlt with some Gravel	0.05	0.4	31.5

Design Results

From the DARWin pavement design analysis, it follows that the required pavement structural number (SN) to accommodate the future predicted traffic on the proposed North/Southbound HOV Lanes on Median HSR and Northbound outside / right shoulder lanes are 4.92 and 6.54 respectively. Based on an evaluation and analysis of the existing pavement structures observed on I-270 the corresponding existing SN's are 5.09, 4.91 and 6.39 for the NB HOV lane on HSR, SB HOV lane on HSR and NB Outside / Right shoulder respectively.

Hence, results indicate both Northbound and Southbound median shoulders have sufficient residual structural capacity to be used as HOV lanes on HSR– without need for any structural strengthening. The Northbound outside / right shoulder however, will require minimal additional structural strengthening (approximately ⅜ inch AC overlay) to accommodate the anticipated additional traffic when operational during peak traffic hours *(Note, for practical reasons the minimum AC overlay thickness required would probably need to be 1 - 1½ inch)*.

Results of the design analysis are based on limited available traffic and geotechnical data, particularly data pertaining to existing layer thicknesses and engineering properties of base and subgrade materials. For purposes of design analysis, "typical" input values for the materials were used. For example, due to limited available data, SHA's recommended "typical values" were used for subgrade resilient modulus (M_R), material structural coefficients (a_i), etc. However, these results could be regarded as conservative, as the road has been trafficked for some time and visually appears to be in a good condition - indicative that underlying support layers have consolidated under traffic and provides good structural support.

Similar to the existing layer thicknesses, data was used based on limited soil boring log information and although GPR data was available on some sections of the route (more frequent data on AC thicknesses), no data was available north of Middelbrook Rd. These material input values should therefore be confirmed through more detail geotechnical investigation and testing in the field post-award.

Although the design process makes provisions for variability in design input parameters, such as potential variations in traffic data, layer strength properties, pavement layer thicknesses, etc., an analysis was done to highlight some areas along the route where available data indicated areas with potential structural inadequacies (AC layer thicknesses less than what would be required) and which may require additional mitigating structural improvements.

A sensitivity analysis was also performed to check adequacy of designs for some variation in expected pavement material quality, and in particular, the quality of the existing subgrade layer (M_R). Results indicate that an increase in assumed subgrade quality (increase in M_R from 3000 psi to 4500 psi) in the outside /right shoulder would have sufficient existing structural strength to carry expected future traffic and hence, would not require any additional strengthening.

Should lane restrictions for certain vehicle classes be considered as an option for the HSR lanes, i.e. restricting combination units from using the proposed outside/right shoulder HSR, this would also obviate the need for any structural improvements to the lane.

If combination units are restricted from using the outside / right shoulder lane and/or should better subgrade support conditions exist along IS-270, the proposed HSR on the outside/right shoulder have sufficient structural capacity to accommodate the expected future design traffic without the need for any structural improvement.

Results however, indicate that both the northbound and southbound median shoulder has sufficient structural capacity to accommodate the expected future design traffic without the need for any structural improvement for use as HOV lane on HSR. Again, assumed material properties and layer thicknesses need to be confirmed through more rigorous geotechnical investigations and testing post-award.

Summary of Design Analysis Results

a) Northbound Median Shoulder / HOV lane on HSR

	Design Option	Calculated design traffic	DARWin calculated required SN	DARWin calculated existing SN	Additional structural improvement required (SN)	Effective overlay thickness required (inches)
1	**Base design** : use of typical / recommended material design inputs; use assumed traffic & assumptions	1.158E+06	4.92	5.09	***none***	***none***
3	Use **adjusted subgrade strength** properties (MR = 4500 psi); use base design traffic volumes	1.158E+06	4.28	5.09	***none***	***none***

b) Southbound Median Shoulder / HOV lane on HSR (PTC 10)

	Design Option	Calculated design traffic	DARWin calculated required SN	DARWin calculated existing SN	Additional structural improvement required (SN)	Effective overlay thickness required (inches)
1	**Base design** : use of typical / recommended material design inputs; use assumed traffic & assumptions	1.158E+06	4.92	4.91	0.01	≈ 0.0
3	Use **adjusted subgrade strength** properties (MR = 4500 psi); use base design traffic volumes	1.158E+06	4.28	4.91	***none***	***none***

c) Northbound Outside / Right Shoulder lane

	Design Option	Calculated design traffic	DARWin calculated required SN	DARWin calculated existing SN	Additional structural improvement required (increase in existing SN)	Effective overlay thickness required (inches)
1	**Base design** : use of typical / recommended material design inputs; use assumed traffic & assumptions	9.557E+06	6.54	6.39	0.15	⅜
2	Use typical / recommended material design inputs; assume **restriction on use by Combination Units**	5.611E+06	6.11	6.39	***none***	***none***
3	Use **adjusted subgrade strength** properties (MR = 4500 psi); use base design traffic volumes	9.557E+06	5.78	6.39	***none***	***none***

Potential risks and/or areas where structural deficiencies may exist

Evaluation of variability in AC layer thicknesses and potential section lengths which may require additional mitigating structural improvement are as follows:

Northbound Median Shoulder / HOV lane on HSR

		Percentage of section length with AC layer thicknesses (inches) between :		
From	*To*	*7.6 – 6.8* [1]	*6.8 – 5.9* [2]	*< 5.9* [3]
Montrose i/c	Watkins Mill Rd i/c	8%	1%	1%
MD 124	Middelbrook Rd i/c	20%	5%	2%
Mitigating action / AC overlay required (inch)		1.0 – 2.0	2.0 – 3.0	Full-depth patch [4]

Southbound Median Shoulder / HOV lane on HSR (PTC 10)

		Percentage of section length with AC layer thicknesses (inches) between :		
From	*To*	*6.9 – 5.9* [1]	*5.9 – 4.9* [2]	*< 4.9* [3]
Montrose i/c	I-370 i/c	2%	0%	0%
Middelbrook Rd i/c	I-370 i/c	6%	2%	1%
Mitigating action / AC overlay required (inch)		2.0 – 3.0	3.0 – 4.0	Full-depth patch [5]

Northbound Outside / Right Shoulder lane

		Percentage of section length with AC layer thicknesses (inches) between :		
From	*To*	*11.4 – 11.0* [1]	*11.0 – 10.7* [2]	*< 10.7* [3]
Ramp C		8%	4%	2%
Mitigating action / AC overlay required (inch) [4]		1.0 – 1⅜	1⅜ – 1½	1½ - 2.0

Notes :

1. AC layer thicknesses limits denote values of between selected design layer thickness (refer to relevant Tables under "Existing Pavement Structure) less 1 times std dev and 1.5 times the std dev respectively – indicating sections with "potentially" structural inadequacies.
2. AC layer thicknesses limits denote values of between selected design layer thickness (refer to relevant Tables under "Existing Pavement Structure) less 1.5 times std dev and 2.0 times the std dev respectively – indicating sections with "likely" structural inadequacies.
3. AC layer thicknesses limits denote values of less than design layer thickness (refer relevant Tables under "Existing Pavement Structure) minus 2.0 times std dev – indicating areas of concern and sections with structural inadequacies that may require substantial structural strengthening, i.e. would require AC overlay of approximately 5 to 6 inches to attain the required SN. This could also be achieved through means of full-depth patching (removal of existing AC and/or GAB (full or partially) and replacing with suitable HMA of approximately 9.5 – 10 inches, i.e. suitable layers to add SN of 4.27 – should existing road need to be maintained. (Note : these areas are very limited in extent and confined to localized areas).
4. Structural strengthening that would be needed would require AC overlay of approximately 5 to 6 inches to attain the required SN. This could also be achieved through means of full-depth patching (removal of existing AC and/or GAB (full or partially) and replacing with suitable HMA of approximately 9.5 – 10 inches, i.e. suitable layers to add SN of 4.27 – should existing road levels be maintained. Note, these areas are very limited in extent and confined to localized areas and exact details would need to be determined on site.
5. Indicated required AC overlay thickness is in addition to the overlay required as part of initial design.

CONCLUSIONS & RECOMMENDATIONS

a) The proposal put forward by the I-270 DB team in the development of PTC-1 and 10 to use the median shoulder and outside/right shoulder as HSR during peak hours to increase capacity along the I-270 without the need for additional structural capacity and with a goal of leaving the underlying granular materials in-tact, seem to be a viable and technical sound solution.

b) A brief structural analysis of the existing pavement structure, with cognizance of the assumptions that were made due to the limited available traffic and geotechnical data, indicate that minimal additional structural strengthening would be required to the existing northbound outside / right shoulder (⅜ inch required, for practical considerations approximately 1 - 1½ inches of new AC overlay) to accommodate the expected future HSR design traffic.

c) Results indicate that should better subgrade conditions exist along the route than what was assumed for purposes of this design analysis (increase in M_R from 3000 psi to 4500 psi), or, should lane restrictions for certain vehicle classes be considered as an option for the HSR, the outside/right shoulder would have sufficient existing structural strength to carry expected future traffic on the lane without need for any structural strengthening.

d) The structural analysis indicated that both the northbound and southbound median shoulders has sufficient structural capacity to accommodate the expected future design traffic without the need for any structural improvement for use as HOV lanes on HSR.

e) Results, and in particular, GPR results, show some degree of variability in measured AC layer thickness along the route and although the DARWin design do allow for some degree of variability through inherent confidence limits and/or reliability factors, layer thicknesses need to be confirmed and areas verified where layer properties indicate potential structural inadequacies.

f) Available GPR data was used to identify and “flag” sections of potential risks and/or areas where potential structural deficiencies may exist.

g) Areas were “flagged” as a “concern – structurally inadequate” which indicate instances that may require substantial structural strengthening, i.e. full-depth patching, as “likely structurally inadequate”, indicating instances that may require some structural strengthening in the form of an additional AC overlay, (typically 2.0 to 4.0 inches) and as “potentially structural inadequate”, indicating instances that may require some minor structural strengthening in the form of an additional AC overlay (typically 1.0 – 2.0 inches).

h) However, it is imperative that the assumed material properties and layer thicknesses be confirmed through more detail geotechnical investigations and testing. Detailed geotechnical investigation will be conducted post-award to quantify the design assumptions and hence, structural adequacy of the existing pavement structure.

APPENDIX VI
PRELIMINARY QUALITATIVE NOISE ANALYSIS

IS-270 - Innovative Congestion Management Contract
Preliminary Qualitative Noise Barrier Analysis

Noise Barrier System Designation	Land Use Description	NSAs Included	Location Description	Traffic Noise Impacts in the Barrier System Area?	Barrier Analysis Warranted	Potential Noise Barrier			Cost Effectiveness	Reasonableness Cost Criteria	Wall potientally warranted?	
				Yes/No	Yes/No	Estimated Average Height (FT)	Estimated Length (LF)	Area (SF)	Number of Benefited Residences	SF/ Ben Res	Yes/No	If no or possible, why?
BS-1	residential	341-B	I-270 SB from Game Preserve Road to south of Game Preserve Road	Yes	Yes	14.62	1,512	22,107	4	5,527	No	>3700 SF/Ben
BS-2	residential	342-B	I-270 SB from W Watkins Mill Road to south of W Watkins Mill Road	Yes	Yes	20	605	12,360	3	4,120	No	>3700 SF/Ben
BS-3	residential	343-B	I-270 SB from south of MD-124 to north of Firstfield Road	No	No						No	No Noise Impacts
BS-4	baseball fields and picnic area	346-C	I-270 SB from south of MD-117 to Muddy Branch Road	Yes	Yes	15	1,830	27,450	6	4,575	No	>3700 SF/Ben
BS-5	residential and hiker biker trail at park	portion of 348-B, 349-C	I-270 SB from north of I-370 to I-370	Yes	Yes	11	1,340	14,740	10	1,474	No	Not feasible to construct as per structural review of exisitng retaining wall 15290RO
BS-6a	hiker biker trail at park	350-E, 351-C, 353-E	I-270 SB from south of I-370 to north of Shady Grove Road	Yes	Yes	16	1,100	17,600	5	3,520	Possible	<3700 SF/Ben but could possibly be >3700 SF/Ben
BS-6b	outdoor pool at hotel	355-E	I-270 SB from south of I-370 to north of Shady Grove Road	Yes	Yes	11	470	5,170	1	5,170	No	>3700 SF/Ben
BS-7	interior medical facility and outdoor pool at hotel	358-D, 359-E	I-270 SB from Shady Grove Road to south of Shady Grove Road	Yes	Yes	12	824	9,888	2	4,944	No	No Noise Impacts at Medical Facility and >3700 SF/Ben at Pool
BS-8	courtyard with benches and tables at office	361-E	I-270 SB from north of W Gude Drive to W Gude Drive	Yes	Yes	10	960	9,600	2	4,800	No	>3700 SF/Ben
BS-9	outdoor pool at hotel	363-E	I-270 SB from Hurley Ave to north of MD-28	Yes	Yes	10	690	6,900	2	3,450	No	>3700 SF/Ben including R/W costs
BS-10 opt1		portion of 222-B, 223-B	I-270 SB from north of MD-189 to MD-189	Yes	Yes	24	770	18,480	5	3,696	Possible	
BS-10 opt2		portion of 222-B, 223-B	I-270 SB from north of MD-189 to MD-189	Yes	Yes	7	680	4,760	5	952	Possible	
BS-10 opt2 (after field visit)	residential	portion of 222-B, 223-B	I-270 SB from north of MD-189 to MD-189	Yes	Yes	20	640	12,800	5	2,560	Yes	n/a
BS-11	residential	224-B	I-270 SB from MD-189 to south of MD-189	No	No						No	No Noise Impacts
BS-12	residential and campground	229-B, 230-C	I-270 SB from Montrose Road to Tuckerman Lane	Yes	Yes	15	2,790	41,850	10	4,185	Possible	No Impacts for Residential Area and Need Analysis to Verify Feasibility of Meeting Noise Reduction Goals and Cost Effectivenes given active use area distance from noise barrier
BS-13a (on country club property)	golf course	103-C	I-270 Spur SB and along I-495 SB from south of Democracy Blvd to Bradley Blvd	Yes	Yes	12	2,250	27,000	15	1,800	No	Has Extensive R/W Needs and Possible Flood Plain Issues
BS-13b (on SHA R/W)	golf course	103-C	I-270 Spur SB and along I-495 SB from south of Democracy Blvd to Bradley Blvd	Yes	Yes	24	1,980	47,520	11	4,320	Possible	Need Analysis to Verify Feasibility of Meeting Noise Reduction Goals and Cost Effectiveness given active use area distance from noise barrier
BS-13c	residential	104-B	I-270 Spur SB and along I-495 SB from south of Democracy Blvd to Bradley Blvd	Not within project limits								
BS-14	residential	107-B, 108-B, 109-B	I-270 Spur NB from north of I-495 to Democracy Blvd									
BS-15	hotel with trail and outdoor pool	110-E	I-270 Spur NB from Democracy Blvd to north of Democracy Blvd									
BS-16	office buildings with walking paths	111-E, 112-E	I-270 Spur NB from Westlake Terrace to I-270									
BS-17	residential	115-B	I-270 SB from MD-187 to east of MD-187									
BS-18	residential	117-B	I-270 SB from north of Grosvenor Lane to Grosvenor Lane									
BS-19	townhouses with rooftop terrace and deck	118-B	I-270 SB from Grosvenor Lane to south of Grosvenor Lane									
BS-20	high-rise condos with balconies and an outdoor pool	119-B	I-270 SB, south of I-495 merge									
BS-21	residential	121-B	I-270 NB from north of I-495 merge to Grosvenor Lane									
BS-22	residential, retirement facility (interior), church with playground and memorial garden	122-B, 123-B, 124-B, 125-B, 127-D, 128-B, 129-B, 130-B,	I-270 NB from north of Grosvenor Lane to MD-187	Yes	Yes	19	6,160	117,040	124	944	Yes	n/a
BS-23	nursing center with tables and chairs at front of building	208-C	I-270 NB, south of Potomac Valley Road	No	No						No	No Noise Impacts
BS-24a	school with ball fields, tennis courts, and basketball courts; walking paths	210-C, 211-C, 212-B, 213-B	I-270 NB from MD-189 to MD-28	No	No						No	n/a
BS-24b	residential; nursing home with benches at entrance; churches with playground, benches, basketball hoop	214-C, 215-C, 216-B, 217-C	I-270 NB from MD-189 to MD-28	Yes	Yes	12	1,300	15,600	5	3,120	Possible	R/W needs may push it over 3700 SF/BEN
BS-25	residential, ball fields, church (interior), shopping center with tables	301-B, 302-D, 303-B, 304-C, 305-E	I-270 NB from MD-28 to north of MD-28	Yes	Yes	27	2,608	68,728	38	1,809	Yes	n/a

IS-270 - Innovative Congestion Management Contract
Preliminary Qualitative Noise Barrier Analysis

Noise Barrier System Designation	Land Use Description	NSAs Included	Location Description	Traffic Noise Impacts in the Barrier System Area?	Barrier Analysis Warranted	Potential Noise Barrier			Cost Effectiveness	Reasonableness Cost Criteria	Wall potientally warranted?	
				Yes/No	Yes/No	Estimated Average Height (FT)	Estimated Length (LF)	Area (SF)	Number of Benefited Residences	SF/ Ben Res	Yes/No	If no or possible, why?
BS-26	medical facility (interior)	310-D	I-270 NB north of W Gude Drive	No	No						No	No Noise Impacts
BS-27a	medical center (interior)	315-D	I-270 NB from south of Redland Blvd to Shady Grove Road	No	No						No	No Noise Impacts
BS-27b	apartments with outdoor pool, hotel with paths and benches	316-E, 317-B	I-270 NB from south of Redland Blvd to Shady Grove Road	Yes	Yes	25	1,360	34,000	4	8,500	No	>3700 SF/Ben
BS-28	park with playground, tennis & basketball courts, baseball & soccer fields, picnic pavilion	majority of 320-C	I-270 NB from I-370 to south of Summit Hall Road	No	No						No	No Noise Impacts
BS-29	residential	325-B	I-270 NB, south of Muddy Branch Road	Yes	Yes	25	980	24,500	8	3,063	Possible	Close to 3,700 SF/Ben and needs further analysis
BS-30	residential	326-B, 327-B, 328-B, 329-B	I-270 NB from Muddy Branch Road to MD-117	Yes	Yes	35	3,440	120,400	75	1,605	Yes	n/a
BS-31	hotel with patio and tables	330-E	I-270 NB from north of MD-117 to south of Perry Pkwy	No	No						No	No Noise Impacts
BS-32a	office buildings with walking paths	335-E	I-270 NB from MD-124 to south of Watkins Mill Road	Yes	Yes	20	1,140	22,800	4	5,700	No	>3700 SF/Ben
BS-32b	tennis courts	336-E	I-270 NB from MD-124 to south of Watkins Mill Road	Yes	Yes	9	400	3,513	2	1,757	No	n/a
BS-33	office building with bench	338-E	I-270 NB from Watkins Mill Road to north of Watkins Mill Road	No	No						No	No Noise Impacts
BS-34	residential, playground	n/a	I-270 NB from 1600' south of Middlebrook Road to south of Middlebrook Road	Yes	Yes	24	1,460	35,040	40	876	Yes	
BS-35	office building with outdoor tables/patio	n/a	I-270 NB, north of Middlebrook Road	Possible	Yes	24	1,100	26,400	1	26,400	No	outdoor use area sits far back and wall would need to be long/high to get benefits
BS-36	hotel with benches out front/pool along Gernmantown Road and Daycare center with playground out back	n/a	I-270 NB, south of Germantown Road	Yes	Yes	24	1,900	45,600	3	15,200	No	outdoor use area sits far back and wall would need to be long/high to get benefits
BS-37	office building with bench	n/a	I-270 NB, from Germantown Road to Father Hurley Blvd	No	No							No Noise Impacts
BS-38	office building with bench, hotel	n/a	I-270 NB, north of Father Hurley Blvd	No	No							No Noise Impacts
BS-39	farm and residential & baseball fields	n/a	I-270 NB, south of W Old Baltimore Road	No	No							No Noise Impacts
BS-40	offices and daycare center	n/a	I-270 NB, south of Stringtown Road	Yes	Yes	24	910	21,840	2	10,920	No	outdoor use area sits far back and wall would need to be long/high to get benefits
BS-41	Clarksburg Premium Outlets	n/a	I-270 SB, south of Clarksburg Road	Possible	No							Barrier not likley to meet reasonabless criteria
BS-42	Owned by ADVENTIST HEALTHCARE INC as residential, in construction now, believe that it's being develed as commercial office (Cabin Branch) with residential behind. May have walking trails along I-270 which could be impacted by noise. Planning Zoning Application document says, "Noise: Limit the acceptable noise levels to a maximum 65 LdN for residential rear yards, per Montgomery County Guidelines."	n/a	I-270 SB, north of W Old Baltimore Road	No	No							No Noise Impacts
BS-43	BLACK HILL REGIONAL PARK with trails	n/a	I-270 SB, south of W Old Baltimore Road	No	No							No Noise Impacts
BS-44	Black Hills Development (office, retail, hotel residential, walking path)	n/a	I-270 SB, north of Father Hurley Blvd	Possible	Yes	24	3,000	72,000	2	36,000	No	Barrier not likley to meet reasonabless criteria
BS-45	office, softball, tennis, hotel, restaurants	n/a	I-270 SB, from Germantown Road to Father Hurley Blvd	No	No							No Noise Impacts
BS-46	office, retail	n/a	I-270 SB, from Middlebrook Road to Germantown Road	No	No							No Noise Impacts
BS-47	residential, church	n/a	I-270 NB from 1600' south of Middlebrook Road to south of Middlebrook Road	Yes	Yes	24	4,900	117,600	40	2,940		

