

TECHNICAL APPENDICES

# Moving Cooler

An Analysis of  
Transportation Strategies  
for Reducing  
Greenhouse Gas Emissions

**Prepared for**  
*Moving Cooler Steering Committee*

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# Appendix D

*Moving Cooler Data Tables*



**Table D.1 Annual Reductions (Level A, B, and C)**  
*Short-Term: 2015, 2020*

Annual Reductions (Short Term) Strategy Description	Expanded Current Practice GHG Reduction (mmt)		More Aggressive GHG Reduction (mmt)		Maximum GHG Reduction (mmt)	
	2015	2020	2015	2020	2015	2020
<i>Pricing</i>						
CBD/ Activity Center on-street parking	0.00	0.45	0.69	1.14	0.97	1.21
Tax/higher tax on free private parking	N/A	N/A	0.00	0.00	0.00	0.98
Residential parking permits	N/A	N/A	0.00	0.00	0.00	1.30
Cordon Pricing	0.00	0.63	0.00	0.63	0.65	1.33
Congestion Pricing	0.00	5.45	0.00	10.54	0.00	18.01
Intercity Tolls	0.00	0.00	0.00	1.71	2.92	2.84
PAYD Insurance	20.49	20.14	20.37	39.43	20.37	56.29
VMT fee	0.00	8.42	0.00	25.25	0.00	101.01
Carbon Pricing (VMT impact) <sup>b</sup>	-	10.62	-	32.15	-	135.88
Carbon Pricing (Fuel economy impact)	-	24.36	-	70.30	-	236.27
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	0.00	0.97	0.00	6.69	0.00	11.48
Combined Pedestrian	0.94	2.07	2.17	4.76	2.88	6.32
Combined Bicycle	0.00	0.86	0.00	1.49	0.00	2.47
<i>Public Transportation Strategies</i>						
Transit Fare Measures	0.45	0.50	0.79	0.89	2.09	2.04
Transit Frequency/LOS/Extent	0.28	0.66	0.76	1.11	1.86	2.46
Urban Transit Expansion	1.24	2.03	2.50	4.04	4.93	7.99
Intercity Passenger Rail	1.36	1.30	1.37	1.32	1.39	1.56
High-Speed Passenger Rail	0.00	0.60	0.00	0.92	0.96	2.15
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	0.55	1.26	0.87	1.76	3.46	4.06
HOV Lanes (24-hour applicability)	0.00	0.00	0.00	0.04	0.05	0.04
Car-Sharing	0.49	0.84	0.97	2.30	3.46	4.59
Employer-Based Commute Strategies	0.00	7.48	0.00	14.99	0.00	35.49

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.1 Annual Reductions (Level A, B, and C) (continued)**  
*Short-Term: 2015, 2020*

Annual Reductions (Short Term) Strategy Description	Expanded Current Practice GHG Reduction (mmt)		More Aggressive GHG Reduction (mmt)		Maximum GHG Reduction (mmt)	
	2015	2020	2015	2020	2015	2020
<i>Regulatory Strategies</i>						
Nonmotorized Zones	0.00	0.01	0.02	0.07	0.04	0.10
Urban Parking Restrictions	0.00	0.00	0.00	0.50	0.99	3.45
Speed Limit Reductions	0.00	12.44	13.00	40.31	21.42	50.65
<i>System Operations and Management Strategies</i>						
EcoDriving	3.45	7.57	6.90	15.13	17.24	37.84
Ramp Metering	0.16	0.07	0.22	0.10	0.23	0.18
Variable Message Signs	0.01	0.01	0.02	0.02	0.02	0.02
Active Traffic Management	N/A	N/A	0.39	0.12	0.48	0.10
Integrated Corridor Management	N/A	N/A	0.39	0.12	0.48	0.10
Incident Management	0.35	0.13	0.60	0.12	0.72	0.08
Road Weather Management	0.01	0.00	0.02	0.01	0.06	0.03
Signal Control Management	0.02	0.01	0.04	0.02	0.07	0.04
Traveler Information	0.02	0.01	0.04	0.01	0.05	0.01
Vehicle Infrastructure Integration	0.16	0.20	0.24	0.30	0.48	0.48
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	0.58	0.91	1.13	1.77	2.48	3.88
Capacity Expansion <sup>c</sup>	0.86	1.35	1.68	2.63	3.36	5.25
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	0.12	0.50	0.18	0.75	0.37	1.50
Marine System Improvements	0.04	0.10	0.06	0.15	0.08	0.22
Shipping Container Permits	0.05	0.14	0.08	0.22	0.19	0.25
LCV Permits	0.06	0.16	0.13	0.33	0.32	0.42
WIM Screening	0.00	0.01	0.01	0.02	0.02	0.02
Weigh Station Bypass	0.01	0.02	0.01	0.04	0.03	0.04
Truck Stop Electrification	0.08	0.21	0.26	0.68	0.99	1.30
Truck APUs	0.31	2.79	0.46	3.66	0.77	5.05
Truck-Only Toll Lanes	0.00	0.25	0.00	0.63	0.00	1.01
Urban Consolidation Centers	0.03	0.09	0.05	0.14	0.12	0.16