Summary	Total Number of Barrier Systems	Length (LF)	Area (SF)
Yes	7	16,878	417,038
Possible	8	14,310	287,350
Total	15	31,188	704,388

APPENDIX VII
PROPOSED PTC 1 AND PTC 10 ROLLMAP (PDF ONLY)

PROPOSED TECHNICAL CONCEPT 1 AND 10
I-270 – INNOVATIVE CONGESTION MANAGEMENT CONTRACT
LANE AND SHOULDER SCHEMATIC
SHEET 1 OF 5
JANUARY 2017

CONCEPT ONLY – NOT FOR CONSTRUCTION

SHA State Highway Maryland Department of Transportation

SOUTHBOUND HARD SHOULDER RUNNING

NORTHBOUND HARD SHOULDER RUNNING

EXISTING LANE

PROPOSED LANE

200' 0 200' 400'
SCALE: 1" =200'

LEGEND
ELECTRIC
ELECTRIC DUCT BANK
GAS SUCTION
STREET LIGHT ELECTRIC
BRIDGES ELECTRIC
TRAFFIC CONTROL WIRE
CABLE TELEVISION
COMMUNICATIONS (FIBER OPTIC)
COMMUNICATIONS (TELEPHONE)
COMMUNICATIONS DUCT BANK
GAS
SANITARY SEWER MAIN
SANITARY SEWER LATERAL
WATER
UNKNOWN
ABANDONED UTILITY

Typical Section A-A
South of Montrose Road
Existing Typical Section
NB Express Lanes
SB Express Lanes
Proposed Typical Section

Typical Section B-B
Montrose Road to MD 28 (W Montgomery Ave)
Existing Typical Section
NB Express Lanes
SB Express Lanes
Proposed Typical Section

TO WASHINGTON D.C. (I-495)

LIMIT OF WORK
NB AND SB I-270

LIMIT OF WORK
SB-OUTSIDE I-270

I-270 – WEST SPUR

270

I-270 – EAST SPUR

Tuckerman Lane

Montrose Rd

Wooden Pkwy

FALLS RD

189

TO FREDERICK (I-70)

MATCHLINE
SEE SHEET 2

SOUTHBOUND HARD SHOULDER RUNNING

NORTHBOUND HARD SHOULDER RUNNING

EXISTING LANE

PROPOSED LANE

200' 0 200' 400'
SCALE: 1" = 200'

LEGEND

ELECTRIC

ELECTRIC DUCT BANK

SHA ELECTRIC

STREET LIGHT ELECTRIC

PRIVATE ELECTRIC

TRAFFIC CONTROL WIRE

CABLE TELEVISION

COMMUNICATIONS (FIBER OPTIC)

COMMUNICATIONS (TELEPHONE)

COMMUNICATIONS DUCT BANK

GAS

SANITARY SEWER MAIN

SANITARY SEWER LATERAL

WATER

UNKNOWN

INDICATES (DATR)

PROPOSED TECHNICAL CONCEPT 1 AND 10
I–270 – INNOVATIVE CONGESTION MANAGEMENT CONTRACT
LANE AND SHOULDER SCHEMATIC
SHEET 2 OF 5

JANUARY 2017

CONCEPT ONLY – NOT FOR CONSTRUCTION

PROPOSED TECHNICAL CONCEPT 1 AND 10
I-270 – INNOVATIVE CONGESTION MANAGEMENT CONTRACT
LANE AND SHOULDER SCHEMATIC
SHEET 3 OF 5
JANUARY 2017

CONCEPT ONLY – NOT FOR CONSTRUCTION

SHA State Highway Administration

SOUTHBOUND HARD SHOULDER RUNNING

NORTHBOUND HARD SHOULDER RUNNING

EXISTING LANE

PROPOSED LANE

200' 0 200' 400'

SCALE: 1" =200'

LEGEND

ELECTRIC	
ELECTRIC DUCT BANK	ELEC DUCT BANK
GAS SUCTION	GAS
STREET LIGHT ELECTRIC	SL
WIRING ELECTRIC	WIRING
TRAFFIC CONTROL WIRE	TC
CABLE TELEVISION	CATV
COMMUNICATIONS (FIBER OPTIC)	
COMMUNICATIONS (TELEPHONE)	
COMMUNICATIONS DUCT BANK	COMM DUCT BANK
FIRE	
SANITARY SEWER MAIN	S SEWER
SANITARY SEWER LATERAL	SS
WATER	
UNKNOWN	UNK
WORLDVIEW (NGTOS)	

TO WASHINGTON D.C. (I-495)

MATCHLINE SEE SHEET 2

MATCHLINE SEE SHEET 4

TO FREDERICK (I-70)

LIMIT OF WORK
SR I-270

MARYLAND 117

MARYLAND 124

Muddy Branch Rd

W. Diamond Ave

CSX Railroad Tracks

Quince Orchard Rd

Montgomery Village Ave

Watkins Mill Rd

Goshen Reserve Rd

Typical Section C-C
MD 28 (W Montgomery Ave) to Watkins Mill Rd

Existing Typical Section

Proposed Typical Section

Typical Section D-D
Watkins Mill Rd to MD 121 (Clarksburg Road)

Existing Typical Section

Proposed Typical Section

PROPOSED TECHNICAL CONCEPT 1 AND 10
I-270 – INNOVATIVE CONGESTION MANAGEMENT CONTRACT
LANE AND SHOULDER SCHEMATIC
SHEET 4 OF 5
JANUARY 2017

CONCEPT ONLY – NOT FOR CONSTRUCTION

SHA State Highway Maryland Department of Transportation

SOUTHBOUND HARD SHOULDER RUNNING

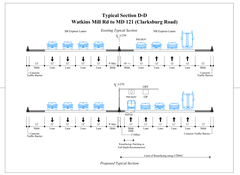
NORTHBOUND HARD SHOULDER RUNNING

EXISTING LANE

PROPOSED LANE

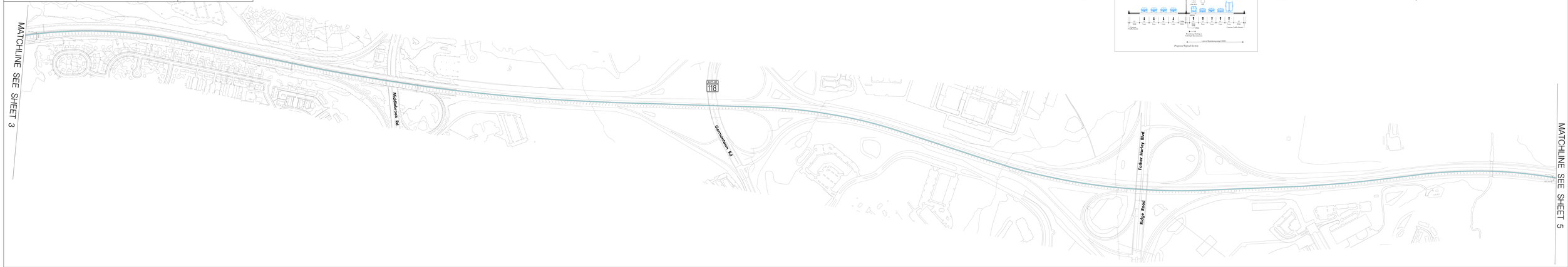
200' 0 200' 400'
SCALE: 1" =200'

TO WASHINGTON D.C. (I-495)



TO FREDERICK (I-70)

MATCHLINE SEE SHEET 3



MATCHLINE SEE SHEET 5

PROPOSED TECHNICAL CONCEPT 1 AND 10
I–270 – INNOVATIVE CONGESTION MANAGEMENT CONTRACT
LANE AND SHOULDER SCHEMATIC
SHEET 5 OF 5
JANUARY 2017

CONCEPT ONLY – NOT FOR CONSTRUCTION

SHA State Highway Maryland Department of Transportation

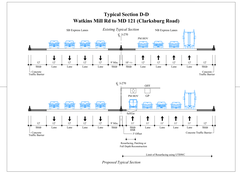
SOUTHBOUND HARD SHOULDER RUNNING

NORTHBOUND HARD SHOULDER RUNNING

EXISTING LANE

PROPOSED LANE

200' 0 200' 400'
SCALE: 1" =200'



TO WASHINGTON D.C. (I–495)

MATCHLINE SEE SHEET 4

W. Old Baltimore Rd

LIMIT OF WORK
NB I–270

Clarksburg Rd
MD 121

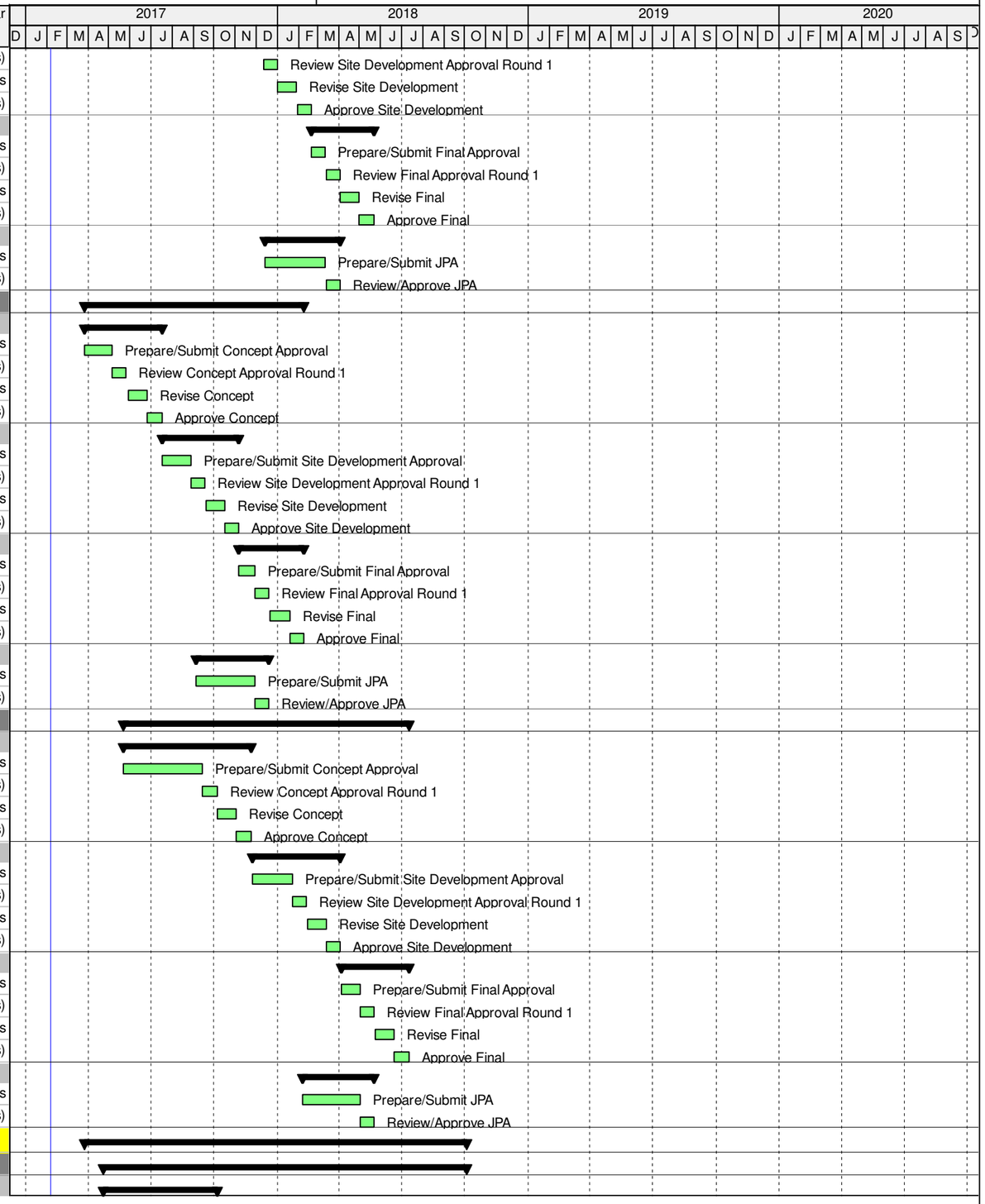
270

TO FREDERICK (I–70)

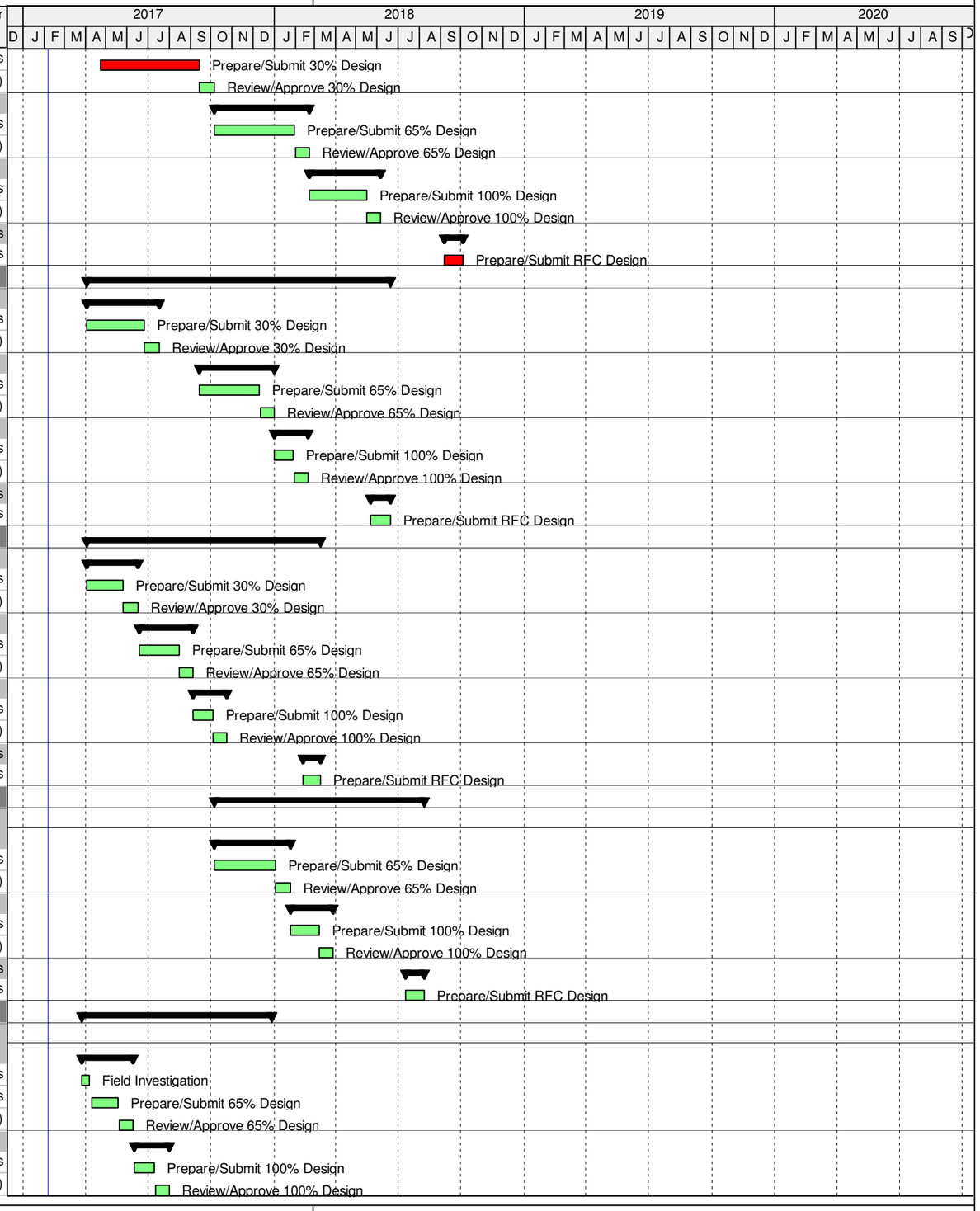
APPENDIX VIII
SCHEDULE

#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
1	**I-270 Congestion Management**		891	06-Feb-17	15-Aug-20	
2	**Milestones and Admin**		893	06-Feb-17	15-Aug-20	
3	001 Award	Award	0	06-Feb-17		08H x 7D (Calendar Days)
4	003 CALD	Calendar Days	1208	27-Mar-17	16-Jul-20	08H x 7D (Calendar Days)
5	004 WRKD	Work Days	837	27-Mar-17	16-Jul-20	08H x 5D w/ Holidays
6	A1060	NTP for Preconstruction	0	27-Mar-17*		08H x 5D w/ Holidays
7	005 SC	Substantial Completion	0		16-Jul-20	08H x 7D (Calendar Days)
8	005 SC10	Closeout and Punchlist	30	17-Jul-20	15-Aug-20	08H x 7D (Calendar Days)
9	007 PC	Project Complete	0		15-Aug-20	08H x 7D (Calendar Days)
10	**Preconstruction**		385	27-Mar-17	03-Oct-18	
11	**Field Investigation**		120	27-Mar-17	14-Sep-17	08H x 5D w/ Holidays
12	A1030	Field Survey	80	27-Mar-17	19-Jul-17	08H x 5D w/ Holidays
13	A1040	Geographical Borings	60	22-May-17	16-Aug-17	08H x 5D w/ Holidays
14	A1080	Prepare/Deliver Foundations Report	20	17-Aug-17	14-Sep-17	08H x 5D w/ Holidays
15	A1090	Prepare/Deliver Pavement Report	20	17-Aug-17	14-Sep-17	08H x 5D w/ Holidays
16	A1100	SWM Infiltration Testing	20	17-Aug-17	14-Sep-17	08H x 5D w/ Holidays
17	**Environmental Documentation (NEPA)**		172	25-Jul-17	28-Mar-18	08H x 5D w/ Holidays
18	A1510	PCE for Local Congestion Relief Areas	90	25-Jul-17	30-Nov-17	08H x 5D w/ Holidays
19	A1540	PCE for Advanced OD Collection	90	25-Jul-17	30-Nov-17	08H x 5D w/ Holidays
20	A1120	CE for Median & Outside HSR	160	03-Aug-17	21-Mar-18	08H x 5D w/ Holidays
21	A1130	Noise Analysis	120	06-Oct-17	28-Mar-18	08H x 5D w/ Holidays
22	A1520	PCE for ITS/DMS	90	13-Oct-17	21-Feb-18	08H x 5D w/ Holidays
23	**Environmental Permitting**		367	27-Mar-17	05-Sep-18	
24	**E&S & SWM Median HSR Managed Lanes**		327	22-May-17	05-Sep-18	
25	**Concept Approval**		129	22-May-17	23-Nov-17	
26	A1560	Prepare/Submit Concept Approval	80	22-May-17	14-Sep-17	08H x 5D w/ Holidays
27	A1570	Review Concept Approval Round 1	21	15-Sep-17	05-Oct-17	08H x 7D (Calendar Days)
28	A1980	Revise Concept	20	06-Oct-17	02-Nov-17	08H x 5D w/ Holidays
29	A1990	Approve Concept	21	03-Nov-17	23-Nov-17	08H x 7D (Calendar Days)
30	**Site Approval**		110	27-Nov-17	01-May-18	
31	A1580	Prepare/Submit Site Development Approval	60	27-Nov-17	20-Feb-18	08H x 5D w/ Holidays
32	A1590	Review Site Development Approval Round 1	21	21-Feb-18	13-Mar-18	08H x 7D (Calendar Days)
33	A2000	Revise Site Development	20	14-Mar-18	10-Apr-18	08H x 5D w/ Holidays
34	A2010	Approve Site Development	21	11-Apr-18	01-May-18	08H x 7D (Calendar Days)
35	**Final Approval**		88	02-May-18	05-Sep-18	
36	A1600	Prepare/Submit Final Approval	40	02-May-18	27-Jun-18	08H x 5D w/ Holidays
37	A1610	Review Final Approval Round 1	21	28-Jun-18	18-Jul-18	08H x 7D (Calendar Days)
38	A2020	Revise Final	20	19-Jul-18	15-Aug-18	08H x 5D w/ Holidays
39	A2030	Approve Final	21	16-Aug-18	05-Sep-18	08H x 7D (Calendar Days)
40	**USACE - JPA (If Applicable)**		74	04-Apr-18	18-Jul-18	
41	A1800	Prepare/Submit JPA	60	04-Apr-18	27-Jun-18	08H x 5D w/ Holidays
42	A1810	Review/Approve JPA	21	28-Jun-18	18-Jul-18	08H x 7D (Calendar Days)
43	**E&S & SWM Outside HSR Managed Lanes**		273	24-Apr-17	21-May-18	
44	**Concept Approval**		92	24-Apr-17	04-Sep-17	
45	A1620	Prepare/Submit Concept Approval	45	24-Apr-17	26-Jun-17	08H x 5D w/ Holidays
46	A1630	Review Concept Approval Round 1	21	27-Jun-17	17-Jul-17	08H x 7D (Calendar Days)
47	A2040	Revise Concept	20	18-Jul-17	14-Aug-17	08H x 5D w/ Holidays
48	A2050	Approve Concept	21	15-Aug-17	04-Sep-17	08H x 7D (Calendar Days)
49	**Site Approval**		93	06-Oct-17	19-Feb-18	
50	A1640	Prepare/Submit Site Development Approval	45	06-Oct-17	11-Dec-17	08H x 5D w/ Holidays

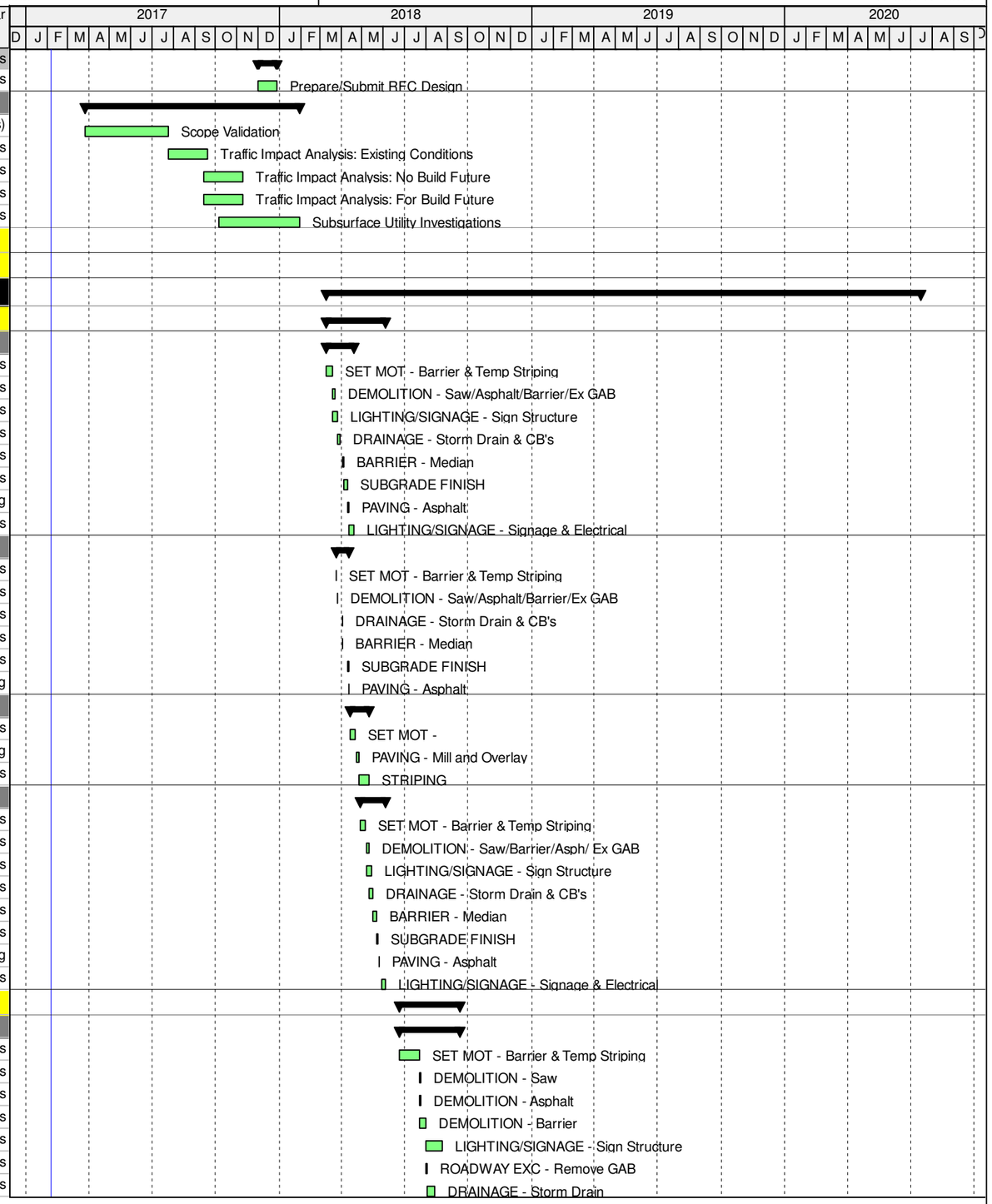
#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
51	A1650	Review Site Development Approval Round 1	21	12-Dec-17	01-Jan-18	08H x 7D (Calendar Days)
52	A2060	Revise Site Development	20	02-Jan-18	29-Jan-18	08H x 5D w/ Holidays
53	A2070	Approve Site Development	21	30-Jan-18	19-Feb-18	08H x 7D (Calendar Days)
54	**Final Approval**		65	20-Feb-18	21-May-18	
55	A1660	Prepare/Submit Final Approval	15	20-Feb-18	12-Mar-18	08H x 5D w/ Holidays
56	A1670	Review Final Approval Round 1	21	13-Mar-18	02-Apr-18	08H x 7D (Calendar Days)
57	A2080	Revise Final	20	03-Apr-18	30-Apr-18	08H x 5D w/ Holidays
58	A2090	Approve Final	21	01-May-18	21-May-18	08H x 7D (Calendar Days)
59	**USACE - JPA (If Applicable)**		75	15-Dec-17	02-Apr-18	
60	A1820	Prepare/Submit JPA	60	15-Dec-17	12-Mar-18	08H x 5D w/ Holidays
61	A1830	Review/Approve JPA	21	13-Mar-18	02-Apr-18	08H x 7D (Calendar Days)
62	**E&S & SWM Local Congestion Relief Areas**		222	27-Mar-17	09-Feb-18	
63	**Concept Approval**		78	27-Mar-17	17-Jul-17	
64	A1680	Prepare/Submit Concept Approval	30	27-Mar-17	05-May-17	08H x 5D w/ Holidays
65	A1690	Review Concept Approval Round 1	21	06-May-17	26-May-17	08H x 7D (Calendar Days)
66	A2100	Revise Concept	20	30-May-17	26-Jun-17	08H x 5D w/ Holidays
67	A2110	Approve Concept	21	27-Jun-17	17-Jul-17	08H x 7D (Calendar Days)
68	**Site Approval**		79	18-Jul-17	06-Nov-17	
69	A1700	Prepare/Submit Site Development Approval	30	18-Jul-17	28-Aug-17	08H x 5D w/ Holidays
70	A1710	Review Site Development Approval Round 1	21	29-Aug-17	18-Sep-17	08H x 7D (Calendar Days)
71	A2120	Revise Site Development	20	19-Sep-17	16-Oct-17	08H x 5D w/ Holidays
72	A2130	Approve Site Development	21	17-Oct-17	06-Nov-17	08H x 7D (Calendar Days)
73	**Final Approval**		65	07-Nov-17	09-Feb-18	
74	A1720	Prepare/Submit Final Approval	15	07-Nov-17	29-Nov-17	08H x 5D w/ Holidays
75	A1730	Review Final Approval Round 1	21	30-Nov-17	20-Dec-17	08H x 7D (Calendar Days)
76	A2140	Revise Final	20	21-Dec-17	19-Jan-18	08H x 5D w/ Holidays
77	A2150	Approve Final	21	20-Jan-18	09-Feb-18	08H x 7D (Calendar Days)
78	**USACE - JPA (If Applicable)**		75	05-Sep-17	20-Dec-17	
79	A1840	Prepare/Submit JPA	60	05-Sep-17	29-Nov-17	08H x 5D w/ Holidays
80	A1850	Review/Approve JPA	21	30-Nov-17	20-Dec-17	08H x 7D (Calendar Days)
81	**E&S & SWM ITS & DMS (Outside of HSR Limits)**		288	22-May-17	11-Jul-18	
82	**Concept Approval**		129	22-May-17	23-Nov-17	
83	A1740	Prepare/Submit Concept Approval	80	22-May-17	14-Sep-17	08H x 5D w/ Holidays
84	A1750	Review Concept Approval Round 1	21	15-Sep-17	05-Oct-17	08H x 7D (Calendar Days)
85	A2160	Revise Concept	20	06-Oct-17	02-Nov-17	08H x 5D w/ Holidays
86	A2170	Approve Concept	21	03-Nov-17	23-Nov-17	08H x 7D (Calendar Days)
87	**Site Approval**		90	27-Nov-17	03-Apr-18	
88	A1760	Prepare/Submit Site Development Approval	40	27-Nov-17	23-Jan-18	08H x 5D w/ Holidays
89	A1770	Review Site Development Approval Round 1	21	24-Jan-18	13-Feb-18	08H x 7D (Calendar Days)
90	A2180	Revise Site Development	20	14-Feb-18	13-Mar-18	08H x 5D w/ Holidays
91	A2190	Approve Site Development	21	14-Mar-18	03-Apr-18	08H x 7D (Calendar Days)
92	**Final Approval**		69	04-Apr-18	11-Jul-18	
93	A1780	Prepare/Submit Final Approval	20	04-Apr-18	01-May-18	08H x 5D w/ Holidays
94	A1790	Review Final Approval Round 1	21	02-May-18	22-May-18	08H x 7D (Calendar Days)
95	A2200	Revise Final	20	23-May-18	20-Jun-18	08H x 5D w/ Holidays
96	A2210	Approve Final	21	21-Jun-18	11-Jul-18	08H x 7D (Calendar Days)
97	**USACE - JPA (If Applicable)**		75	07-Feb-18	22-May-18	
98	A1860	Prepare/Submit JPA	60	07-Feb-18	01-May-18	08H x 5D w/ Holidays
99	A1870	Review/Approve JPA	21	02-May-18	22-May-18	08H x 7D (Calendar Days)
100	**Design**		385	27-Mar-17	03-Oct-18	
101	**Median HSR Managed Lanes**		367	24-Apr-17	03-Oct-18	
102	**30% Design**		115	24-Apr-17	05-Oct-17	



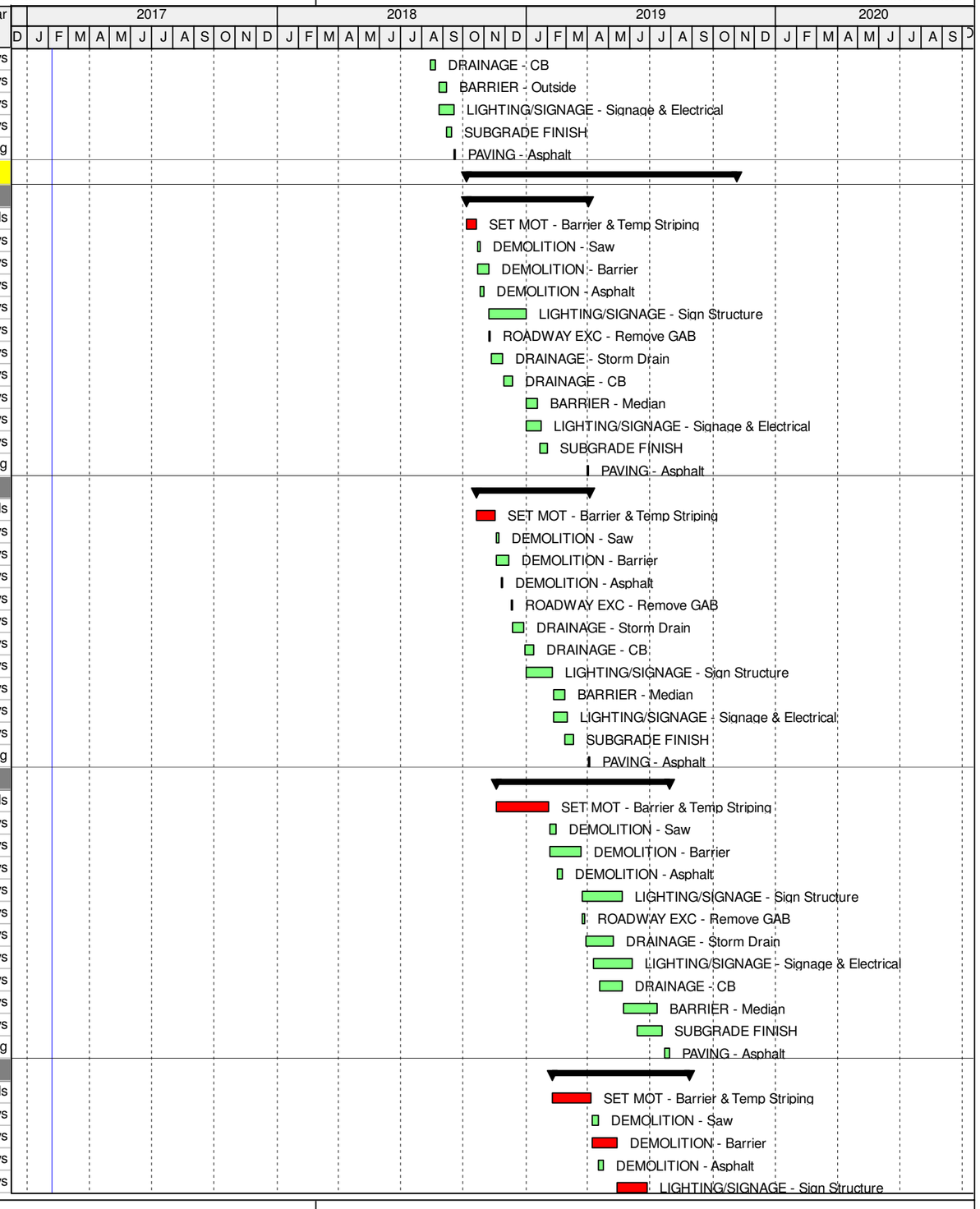
#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
103	A1140	Prepare/Submit 30% Design	100	24-Apr-17	14-Sep-17	08H x 5D w/ Holidays
104	A1150	Review/Approve 30% Design	21	15-Sep-17	05-Oct-17	08H x 7D (Calendar Days)
105	**65% Design**		95	06-Oct-17	21-Feb-18	
106	A1160	Prepare/Submit 65% Design	80	06-Oct-17	31-Jan-18	08H x 5D w/ Holidays
107	A1180	Review/Approve 65% Design	21	01-Feb-18	21-Feb-18	08H x 7D (Calendar Days)
108	**100% Design**		74	22-Feb-18	06-Jun-18	
109	A1190	Prepare/Submit 100% Design	60	22-Feb-18	16-May-18	08H x 5D w/ Holidays
110	A1200	Review/Approve 100% Design	21	17-May-18	06-Jun-18	08H x 7D (Calendar Days)
111	**RFC Design**		20	06-Sep-18	03-Oct-18	08H x 5D w/ Holidays
112	A1210	Prepare/Submit RFC Design	20	06-Sep-18	03-Oct-18	08H x 5D w/ Holidays
113	**Outside HSR Managed Lanes**		308	03-Apr-17	19-Jun-18	
114	**30% Design**		73	03-Apr-17	17-Jul-17	
115	A1220	Prepare/Submit 30% Design	60	03-Apr-17	26-Jun-17	08H x 5D w/ Holidays
116	A1230	Review/Approve 30% Design	21	27-Jun-17	17-Jul-17	08H x 7D (Calendar Days)
117	**65% Design**		73	15-Sep-17	01-Jan-18	
118	A1240	Prepare/Submit 65% Design	60	15-Sep-17	11-Dec-17	08H x 5D w/ Holidays
119	A1250	Review/Approve 65% Design	21	12-Dec-17	01-Jan-18	08H x 7D (Calendar Days)
120	**100% Design**		35	02-Jan-18	19-Feb-18	
121	A1260	Prepare/Submit 100% Design	20	02-Jan-18	29-Jan-18	08H x 5D w/ Holidays
122	A1270	Review/Approve 100% Design	21	30-Jan-18	19-Feb-18	08H x 7D (Calendar Days)
123	**RFC Design**		20	22-May-18	19-Jun-18	08H x 5D w/ Holidays
124	A1280	Prepare/Submit RFC Design	20	22-May-18	19-Jun-18	08H x 5D w/ Holidays
125	**Local Congestion Relief Areas**		237	03-Apr-17	09-Mar-18	
126	**30% Design**		54	03-Apr-17	16-Jun-17	
127	A1290	Prepare/Submit 30% Design	40	03-Apr-17	26-May-17	08H x 5D w/ Holidays
128	A1300	Review/Approve 30% Design	21	27-May-17	16-Jun-17	08H x 7D (Calendar Days)
129	**65% Design**		54	19-Jun-17	05-Sep-17	
130	A1310	Prepare/Submit 65% Design	40	19-Jun-17	15-Aug-17	08H x 5D w/ Holidays
131	A1320	Review/Approve 65% Design	21	16-Aug-17	05-Sep-17	08H x 7D (Calendar Days)
132	**100% Design**		35	06-Sep-17	24-Oct-17	
133	A1330	Prepare/Submit 100% Design	20	06-Sep-17	03-Oct-17	08H x 5D w/ Holidays
134	A1340	Review/Approve 100% Design	21	04-Oct-17	24-Oct-17	08H x 7D (Calendar Days)
135	**RFC Design**		20	12-Feb-18	09-Mar-18	08H x 5D w/ Holidays
136	A1350	Prepare/Submit RFC Design	20	12-Feb-18	09-Mar-18	08H x 5D w/ Holidays
137	**ITS & DMS (Outside of HSR Limits)**		212	06-Oct-17	08-Aug-18	
138	**30% Design**		0			
139	**65% Design**		75	06-Oct-17	24-Jan-18	
140	A1380	Prepare/Submit 65% Design	60	06-Oct-17	03-Jan-18	08H x 5D w/ Holidays
141	A1390	Review/Approve 65% Design	21	04-Jan-18	24-Jan-18	08H x 7D (Calendar Days)
142	**100% Design**		45	25-Jan-18	28-Mar-18	
143	A1400	Prepare/Submit 100% Design	30	25-Jan-18	07-Mar-18	08H x 5D w/ Holidays
144	A1410	Review/Approve 100% Design	21	08-Mar-18	28-Mar-18	08H x 7D (Calendar Days)
145	**RFC Design**		20	12-Jul-18	08-Aug-18	08H x 5D w/ Holidays
146	A1420	Prepare/Submit RFC Design	20	12-Jul-18	08-Aug-18	08H x 5D w/ Holidays
147	**Advanced OD Collection**		191	27-Mar-17	29-Dec-17	
148	**30% Design**		0			
149	**65% Design**		54	27-Mar-17	09-Jun-17	
150	A1500	Field Investigation	10	27-Mar-17	07-Apr-17	08H x 5D w/ Holidays
151	A1450	Prepare/Submit 65% Design	30	10-Apr-17	19-May-17	08H x 5D w/ Holidays
152	A1460	Review/Approve 65% Design	21	20-May-17	09-Jun-17	08H x 7D (Calendar Days)
153	**100% Design**		35	12-Jun-17	01-Aug-17	
154	A1470	Prepare/Submit 100% Design	20	12-Jun-17	11-Jul-17	08H x 5D w/ Holidays
155	A1480	Review/Approve 100% Design	21	12-Jul-17	01-Aug-17	08H x 7D (Calendar Days)