**Table D.2 Annual Reductions (Level A, B, and C)**  
*Long-Term: 2030, 2040, 2050*

Annual Reductions (Long-Term) Strategy Description	Expanded Current Practice GHG Reduction (mmt)			More Aggressive GHG Reduction (mmt)			Maximum GHG Reduction (mmt)		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>Pricing</i>									
CBD/Activity Center on-street parking	1.15	1.10	1.04	1.15	1.10	1.04	1.15	1.10	1.04
Tax/higher tax on free private parking	N/A	N/A	N/A	0.67	0.64	0.61	0.93	0.89	0.84
Residential parking permits	N/A	N/A	N/A	0.77	0.73	0.70	1.54	1.47	1.39
Cordon Pricing	1.44	2.90	2.90	2.29	3.04	2.90	3.04	3.04	2.90
Congestion Pricing	18.18	18.56	17.69	34.72	36.61	35.04	42.86	40.88	39.13
Intercity Tolls	1.08	1.03	0.98	1.62	1.54	1.47	2.70	2.57	2.45
PAYD Insurance	19.39	19.37	18.61	47.23	46.66	44.37	62.98	62.21	59.16
VMT fee	8.09	7.78	7.46	24.28	23.33	22.39	97.13	93.32	89.58
Carbon Pricing (VMT impact) <sup>b</sup>	10.14	9.66	9.20	31.94	29.59	28.28	135.72	134.01	132.25
Carbon Pricing (Fuel economy impact)	36.74	37.94	38.63	103.90	105.83	106.38	322.54	325.48	325.41
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>									
Combined Land Use	3.23	6.65	9.87	22.27	34.36	45.01	38.20	57.06	73.44
Combined Pedestrian	2.18	2.08	1.97	5.03	4.78	4.55	6.68	6.36	6.04
Combined Bicycle	2.04	1.94	1.84	2.08	2.00	1.69	6.11	5.81	5.53
<i>Public Transportation Strategies</i>									
Transit Fare Measures	0.50	0.47	0.45	0.87	0.83	0.79	1.94	1.85	1.76
Transit Frequency/LOS/Extent	1.13	1.53	2.03	1.68	2.35	3.36	3.56	5.35	9.10
Urban Transit Expansion	3.57	5.05	6.57	7.00	9.77	12.33	14.09	20.16	26.14
Intercity Passenger Rail	1.16	1.03	0.90	1.20	1.05	0.92	2.29	2.13	1.97
High-Speed Passenger Rail	1.93	2.88	3.52	2.92	3.64	4.44	3.93	4.88	5.98
<i>HOV/Carpool/Vanpool/Commute Strategies</i>									
HOV Lanes	1.44	1.38	1.31	1.83	1.74	1.66	3.86	3.67	3.50
HOV Lanes (24-hour applicability)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Car-Sharing	1.09	1.04	0.99	2.18	2.08	1.97	4.37	4.15	3.95
Employer-Based Commute Strategies	7.40	7.03	6.69	14.26	13.56	12.90	33.76	32.10	30.53
<i>Regulatory Strategies</i>									
Nonmotorized Zones	0.05	0.06	0.06	0.13	0.13	0.12	0.19	0.19	0.18
Urban Parking Restrictions	1.03	3.66	6.61	3.57	8.20	13.05	8.93	13.78	18.13
Speed Limit Reductions	43.75	42.31	40.97	75.38	73.20	71.36	76.04	73.90	72.11

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.2 Annual Reductions (Level A, B, and C) (continued)**  
*Long-Term: 2030, 2040, 2050*

Annual Reductions (Long-Term) Strategy Description	Expanded Current Practice GHG Reduction (mmt)			More Aggressive GHG Reduction (mmt)			Maximum GHG Reduction (mmt)		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>System Operations and Management Strategies</i>									
EcoDriving	17.92	27.54	36.17	29.44	42.62	54.25	49.91	57.96	65.10
Ramp Metering	0.21	1.09	2.42	0.11	3.57	6.57	0.11	3.87	7.23
Variable Message Signs	0.01	0.07	0.17	0.02	0.10	0.23	0.02	0.10	0.24
Active Traffic Management	N/A	N/A	N/A	0.38	1.83	4.13	0.25	3.40	6.93
Integrated Corridor Management	N/A	N/A	N/A	0.38	1.83	4.13	0.25	3.40	6.93
Incident Management	0.43	2.29	5.25	0.52	2.83	6.69	0.52	3.20	7.40
Road Weather Management	0.02	0.02	0.02	0.04	0.03	0.04	0.07	0.05	0.06
Signal Control Management	0.03	0.12	0.26	0.06	0.87	1.39	0.08	1.83	2.52
Traveler Information	0.03	0.16	0.38	0.05	1.42	2.34	0.04	1.48	2.42
Vehicle Infrastructure Integration	0.10	3.57	6.13	0.14	0.54	2.23	0.11	0.49	0.71
<i>Bottleneck Relief and Capacity Expansion Strategies</i>									
Bottleneck Relief <sup>c</sup>	0.99	(0.50)	(3.79)	2.87	(0.98)	(4.97)	4.24	(2.14)	(10.00)
Capacity Expansion <sup>c</sup>	1.47	(0.74)	(2.15)	1.93	(1.45)	(7.37)	5.74	(2.90)	(12.74)
<i>Multimodal Freight Strategies</i>									
Rail Capacity Improvements	1.50	1.54	1.50	2.25	2.32	2.25	4.51	4.63	4.50
Marine System Improvements	0.17	0.17	0.17	0.26	0.26	0.26	0.39	0.39	0.39
Shipping Container Permits	0.24	0.23	0.23	0.24	0.23	0.23	0.24	0.23	0.23
LCV Permits	0.27	0.26	0.25	0.36	0.35	0.34	0.41	0.39	0.38
WIM Screening	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Weigh Station Bypass	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Truck Stop Electrification	0.35	0.34	0.33	0.74	0.72	0.70	1.26	1.23	1.19
Truck APUs	5.01	4.77	4.23	5.01	4.77	4.23	5.01	4.77	4.23
Truck-Only Toll Lanes	0.74	0.85	0.97	1.84	2.12	2.43	3.33	3.88	4.46
Urban Consolidation Centers	0.17	0.19	0.20	0.24	0.27	0.30	0.26	0.28	0.31

**Table D.3 Percent Annual Reductions from Baseline (Level A, B, and C)**  
*Short-Term: 2015, 2020*

Annual Percent Reductions from Baseline (Short Term) Strategy Description	Expanded Current Practice Annual Percent Reduction		More Aggressive Annual Percent Reduction		Maximum Annual Percent Reduction	
	2015	2020	2015	2020	2015	2020
<i>Pricing</i>						
CBD/Activity Center on-street parking	0.00%	0.03%	0.04%	0.07%	0.06%	0.07%
Tax/higher tax on free private parking	N/A	N/A	0.00%	0.00%	0.00%	0.06%
Residential parking permits	N/A	N/A	0.00%	0.00%	0.00%	0.08%
Cordon Pricing	0.00%	0.04%	0.00%	0.04%	0.04%	0.08%
Congestion Pricing	0.00%	0.32%	0.00%	0.62%	0.00%	1.05%
Intercity Tolls	0.00%	0.00%	0.00%	0.10%	0.17%	0.17%
PAYD Insurance	1.18%	1.18%	1.17%	2.30%	1.17%	3.29%
VMT fee	0.00%	0.49%	0.00%	1.47%	0.00%	5.90%
Carbon Pricing (VMT impact) <sup>b</sup>	-	0.62%	-	1.88%	-	7.94%
Carbon Pricing (Fuel economy impact)	-	1.42%	-	4.11%	-	13.80%
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	0.00%	0.06%	0.00%	0.39%	0.00%	0.67%
Combined Pedestrian	0.05%	0.12%	0.13%	0.28%	0.17%	0.37%
Combined Bicycle	0.00%	0.05%	0.00%	0.09%	0.00%	0.14%
<i>Public Transportation Strategies</i>						
Transit Fare Measures	0.03%	0.03%	0.05%	0.05%	0.12%	0.12%
Transit Frequency/LOS/Extent	0.02%	0.04%	0.04%	0.06%	0.11%	0.14%
Urban Transit Expansion	0.07%	0.12%	0.14%	0.24%	0.28%	0.47%
Intercity Passenger Rail	0.08%	0.08%	0.08%	0.08%	0.08%	0.09%
High-Speed Passenger Rail	0.00%	0.04%	0.00%	0.05%	0.06%	0.13%
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	0.03%	0.07%	0.05%	0.10%	0.20%	0.24%
HOV Lanes (24-hour applicability)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Car-Sharing	0.03%	0.05%	0.06%	0.13%	0.20%	0.27%
Employer-Based Commute Strategies	0.00%	0.44%	0.00%	0.88%	0.00%	2.07%
<i>Regulatory Strategies</i>						
Nonmotorized Zones	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Urban Parking Restrictions	0.00%	0.00%	0.00%	0.03%	0.06%	0.20%
Speed Limit Reductions	0.00%	0.73%	0.75%	2.35%	1.24%	2.96%

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.3 Percent Annual Reductions from Baseline (Level A, B, and C) (continued)**  
*Short-Term: 2015, 2020*

Annual Percent Reductions from Baseline (Short Term) Strategy Description	Expanded Current Practice Annual Percent Reduction		More Aggressive Annual Percent Reduction		Maximum Annual Percent Reduction	
	2015	2020	2015	2020	2015	2020
<i>System Operations and Management Strategies</i>						
EcoDriving	0.20%	0.44%	0.40%	0.88%	0.99%	2.21%
Ramp Metering	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%
Variable Message Signs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Active Traffic Management	N/A	N/A	0.02%	0.01%	0.03%	0.01%
Integrated Corridor Management	N/A	N/A	0.02%	0.01%	0.03%	0.01%
Incident Management	0.02%	0.01%	0.03%	0.01%	0.04%	0.00%
Road Weather Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Signal Control Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Traveler Information	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Vehicle Infrastructure Integration	0.01%	0.01%	0.01%	0.02%	0.03%	0.03%
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	0.03%	0.05%	0.07%	0.10%	0.14%	0.23%
Capacity Expansion <sup>c</sup>	0.05%	0.08%	0.10%	0.15%	0.19%	0.31%
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	0.01%	0.03%	0.01%	0.04%	0.02%	0.09%
Marine System Improvements	0.00%	0.01%	0.00%	0.01%	0.00%	0.01%
Shipping Container Permits	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%
LCV Permits	0.00%	0.01%	0.01%	0.02%	0.02%	0.02%
WIM Screening	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Weigh Station Bypass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Truck Stop Electrification	0.00%	0.01%	0.01%	0.04%	0.06%	0.08%
Truck APUs	0.02%	0.10%	0.03%	0.16%	0.04%	0.30%
Truck-Only Toll Lanes	0.00%	0.01%	0.00%	0.04%	0.00%	0.06%
Urban Consolidation Centers	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%