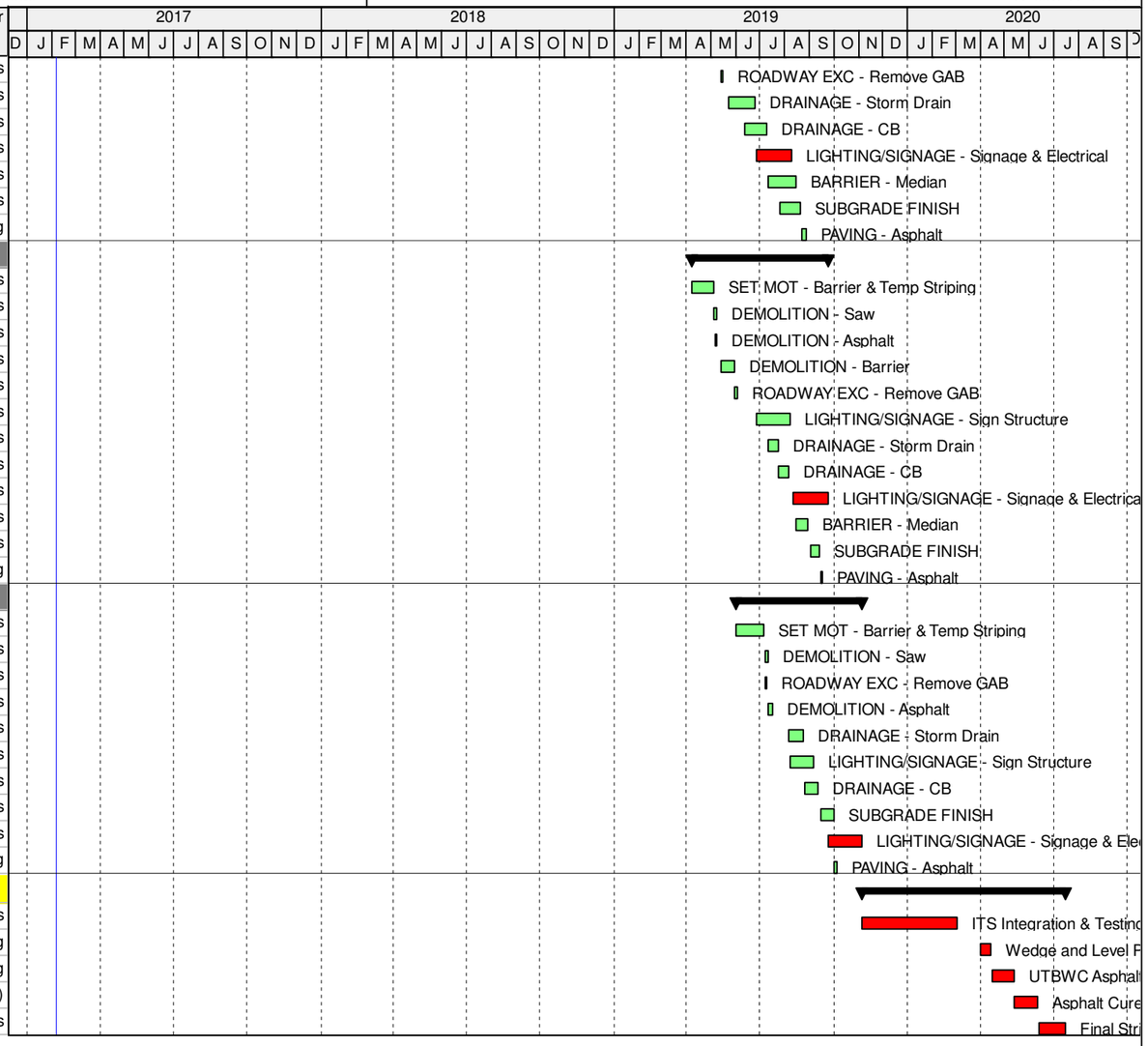
#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
156		**RFC Design**	20	01-Dec-17	29-Dec-17	08H x 5D w/ Holidays
157	A1490	Prepare/Submit RFC Design	20	01-Dec-17	29-Dec-17	08H x 5D w/ Holidays
158		**Misc Design**	215	27-Mar-17	31-Jan-18	
159	A1550	Scope Validation	120	27-Mar-17	24-Jul-17	08H x 7D (Calendar Days)
160	A1880	Traffic Impact Analysis: Existing Conditions	40	25-Jul-17	19-Sep-17	08H x 5D w/ Holidays
161	A1890	Traffic Impact Analysis: No Build Future	40	15-Sep-17	09-Nov-17	08H x 5D w/ Holidays
162	A1900	Traffic Impact Analysis: For Build Future	40	15-Sep-17	09-Nov-17	08H x 5D w/ Holidays
163	A1110	Subsurface Utility Investigations	80	06-Oct-17	31-Jan-18	08H x 5D w/ Holidays
164		**ROW (Potential)**	0			
165		**Utilities (Unanticipated)**	0			
166		**Construction**	595	10-Mar-18	16-Jul-20	
167		**Local Congestion Relief Areas**	60	10-Mar-18	04-Jun-18	
168		**PTC 5C - Extension of Accel/Decel Lanes at MD80**	28	10-Mar-18	18-Apr-18	
169	A11.1010	SET MOT - Barrier & Temp Striping	4	10-Mar-18	18-Mar-18	08H Weekends
170	A11.1020	DEMOLITION - Saw/Asphalt/Barrier/Ex GAB	5	19-Mar-18	23-Mar-18	08H x 5D w/ Holidays
171	A11.1130	LIGHTING/SIGNAGE - Sign Structure	6	19-Mar-18	26-Mar-18	08H x 5D w/ Holidays
172	A11.1070	DRAINAGE - Storm Drain & CB's	5	26-Mar-18	30-Mar-18	08H x 5D w/ Holidays
173	A11.1120	BARRIER - Median	3	02-Apr-18	04-Apr-18	08H x 5D w/ Holidays
174	A11.1080	SUBGRADE FINISH	4	05-Apr-18	10-Apr-18	08H x 5D w/ Holidays
175	A11.1110	PAVING - Asphalt	1	11-Apr-18	11-Apr-18	08H Paving
176	A11.1160	LIGHTING/SIGNAGE - Signage & Electrical	5	12-Apr-18	18-Apr-18	08H x 5D w/ Holidays
177		**PTC 5D - NB Off Ramp to MD124 3rd Lane Eddition**	14	24-Mar-18	12-Apr-18	
178	A12.1000	SET MOT - Barrier & Temp Striping	1	24-Mar-18	24-Mar-18	08H Weekends
179	A12.1010	DEMOLITION - Saw/Asphalt/Barrier/Ex GAB	1	26-Mar-18	26-Mar-18	08H x 5D w/ Holidays
180	A12.1060	DRAINAGE - Storm Drain & CB's	1	02-Apr-18	02-Apr-18	08H x 5D w/ Holidays
181	A12.1110	BARRIER - Median	1	03-Apr-18	03-Apr-18	08H x 5D w/ Holidays
182	A12.1070	SUBGRADE FINISH	1	11-Apr-18	11-Apr-18	08H x 5D w/ Holidays
183	A12.1100	PAVING - Asphalt	1	12-Apr-18	12-Apr-18	08H Paving
184		**PTC 5A - NB Switch of Lane Merge from I270 to I495**	19	14-Apr-18	10-May-18	
185	A10.1000	SET MOT -	3	14-Apr-18	21-Apr-18	08H Weekends
186	A10.1100	PAVING - Mill and Overlay	4	23-Apr-18	26-Apr-18	08H Paving
187	A10.1120	STRIPING	10	27-Apr-18	10-May-18	08H x 5D w/ Holidays
188		**PTC 4A - OUTSIDE HSR - Shady Grove Road to I-370 - 26**	25	28-Apr-18	04-Jun-18	
189	A08.1000	SET MOT - Barrier & Temp Striping	3	28-Apr-18	05-May-18	08H Weekends
190	A08.1010	DEMOLITION - Saw/Barrier/Asph/ Ex GAB	4	07-May-18	10-May-18	08H x 5D w/ Holidays
191	A08.1130	LIGHTING/SIGNAGE - Sign Structure	6	07-May-18	14-May-18	08H x 5D w/ Holidays
192	A08.1060	DRAINAGE - Storm Drain & CB's	4	11-May-18	16-May-18	08H x 5D w/ Holidays
193	A08.1120	BARRIER - Median	3	17-May-18	21-May-18	08H x 5D w/ Holidays
194	A08.1070	SUBGRADE FINISH	3	22-May-18	24-May-18	08H x 5D w/ Holidays
195	A08.1100	PAVING - Asphalt	1	25-May-18	25-May-18	08H Paving
196	A08.1190	LIGHTING/SIGNAGE - Signage & Electrical	5	29-May-18	04-Jun-18	08H x 5D w/ Holidays
197		**Outside HSR**	60	23-Jun-18	18-Sep-18	
198		**OUTSIDE HSR NB - ROCKLEDGE TO MONTROSE - 8,70**	60	23-Jun-18	18-Sep-18	
199	A01.1000	SET MOT - Barrier & Temp Striping	10	23-Jun-18	22-Jul-18	08H Weekends
200	A01.1010	DEMOLITION - Saw	2	23-Jul-18	24-Jul-18	08H x 5D w/ Holidays
201	A01.1020	DEMOLITION - Asphalt	2	23-Jul-18	24-Jul-18	08H x 5D w/ Holidays
202	A01.1030	DEMOLITION - Barrier	8	23-Jul-18	01-Aug-18	08H x 5D w/ Holidays
203	A01.1130	LIGHTING/SIGNAGE - Sign Structure	17	02-Aug-18	24-Aug-18	08H x 5D w/ Holidays
204	A01.1106	ROADWAY EXC - Remove GAB	1	02-Aug-18	02-Aug-18	08H x 5D w/ Holidays
205	A01.1060	DRAINAGE - Storm Drain	7	03-Aug-18	13-Aug-18	08H x 5D w/ Holidays



#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
206	A01.1050	DRAINAGE - CB	6	14-Aug-18	21-Aug-18	08H x 5D w/ Holidays
207	A01.1120	BARRIER - Outside	8	27-Aug-18	06-Sep-18	08H x 5D w/ Holidays
208	A01.1180	LIGHTING/SIGNAGE - Signage & Electrical	15	27-Aug-18	17-Sep-18	08H x 5D w/ Holidays
209	A01.1070	SUBGRADE FINISH	6	07-Sep-18	14-Sep-18	08H x 5D w/ Holidays
210	A01.1100	PAVING - Asphalt	2	17-Sep-18	18-Sep-18	08H Paving
211	**Median HSR Managed Lanes**		272	06-Oct-18	04-Nov-19	
212	**MEDIAN HSR NB AND SB - Y-SPLIT to MONTROSE - 7,4(**		122	06-Oct-18	02-Apr-19	
213	A02.1000	SET MOT - Barrier & Temp Striping	5	06-Oct-18	20-Oct-18	08H Weekends
214	A02.1010	DEMOLITION - Saw	4	22-Oct-18	25-Oct-18	08H x 5D w/ Holidays
215	A02.1030	DEMOLITION - Barrier	13	22-Oct-18	07-Nov-18	08H x 5D w/ Holidays
216	A02.1020	DEMOLITION - Asphalt	3	26-Oct-18	30-Oct-18	08H x 5D w/ Holidays
217	A02.1130	LIGHTING/SIGNAGE - Sign Structure	34	08-Nov-18	31-Dec-18	08H x 5D w/ Holidays
218	A1910	ROADWAY EXC - Remove GAB	2	08-Nov-18	09-Nov-18	08H x 5D w/ Holidays
219	A02.1060	DRAINAGE - Storm Drain	11	12-Nov-18	28-Nov-18	08H x 5D w/ Holidays
220	A02.1050	DRAINAGE - CB	9	29-Nov-18	11-Dec-18	08H x 5D w/ Holidays
221	A02.1120	BARRIER - Median	13	02-Jan-19	18-Jan-19	08H x 5D w/ Holidays
222	A02.1170	LIGHTING/SIGNAGE - Signage & Electrical	15	02-Jan-19	22-Jan-19	08H x 5D w/ Holidays
223	A02.1070	SUBGRADE FINISH	10	21-Jan-19	01-Feb-19	08H x 5D w/ Holidays
224	A02.1100	PAVING - Asphalt	2	01-Apr-19	02-Apr-19	08H Paving
225	**MEDIAN HSR NB AND SB - MONTROSE to MD 189 - 7,2(**		114	21-Oct-18	04-Apr-19	
226	A03.1020	SET MOT - Barrier & Temp Striping	8	21-Oct-18	17-Nov-18	08H Weekends
227	A03.1030	DEMOLITION - Saw	3	19-Nov-18	21-Nov-18	08H x 5D w/ Holidays
228	A03.1050	DEMOLITION - Barrier	13	19-Nov-18	07-Dec-18	08H x 5D w/ Holidays
229	A03.1040	DEMOLITION - Asphalt	2	26-Nov-18	27-Nov-18	08H x 5D w/ Holidays
230	A1920	ROADWAY EXC - Remove GAB	2	10-Dec-18	11-Dec-18	08H x 5D w/ Holidays
231	A03.1080	DRAINAGE - Storm Drain	11	12-Dec-18	28-Dec-18	08H x 5D w/ Holidays
232	A03.1070	DRAINAGE - CB	9	31-Dec-18	11-Jan-19	08H x 5D w/ Holidays
233	A03.1150	LIGHTING/SIGNAGE - Sign Structure	28	02-Jan-19	08-Feb-19	08H x 5D w/ Holidays
234	A03.1140	BARRIER - Median	12	11-Feb-19	26-Feb-19	08H x 5D w/ Holidays
235	A03.1180	LIGHTING/SIGNAGE - Signage & Electrical	15	11-Feb-19	01-Mar-19	08H x 5D w/ Holidays
236	A03.1090	SUBGRADE FINISH	9	27-Feb-19	11-Mar-19	08H x 5D w/ Holidays
237	A03.1120	PAVING - Asphalt	2	03-Apr-19	04-Apr-19	08H Paving
238	**MEDIAN HSR NB AND SB - MD 189 to I-370 - 20,118 LF**		173	18-Nov-18	29-Jul-19	
239	A04.1000	SET MOT - Barrier & Temp Striping	23	18-Nov-18	03-Feb-19	08H Weekends
240	A04.1010	DEMOLITION - Saw	9	04-Feb-19	14-Feb-19	08H x 5D w/ Holidays
241	A04.1030	DEMOLITION - Barrier	35	04-Feb-19	22-Mar-19	08H x 5D w/ Holidays
242	A04.1020	DEMOLITION - Asphalt	6	15-Feb-19	22-Feb-19	08H x 5D w/ Holidays
243	A04.1150	LIGHTING/SIGNAGE - Sign Structure	42	25-Mar-19	21-May-19	08H x 5D w/ Holidays
244	A1930	ROADWAY EXC - Remove GAB	4	25-Mar-19	28-Mar-19	08H x 5D w/ Holidays
245	A04.1060	DRAINAGE - Storm Drain	29	29-Mar-19	08-May-19	08H x 5D w/ Holidays
246	A04.1200	LIGHTING/SIGNAGE - Signage & Electrical	40	10-Apr-19	05-Jun-19	08H x 5D w/ Holidays
247	A04.1050	DRAINAGE - CB	24	19-Apr-19	22-May-19	08H x 5D w/ Holidays
248	A04.1120	BARRIER - Median	34	23-May-19	12-Jul-19	08H x 5D w/ Holidays
249	A04.1070	SUBGRADE FINISH	26	12-Jun-19	19-Jul-19	08H x 5D w/ Holidays
250	A04.1100	PAVING - Asphalt	6	22-Jul-19	29-Jul-19	08H Paving
251	**MEDIAN HSR NB AND SB - I-370 to WATKINS MILL 15,0(**		139	09-Feb-19	27-Aug-19	
252	A05.1000	SET MOT - Barrier & Temp Striping	17	09-Feb-19	06-Apr-19	08H Weekends
253	A05.1010	DEMOLITION - Saw	7	08-Apr-19	16-Apr-19	08H x 5D w/ Holidays
254	A05.1030	DEMOLITION - Barrier	26	08-Apr-19	13-May-19	08H x 5D w/ Holidays
255	A05.1020	DEMOLITION - Asphalt	5	17-Apr-19	23-Apr-19	08H x 5D w/ Holidays
256	A05.1130	LIGHTING/SIGNAGE - Sign Structure	31	14-May-19	26-Jun-19	08H x 5D w/ Holidays



#	Activity ID	Activity Name	Original Duration	Start	Finish	Calendar
257	A1940	ROADWAY EXC - Remove GAB	3	14-May-19	16-May-19	08H x 5D w/ Holidays
258	A05.1060	DRAINAGE - Storm Drain	22	23-May-19	24-Jun-19	08H x 5D w/ Holidays
259	A05.1050	DRAINAGE - CB	18	13-Jun-19	10-Jul-19	08H x 5D w/ Holidays
260	A05.1170	LIGHTING/SIGNAGE - Signage & Electrical	30	27-Jun-19	09-Aug-19	08H x 5D w/ Holidays
261	A05.1120	BARRIER - Median	25	11-Jul-19	14-Aug-19	08H x 5D w/ Holidays
262	A05.1070	SUBGRADE FINISH	19	26-Jul-19	21-Aug-19	08H x 5D w/ Holidays
263	A05.1100	PAVING - Asphalt	4	22-Aug-19	27-Aug-19	08H Paving
264	**MEDIAN HSR NB - WATKINS MILL TO MD 118 - 13,300 L**		117	07-Apr-19	23-Sep-19	
265	A06.1000	SET MOT - Barrier & Temp Striping	8	07-Apr-19	04-May-19	08H Weekends
266	A06.1010	DEMOLITION - Saw	3	06-May-19	08-May-19	08H x 5D w/ Holidays
267	A06.1020	DEMOLITION - Asphalt	2	07-May-19	08-May-19	08H x 5D w/ Holidays
268	A06.1030	DEMOLITION - Barrier	12	14-May-19	30-May-19	08H x 5D w/ Holidays
269	A1950	ROADWAY EXC - Remove GAB	2	31-May-19	03-Jun-19	08H x 5D w/ Holidays
270	A06.1130	LIGHTING/SIGNAGE - Sign Structure	28	27-Jun-19	07-Aug-19	08H x 5D w/ Holidays
271	A06.1060	DRAINAGE - Storm Drain	10	11-Jul-19	24-Jul-19	08H x 5D w/ Holidays
272	A06.1050	DRAINAGE - CB	8	25-Jul-19	05-Aug-19	08H x 5D w/ Holidays
273	A06.1170	LIGHTING/SIGNAGE - Signage & Electrical	30	12-Aug-19	23-Sep-19	08H x 5D w/ Holidays
274	A06.1120	BARRIER - Median	12	15-Aug-19	30-Aug-19	08H x 5D w/ Holidays
275	A06.1070	SUBGRADE FINISH	9	03-Sep-19	13-Sep-19	08H x 5D w/ Holidays
276	A06.1100	PAVING - Asphalt	2	16-Sep-19	17-Sep-19	08H Paving
277	**MEDIAN HSR NB - MD 118 - MD 121 - 19,252 LF**		108	01-Jun-19	04-Nov-19	
278	A07.1000	SET MOT - Barrier & Temp Striping	11	01-Jun-19	06-Jul-19	08H Weekends
279	A07.1010	DEMOLITION - Saw	4	08-Jul-19	11-Jul-19	08H x 5D w/ Holidays
280	A1960	ROADWAY EXC - Remove GAB	2	08-Jul-19	09-Jul-19	08H x 5D w/ Holidays
281	A07.1020	DEMOLITION - Asphalt	3	12-Jul-19	16-Jul-19	08H x 5D w/ Holidays
282	A07.1060	DRAINAGE - Storm Drain	14	06-Aug-19	23-Aug-19	08H x 5D w/ Holidays
283	A07.1130	LIGHTING/SIGNAGE - Sign Structure	20	08-Aug-19	05-Sep-19	08H x 5D w/ Holidays
284	A07.1050	DRAINAGE - CB	12	26-Aug-19	11-Sep-19	08H x 5D w/ Holidays
285	A07.1070	SUBGRADE FINISH	12	16-Sep-19	01-Oct-19	08H x 5D w/ Holidays
286	A07.1180	LIGHTING/SIGNAGE - Signage & Electrical	30	24-Sep-19	04-Nov-19	08H x 5D w/ Holidays
287	A07.1100	PAVING - Asphalt	3	02-Oct-19	04-Oct-19	08H Paving
288	**Job Wide**		176	05-Nov-19	16-Jul-20	
289	A1020	ITS Integration & Testing	80	05-Nov-19	02-Mar-20	08H x 5D w/ Holidays
290	A1970	Wedge and Level Paving	10	01-Apr-20	14-Apr-20	08H Paving
291	A13.1000	UTBWC Asphalt Paving	20	15-Apr-20	12-May-20	08H Paving
292	A1010	Asphalt Cure	30	13-May-20	11-Jun-20	08H x 7D (Calendar Days)
293	A1000	Final Striping	24	12-Jun-20	16-Jul-20	08H x 5D w/ Holidays



APPENDIX IX
ADDENDUMS

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF HIGHWAY DEVELOPMENT
707 NORTH CALVERT STREET
BALTIMORE, MARYLAND 21202

September 1, 2016

Contract No.: MO0695172
F.A.P. No.: Not Applicable
Description: IS 270 Innovative Congestion Management Contract – Progressive Design-Build: Request for Proposals (RFP)

ADDENDUM NO. 1

To All Prospective Proposers:

Please be advised that the Technical and Price Proposal Submittal Date for this contract is still scheduled for **January 5, 2017**.

The attention of prospective proposers is directed to the following revisions, additions and/or deletions to the Request for Proposals (RFP).

REQUEST FOR PROPOSALS

Page No.	Description
18	ADDED "ITS Information" to the Additional Material.
Appendix	Stipend Agreement, page 2 of 6: REVISED "Alternative Technical Concept" and "ATC" to "Proposed Technical Concept" and "PTC." Also, REVISED stipend amount in section 2.2 (a) to $750,000.

NOTICE TO PROSPECTIVE PROPOSERS

The attention of prospective proposers is directed to the following revisions, additions, and/or deletions to the Additional Information on ProjectWise:

ADDED "I-270 ITS Devices.xlsx" and "ITS_I270.kmz" and "I270_FiberLine.kmz" and "I270_MH_FM.kmz" at the following location on ProjectWise:
pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\06 - ITS Information\

Questions relating to this Addendum No. 1 may be directed in writing to:

Jason A. Ridgway, P.E.
Director, Office of Highway Development
Maryland Department of Transportation
State Highway Administration
e-mail address: MO069_IS_270@sha.state.md.us

During the Technical Proposal Phase, only e-mailed inquires will be accepted. No requests for additional information or clarification to any other Department or Administration office, consultant, or employee will be considered.

FOR

GREGORY I. SLATER, DEPUTY ADMINSTRATOR FOR PLANNING, ENGINEERING, REAL ESTATE, AND ENVIRONMENT.

THIS ADDENDUM IS ISSUED TO CLARIFY, ADD TO, DELETE FROM, CORRECT AND/OR CHANGE THE CONTRACT DOCUMENTS TO THE EXTENT INDICATED AND IS HEREBY MADE PART OF THE SAID CONTRACT DOCUMENTS. COMAR 21.05.02.08 REQUIRES THAT ALL ADDENDA ISSUED BE ACKNOWLEDGED; THEREFORE, PRIOR TO SUBMITTING YOUR PRICE PROPOSAL, ATTACH THE ADDENDUM RECEIPT VERIFICATION FORM TO THE FRONT OF THE PRICE PROPOSAL FORM PACKET. FAILURE TO DO SO MAY RESULT IN THE PRICE PROPOSAL BEING DECLARED NON-RESPONSIVE.