**Table D.4 Percent Annual Reductions from Baseline (Level A, B, and C)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from Baseline (Long-Term) Strategy Description	Expanded Current Practice Annual Percent Reduction			More Aggressive Annual Percent Reduction			Maximum Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>Pricing</i>									
CBD/Activity Center on-street parking	0.07%	0.07%	0.06%	0.07%	0.07%	0.06%	0.07%	0.07%	0.06%
Tax/higher tax on free private parking	N/A	N/A	N/A	0.04%	0.04%	0.04%	0.06%	0.05%	0.05%
Residential parking permits	N/A	N/A	N/A	0.05%	0.04%	0.04%	0.09%	0.09%	0.08%
Cordon Pricing	0.09%	0.17%	0.18%	0.14%	0.18%	0.18%	0.18%	0.18%	0.18%
Congestion Pricing	1.08%	1.11%	1.07%	2.06%	2.19%	2.12%	2.54%	2.45%	2.37%
Intercity Tolls	0.06%	0.06%	0.06%	0.10%	0.09%	0.09%	0.16%	0.15%	0.15%
PAYD Insurance	1.15%	1.16%	1.13%	2.80%	2.80%	2.68%	3.73%	3.73%	3.58%
VMT fee	0.48%	0.47%	0.45%	1.44%	1.40%	1.35%	5.75%	5.59%	5.42%
Carbon Pricing (VMT impact) <sup>b</sup>	0.60%	0.58%	0.56%	1.83%	1.77%	1.71%	8.16%	8.09%	8.00%
Carbon Pricing (Fuel economy impact)	2.18%	2.27%	2.34%	6.15%	6.40%	6.56%	19.10%	19.51%	19.68%
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>									
Combined Land Use	0.19%	0.40%	0.60%	1.32%	2.06%	2.72%	2.26%	3.42%	4.44%
Combined Pedestrian	0.13%	0.12%	0.12%	0.30%	0.29%	0.28%	0.40%	0.38%	0.37%
Combined Bicycle	0.12%	0.12%	0.11%	0.12%	0.12%	0.10%	0.36%	0.35%	0.33%
<i>Public Transportation Strategies</i>									
Transit Fare Measures	0.03%	0.03%	0.03%	0.05%	0.05%	0.05%	0.12%	0.11%	0.11%
Transit Frequency/LOS/Extent	0.07%	0.09%	0.12%	0.10%	0.14%	0.20%	0.21%	0.32%	0.55%
Urban Transit Expansion	0.21%	0.30%	0.40%	0.41%	0.59%	0.75%	0.83%	1.21%	1.58%
Intercity Passenger Rail	0.07%	0.06%	0.05%	0.07%	0.06%	0.06%	0.14%	0.13%	0.12%
High-Speed Passenger Rail	0.11%	0.17%	0.21%	0.17%	0.22%	0.27%	0.23%	0.29%	0.36%
<i>HOV/Carpool/Vanpool/Commute Strategies</i>									
HOV Lanes	0.09%	0.08%	0.08%	0.11%	0.10%	0.10%	0.23%	0.22%	0.21%
HOV Lanes (24-hour applicability)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Car-Sharing	0.06%	0.06%	0.06%	0.13%	0.12%	0.12%	0.26%	0.25%	0.24%
Employer-Based Commute Strategies	0.44%	0.42%	0.40%	0.84%	0.81%	0.78%	2.00%	1.92%	1.85%

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.4 Percent Annual Reductions from Baseline (Level A, B, and C) (continued)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from Baseline (Long-Term) Strategy Description	Expanded Current Practice Annual Percent Reduction			More Aggressive Annual Percent Reduction			Maximum Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>Regulatory Strategies</i>									
Nonmotorized Zones	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Urban Parking Restrictions	0.06%	0.22%	0.40%	0.21%	0.49%	0.79%	0.53%	0.83%	1.10%
Speed Limit Reductions	2.59%	2.54%	2.48%	4.46%	4.39%	4.32%	4.50%	4.43%	4.36%
<i>System Operations and Management Strategies</i>									
EcoDriving	1.06%	1.65%	2.19%	1.74%	2.55%	3.28%	2.96%	3.47%	3.94%
Ramp Metering	0.01%	0.07%	0.15%	0.01%	0.21%	0.40%	0.01%	0.23%	0.44%
Variable Message Signs	0.00%	0.00%	0.01%	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%
Active Traffic Management	N/A	N/A	N/A	0.02%	0.11%	0.25%	0.02%	0.20%	0.42%
Integrated Corridor Management	N/A	N/A	N/A	0.02%	0.11%	0.25%	0.02%	0.20%	0.42%
Incident Management	0.03%	0.14%	0.32%	0.03%	0.17%	0.40%	0.03%	0.19%	0.45%
Road Weather Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Signal Control Management	0.00%	0.01%	0.02%	0.00%	0.05%	0.08%	0.00%	0.11%	0.15%
Traveler Information	0.00%	0.01%	0.02%	0.00%	0.08%	0.14%	0.00%	0.09%	0.15%
Vehicle Infrastructure Integration	0.01%	0.21%	0.37%	0.01%	0.03%	0.13%	0.01%	0.03%	0.04%
<i>Bottleneck Relief and Capacity Expansion Strategies</i>									
Bottleneck Relief <sup>c</sup>	0.06%	-0.03%	-0.17%	0.11%	-0.06%	-0.30%	0.25%	-0.13%	-0.66%
Capacity Expansion <sup>c</sup>	0.09%	-0.04%	-0.25%	0.17%	-0.09%	-0.45%	0.34%	-0.17%	-0.89%
<i>Multimodal Freight Strategies</i>									
Rail Capacity Improvements	0.09%	0.09%	0.09%	0.13%	0.14%	0.14%	0.27%	0.28%	0.27%
Marine System Improvements	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Shipping Container Permits	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
LCV Permits	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
WIM Screening	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Weigh Station Bypass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Truck Stop Electrification	0.02%	0.02%	0.02%	0.04%	0.04%	0.04%	0.07%	0.07%	0.07%
Truck APUs	0.30%	0.29%	0.26%	0.30%	0.29%	0.26%	0.30%	0.29%	0.26%
Truck-Only Toll Lanes	0.04%	0.05%	0.06%	0.11%	0.13%	0.15%	0.20%	0.23%	0.27%
Urban Consolidation Centers	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%

**Table D.5 Percent Annual Reductions from 2005 (Level A, B, and C)**  
*Short-Term: 2015, 2020*

Annual Percent Reductions from 2005 (Short Term) Strategy Description	Expanded Current Practice Annual Percent Reduction		More Aggressive Annual Percent Reduction		Maximum Annual Percent Reduction	
	2015	2020	2015	2020	2015	2020
<i>Pricing</i>						
CBD/ Activity Center on-street parking	0.00%	0.03%	0.04%	0.07%	0.06%	0.07%
Tax/higher tax on free private parking	N/A	N/A	0.00%	0.00%	0.00%	0.06%
Residential parking permits	N/A	N/A	0.00%	0.00%	0.00%	0.08%
Cordon Pricing	0.00%	0.04%	0.00%	0.04%	0.04%	0.08%
Congestion Pricing	0.00%	0.33%	0.00%	0.64%	0.00%	1.09%
Intercity Tolls	0.00%	0.00%	0.00%	0.10%	0.18%	0.17%
PAYD Insurance	1.24%	1.22%	1.24%	2.39%	1.24%	3.42%
VMT fee	0.00%	0.51%	0.00%	1.53%	0.00%	6.13%
Carbon Pricing (VMT impact) <sup>b</sup>	-	0.64%	-	1.95%	-	8.25%
Carbon Pricing (Fuel economy impact)	-	1.48%	-	4.27%	-	14.34%
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	0.00%	0.06%	0.00%	0.41%	0.00%	0.70%
Combined Pedestrian	0.06%	0.13%	0.13%	0.29%	0.17%	0.38%
Combined Bicycle	0.00%	0.05%	0.00%	0.09%	0.00%	0.15%
<i>Public Transportation Strategies</i>						
Transit Fare Measures	0.03%	0.03%	0.05%	0.05%	0.13%	0.12%
Transit Frequency/LOS/Extent	0.02%	0.04%	0.05%	0.07%	0.11%	0.15%
Urban Transit Expansion	0.08%	0.12%	0.15%	0.24%	0.30%	0.48%
Intercity Passenger Rail	0.08%	0.08%	0.08%	0.08%	0.08%	0.09%
High-Speed Passenger Rail	0.00%	0.04%	0.00%	0.06%	0.06%	0.13%
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	0.03%	0.08%	0.05%	0.11%	0.21%	0.25%
HOV Lanes (24-hour applicability)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Car-Sharing	0.03%	0.05%	0.06%	0.14%	0.21%	0.28%
Employer-Based Commute Strategies	0.00%	0.45%	0.00%	0.91%	0.00%	2.15%
<i>Regulatory Strategies</i>						
Nonmotorized Zones	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Urban Parking Restrictions	0.00%	0.00%	0.00%	0.03%	0.06%	0.21%
Speed Limit Reductions	0.00%	0.76%	0.79%	2.45%	1.30%	3.08%

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.5 Percent Annual Reductions from 2005 (Level A, B, and C) (continued)**  
*Short-Term: 2015, 2020*

Annual Percent Reductions from 2005 (Short Term) Strategy Description	Expanded Current Practice Annual Percent Reduction		More Aggressive Annual Percent Reduction		Maximum Annual Percent Reduction	
	2015	2020	2015	2020	2015	2020
<i>System Operations and Management Strategies</i>						
EcoDriving	0.21%	0.46%	0.42%	0.92%	1.05%	2.30%
Ramp Metering	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%
Variable Message Signs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Active Traffic Management	N/A	N/A	0.02%	0.01%	0.03%	0.01%
Integrated Corridor Management	N/A	N/A	0.02%	0.01%	0.03%	0.01%
Incident Management	0.02%	0.01%	0.04%	0.01%	0.04%	0.01%
Road Weather Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Signal Control Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Traveler Information	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Vehicle Infrastructure Integration	0.01%	0.01%	0.01%	0.02%	0.03%	0.03%
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	0.04%	0.06%	0.07%	0.11%	0.15%	0.24%
Capacity Expansion <sup>c</sup>	0.05%	0.08%	0.10%	0.16%	0.20%	0.32%
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	0.01%	0.03%	0.01%	0.05%	0.02%	0.09%
Marine System Improvements	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%
Shipping Container Permits	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%
LCV Permits	0.00%	0.01%	0.01%	0.02%	0.02%	0.03%
WIM Screening	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Weigh Station Bypass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Truck Stop Electrification	0.00%	0.01%	0.02%	0.04%	0.06%	0.08%
Truck APUs	0.02%	0.11%	0.03%	0.16%	0.05%	0.31%
Truck-Only Toll Lanes	0.00%	0.02%	0.00%	0.04%	0.00%	0.06%
Urban Consolidation Centers	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%