- Watkins Mill IAPA and Permits

F. Watkins Mill Interchange Plans

G. Watkins Mill Interchange Design Files

The following materials are being provided in electronic format on Projectwise. The Administration makes no representation regarding its accuracy.

H. Additional Material

- 100-Scale Mapping
- Existing Right-of-Way mosaic file
- Inventory of Existing Structures
- Utility plans and/or as-builts
- As-builts
- ITS Information

The following materials are being provided in electronic format on Projectwise, unless otherwise noted. This material is considered necessary for the Design-Build Team to submit a technical proposal and prepare a bid.

I. I-270 Concept Evaluation Templates

J. Manuals and Guidance

- VISSIM Modeling Techniques
- Manual for the Inspection of Highway Right of Way in Karst Areas

In general, the Microstation files included on the ProjectWise are in conformance with the MDSHA Microstation V8 CAD Standards Manual.

It is likely that most Proposers will use plot drivers that differ from the drivers used to produce the provided plans. Some of the drawings screen existing features through level symbology color 250. The manipulation of the drawing files to produce any requirements (as found elsewhere in the RFP) for as-built plans will be the responsibility of the selected Design-Builder.

Proposers are also provided with a file index provided on ProjectWise. The file is a Word Document describing all the files and files names as outlined above.

III. RULES OF CONTACT

The Procurement Officer is the Administration's single contact and source of information for this procurement.

The following rules of contact will apply during the Contract procurement process, which begins upon the submittal of the SOQ, and will be completed with the execution of the Contract. These rules are designed to promote a fair, unbiased, and legally defensible

1.5 shall not be entitled to use information submitted by Proposer to the SHA in which the SHA determines is exempt from disclosure under the Maryland Public Information Act ("PIA"), Title 10, Subtitle 6, Part III of the State Government Article of the Annotated Code of Maryland, unless the RFP otherwise provides.

1.6 The SHA acknowledges that the use of any of the Work Product by the SHA or the Design-Builder is at the sole risk and discretion of the SHA and the Design-Builder, and shall in no way be deemed to confer liability on the unsuccessful Proposer.

2. Compensation And Payment.

2.1 Compensation payable to Proposer for the Work Product described herein shall be $750,000.00 if any of the following conditions are met:

(a) The Proposer was in the competitive range and was not the most advantageous to the State or was not selected for award;

(b) The Proposer was selected for award, but the Contract was not executed or it was terminated by SHA for its convenience prior to issuance of a notice to proceed for events outside the control of the Design-Builder and the Design-Builder is not seeking reimbursement for design activities undertaken after notice of selection;

(c) The Proposer was not in the competitive range, but it submitted an Proposed Technical Concept (PTC) approved by the Administration and that the Administration wishes to utilize the PTC in the final design.

2.2 In its sole discretion, the SHA may pay compensation to Proposer, in an amount to be determined by the SHA, for the Work Product described herein under the following conditions:

(a) For any Proposer meeting the criteria identified in Section 2.1, above.

Any amount paid under this subparagraph (a) will not exceed $750,000.00 and will be subject to audit of the costs incurred by the Proposer in preparing its Technical Proposal and Price Proposal. Auditors shall have access to all books, records, documents and other evidence and accounting principles and practices sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred. Failure of the Proposer or its team members to maintain and retain sufficient records to allow the auditors to verify all or a portion of the claim or to permit the auditors access to the books and records of Proposer and its team members shall constitute a waiver of the right to be paid a stipend and shall bar any recovery hereunder.

Any Proposer wishing to apply for a stipend under this subparagraph (a) shall submit the completed Agreement to the SHA concurrently with the price proposals being submitted. Eligibility of receipt of a stipend is dependent upon

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF HIGHWAY DEVELOPMENT
707 NORTH CALVERT STREET
BALTIMORE, MARYLAND 21202

October 7, 2016

Contract No.: MO0695172
F.A.P. No.: Not Applicable
Description: IS 270 Innovative Congestion Management Contract – Progressive Design-Build: Request for Proposals (RFP)

ADDENDUM NO. 2

To All Prospective Proposers:

Please be advised that the Technical and Price Proposal Submittal Date for this contract has been POSTPONED from January 5, 2017 to **January 19, 2017**.

The attention of prospective proposers is directed to the following revisions, additions and/or deletions to the Request for Proposals (RFP).

REQUEST FOR PROPOSALS

Page No.	Description
38	REVISED the submittal deadline for Proposed Technical Concepts to November 17, 2016.
41	REVISED the submittal deadline for the Technical and Price Proposals to January 19, 2017.
57	REVISED the submittal deadline for Proposed Technical Concepts to November 17, 2016.
57	REVISED the submittal deadline for the Technical and Price Proposals to January 19, 2017.
Appendix	Price Proposal, Page 1 of 43: REVISED the submittal deadline for the Technical and Price Proposals to January 19, 2017.

Questions relating to this Addendum No. 2 may be directed in writing to:

Jason A. Ridgway, P.E.
Director, Office of Highway Development
Maryland Department of Transportation
State Highway Administration
e-mail address: MO069_IS_270@sha.state.md.us

During the Technical Proposal Phase, only e-mailed inquires will be accepted. No requests for additional information or clarification to any other Department or Administration office, consultant, or employee will be considered.

GREGORY I. SLATER, DEPUTY ADMINSTRATOR FOR PLANNING, ENGINEERING, REAL ESTATE, AND ENVIRONMENT.

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A Letter of Interest (LOI), on official letterhead of the Design-Builder, notifying the Administration whether or not the Design-Builder intends to submit a Technical and Price Proposal must be delivered no later than **December 15, 2016 prior to 12 noon** (EST). The LOI must be delivered to the following email address:

MO069_IS_270@sha.state.md.us

The LOI must be signed by individual(s) authorized to represent the Major Participant firm(s) and the lead Constructor firm(s). A Major Participant is defined as the legal entity, firm or company, individually or as a party in a joint venture or limited liability company or some other legal entity, that will be signatory to the Design–Build Contract with the Administration. Major Participant(s) will be expected to accept joint and several liability for performance of the Design–Build Contract. Major Participants are not design subconsultants, construction subcontractors or any other subcontractors to the legal entity that signs the Design–Build Contract.

If the Design–Build contracting entity will be a joint venture, or some other entity involving multiple firms, all Major Participant firms involved must have an authorized representative sign the LOI.

iii. Proposed Technical Concepts Submittal and Review

Section iii through section vii sets the process for the submittal and review of Proposed Technical Concepts (PTC). The process is intended to:

- Allow Proposers to incorporate innovation and creativity into the Proposals.
- Allow the Administration to consider Proposer PTCs in making the selection decision.
- Avoid delays and potential conflicts in the design associated with deferring of reviews of PTCs to the post-award period.
- Obtain the best-value for the public.

The Proposer is also encouraged to submit standards or specifications that are approved for usage by other state Departments of Transportation as PTCs.

△2 The Proposer may submit PTCs for review by the Administration on or before **November 17, 2016 prior to 12 noon.** (prevailing local time). Inquiries received after that date and time will not be accepted.

All PTCs shall be submitted in writing via email only to the project email address, with a cover letter clearly identifying the submittal as a request for review of a PTC. If the Proposer does not clearly designate its submittal as a PTC, the submission will not be treated as a PTC by the Administration

The Administration will review each PTC submitted to assess the implementation potential of the technical aspects of the concept and its compatibility with the project goals. The Administration will not approve PTCs but will return comments on the PTC on its implementation potential and its compatibility with the project goals. If the Administration needs more information, the Administration will submit written questions to the Proposer and/or request a one-on-one meeting in order to better understand the details of the PTC.

Proposer's Name

Price Proposal

Contract No. MO0695172

Container ____of____

d. Location and deadline for submittal of Technical and Price Proposals

2 Technical Proposals and Price Proposals must be delivered no later than **January 19, 2017 prior to 12 noon** (prevailing local time). The proposal must be delivered to the following location:

Office of Procurement and Contract Management
Fourth Floor, C-405
707 N. Calvert Street
Baltimore, Maryland 21202

e. Number of Copies

One original and eleven (11) copies of the complete Technical Proposal shall be submitted along with one (1) electronic copy PDF file on a CD or flash drive. A single original of the Price Proposal shall also be submitted.

f. Proposal Guaranty

The Proposal Guaranty shall be delivered with the Price Proposal in a sealed business-sized envelope clearly marked as follows:

Prospective Proposer's Name

Proposal Guaranty

IS 270 – Innovative Congestion Management Project

Contract No. MO0695172

4. Effect of Submitting Proposal

Signing of the Design-Build Proposal Submission Form and Price Proposal Form, and delivery of the Proposal represents (a) an offer by the proposer to perform the Work for the Price submitted within the time(s) specified in accordance with all provisions of this RFP and (b) the Prospective proposer's agreement to all the provisions of the RFP and Contract governing requirements and procedures applicable through execution of the Design – Build Contract. **The Technical Proposal will become part of the Design – Build Contract.**

By so signing the above referenced terms and by delivering the Proposals, the Prospective Proposer makes the following affirmative representations.

XVII. PROPOSED PROCUREMENT SCHEDULE

	Issue RFQ/RFP	June 7, 2016
	Final Date for RFQ Questions	July 11, 2016
	SOQ submittal to MSHA	July 25, 2016
	Reduced Candidate List (RCL) Notified	August 11, 2016
	One-on-One Meetings	August 24-25, 2016
	One-on-One Meetings	September 28-29, 2016
	One-on-One Meetings	October 26-27, 2016
2	Last Day to submit PTCs	November 17, 2016
	Final Date for RFP Questions	December 8, 2016
	Letter or Interest	December 15, 2016
2	Technical and Price Proposal Submittal	January 19, 2017
	Selection of Successful Proposer	February 2017
	Notice to Proceed (Anticipated)	March 2017

This is the proposed procurement schedule for this project as of the date of the issuance of this RFQ/RFP.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROPOSAL FORM

Proposal by_____
Name

_____
Address (Street and/or P.O. Box)

_____
City State Zip

( ) ( )
A.C. Phone No. A.C. Fax No.

to furnish and deliver all materials and to do and perform all work, in conformance with the Standard Specifications, revisions thereto, General Provisions and the Special Provisions in this contract to IS 270 Innovative Congestion Management located in, Frederick and Montgomery Counties, Maryland, for which Technical and Price Proposals will be received until 12:00 o'clock
△2 noon on January 19, 2017. Technical and Price Proposals shall be submitted to:

State Highway Administration
Office of Procurement and Contract Management
Fourth Floor, C-405
707 N. Calvert Street
Baltimore, MD 21202

In response to the advertisement by the Administration, requesting proposals for the work in conformance with the Contract Documents, now on file in the office of the Administration. I/We hereby certify that I/we am/are the only person, or persons, interested in this proposal as principals, and that an examination has been made of the work site, the Specifications, and Request for Proposals, including the Special Provisions contained herein. I/We propose to furnish all necessary machinery, equipment, tools, labor and other means of construction, and to furnish all materials required to complete the project at the following unit price or lump sum price.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF HIGHWAY DEVELOPMENT
707 NORTH CALVERT STREET
BALTIMORE, MARYLAND 21202

November 9, 2016

Contract No.: MO0695172
F.A.P. No.: Not Applicable
Description: IS 270 Innovative Congestion Management Contract – Progressive Design-Build: Request for Proposals (RFP)

ADDENDUM NO. 3

To All Prospective Proposers:

Please be advised that the Technical and Price Proposal Submittal Date for this contract is still scheduled for **January 19, 2017**.

The attention of prospective proposers is directed to the following revisions, additions and/or deletions to the Request for Proposals (RFP).

REQUEST FOR PROPOSALS

Page No.	Description
9	REVISED the 3rd bullet to shift the responsibility of constructing noise barriers required for the project from the Design-Builder to the Administration.
14	ADDED noise studies to the Design-Builder's services.
16	ADDED construction of any required noise abatement to the Administration's services.
45	REVISED the page limit for the Mobility goal from 16 pages to 20 pages.
Appendix	Contract Provisions: REPLACED TC-5.01.

Questions relating to this Addendum No. 3 may be directed in writing to:

Jason A. Ridgway, P.E.
Director, Office of Highway Development
Maryland Department of Transportation
State Highway Administration
e-mail address: MO069_IS_270@sha.state.md.us

During the Technical Proposal Phase, only e-mailed inquires will be accepted. No requests for additional information or clarification to any other Department or Administration office, consultant, or employee will be considered.

FOR

GREGORY I. SLATER, DEPUTY ADMINSTRATOR FOR PLANNING, ENGINEERING, REAL ESTATE, AND ENVIRONMENT

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Act (MEPA)

- Project(s) will require NEPA approval from the Federal Highway Administration (FHWA) when federal actions will be required (e.g. design exceptions, Interstate Access Point Approval [IAPA]). If no federal action is required, then MEPA approval will be needed. Multiple environmental documents may be developed for the contract. Each separate project for an environmental document must be a standalone construction project that connects logical termini and be of sufficient length, have independent utility, and not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. Any NEPA/MEPA document will be prepared by SHA. The Design-Builder will have no decision making responsibility with respect to the NEPA/MEPA process but will provide information needed about the project and possible mitigation actions.
- Public Involvement will be needed as part of NEPA/MEPA and should ensure travel shed is covered, not just the immediate project area.

- The requirements of the SHA Noise Policy must be met for the Design-Builder's improvements. However, noise barriers, if required, will be excluded from any work package or CAP, and will not be paid for from the contract budget. The Administration will be responsible for the costs associated with noise barriers and the additional impacts or requirements they incur, including additional right-of-way, utility relocations, grading, drainage, stormwater management, retaining walls, etc.
- DNR managed land (Seneca Creek State Park) is within the contract limits.

5. Minimize Environmental Impacts

   - No permits have been obtained. Agency coordination will be required to secure necessary permits for any environmental impacts.
   - The Design-Builder will prepare permit applications for submittal by the Administration.
   - Environmental impacts due to Design-Builder's project should be minimized to the extent practical.
   - Mitigation may be required by permitting agencies depending on impacts to environmental features as a result of Design-Builder's project.

6. Minimize utility and property impacts and relocations

   - Utility and property impacts due to Design-Builder's project should be minimized to the extent practical.
   - All costs for third party utility relocations and property impacts will be subtracted from the fixed value contract.

E. Project Status

The current status of aspects of the project is as follows:

Mapping and Survey

- Develop any Right-of-way needs for the project(s)
- Preparation of any Design Exceptions as required for the project(s)
- Design of any surface drainage conveyances, stormwater management, and erosion and sediment control and obtain any related environmental agency approvals required for the project(s) (including NPDES and MDE Approvals).
- Hydrologic and Hydraulic analyses, Drainage and Storm Water Management (SWM) Analyses, Design, and Approvals.
- Closed-Circuit Television (CCTV) inspections of existing drainage pipes as needed.
- The pavement engineering for the Project shall include, but is not limited to, the pavement investigation, pavement type selection, new pavement design, pavement rehabilitation design, and material selection.
- Perform pavement and subsurface geotechnical investigations needed to determine subsurface features and characteristics, and properties to support pavement and geotechnical engineering functions.
- Analyze pavement performance data and existing material conditions to determine the structural and functional conditions for the development of pavement engineering recommendations;
- Analyze subsurface geotechnical field and laboratory test data to determine existing soil, rock, and groundwater conditions etc. for the development of geotechnical engineering recommendations;
- Structural design for all bridges, culverts, walls and any and all other incidental structures required for the project(s).
- Traffic engineering design of any temporary and permanent signing, lighting, traffic signals, pavement markings, and Intelligent transportation systems (ITS) required for the project(s)
- Traffic Operations Analyses including the preparation of a Traffic Operations Analysis Report
- Temporary Traffic Control Design and Implementation including the preparation of a Traffic Management Plan (TMP), red flag summary, Maintenance of Traffic Alternatives Analysis (MOTAA). Additionally, attending and running TMP meetings.
- HOV equivalency analysis and submit to FHWA for approval, if required
- Safety analysis using the Highway Safety Manual (HSM) and submit to FHWA for approval, if required
- Landscape Architecture design of any roadside landscaping and stormwater management landscaping required for the project(s)
- Forest Impact Analysis, Significant tree identification, development of forest impact plans, tree preservation plan and design of any reforestation mitigation required for the project(s)
- Preparation of any necessary documents to obtain final reforestation site review approval from the Maryland Department of Natural Resources
- Prepare and coordinate the Joint Permit Application(s) (JPA) including but not limited to preparation and submittal of the JPA application(s) to SHA with attachments including location map, impact plates, trilogy request and

△3

- Complete all work related to providing a noise study(ies) that makes a final determination on reasonableness and feasibleness related to noise abatement.

- Acquisition of Environmental Permits
- Acquisition of Right-of-Way
- Review Construction CAP proposals and compare to ICE
- Reconcile Final CAP for each phase
- Construction Management and Inspection Services
- Design and construct required noise abatement, including additional impacts or requirements they incur, such as additional utility relocations, grading, drainage, stormwater management, retaining walls, etc.

Scope Validation and Identification of Scope Issues

A Scope Validation Period of 120 days from the date of the Notice to Proceed for Design and Preconstruction Services will be provided on this contract. During the Scope Validation Period, the Design-Builder shall thoroughly verify and validate that the Design-Builder's understanding of the scope of work and its ability to complete it within the Design and Preconstruction Services Fee. Any Scope Issues determined during this period shall not be deemed to include items that the Design-Builder should have reasonably discovered prior to submission of its Technical Proposal.

If the Design-Builder intends to seek an adjustment to the Design and Preconstruction Fee due to a Scope Issue, it shall promptly, but in no event later than the expiration of the Scope Validation Period, provide the Administration in writing with a notice of the existence of such Scope Issue and basis for such Scope Issue. Within 30 days of the notice, the Design-Builder shall provide documentation that specifically explains its support for the Scope Issue, which shall include among other things: (a) the assumptions the Design-Builder made during the preparation of its Proposal that form the basis of its allegation, along with documentation verifying it made such assumptions in developing its Proposal; (b) explanation of the Scope Issue that the Design-Builder could not have reasonably identified prior to submission of the Technical Proposal; (c) specific impact on the Design and Preconstruction Services. For the avoidance of doubt: (1) The Design-Builder shall not be entitled to raise any Scope Issues that were not previously addressed with a notice; and (2) Design-Builder shall have no right to seek any relief for any Scope Issues not identified in a notice provided to the Administration during the Scope Validation Period.

Within a reasonable time after the Administration's receipt of the documentation, the parties shall meet and confer to discuss the resolution of such Scope Issues. If the Administration agrees that the Design-Builder has identified a valid Scope Issue, a change order will be executed to increase the value of the Design and Preconstruction Fee; however, the Construction Services will be adjusted to retain the overall fixed value of the contract. Notwithstanding anything to the contrary in the Contract Documents or a matter of law, the Design-Builder shall have the burden of proving that the alleged Scope Issue could not have reasonably been identified prior to the submission of the Technical Proposal and such Scope Issue materially impacts its Design and Preconstruction Services Fee.

The parties acknowledge that the purpose of the Scope Validation Period is to enable the Design-Builder to identify those Scope Issues that could not have reasonably been identified prior to the submission of the Technical Proposal. By submission of the Technical Proposal, the Design-Builder acknowledges that the Scope Validation Period is a reasonable time to enable the Design-Builder to identify Scope Issues that materially impacts its Design and Preconstruction Fee. The Design-Builder will assume and accept all risks to complete the Design and

Proposer is alerted to their responsibility to confirm that all team members have received addenda. The Proposer is solely responsible to ensure that their team has the correct information.

i. Statement including the proposed legal structure of the Design–Builder.

j. Include a general authorization for the Administration to confirm all information contained in the Technical Proposal submittal with third parties, and indicate limitations, if any, to such authorization.

As an attachment to the cover letter and excluded from the page limitation for this section, provide documentation that the Design Team has Professional Liability Insurance.

△3 **2. Mobility (20 Pages Maximum) – CRITICAL**

Goal: Provide improvements that maximize vehicle throughput, minimize vehicle travel times and create a more predictable commuter trip along I-270.

Value Statement: Effective and reliable traffic flow along I-270 is necessary for its function as a primary commuter route and for the vitality of economic development. Describe the improvements you will provide to address and manage congestion along I-270 while reducing delay and increasing reliability.

i. Provide the Design-Builder's improvements for maximizing vehicle throughput and minimizing vehicle travel times. Specifically, discuss how the Design-Builder's improvements will reduce recurring congestion in terms of travel time, vehicle throughput, density, intersection operations, queues and vehicle network performance, both along I-270 and on the connecting ramps and arterial roadways. – **CRITICAL**

ii. Discuss how the Design-Builder's improvements will provide a more predictable commuter trip, including innovative technologies or techniques that will be provided. – **SIGNIFICANT**

iii. Discuss the performance life of the improvements; that is, the time it will take for congestion levels to return to pre-construction levels and the basis for the Design-Builder's assessment of performance. – **IMPORTANT**

3. Safety (10 Pages Maximum) – IMPORTANT

Goal: Provide for a safer I-270 corridor.

Value Statement: Safer flow of traffic will increase mobility along I-270 by reducing incidents that increase delay and reduce travel time reliability. Discuss how your improvements will increase safety along I-270.

TERMS AND CONDITIONS

TC SECTION 5
LEGAL RELATIONS AND PROGRESS

TC-5.01 INSURANCE

100 **DELETE:** In its entirety.

INSERT: The following.

TC-5.01 INSURANCE FOR DESIGN-BUILD

In addition to the provisions of GP-7.14 (Liability Insurance), the following shall apply on Administration Contracts.

The Contractor shall maintain in full force and effect third party legal liability insurance necessary to cover claims arising from the Contractor's operations under this agreement that cause damage to the person or property of third parties. The insurance shall be under a standard commercial general liability (CGL) form endorsed as necessary to comply with the above requirements and the other requirements of this Section. The State of Maryland shall be listed as an additional insured on the policy. The limit of liability shall be no less than $1 000 000 per occurrence/$2 000 000 general aggregate. The insurance shall be kept in full force and effect until all work has been satisfactorily completed and accepted.

When specified in the Contract Documents or otherwise required by law, the Contractor shall carry the type and amounts of insurance in addition to any other forms of insurance or bonds required under the terms of the Contract and these Specifications.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, shall be kept in full force and effect until all work has been satisfactorily completed and accepted. The Contractor shall be responsible for the payment of all deductibles or self-insured retentions.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, (other than Workers' Compensation Policies) shall include endorsements:

(a) Stating that the State of Maryland is additional insured with respect to liability arising from the Contractor's operations under this agreement that cause damage to the person or property of third parties.

(b) Stating that such coverage as is provided by the policies for the benefit of the additional insureds is primary and any other coverage maintained by such additional insureds (including self-insurance pursuant to the Maryland Tort Claims Act) shall be non-contributing with the coverage provided under the policies.

(c) Containing waivers of subrogation with respect to all named insureds and additional insureds.

(d) Stating that the insurer has the duty to adjust claims and provide a defense with regard to such claims made against the additional insured.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, (including Workers' Compensation Policies) shall be endorsed to state that the insurer shall provide at least 7 days notice of cancellation or nonrenewal to:

Maryland State Highway Administration
Director, Office of Construction
7450 Traffic Drive
Hanover MD 21076

Evidence of insurance shall be provided to the Administration at the address listed above prior to the award of the Contract by means of a Certificate of Insurance with copies of all endorsements attached.

Any policy exclusions shall be shown on the face of the Certificate of Insurance or provided with the Certificate of Insurance.

Certificates of Insurance shall comply with all requirements of the Maryland Annotated Code, Insurance Article, § 19-116. Certificates of Insurance shall be on a form approved by the Maryland Insurance Commissioner (Commissioner). Standard Certificate of Insurance forms currently adopted for use by the Association for Cooperative Operations Research (ACORD) or the Insurance Services Office (ISO) are deemed approved by the Commissioner and are acceptable. Outdated ACORD or ISO forms (those with a revision date prior to the date of the form currently adopted for current use by ACORD or ISO) are not acceptable. The Contractor shall ensure that all required Certificates of Insurance satisfy all requirements of §19-116 of the Insurance Article, including the prohibition against the issuance of any certificate of insurance that contains false or misleading information or that purports to amend, alter, or extend the coverage provided by the policies referenced in the certificate.

The Certificate of Insurance shall be accompanied by a document (a copy of State License or letter from insurer) that indicates that the agent signing the certificate is an authorized agent of the insurer.

No acceptance and/or approval of any Certificate of Insurance or insurance by the Administration shall be construed as relieving or excusing the Contractor, or the Contractor's Surety from any liability or obligation imposed upon either or both of them by the provisions of this Contract or elsewhere in the Contract Documents.

The cost of the insurance will not be measured but the cost will be incidental to the Contract lump sum price.

Contractor and Railroad Public Liability and Property Damage Insurance shall be provided as specified in TC-6.05.

.01 Indemnification

The Design-Build Team shall indemnify, defend and hold the Administration and its officers, directors, employees, agents and consultants from and against all claims, actions, torts, costs, losses, and damages for bodily injury (including sickness, disease or death) and/or tangible property damage (other than to the Work itself) arising out of or resulting from the performance of the Work by the Design-Build Team, any subcontractor, subconsultant, engineer, supplier, any individual or entity directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. Damages covered by the preceding sentence include, but are not limited to, all fees and charges of engineers, attorneys and all other professionals and all mediation, arbitration, court or other dispute resolution costs.

The indemnity obligation set forth in the preceding paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Design-Build Team or any subcontractor, subconsultant, engineer, supplier, or other individual or entity under Workers' Compensation acts, disability benefit acts, or other employee benefit acts.

.02 Additional Insurance Requirements

.02.1 Professional Liability Insurance

Professional Liability Insurance Policy, which covers the Indemnification Clause of this contract (paragraph .02 above), as it relates to errors, omissions, negligent acts or negligent performance in the work performance under this contract by the Designer, its subcontractors, employees and agents. The limitation of the Courts and Judical Proceedings Article states Annotated Code of Maryland Section 5-108(b) shall apply.

.02.2 Workers' Compensation Insurance

Workers' compensation, as required by the laws of the State of Maryland, including Employer's Liability Coverage and coverage for the benefits set forth under the U.S. Longshoremen and Harbor Workers' Compensation Act, the Jones Act, and other federal laws where applicable.

.02.3 Comprehensive Automobile Liability Insurance

Comprehensive Business Automobile Liability covering use of any motor vehicle to be used in conjunction with this contract, including hired automobiles and non-owned automobiles. Loading and unloading of any motor vehicle must be covered by endorsement to the automobile liability policy or policies.

.02.4 Administrative & General Provisions

a. Each policy, with the exception of Workers' Compensation and Professional Liability Insurance, shall name the State Highway Administration.

b. Defense of Claims

Each insurance policy shall include a provision requiring the carrier to investigate and defend all named insured against any and all claims for death, bodily injury or property damage, even if groundless.

c. Compliance

The Design-Build Team shall be in compliance with this Section provided it procures either one policy or insurance covering all work under the contract or separate insurance policies for all segments constituting the entire project. In either case, a certificate of insurance must be filed for each policy with the Administration indicating that all required insurance has been obtained.

The Design-Build Team is responsible for assuring that insurance policies required by this Contract comply with all the requirements. The Design-Build Team is also responsible to determine that all subconsultants, subcontractors, suppliers, and all other individuals or entities performing Work for the Project carry all applicable insurance coverages set forth in this section, including, in all cases, Workers' Compensation, Automobile, and Commercial General Liability Insurance. The Design-Build Team shall indemnify and hold harmless the Administration from any claims arising from the failure to fulfill said responsibilities.

d. Reporting Provisions

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Administration, its officers, agents and employees.

e. Separate Application

The insurance provided by the Design-Build Team shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

.02.5 Notice of Cancellation or Modification

All policies of insurance provided in this Section shall be endorsed to provide that the insurance company shall notify the Administration, the Design-Build Team, and each named insured at least thirty (30) days prior to the effective date of any cancellation or modification of such policies.

TC-5.03 SUBCONTRACTING AND SUBCONTRACTORS

102 **INSERT**: The following before the paragraph titled '**Subcontractors Prompt Payment.**'

Percentage of Own Workforce Required. The Design-Build Team must perform at least fifty percent of the value of the on-site construction work with its own workforce, not including the percent goal required in the contract proposal to be performed by DBE's. The Designer must perform at least fifty percent (50%) of the value of the design work with its own workforce, not including the work required by DBE's.

106 **ADD**: The following sections at the end of section '**TC-5.05 DETERMINATION AND EXTENSION OF CONTRACT TIME.**'

TC-5.06 OWNERSHIP OF DOCUMENTS

All plans, specifications, inspection records, or other documents ("Documents") generated by the Design-Build Team and all consultants, subcontractors, suppliers, manufacturers performing Work on the Project are the property of the Administration. Upon request by the Administration, the Design-Build Team or any other person or entity performing Work will produce and deliver such Documents as requested, both in hard copy and electronic format.

TC-5.07 ACCESS TO AND RETENTION OF RECORDS

The Design-Build Team and its employees and Subcontractors shall make all project records available for inspection by the Project Manager and all other persons authorized by the Administration, and shall permit such representatives to interview employees during working hours. Project records include daily time reports, records of force account work, quality control or assurance documentation, inspectors reports, employment records, payrolls, equal opportunity records, construction conference records, partnering records, and any other documents in any way related to the Project substantiating payment. These records shall be retained at least three years after final acceptance of the project.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF HIGHWAY DEVELOPMENT
707 NORTH CALVERT STREET
BALTIMORE, MARYLAND 21202

December 19, 2016

Contract No.: MO0695172
F.A.P. No.: Not Applicable
Description: IS 270 Innovative Congestion Management Contract – Progressive Design-Build: Request for Proposals (RFP)

ADDENDUM NO. 4

To All Prospective Proposers:

Please be advised that the Technical and Price Proposal Submittal Date for this contract is still scheduled for **January 19, 2017**.

The attention of prospective proposers is directed to the following revisions, additions and/or deletions to the Request for Proposals (RFP).

REQUEST FOR PROPOSALS

Page No.	Description
14	REVISED the order of the last two bullets at the bottom of the page so the language for the JPA services, which flows onto the next page, is continuous.
16	REVISED the last bullet of the Administration's Services to exclude construction, as the construction will not occur during the preconstruction phase.

Questions relating to this Addendum No. 4 may be directed in writing to:

Jason A. Ridgway, P.E.
Director, Office of Highway Development
Maryland Department of Transportation
State Highway Administration
e-mail address: MO069_IS_270@sha.state.md.us

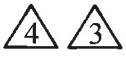
During the Technical Proposal Phase, only e-mailed inquires will be accepted. No requests for additional information or clarification to any other Department or Administration office, consultant, or employee will be considered.

For

GREGORY I. SLATER, DEPUTY ADMINSTRATOR FOR PLANNING, ENGINEERING, REAL ESTATE, AND ENVIRONMENT.

THIS ADDENDUM IS ISSUED TO CLARIFY, ADD TO, DELETE FROM, CORRECT AND/OR CHANGE THE CONTRACT DOCUMENTS TO THE EXTENT INDICATED AND IS HEREBY MADE PART OF THE SAID CONTRACT DOCUMENTS. COMAR 21.05.02.08 REQUIRES THAT ALL ADDENDA ISSUED BE ACKNOWLEDGED; THEREFORE, PRIOR TO SUBMITTING YOUR PRICE PROPOSAL, ATTACH THE ADDENDUM RECEIPT VERIFICATION FORM TO THE FRONT OF THE PRICE PROPOSAL FORM PACKET. FAILURE TO DO SO MAY RESULT IN THE PRICE PROPOSAL BEING DECLARED NON-RESPONSIVE.

- Develop any Right-of-way needs for the project(s)
- Preparation of any Design Exceptions as required for the project(s)
- Design of any surface drainage conveyances, stormwater management, and erosion and sediment control and obtain any related environmental agency approvals required for the project(s) (including NPDES and MDE Approvals).
- Hydrologic and Hydraulic analyses, Drainage and Storm Water Management (SWM) Analyses, Design, and Approvals.
- Closed-Circuit Television (CCTV) inspections of existing drainage pipes as needed.
- The pavement engineering for the Project shall include, but is not limited to, the pavement investigation, pavement type selection, new pavement design, pavement rehabilitation design, and material selection.
- Perform pavement and subsurface geotechnical investigations needed to determine subsurface features and characteristics, and properties to support pavement and geotechnical engineering functions.
- Analyze pavement performance data and existing material conditions to determine the structural and functional conditions for the development of pavement engineering recommendations;
- Analyze subsurface geotechnical field and laboratory test data to determine existing soil, rock, and groundwater conditions etc. for the development of geotechnical engineering recommendations;
- Structural design for all bridges, culverts, walls and any and all other incidental structures required for the project(s).
- Traffic engineering design of any temporary and permanent signing, lighting, traffic signals, pavement markings, and Intelligent transportation systems (ITS) required for the project(s)
- Traffic Operations Analyses including the preparation of a Traffic Operations Analysis Report
- Temporary Traffic Control Design and Implementation including the preparation of a Traffic Management Plan (TMP), red flag summary, Maintenance of Traffic Alternatives Analysis (MOTAA). Additionally, attending and running TMP meetings.
- HOV equivalency analysis and submit to FHWA for approval, if required
- Safety analysis using the Highway Safety Manual (HSM) and submit to FHWA for approval, if required
- Landscape Architecture design of any roadside landscaping and stormwater management landscaping required for the project(s)
- Forest Impact Analysis, Significant tree identification, development of forest impact plans, tree preservation plan and design of any reforestation mitigation required for the project(s)
- Preparation of any necessary documents to obtain final reforestation site review approval from the Maryland Department of Natural Resources



- Complete all work related to providing a noise study(ies) that makes a final determination on reasonableness and feasibleness related to noise abatement.
- Prepare and coordinate the Joint Permit Application(s) (JPA) including but not limited to preparation and submittal of the JPA application(s) to SHA with attachments including location map, impact plates, trilogy request and

- Acquisition of Environmental Permits
- Acquisition of Right-of-Way
- Review Construction CAP proposals and compare to ICE
- Reconcile Final CAP for each phase
- Construction Management and Inspection Services
- Design required noise abatement

△4 △3

Scope Validation and Identification of Scope Issues

A Scope Validation Period of 120 days from the date of the Notice to Proceed for Design and Preconstruction Services will be provided on this contract. During the Scope Validation Period, the Design-Builder shall thoroughly verify and validate that the Design-Builder's understanding of the scope of work and its ability to complete it within the Design and Preconstruction Services Fee. Any Scope Issues determined during this period shall not be deemed to include items that the Design-Builder should have reasonably discovered prior to submission of its Technical Proposal.

If the Design-Builder intends to seek an adjustment to the Design and Preconstruction Fee due to a Scope Issue, it shall promptly, but in no event later than the expiration of the Scope Validation Period, provide the Administration in writing with a notice of the existence of such Scope Issue and basis for such Scope Issue. Within 30 days of the notice, the Design-Builder shall provide documentation that specifically explains its support for the Scope Issue, which shall include among other things: (a) the assumptions the Design-Builder made during the preparation of its Proposal that form the basis of its allegation, along with documentation verifying it made such assumptions in developing its Proposal; (b) explanation of the Scope Issue that the Design-Builder could not have reasonably identified prior to submission of the Technical Proposal; (c) specific impact on the Design and Preconstruction Services. For the avoidance of doubt: (1) The Design-Builder shall not be entitled to raise any Scope Issues that were not previously addressed with a notice; and (2) Design-Builder shall have no right to seek any relief for any Scope Issues not identified in a notice provided to the Administration during the Scope Validation Period.

Within a reasonable time after the Administration's receipt of the documentation, the parties shall meet and confer to discuss the resolution of such Scope Issues. If the Administration agrees that the Design-Builder has identified a valid Scope Issue, a change order will be executed to increase the value of the Design and Preconstruction Fee; however, the Construction Services will be adjusted to retain the overall fixed value of the contract. Notwithstanding anything to the contrary in the Contract Documents or a matter of law, the Design-Builder shall have the burden of proving that the alleged Scope Issue could not have reasonably been identified prior to the submission of the Technical Proposal and such Scope Issue materially impacts its Design and Preconstruction Services Fee.

The parties acknowledge that the purpose of the Scope Validation Period is to enable the Design-Builder to identify those Scope Issues that could not have reasonably been identified prior to the submission of the Technical Proposal. By submission of the Technical Proposal, the Design-Builder acknowledges that the Scope Validation Period is a reasonable time to enable the Design-Builder to identify Scope Issues that materially impacts its Design and Preconstruction Fee. The Design-Builder will assume and accept all risks to complete the Design and

APPENDIX X
QUESTIONS AND RESPONSES

Contract No. MO0695172

IS 270 Innovative Congestion Management Contract

Request for Proposals – Questions and Responses

The following questions were received on September 2, 2016.

Question 1:
Please provide the SHA I-270 accident data in Excel Spreadsheet format from SHA OOTS TDSD's ACRES system to aid with the expedited review and analysis of data during the Technical Proposal phase of the I-270 project.

Response 1:
Crash data in Excel format has been posted on ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\04 - Existing Crash Data\Accident Data\

Question 2:
Please provide Synchro files which were used to develop signal timing for signalized intersections in the VISSIM network to aid with the review and analysis of solutions during the Technical Proposal phase of the I-270 project.

Response 2:
Synchro files are not available. The existing signal timing sheets were used for 2015 design year and minor signal timing adjustments were made to traffic signals with excessive delays and queues for 2040 no-build design year.

Question 3:
Will SHA provide consistent parameters such as number of runs, seeds, seeding time for the VISSIM runs so that all teams provide comparable results for SHA to evaluate?

Response 3:
As stated on Page 48 of the Request for Proposals (RFP), "The Proposer shall use VISSIM version 7.00-13, shall follow SHA's VISSIM Modeling Techniques, shall not modify calibration parameters, such as vehicle inputs, vehicle routes, driving behavior, link behavior type, lane change distance, speed distributions and decisions without providing justification to the SHA and must use the simulation parameters and random seeds as provided in the VISSIM files when reporting results."

The following questions were received on September 7, 2016.

Question 4:
Please provide the following: schedule and plans for MD 85 at I-270 project, MD 121 at I-270 project, and schedule for I-270 at Watkins Mill project.

Response 4:
The Watkins Mill Interchange is planned to be re-advertised in 2017; however, a precise schedule is undetermined and will depend on the magnitude of the design changes (if any) that will be required to accommodate the I-270 Innovative Congestion Management (ICM) Contract.

The I-270/MD 121 Interchange Improvements Project is in the planning phase. Information can be found at the following project website:

http://apps.roads.maryland.gov/WebProjectLifeCycle/ProjectInformation.aspx?projectno=MO4261115

Final review plans for the I-270/MD 85 (Phase 1) Interchange Reconstruction Project (Contract No. FR3885171) have been posted to ProjectWise at the location below. Additionally, Plans, Specifications, & Estimate (PS&E) plans for a stream stabilization project (Contract No. MO1605174) have been posted to ProjectWise at the location below:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\11 - Other Projects\

The latest advertisement, bid, and notice to proceed (NTP) dates for these projects can be found in the Contractor's Ad Schedule on SHA's website:

http://www.roads.maryland.gov/pages/contractadschedule.aspx

Question 5:
Please provide the following: 100 scale mapping north of the Watkins Mill project.

Response 5:
The SHA will not provide additional 100 scale mapping. A planimetrics file for the area north of the 100 scale mapping has been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\07 - Planimetrics\mTO_planimetrics_I270.dgn

Question 6:
Please provide the following: crash data in MS Excel format.

Response 6:
See question 1.

Question 7:
Please provide the following: traffic counts in 15 minute increments and in MS Excel format.

Response 7:
Two MS Access databases have been posted to the ProjectWise location below, one for I-270 and one for Montgomery and Frederick Counties. A data dictionary has been included to explain

the columns in the tables. Also, the locations of the counts have been included in shape and KMZ formats.

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\02 - Existing Traffic Counts\15 minute counts\

Question 8:
Please provide the following: speed data in 15 minute increments (collected at the same time as the traffic counts).

Response 8:
Speed, Travel Time Index (TTI), and Planning Time Index (PTI) data for the I-270 mainline (from the spurs to I-70), the I-270 collector distributor (CD) lanes, and I-495 (from American Legion Bridge to the spurs) has been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\10 - 2015 Avg Weekday INRIX Data\

Question 9:
Please provide the following: Excel sheet for I-270 Concept Evaluation 042516 Final.pdf.

Response 9:
The Excel files used to generate said document had been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\I_I-270 Concept Evaluation Templates\files\

Question 10:
Please provide the following: origin-destination data and 5 year interval traffic projections through 2040.

Response 10:
Origin-destination data and land use information in 5 year increments have been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\09 - MWCOG Travel Demand Model Outputs\

Question 11:
Please provide the following: small structure inventory for Frederick County.

Response 11:
The following file on ProjectWise has been updated to include the maps for Frederick County:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\03 - Inventory of Existing Structures\Inventory Maps\Small Structures.pdf

Three additional small structures (10182X0, 10358X0, and 10359X0) have been added to the following ProjectWise folder:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\03 - Inventory of Existing Structures\Other Structures\

Question 12:
Please provide the following: utility designation north of the Watkins Mill Project, right-of-way (ROW) mosaic north of the Watkins Mill Project, pavement borings/geotech info north of the Watkins Mill Project, and wetland delineation and environmental features north of Game Preserve Road.

Response 12:
The extent of additional base information required to complete design will be highly dependent on the concept; therefore, the additional data collection needed to complete the project is included in the pre-construction services to be provided by the Design-Builder.

Question 13:
Please provide the following: pavement structure numbers of all shoulders.

Response 13:
The SHA has not performed any design to date. Pavement design is included in the pre-construction services to be provided by the Design-Builder. Prospective proposers may, at their will and discretion, perform preliminary calculations during the procurement phase.

Question 14:
Please provide the following: noise model north of Watkins Mill.

Response 14:
The SHA will not provide additional noise models. Should the project require noise analyses, the Design-Builder shall develop the required noise models, analyses and reports as part of the pre-construction services.

The following questions were received on September 12, 2016.

Question 15:
Our Team is requesting access to view and use the “Explore and Visualize Crashes” tool within the RITIS (Regional Integrated Transportation Information System). This tool will be beneficial to the project by allowing our team to view more detailed crash data to better identify the deficiencies along I-270.