**Table D.6 Percent Annual Reductions from 2005 (Level A, B, and C)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from 2005 (Long-Term) Strategy Description	Expanded Current Practice Annual Percent Reduction			More Aggressive Annual Percent Reduction			Maximum Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>Pricing</i>									
CBD/Activity Center on-street parking	0.07%	0.07%	0.06%	0.07%	0.07%	0.06%	0.07%	0.07%	0.06%
Tax/higher tax on free private parking	N/A	N/A	N/A	0.04%	0.04%	0.04%	0.06%	0.05%	0.05%
Residential parking permits	N/A	N/A	N/A	0.05%	0.04%	0.04%	0.09%	0.09%	0.08%
Cordon Pricing	0.09%	0.18%	0.18%	0.14%	0.18%	0.18%	0.18%	0.18%	0.18%
Congestion Pricing	1.10%	1.13%	1.07%	2.11%	2.22%	2.13%	2.60%	2.48%	2.38%
Intercity Tolls	0.07%	0.06%	0.06%	0.10%	0.09%	0.09%	0.16%	0.16%	0.15%
PAYD Insurance	1.18%	1.18%	1.13%	2.87%	2.83%	2.69%	3.82%	3.78%	3.59%
VMT fee	0.49%	0.47%	0.45%	1.47%	1.42%	1.36%	5.90%	5.67%	5.44%
Carbon Pricing (VMT impact) <sup>b</sup>	0.60%	0.57%	0.54%	1.83%	1.75%	1.67%	8.14%	7.98%	7.82%
Carbon Pricing (Fuel economy impact)	2.17%	2.24%	2.28%	6.14%	6.31%	6.41%	19.07%	19.24%	19.24%
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>									
Combined Land Use	0.20%	0.40%	0.60%	1.35%	2.09%	2.73%	2.32%	3.46%	4.46%
Combined Pedestrian	0.13%	0.13%	0.12%	0.31%	0.29%	0.28%	0.41%	0.39%	0.37%
Combined Bicycle	0.12%	0.12%	0.11%	0.13%	0.12%	0.10%	0.37%	0.35%	0.34%
<i>Public Transportation Strategies</i>									
Transit Fare Measures	0.03%	0.03%	0.03%	0.05%	0.05%	0.05%	0.12%	0.11%	0.11%
Transit Frequency/LOS/Extent	0.07%	0.09%	0.12%	0.10%	0.14%	0.20%	0.22%	0.32%	0.55%
Urban Transit Expansion	0.22%	0.31%	0.40%	0.42%	0.59%	0.75%	0.86%	1.22%	1.59%
Intercity Passenger Rail	0.07%	0.06%	0.05%	0.07%	0.06%	0.06%	0.14%	0.13%	0.12%
High-Speed Passenger Rail	0.12%	0.18%	0.21%	0.18%	0.22%	0.27%	0.24%	0.30%	0.36%
<i>HOV/Carpool/Vanpool/Commute Strategies</i>									
HOV Lanes	0.09%	0.08%	0.08%	0.11%	0.11%	0.10%	0.23%	0.22%	0.21%
HOV Lanes (24-hour applicability)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Car-Sharing	0.07%	0.06%	0.06%	0.13%	0.13%	0.12%	0.27%	0.25%	0.24%
Employer-Based Commute Strategies	0.45%	0.43%	0.41%	0.87%	0.82%	0.78%	2.05%	1.95%	1.85%

Note: the term “Annual Reductions” refers to snapshot GHG reductions for specific horizon years.

**Table D.6 Percent Annual Reductions from 2005 (Level A, B, and C) (continued)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from 2005 (Long-Term) Strategy Description	Expanded Current Practice Annual Percent Reduction			More Aggressive Annual Percent Reduction			Maximum Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
<i>Regulatory Strategies</i>									
Nonmotorized Zones	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Urban Parking Restrictions	0.06%	0.22%	0.40%	0.22%	0.50%	0.79%	0.54%	0.84%	1.10%
Speed Limit Reductions	2.66%	2.57%	2.49%	4.58%	4.44%	4.33%	4.62%	4.49%	4.38%
<i>System Operations and Management Strategies</i>									
EcoDriving	1.09%	1.67%	2.20%	1.79%	2.59%	3.29%	3.03%	3.52%	3.95%
Ramp Metering	0.01%	0.07%	0.15%	0.01%	0.22%	0.40%	0.01%	0.24%	0.44%
Variable Message Signs	0.00%	0.00%	0.01%	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%
Active Traffic Management	N/A	N/A	N/A	0.02%	0.11%	0.25%	0.02%	0.21%	0.42%
Integrated Corridor Management	N/A	N/A	N/A	0.02%	0.11%	0.25%	0.02%	0.21%	0.42%
Incident Management	0.03%	0.14%	0.32%	0.03%	0.17%	0.41%	0.03%	0.19%	0.45%
Road Weather Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Signal Control Management	0.00%	0.01%	0.02%	0.00%	0.05%	0.08%	0.01%	0.11%	0.15%
Traveler Information	0.00%	0.01%	0.02%	0.00%	0.09%	0.14%	0.00%	0.09%	0.15%
Vehicle Infrastructure Integration	0.01%	0.22%	0.37%	0.01%	0.03%	0.14%	0.01%	0.03%	0.04%
<i>Bottleneck Relief and Capacity Expansion Strategies</i>									
Bottleneck Relief <sup>c</sup>	0.06%	-0.03%	-0.17%	0.12%	-0.06%	-0.30%	0.26%	-0.13%	-0.66%
Capacity Expansion <sup>c</sup>	0.09%	-0.05%	-0.25%	0.17%	-0.09%	-0.45%	0.35%	-0.18%	-0.90%
<i>Multimodal Freight Strategies</i>									
Rail Capacity Improvements	0.09%	0.09%	0.09%	0.14%	0.14%	0.14%	0.27%	0.28%	0.27%
Marine System Improvements	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Shipping Container Permits	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
LCV Permits	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
WIM Screening	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Weigh Station Bypass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Truck Stop Electrification	0.02%	0.02%	0.02%	0.05%	0.04%	0.04%	0.08%	0.07%	0.07%
Truck APUs	0.30%	0.29%	0.26%	0.30%	0.29%	0.26%	0.30%	0.29%	0.26%
Truck-Only Toll Lanes	0.04%	0.05%	0.06%	0.11%	0.13%	0.15%	0.20%	0.24%	0.27%
Urban Consolidation Centers	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%