Response 15:
Proposers may request one team member to be provided RITIS access. If access is desired, please submit a request to the project email address along with the name and email address of the user to whom RITIS access will be given.

Question 16:
In reference to RFQ/RFQ Article XII.B.7, is it acceptable to use VISSIM Version 8.00-10 in lieu of Version 7.00-13?

Response 16:
VISSIM version 7.00-13 shall be used. However, additional supporting information related to the technical proposal may be included in the Appendix.

The following questions were received on September 27, 2016.

Question 17:
Please provide clarification on the schedule of prices as shown in the RFP. All three bid items are shown as lump sum, but the RFP describes a design development process involving SHA, the DB team and public/stakeholders as required by SHA design development policies. Throughout the design process, it is likely that the construction scope will evolve with stakeholder and SHA input. For clarity, will the lump sum prices also evolve as the scope becomes better defined in the design period?

Response 17:
The contract budget is $100,000,000 and this budget is fixed. As noted in the question, the proposed concept and final construction scope shall continue to evolve during design, as is usual for all design processes and projects, prior to reconciliation of a Construction Agreed Price (CAP). However, the Design and Preconstruction Services Fee should be considered to be a "Guaranteed Maximum Price" or upset limit. It shall include all design and preconstruction services needed to deliver the scope of improvement proposed by the Design-Builder.

The Construction Management Fee shall include all profit, general and administrative costs, regional and home office overhead, and other indirect costs, as specified in Article XII.C.2 beginning on page 48 of the RFP.

The Construction Services Fee is determined by subtracting the Design and Preconstruction Services Fee and Construction Management Fee from the total contract budget. Regardless of what the final construction scope becomes, each construction package price will be reconciled and have its own agreed upon CAP. The sum of all the CAPs, any necessary right-of-way acquisition costs, and utility relocations costs will not exceed the Construction Services Fee, which is a "Guaranteed Maximum Price" or upset limit.

If there is a scope change during the design and preconstruction services, then it will be handled by the appropriate contract specifications. However, the Administration does not intend to

increase the value of the contract and the Design-Builder will need to propose modifications to stay within budget.

Question 18:
What level of design and plans related to PTCs are required for the Technical Proposal submittal?

Response 18:
Per General paragraph of Article XII.B (Technical Proposal) in the RFP (page 42), "The Technical Proposal submittal shall contain concise narrative descriptions and graphic illustrations, drawings, charts, plans and specifications that will enable the Administration to clearly understand and evaluate the capabilities of the Design - Builder and the characteristics and benefits of the proposed solutions." Proposers are responsible for determining the necessary level of detail that will enable the Administration to clearly understand and evaluate the capabilities of the Design - Builder and the characteristics and benefits of the proposed solutions.

Question 19:
Since each PTC is being evaluated on its own merits, and with its own VISSIM analysis, please clarify what should be submitted with the final Technical Proposal? Is a VISSIM model for each PTC required, or one model that combines each of the PTCs selected by the DB for inclusion in their Technical Proposal?

Response 19:
One VISSIM model that combines each of the PTCs selected by the Design-Builder for inclusion in the Technical Proposal shall be submitted. Please refer to Article XII.B.7 in the RFP (page 48).

Question 20:
We request that SHA consider revising the Technical Proposal due date to either December 21st or January 18th.

Response 20:
In Addendum No. 2 the Technical Proposal due date was revised to January 19, 2017.

Question 21:
Is there any VISSIM calibration report available? If so, please provide.

Response 21:
A VISSIM calibration memorandum has been posted on ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\ 03 - VISSIM Traffic Models\I-270 Modeling Calibration Methodologies Memorandum.pdf

Question 22:
Can SHA provide any origin-destination traffic data for the GP and HOV lanes within the corridor used to develop existing and 2040 traffic volumes for the corridor?

Response 22:
See response to question 10.

Question 23:
We have been unable to locate any CAD files on PW that support the TNM validation that has been done, including Microstation files with the NSA shapes, the measured receptors and the TNM validation model layouts. Will SHA provide these files to all proposers?

Response 23:
MicroStation files with the NSA shapes, the measured receptors and the TNM validation model layouts will not be provided.

Question 24:
Special Provision Insert, TC-5.01 Insurance, page 2, 6th paragraph requires *"Any policy exclusions shall be shown on the face of the Certificate of Insurance or provided with the Certificate of Insurance."* All policies have numerous standard exclusions which are usual and customary in the industry. Listing all these exclusions in or attached to the certificate of insurance would be an unnecessary administrative burden. Please consider the following amendment, which we believe is the true intent of this requirement, *"~~Any policy~~ Policy exclusions applicable to the requirements herein shall be shown on the face of the Certificate of Insurance or provided with the Certificate of Insurance."*

Response 24:
This is a standard Special Provision for all Administration contracts and will not be modified.

The following questions were received on October 6, 2016.

Question 25:
If our proposed solution requires additional staff to operate, beyond the existing MDOT / CHART manpower capabilities, is the additional staffing to be included in the current $100M budget? If yes, for what period of time (years) would the staff need to be provided? Will additional staffing (temporary or permanent) be SHA employees, contract employees, or staff provided by the Design Builder? Will staff be located in an existing MDOT / CHART facility. If yes, which existing facility?

Response 25:
No, the contract budget does not include long-term Operations and Maintenance (O&M) costs. The budget does include design, construction, integration, testing, system documentation, training and anything else needed to turn over to the State a fully functional & operational system.

Though long-term O&M costs are not included in the budget, as part of their Technical Proposal Submittal, Proposers are responsible for evaluating impacts to O&M, and justifying and documenting anticipated O&M requirements. Please refer to the Operability/Maintainability/Adaptability goal in the RFP. The SHA needs to clearly understand the impacts the project will have on its O&M programs.

Question 26:
If our proposed solution requires "back-office" computers and other equipment, shall they be housed in an existing MDOT / CHART facility. If yes which one? If no, would the Design Builder be required to provide such facilities and would the cost be included in the current $100 Million budget?

Response 26:
Housing back-office computers and equipment in MDOT, SHA and/or CHART facilities is potentially feasible, but not required. Proposers would need to confirm that the proposed location would be implementable, assuring basic system support such as telecommunication connectivity, a reliable power supply, accessibility for maintenance and system redundancy.

Proposers will design the system and should propose where the best location would be. There are numerous alternatives – e.g. the Statewide Operations Center, the Hanover Traffic Signal Shop, the Glen Burnie Data Center, District 3, etc. Proposers shall determine the most practical solution that meets the goals of the project. As noted above, using a State facility is feasible.

Regardless of where the equipment is housed, the Design-Builder shall provide all required equipment and facilities to turn over to the State a fully functional & operational system, as noted in response 25, the cost for which must be paid for from the contract budget.

Question 27:
If existing MDOT / CHART facilities are being utilized for proposed operational activities, is the Design Builder responsible for any improvements to the facility (physical improvements or new equipment/connectivity) as part of the $100 Million budget? Please provide any existing plans or requirements for where equipment or staffing might be housed at the proposed MDOT / CHART facility including IT and computer facilities so we can estimate the cost of any improvements. Please arrange for access to the proposed facility for the Design Builders designers and estimators.

Response 27:
The cost of improvements to MDOT facilities shall be paid for from the project budget if the improvements are required for the Design-Builder to provide a fully functional system at project completion. The Design-Builder is not responsible for facility improvements unrelated to the project.

Your request for existing plans/information is too broad. Also, SHA does not know the equipment/staffing requirements for your proposed solutions and would be unable to determine potential housing locations. However, to help Proposers conceptualize potential housing

locations, Proposers may visit SHA facilities. To make an appointment, Proposers may send an email request to the project email address, specifying which facility and potential dates.

Question 28:
Will maintenance of any new field ITS devices need to be covered in our $100 Million budget? If so, for what time period and to what extent is expected?

Response 28:
No. See response to question 25.

The following questions were received on October 10, 2016.

Question 29:
The RFP allows for resubmittal of PTC's after receiving initial feedback from SHA, but it does not specify a due date. Can a PTC be resubmitted after the 11/17 Last Day to submit PTC's, if the initial submittal was made prior to 11/17?

Response 29:
Yes.

Question 30:
We request permission to engage in joint discussions with FHWA and the SHA noise barrier team on proper implementation of Federal Highway Noise Regulations and Guidance. If you concur with this request, please provide appropriate point of contact.

Response 30:
Proposers may meet with the SHA Noise Team by sending a request to the project email address. If additional guidance from FHWA is needed, SHA will follow up and report back to the Proposer(s).

Question 31:
A fiber optic exists along I-270. Can this fiber optic be utilized for the project?

Response 31:
The Administration has determined that up to 4 fibers may be dedicated to this project.

The following question was received on October 13, 2016.

Question 32:
The RFP requests us to "*Discuss what modifications would be needed to the proposed Watkins Mill Interchange project to be compatible in a safe and efficient manner with your Innovative Congestion Management improvements.*" In order to properly reply to that question may we please have the latest Watkins Mill Interchange plans to review so the proper analysis can be made.

Response 32:
The Watkins Mill Interchange plans were previously posted on ProjectWise on June 7, 2016. The Proposer shall discuss what modifications would be needed to the proposed Watkins Mill Interchange as shown in that information.

The following questions were received on October 15, 2016.

Question 33:
Please furnish the 2015 Calibration Report for the I-270 Vissim models.

Response 33:
See response to question 21.

Question 34:
Please furnish contact information for Network Maryland.

Response 34:
Contact information for Network Maryland can be found on the Maryland Department of Information Technology's (DoITs) website.

Question 35:
Page 2 of the RFQ/RFP indicates that all costs for ROW acquisition will be subtracted from the established cost for Construction Services, and that ROW acquisition will be completed by the Administration. Please specify and generally describe applicable SHA costs related to ROW acquisition, e.g. purchase cost, legal fees, assessment fees, GEC fees, SHA staff, etc.

Response 35:
Only the final negotiated purchase cost of the ROW will be subtracted from the Construction Services Fee. All SHA labor and overhead—including that of our ROW specialists who will make first offers, negotiate, prepare documentation, etc.—will not be subtracted from the contract budget. Please note, development of ROW needs and plats are included in the Design & Preconstruction Services, and, therefore, will be subtracted from the contract budget.

The following questions were received on October 17, 2016.

Question 36:
As indicated in the RFQ/RFP, the Mobility Section in our Technical Proposal is of Critical Importance is 16 pages and will represent 50% of our Technical score The other sections representing the remaining 50% are 30 pages are rated only Important. We request that the page count for the Mobility Section be increased to accurately represent the relative level of importance and scoring of our proposal. A suggested page count for the Mobility Section is 25-30 pages.

Response 36:
The Administration will increase the page count to 20 pages for the Mobility section with a future addendum.

Question 37:
We request that full page explanatory graphics not count against the total page count of a specific section when included in the Technical Proposal (and not the appendix).

Response 37:
The specified page limits shall include full page explanatory graphics.

The following questions were received on October 18, 2016.

Question 38:
Can SHA provide GIS information for existing stormwater management BMPs, drainage areas and storm drains along the I-270 corridor in Montgomery County and Frederick County?

Response 38:
Available GIS information has been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\08 - SWM GIS maps\

Question 39:
Please confirm the IS 270 Congestion Management contract shall be all-inclusive and not rely on any follow-up SHA or County contracts, such as future overlays to repair any stripping eradication efforts, to meet SHA or RFP requirements.

Response 39:
No resurfacing projects on I-270 are funded or programmed in the near future. Proposed improvements for the I-270 Innovative Congestion Management contract shall be all-inclusive and not rely on improvements provided in other projects.

The following questions were received on October 31, 2016.

Question 40:
Please confirm that since this is not a capacity addition project, but a congestion management and reduction project of existing roadway traffic that noise analysis and potentially new noise walls, or modifications to existing noise walls or other mitigation efforts, will NOT be required.

Response 40:
Per the RFP Contract Provisions, General Provisions, Terms and Conditions and Technical Requirements, the Design-Builder shall comply with all Federal, State and local laws, ordinances and regulations applicable to the activities and obligations associated with this project. The Design-Builder is responsible for determining whether noise mitigation will be required to implement the Design-Builder's proposed improvements. Please note that noise analysis and mitigation may be required if, based on the scope of improvements, the NEPA defined project is considered Type I. Refer to the MDOT SHA Highway Noise Policy and 23 CFR 772 for additional information related to the definition of Type I projects.

Question 41:
Please confirm that if no new full time mainline or CD lanes are added to the existing I-270 typical section, noise analysis and potentially new noise walls or modifications to existing noise walls or other mitigation efforts will NOT be required.

Response 41:
See response to question 40. Full-time use is not a consideration for the determination of a Type I project. Part-time shoulder use would fall under the definition of a Type I project. Refer to FHWA's Use of Freeway Shoulder for Travel for additional information.

Question 42:
Please confirm that if revisions to current entrances and exit ramp configurations along the I-270 corridor are proposed, noise analysis and potentially new noise walls, or modifications to existing noise walls or other mitigation efforts will NOT be required.

Response 42:
See response to question 40.

Question 43:
If a noise analysis is performed utilizing current criteria on the existing I-270 configuration and traffic, (without any or with only minor improvement such as the installation of gantry's, detection or ramp metering made by the Design Builder) and the results indicate additional noise mitigation is required, will the design builder be required to provide such mitigation as part of the $100 Million dollar budget? If so what would be the limit of the mitigation – the entire corridor from the I-495 juncture to the I-70 interchange - or other limits.

Response 43:
All costs for noise mitigation required by the Design-Builder's project(s) to comply with all applicable Federal, State and local laws, ordinances and regulations, shall be a part of the contract budget. This includes any required Right-of-way and or Utility Relocations needed as a result.

Multiple environmental documents may be developed for the contract. Each separate project for an environmental document must be a standalone construction project that connects logical termini and be of sufficient length, have independent utility, and not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. If the project is determined to be a Type I project, the level of mitigation required and the limits of that mitigation would be determined based on any noise analysis done for the environmental document(s) to meet applicable Federal, State and local laws, ordinances and regulations.

The following questions were received on November 2, 2016.

Question 44:
It was noted that the wetlands and waterways shapes and delineation report were a draft. Have they been finalized?

Response 44:
The wetland delineation report has been finalized and posted to ProjectWise at the location below:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\06 - Wetland Delineations\

Also, the shape files have been updated and replaced at the location below. Included is a CAD file of the wetlands and waterways (mEF_I270_16.1019.dgn).

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\B_Survey and Topographic Files\02 - Environmental Features Files\

Question 45:
Since noise mitigation does not contribute directly to meeting the project goals, would MDOT consider utilizing a separate funding mechanism for noise barriers?

Response 45:
Yes. The Administration has decided to use another funding source(s) for the construction of noise barriers. This will be reflected in Addendum No. 3.

The Design-Builder shall identify in its proposal where noise barriers may be required, including approximate locations and areas. As part of its design and preconstruction services, the Design-Builder will be responsible to complete all work related to providing a noise study to make a final determination on reasonableness and feasibleness related to noise abatement for the Design-Builder's project(s) to comply with all applicable Federal, State and local laws, ordinances and regulations.

The SHA will be responsible for final design and construction of any required noise abatement and the additional impacts or requirements they incur, including additional utility relocations, grading, drainage, SWM, retaining walls, etc.

Please note, responses to questions 40, 41, and 42 still apply. Also note, this response (45) supersedes the first paragraph of response 43.

The following questions were received on November 14, 2016.

Question 46:
Please provide a copy of the SHA application for Federal funding under the Integrated Corridor Management (ICM) program.

Response 46:
The requested document has been posted to ProjectWise at the location below:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\09 - Integrated Corridor Management\

Question 47:
With regard to communications for ITS field devices such as CCTV cameras, message signs, and ramp meters, we understand there are four (4) existing dark fibers on the corridor that are available for use by the design-builder. If so:

a) How do we obtain the exact locations of existing fiber conduits, pull boxes, and splice vaults?
b) Are we able to break into the fiber duct at any point to add additional pull boxes and splice vaults?
c) Can we splice into existing fibers at any new/existing pull box or splice vault?
d) Can we add additional fiber within the existing conduits?
e) Are there spare conduits in the existing ITS duct bank?
f) Does SHA have any mandatory standards on communication architecture or equipment? For instance, is there a requirement for Cisco-supplied switches or for GB Ethernet?

Response 47:
There are four (4) existing dark fiber strands on the corridor that are available for use by the Design-Builder. The locations of these strands were previously posted to ProjectWise and can be found at the following location:
pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\06 - ITS Information\

These four (4) fibers are a part of the MDOT's Resource Share Agreement (RSA) with Level 3. Only these four dark fiber strands are available for the Design-Builder to use. There are no other existing strands or conduits available for the Design-Builder's use. Level 3 owns the strands and requires that any splicing of the strands be performed by Level 3's certified splicers. Any associated cost for that splicing shall be part of the project budget. The RSA does allow for the ability to add new pull boxes and/or splice vaults but does not allow adding fiber to the existing conduits. Any new pull boxes and/or splice vaults must be coordinated with Level 3, and locations must be approved by Level 3. If the Design-Builder's solutions require additional conduit/fiber, the Design-Builder will be required to construct these new resources as part of their project.

SHA does not have any mandatory standards on communication architecture or equipment. However, the Administration values a project which will provide for ease of operations and maintenance. It is the Design-Builder's responsibility, per the RFP, to describe how its approach, including communication architecture or equipment, will ensure the SHA will have a fully functional system that is easily maintainable.

Question 48:
We request the SHA re-evaluate the DBE participation goal of 25% for the Design and Preconstruction phase of the project.

The Construction portion of this phase involves only Estimating and Project Management (no construction). It is unrealistic to ask the Construction firm selected to subcontract out ¼ of its estimating and or management functions. Those two key functions are never subcontracted out by any Construction firms as no firm would allow these two key functions to be performed

outside of their organizations from both a propriety and leadership standpoint. This fact is recognized in the DBE requirements included in SHA's CMAR program where DBE participation is not required for this phase of the project. The following is taken from one of the recent CMAR RFQ's. *"The overall DBE participation goal will be 0% of the total Contract price for the Preconstruction Services. Due to the nature of the Contractor's role in the Preconstruction Design phase, the Administration has determined that there are insufficient subcontracting opportunities to justify a DBE goal on the Preconstruction Design phase."*

The above will therefore require that the full 25% of Design and Preconstruction services be shifted to the Engineering portion of the fee putting a DBE component of approx. 35% to 40% on the designer. As an innovative project requiring "World Class" expertise to identify and implement new innovative solutions specialize senior staff will be required from the firms other national or international offices. That staff is generally only found in large multinational engineering and planning firms - not local small DBE organizations. There are specific areas where DBE firms can be utilized (e.g. Outreach, Survey, Subsurface investigations, etc.) but these tasks do not come close to equaling 25% of the total Design and Preconstruction fee.

We respectfully request the Design and Preconstruction DBE requirement be lowered to no more than 5% to 10% of the total Design and Preconstruction fee. If desired by SHA, the resulting decrease in DBE dollars can be shifted to the Construction portion of the project so as to provide the same total DBE participation for the full $100 million dollar project budget as previously desired.

Response 48:
On Design-Build projects, typically 30% of the portion of the contract price allocable to professional services requires good faith effort to achieving DBE/MBE participation. Understanding that, in addition to the professional services, that the Contractor's preconstruction services are included in the Design and Preconstruction Services Fee, the Administration determined that overall 25% was a realistic MBE goal contract to be in line with 30% of professional services allocable to MBE participation. This would allow all preconstruction services to be completed the Contractor with a similar level of MBE for professional services to other Design-Build contracts. We believe there are other areas for DBE participation above those identified such as highway, traffic, drainage, stormwater management, erosion and sediment control, permitting, noise analysis, etc.

Question 49:
On normal DB and CMAR projects the different sections of the technical proposal are divided between several different groups to review and score totally independently. Will that be same on this project. Will the Technical Proposal be reviewed by three independent groups, do the individual groups see the other sections, and are the given the appendix?

On this project, that is so non typical and innovative, we request SHA review the above assumed procedures and have one team review and score the entire document. As a minimum we believe, if independently scored, the teams should have access to the entire document, including the appendix.

Response 49:
Yes, the technical proposal will be broken down into individual Evaluation Factors and evaluated independently by different evaluation teams as described in the RFP beginning on page 50. This is SHA's standard evaluation process that serves the organization well, regardless of the nature of the project.

The following question was received on November 27, 2016.

Question 50:
On page 41 Item 4 of the RFP "Effect of Submitting a Proposal" it states we are to "*perform the work for the price submitted within the time(s) specified*". We have found no time to be specified in the RFP for completion and Section B on pages 42 thru 47, which details what is to be included in our technical proposal, does not request a schedule or completion date. We therefore assume individual completion dates will be assigned to each construction package at the time the CAP's are determined. Please confirm our assumption or inform us where the completion date is specified or requested.

Response 50:
The schedule for design and completion of construction for each CAP will be determined by the Design-Builder as part of the submittal of its Technical and Price Proposal. See Response 2 (R2) in the Notice to Prospective Proposers dated June 17, 2016. The completion date shall be provided on Page 41 of 43 of the Price Proposal Form Packet.

The following question was received on December 1, 2016.

Question 51:
As a follow up to question number 49: Will the reviewers of the individual sections have access to the full technical proposal, including the appendix?

Response 51:
As stated in the RFP on page 51, "Each Evaluation Team will only be given the section or sections for each specific Evaluation Factor or Factors they are rating and not the Technical Proposals in its entirety. Evaluations will be limited to the information provided in the specific Evaluation Factor section and will not consider information provided in other sections." Each Evaluation Team will have access to the appendix, which is not rated. It should be noted the Evaluation Teams determine the initial technical ratings. The Evaluation Committee, which determines the overall technical ratings, will have access to the entire Technical Proposal and appendix.

The following questions were received on December 5, 2016.

Question 52:
RFQ Article XII.B.5.ii (Page 47) requires the proposer to "Discuss the services to be provided by the Design-Builder." Please clarify what services are to be addressed in this section of the Technical Proposal.

Response 52:
Discuss the Design and Preconstruction Services, and any other services the Design-Builder will provide that will best meet or exceed the goals of the project.

Question 53:
In the definition of Construction Agreed Price on pages 3 and 4 of the RFP, it states that a CAP "shall include all final design…" Please define "final design".

- Is this the design effort required to progress the design to 100% from the 65% state used for negotiation of the CAP?
- If the cost to progress the design from 65% to 100% is included in the CAP, what further design effort, if any, is required if SHA elects to bid a package competitively?

Response 53:
Final design for a work package, the cost of which is included in the CAP, is the design effort required to complete design for that work package. For example, if the CAP is initiated at 65% design, final design is the effort required to progress design from 65% to 100% release for construction drawings, including revisions/redlines. If the CAP is initiated at 90% design, final design is the effort required to progress design from 90% to 100% release for construction drawings, including revisions/redlines. Proposers shall identify in their proposals at what percent design completion (e.g. 65%, 90%, 100%, etc.) CAPs will be initiated. If SHA rejects the Design-Builder's price and bids the package competitively, no further design effort will be required by the Design-Builder. The Administration will terminate the process and complete design by some other means for that work package.

Question 54:
In the second paragraph addressing Construction Agree Price on page 4, it is noted that, "A proportionate amount of the Construction Management Fee will be included in the CAP." Is it the intent of the PDB process for the total amount of all executed CAPs to equal the sum of the Construction Management Fee bid item and the Construction Services Fee bid item, less any amount paid to third parties for ROW acquisition and utility relocation? If so, this seems inconsistent with the paragraph's first sentence that says, "A zero-dollar change order will be executed to subtract the amount of the CAP, and any associated right-of-way and utility relocation costs, from the Construction services costs..." (Emphasis added.)

Response 54:
Assuming the entire budget were to be spent and there were multiple independent projects, then the sum of the CAPs and amount paid to third parties for ROW acquisition and utility relocation for each project would add up to the Construction Services Fee submitted as part of the Price Proposal. Likewise the Construction Management Fee for each project would add up to the Construction Management Fee submitted as part of the Price Proposal.

Page 4 of the RFP goes on to state, "For example, if the Construction Management Fee was five percent when compared to the Construction services costs, this amount will be added to the CAP and subtracted from the original Construction Management Fee as part of the change order. Payment for the Construction of the project will be paid through an agreed upon work

breakdown structure." Thus the change order pulls the CAP, ROW costs, and utility relocation costs from the Proposal Construction Services Fee, and pulls a proportionate amount from the Proposal Construction Management Fee. The purpose of the net zero dollar change order is to approve the CAP and create a pay item for it.

Question 55:
In the event that SHA executes its right to competitively bid a PS&E package, will there be any further obligation under this contract to provide design, preconstruction, or construction management services?

Response 55:
All Design and Preconstruction Services in the contract shall be provided until the Administration terminates the contract.

There is no obligation to perform Construction Management (CM) services until a CAP is accepted. If a CAP is not accepted, then the Design-Builder is not obligated to provide CM services for that work package. If a CAP is not accepted, this does not release the Design-Builder from its obligation to perform CM services for other CAPs that have been accepted.

Question 56:
On the bottom of Page 4 of the RFP in Section I.A, there is the subtitle **Design and Preconstruction Services**. The ensuing paragraph seems to be addressing the contract as a whole, including the Construction Management Fee and Construction Services Fee. Is there an inconsistency here?

Response 56:
The SHA is entering into a contract with the Design-Builder to complete the Design and Pre-Construction Services as required in the Technical Proposal. If SHA is agreeable to the CAP(s), then a net zero dollar change order will be executed for a CAP to include the PS&E package of that CAP. The Design-Builder cannot proceed with any Construction Services until SHA has approved a CAP and issued Notice to Proceed for the CAP.

Question 57:
At the bottom of RFQ page 48 in Section XII.C.2, it is noted that regional and home office overhead costs are to be included in the Construction Management Fee. No further guidance on overhead cost is provided in the ensuing table. Please clarify where to allocate the cost for establishing and maintaining a project office on the jobsite.

Response 57:
An engineer's office would be included in a CAP.

Question 58:
At the bottom of RFQ page 48 in Section XII.C.2, it is noted that general and administrative costs are to be included in the Construction Management Fee. Does this include all costs for indirect items such as Bond, insurance premiums, permits, licenses, and success fees? Might not

a separate mobilization bid item for a fixed amount of say $1,500,000.00 be appropriate for such one-time expenses?

Response 58:
If a separate mobilization item were included in the Schedule of Prices (SOP), it would apply to all work packages; however, each work package must be independent and severable. Like all other work items necessary for construction (e.g. construction stakeout, maintenance of traffic, class 1 excavation, etc.), mobilization for each work package will be included the CAP for that specific package. Permits and licenses are also included in the CAP(s). Any cost associated with providing requirements to submit a proposal, such as Proposal Guaranty for the overall $100 M contract, may be included in the Design and Preconstruction item.

Regarding Success Fees, refer to Response 4 (R4) in the Notice to Prospective Proposers dated June 17, 2016.

Question 59:
Please confirm that the "Traffic Control Plan Certification" is not relevant to this contract.

Response 59:
The Traffic Control Plan Certification Contract Provision should be completed with Option 3 checked as it is the Design-Builder's responsibility to provide any traffic control plan.

Question 60:
TC-4-02 Failure to Maintain Traffic indicates a $1,000 per day deduction for failure to maintain the project. Please clarify if this is only applicable to active work zones or if it is applicable to the entire length of I-270.

Response 60:
TC-4.02, Failure to Maintain Project, is applicable to the work as defined in GP-5.11, Maintenance of Work During Construction.

Question 61:
TC-7.05 addresses retainage on Progress Payments. Is it the intention of the Authority to hold retainage on the Design and Preconstruction Services Fee? Is this necessary when the Authority is only paying for "services actually provided and invoiced" as stated on in XII.C on page 48?

Response 61:
Retainage applies to all work under the contract.

Question 62:
Should execution of the Buy American Steel Form (Page 3 of 43 of the Contract) be deferred until CAP negotiation?

Response 62:
The Price Proposal form needs to be completed in its entirety and no portion of it can be deferred to a CAP.

Question 63:
The standard MDOT MBE Form A on Page 15 of 43 includes a certification referencing the "total dollar amount of the Contract" although the goal at the time of submission is only applicable to design work. Please clarify how this form is to be completed.

Response 63:
The form should be completed for the Design and Preconstruction Services. See response 56.

The following question was received on December 6, 2016.

Question 64:
We have had difficulty reproducing some of the results in the evaluation templates provided by SHA. We would like to be able to replicate the results to ensure the validity and comparability of all team's results.

Response 64:
The model must be run in **32-bit mode** to replicate the VISSIM model results that SHA has provided for every MOE.

The following question was received on December 7, 2016.

Question 65:
Does the Watkins Mill Interchange Project impact Level 3?

Response 65:
Yes. Design plans for the proposed relocation of Level 3 have been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\F_Watkins Mill Interchange Plans\Level 3 Relocation\

The following questions were received on December 8, 2016.

Question 66:
In the *General Requirements* on page 2 of Section I.A, it states that the Design-Builder shall complete all design and construction work in two phases, Phase IV - Final Design and Phase V – Partnering during design and construction, Review Shop Drawings, Revisions, Redesign Under Construction, As-Built Plans and provisions for expert court testimony. Please clarify the intent or significance of Phase IV and Phase V in the context of either this two-phase procurement or the two-phase contract.

Response 66:
The intent is to ensure that the consulting services provided and tasks performed by the Design-Builder during both phases of the contract comply with the Administration's policies and

procedures and the requirements set forth in "Volume II -Specifications for Consulting Engineers' Services," dated 1986.

Question 67:
A definition of *Opinion on Probable Construction Cost* (OPCC) is provided on page 3 in Section I.A. Please confirm that the OPCC is simply the aggregate construction cost of anticipated improvements and that these costs are expected to be incorporated into CAPs as the "Construction, labor, equipment, and materials and all incidentals necessary to complete the Construction of the package."

Response 67:
The OPCC is the actual Construction cost the Design-Builder estimates to build all aspects of a Construction package.

Question 68:
On page 4 as part of the definition of a CAP, it states that SHA will consider establishing a risk sharing pool with the Design-Builder during the Design and Preconstruction phase. Please clarify whether the funding for this risk sharing pool is from within or outside of the $100 million fixed value of the contract.

Response 68:
Risk sharing pools must come from the contract's fixed budget.

Question 69:
In the *General Requirements* in Section I.A and again in Section I.F *Scope of Services / Description of Work,* there are multiple references to "milestones". Please define these milestones.

Response 69:
Proposers shall determine what milestones are needed to deliver a well-managed project.

Question 70:
Section XII.C.1 defines the *Design-Builder Design and Preconstruction Services Fee*, noting that payment will be based on services actually provided and invoiced.

a. Subsequent language requires the Design-Builder to provide a fee breakdown. Is this Design-Builder requirement relevant to Proposal content or is this just guidance on how the successful proposer (the Design-Builder) is to bill for post-Award design services?
b. The final sentence of this segment indicates the Design-Builder shall provide a breakdown for each firm showing the estimated direct labor breakdown, estimated direct expenses, approved audited overhead, and profit. Is this also guidance on how the successful proposer (the Design-Builder) is to bill for post-Award design services for work performed by the Lead Designer and any subconsultants?

Response 70:
The fee breakdowns are not merely guidance. They are required of all Proposers in their Price Proposals.

Question 71:
Section XII.C.2 indicates that the Proposer will provide a breakdown of all components used in establishing the fee. Is this Proposer requirement relevant to Proposal content? If so, where in the Proposal should this information be provided?

Response 71:
This requirement shall be provided with the Price Proposal.

Question 72:
In response to Question #48, it was noted that "the Contractor's preconstruction services are included in the Design and Preconstruction Services Fee." Assuming that the table provided at the top of page 49 is applicable to the entire contract and not just to the Construction Phase, please provide guidance or examples for other types of Contractor costs that can be included in the fee for design and preconstruction services. Alternately, please confirm that the table on page 49 is only applicable to the Construction Phase thereby allowing Contractor project costs to be classified as preconstruction services during the Design Phase.

Response 72:
The table on page 49 is applicable to the Design-Builder's Construction Management services, which support the Construction Services and are not needed for nor applicable to the Design & Preconstruction Services.

Question 73:
Regarding ground mounted signs along the corridor: If a sign is proposed to be relocated without changing the content of the sign, does the sign material need to be upgraded to MUTCD standards?

Response 73:
Upgrading existing facilities to current standards when no safety or operational issues exist is not a contract goal. Existing signs that are not impacted and will remain in place do not necessarily need to be upgraded to MUTCD standards. However, once the Design-Builder changes the conditions in which that sign exists, including the sign's location or message, the sign should be upgraded to current MUTCD standards.

Question 74:
For signs mounted on cantilever or sign bridges: If a sign must be relocated to a different location without changing the content of the sign, does the sign material need to be upgraded to MUTCD standards?

Response 74:
Yes. See response 73.

Question 75:
If a sign remains in place with a different message, does the sign material need to be upgraded to MUTCD standards?

Response 75:
Yes. See response 73.

Question 76:
If a sign with the same message must be temporarily removed and replaced on a new structure in the same location without changing the message, or a different location on the same structure without changing the message, does the sign material need to be upgraded to MUTCD standards?

Response 76:
Yes. See response 73.

Question 77:
Are there any restrictions for including discussion of costs in the technical proposal?

Response 77:
No.

Question 78:
For the final proposal, can the PTC's and other Appendix data be presented in only electronic format and provide the required copies for the technical and cost proposal only?

Response 78:
Proposals shall include hard copies of the Concept Evaluation Templates. All other appendix materials may be saved onto a flash drive.

Question 79:
We would like to request the following data for six scenario years including the years 2015, 2020, 2025, 2030, 2035, and 2040:

A. Four OD trip tables for all scenarios, which are inputs to the 4th iteration highway assignment. These OD trip table names are i4_AM.VTT, i4_MD.VTT, i4_PM.VTT and i4_NT.VTT.
B. Two highway assignment loaded networks for all scenarios, which are outputs from the 4th iteration highway assignment. These loaded network names are i4_HWY.NET and i4_HWYMOD.NET.
C. The full MWCOG model transmittal folder with input files, scripts and all the supporting input data.

Response 79:
The MWCOG model input files and the documentation necessary to run the model successfully have been posted to ProjectWise at the following location:

pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\10 - MWCOG model\

Proposers can use these files to run the interim year models and generate loaded networks and time of day trip tables. This model set represents version 2.3.57a, the 2015 CLRP and Round 8.4 land use assumptions.

The following question was received on December 11, 2016.

Question 80:
We understand this is past the due date for questions and apologize for this late clarification request; however, we believe it may be in the Administration's best interest to provide additional information to the proposers on formatting of the Technical Proposal and Appendix. The only guidance provided is that the Technical Proposal (including appendix) shall be in a 3-ring binder and any "*Charts, exhibits, and other illustrative and graphical information may be on 11"-by-17" paper, but must be folded to 8.5"-by-11", with the title block showing. An 11"-by-17" sheet will be considered only one page*."

It may be inconvenient to unfold and then refold each sheet individually as your team reviews the material and we may not be able to fit, in a reasonably sized single 3-ring binder, if tri-folded. We respectfully request the appendix be allowed in its own 11"x17" binder with unfolded sheets.

Response 80:
The appendix can be in its own 11"x17" binder with unfolded sheets. Also, see Response 78.

The following question was received on December 16, 2016.

Question 81:
Question 70 addressed a cost breakdown that must be provided by the Design-Builder. Question 71 addressed a cost breakdown that must be provided by the Proposer. In both cases, the SHA response indicates that the required breakdown must be provided with the Price Proposal. It is mandated on RFP page 40 that the "Price Proposal shall be submitted on the Price Proposal Form supplied by the Administration…" Would the aforementioned Article XII.C breakdowns be a supplement to the 43-page Price Proposal Form since there does not seem to be an appropriate place for inclusion within those 43 pages.

Response 81:
Yes, the cost breakdown should be a supplement submitted with the Price Proposal Form.

The following question was received on December 19, 2016.

Question 82:
We have been unsuccessful in exporting the document "Ver2.3.57a_Conformity_2015CLRP_Rnd8_4_Xmittal.zip" located in the following folder on ProjectWise:
pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\10 – MWCOG model\

We believe this is due to the zip folders size (25.48 GB). Would you please consider breaking this folder into smaller zip files, or extracting the files into the 10-MWCOG model folder so that we can download the information and put it to use on this project?

Response 82:
The files that were in the zip file "Ver2.3.57a_Conformity_2015CLRP_Rnd8_4_Xmittal.zip" have been extracted and placed at the following location on PW:
pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\H_Additional Material\10 - MWCOG model\Ver2.3.57a_Conformity_2015CLRP_Rnd8_4_Xmittal\

The following questions were received on December 23, 2016.

Question 83:
The fifth paragraph of TC-5.01 indicates that Workers' Compensation policies are the only exceptions to an endorsement requirement. Please note that such endorsements are not commercially available on a Professional Liability insurance policy because of the nature of the coverage. Accordingly, we request listing of Professional Liability insurance as an exception.

Response 83:
Professional Liability insurance may be an exception.

Question 84:
TC Section 5 Article .02.1 is an additional requirement for the Professional Liability Insurance Policy to provide various indemnifications. Please note that such indemnifications are not commercially available because of the nature of the coverage. Accordingly, we request deletion of this requirement.

Response 84:
This is a standard Special Provision for all Administration contracts and will not be modified.

Question 85:
TC Section 5 Article 02.4a establishes a requirement to name the State Highway Administration in various insurance policies, presumably meaning that the Administration must be named as an Additional Insured. Consistent with the questions addressing endorsements and indemnifications and with the nature of errors and omissions coverage, we request that Professional Liability Insurance be listed with Workers' Compensation as an exception to this requirement.

Response 85:
The said article states, "Each policy, with the exception of Workers' Compensation and Professional Liability Insurance, shall name the State Highway Administration."

Question 86:
TC Section 5 Article 02.4b uses "named insured" as an identifier, as was the case in 02.4a. Please consider revising the reference to Additional Insureds, assuming this is the intent of the requirement.

Response 86:
The said language, "named insured," is consistent with other provisions in SHA's Standard Specifications for Construction and Materials, 2008.

Question 87:
TC Section 5 Article 02.5 requires the insurance company to notify the Administration, the Design-Build Team, and each insured about policy cancellation or modification. The industry-standard Notice of Cancellation to Others will trigger appropriate notifications if a policy is cancelled, but it will not react to modifications. We suggest that the obligation for notification of policy modifications be eliminated or assigned to the design-builder. Alternately, could the Administration provide an example Notice of Cancellations to Others endorsement that they have accepted in the past?

Response 87:
This is a standard Special Provision for all Administration contracts and will not be modified.

The following question was received on December 24, 2016.

Question 88:
A safety and resurfacing project (Contract No. MO1865177) has appeared on the contractor's advertisement schedule. It appears to be located on I-495 near the southern end of the I-270 contract. The advertisement date is 2/14/17 and the NTP date is 5/22/17. Are plans available?

Response 88:
Yes. Plans have been posted to ProjectWise at the following location: pw:\\SHAVMPWX.shacadd.ad.mdot.mdstate:SHAEDMS01\Documents\Design-Build\MO0695172\E_Appendices\11 - Other Projects\MO1865177 - IFB_PS&E- Design Plans.pdf

The following question was received on January 4, 2017.

Question 89:
Article VIII.B on page 23 of the RFP mandates meeting or exceeding the DBE Participation Goal for work performed under the Design and Preconstruction Fee bid item. Please clarify this requirement. Does the reference to a goal only pull in the goal for 25% DBE participation, or does this reference also pull in the subgoals for 9% female participation and 6% African-American participation?

Response 89:
The Design-Builder shall meet or exceed the DBE goals, including sub-goals, required by the Contract Provision AFFIRMATIVE ACTION REQUIREMENTS UTILIZATION OF MINORITY BUSINESS ENTERPRISES FOR STRAIGHT STATE CONTRACTS (page 3 of 10).

The following question was received on January 9, 2017.

Question 90:
The RFP states that the Contract MBE goal as shown in the Appendix is only applicable to the Design and Preconstruction item in the Price Proposal. The Design and Preconstruction item includes significant cost for items such as 'costs associated with providing requirements to submit a proposal, such as the Proposal Guaranty' (per Response 58) and the contractually required ACONEX project management software. There is no ability to provide MBE participation for these items or to help meet the MBE goal via the considerable construction to be performed under the CAPS, forcing the entire MBE participation for the Design and Preconstruction to be achieved via professional services participation. Is it SHA's intent that the MBE goal be achieved on the entire value of the Design and Preconstruction item, or may the MBE goal be interpreted to apply only to those professional services being provided by the Lead Design Firm and its subconsultants?

Response 90:
25 percent of the Design & Preconstruction Services Fee provided with the Price Proposal must be MBE. As mentioned in Response 48, the MBE goal has been adjusted down from what a typical design-build project would require to account for Preconstruction Services and Aconex costs. Also note, the Design-Builder is not required to include the Proposal Guaranty in the Design & Preconstruction Services Fee. The Design-Builder may elect to include the Proposal Guaranty in the Construction Services Fee.

The following questions were received on January 10, 2017.

Question 91:
Has the Maryland State Highway Administration issued a wage determination for the project based upon the (Anticipated) Notice to Proceed Date of March 2017?

Response 91:
Prevailing wage rates will be established with the CAP.

Question 92:
Will the Maryland State Highway Administration consider establishing indexed base cost for petroleum based products (diesel fuel, hot mixed asphalt pavements and slurry seal) and structural steel?

Response 92:
Any adjustments will be included in the CAP. Depending on the scope of the CAP, typical SHA adjustments for asphalt binder, pavement density, asphalt mixture, pavement surface profile, and diesel fuel will be included. While SHA does not have a standard structural steel adjustment, this can be discussed with the CAP and potentially included in a risk sharing pool.

The following question was received on January 11, 2017.

Question 93:
Please confirm the design builder must provide Aconex project management software for this project. The cost of providing that software from March 2017 thru March 2020 is almost 1/4 of a million dollars. In addition after that date access to the data base to retrieve the project records would not be available unless additional payments are made by SHA on a yearly basis. Several members of our team have existing service agreement with other software firms for similar Project Management tools that could be made available for use on this project for no cost and would provide the SHA the availability to recover their Project Records at no cost after March 2020.

Response 93:
Confirmed. The Design-Builder is to provide Aconex project management software per the RFP.