**Table D.7 Cumulative Reductions (Level A, B, and C)**  
2020, 2030, 2050

Cumulative GHG Reduction Strategy Description	Expanded Current Practice Cumulative GHG Reduction (mmt)			More Aggressive Cumulative GHG Reduction (mmt)			Maximum Cumulative GHG Reduction (mmt)		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
<i>Pricing</i>									
CBD/Activity Center on-street parking	1.36	11.04	32.92	7.32	19.07	40.95	8.52	20.31	42.19
Tax/higher tax on free private parking	N/A	N/A	N/A	0.00	5.68	18.38	3.95	13.48	31.17
Residential parking permits	N/A	N/A	N/A	0.00	5.54	20.17	3.26	19.03	48.30
Cordon Pricing	1.91	13.94	66.41	1.91	17.11	75.69	7.27	30.85	91.61
Congestion Pricing	13.68	139.16	509.64	26.51	297.08	1020.74	58.08	425.33	1241.40
Intercity Tolls	0.00	9.94	30.47	6.88	23.48	54.28	26.12	53.79	105.13
PAYD Insurance	204.55	401.89	788.52	286.74	745.38	1676.54	370.35	990.05	2231.60
VMT fee	42.39	124.81	280.05	127.17	374.43	840.14	508.69	1497.73	3360.55
Carbon Pricing (VMT impact) <sup>b</sup>	53.58	157.16	349.98	161.60	476.66	1067.24	670.08	2046.31	4744.04
Carbon Pricing (Fuel economy impact)	92.93	421.62	1180.55	270.32	1205.98	3342.51	950.54	3935.99	10442.29
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>									
Combined Land Use	2.44	24.78	159.96	16.81	170.74	865.17	28.83	292.82	1445.08
Combined Pedestrian	10.47	32.80	74.25	24.11	75.55	170.99	32.04	100.40	227.24
Combined Bicycle	2.15	19.82	58.51	4.31	39.65	117.02	6.46	59.47	175.53
<i>Public Transportation Strategies</i>									
Transit Fare Measures	4.82	9.89	19.31	8.48	17.41	33.98	20.89	40.76	77.63
Transit Frequency/LOS/Extent	3.37	12.84	44.29	7.31	21.65	70.60	17.14	47.57	167.72
Urban Transit Expansion	13.20	42.04	144.24	26.49	83.28	280.59	52.35	165.82	574.73
Intercity Passenger Rail	13.54	25.80	46.26	13.64	26.18	47.12	13.88	27.11	49.51
High-Speed Passenger Rail	1.61	14.91	72.67	2.47	22.65	96.45	10.75	43.86	143.01
<i>HOV/Carpool/Vanpool/Commute Strategies</i>									
HOV Lanes	6.26	20.56	48.05	9.59	27.81	62.63	27.65	67.17	140.52
HOV Lanes (24-hour applicability)	0.00	0.39	1.20	0.18	0.62	1.42	0.41	0.85	1.66
Car-Sharing	5.41	16.05	36.77	12.97	35.30	76.75	35.89	80.55	163.44
Employer-Based Commute Strategies	35.47	111.13	251.53	69.31	215.15	485.79	179.26	524.56	1165.31

**Table D.7 Cumulative Reductions (Level A, B, and C) (continued)**  
2020, 2030, 2050

Cumulative GHG Reduction Strategy Description	Expanded Current Practice Cumulative GHG Reduction (mmt)			More Aggressive Cumulative GHG Reduction (mmt)			Maximum Cumulative GHG Reduction (mmt)		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
<i>Regulatory Strategies</i>									
Nonmotorized Zones	0.03	0.38	1.61	0.31	1.40	3.91	0.46	2.09	5.86
Urban Parking Restrictions	0.00	3.71	80.36	0.64	19.59	189.09	14.47	80.01	358.53
Speed Limit Reductions	31.28	390.94	1236.07	180.86	856.47	2319.69	247.13	950.72	2428.06
<i>System Operations and Management Strategies</i>									
EcoDriving	38.35	170.45	727.01	76.70	309.47	1169.60	191.74	651.05	1814.76
Ramp Metering	0.97	2.07	27.14	1.00	1.01	77.48	0.73	0.50	83.41
Variable Message Signs	0.06	0.13	1.80	0.09	0.17	2.49	0.10	0.18	2.54
Active Traffic Management	N/A	N/A	N/A	2.22	4.22	46.43	2.58	3.83	79.56
Integrated Corridor Management	N/A	N/A	N/A	2.22	4.22	46.43	2.58	3.83	79.56
Incident Management	2.13	4.41	57.51	3.19	5.60	71.76	3.63	5.88	80.23
Road Weather Management	0.08	0.19	0.58	0.14	0.34	1.02	0.36	0.73	1.76
Signal Control Management	0.10	0.25	2.93	0.23	0.57	18.32	0.42	0.92	37.21
Traveler Information	0.14	0.32	4.08	0.23	0.45	29.82	0.27	0.47	31.16
Vehicle Infrastructure Integration	-0.32	-1.41	65.42	-0.56	-2.29	15.69	-1.27	-4.36	7.93
<i>Bottleneck Relief and Capacity Expansion Strategies</i>									
Bottleneck Relief <sup>c</sup>	5.52	13.90	-3.05	10.76	27.10	-4.91	23.61	59.48	-10.77
Capacity Expansion <sup>c</sup>	8.19	20.62	-4.07	15.97	40.22	-7.28	31.93	80.43	-14.57
<i>Multimodal Freight Strategies</i>									
Rail Capacity Improvements	1.88	12.96	43.77	2.82	19.44	65.66	5.64	38.90	131.38
Marine System Improvements	0.44	1.98	5.42	0.66	2.97	8.13	1.00	4.45	12.20
Shipping Container Permits	0.64	2.83	7.51	1.00	3.45	8.14	1.63	4.08	8.77
LCV Permits	0.71	3.11	8.26	1.51	5.21	12.27	2.73	6.84	14.69
WIM Screening	0.05	0.24	0.63	0.08	0.29	0.68	0.14	0.34	0.73
Weigh Station Bypass	0.11	0.47	1.25	0.17	0.57	1.35	0.27	0.68	1.46
Truck Stop Electrification	0.94	4.14	11.00	3.08	10.61	25.02	8.52	21.31	45.78
Truck APUs	6.39	40.97	133.05	9.48	54.82	148.90	17.68	68.11	162.19
Truck-Only Toll Lanes	0.62	6.52	23.63	1.54	16.30	59.07	2.49	28.08	106.49
Urban Consolidation Centers	0.40	1.88	5.64	0.63	2.63	8.13	1.02	3.27	8.96

**Table D.8 Percent Cumulative Reductions from Baseline  
(Level A, B, and C)  
2020, 2030, 2050**

Percent Cumulative GHG Reduction from Baseline Strategy Description	Expanded Current Practice Percent Cumulative GHG Reduction			More Aggressive Percent Cumulative GHG Reduction			Maximum Percent Cumulative GHG Reduction		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
<i>Pricing</i>									
CBD/Activity Center on-street parking	0.01%	0.03%	0.05%	0.04%	0.06%	0.06%	0.05%	0.06%	0.06%
Tax/higher tax on free private parking	N/A	N/A	N/A	0.00%	0.02%	0.03%	0.02%	0.04%	0.05%
Residential parking permits	N/A	N/A	N/A	0.00%	0.02%	0.03%	0.02%	0.06%	0.07%
Cordon Pricing	0.01%	0.04%	0.10%	0.01%	0.05%	0.11%	0.04%	0.09%	0.14%
Congestion Pricing	0.08%	0.41%	0.75%	0.15%	0.87%	1.51%	0.34%	1.24%	1.83%
Intercity Tolls	0.00%	0.03%	0.05%	0.04%	0.07%	0.08%	0.15%	0.16%	0.16%
PAYD Insurance	1.18%	1.17%	1.17%	1.66%	2.17%	2.48%	2.14%	2.89%	3.30%
VMT fee	0.24%	0.36%	0.41%	0.73%	1.09%	1.24%	2.94%	4.37%	4.97%
Carbon Pricing (VMT impact) <sup>b</sup>	-	0.46%	-	0.93%	-	1.58%	3.87%	5.97%	7.01%
Carbon Pricing (Fuel economy impact)	-	1.23%	-	1.56%	-	4.94%	5.49%	11.48%	15.43%
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>									
Combined Land Use	0.01%	0.07%	0.24%	0.10%	0.50%	1.28%	0.17%	0.85%	2.14%
Combined Pedestrian	0.06%	0.10%	0.11%	0.14%	0.22%	0.25%	0.19%	0.29%	0.34%
Combined Bicycle	0.01%	0.06%	0.09%	0.02%	0.12%	0.17%	0.04%	0.17%	0.26%
<i>Public Transportation Strategies</i>									
Transit Fare Measures	0.03%	0.03%	0.03%	0.05%	0.05%	0.05%	0.12%	0.12%	0.11%
Transit Frequency/LOS/Extent	0.02%	0.04%	0.07%	0.04%	0.06%	0.10%	0.10%	0.14%	0.24%
Urban Transit Expansion	0.08%	0.12%	0.21%	0.15%	0.24%	0.41%	0.30%	0.48%	0.85%
Intercity Passenger Rail	0.08%	0.08%	0.07%	0.08%	0.08%	0.07%	0.08%	0.08%	0.07%
High-Speed Passenger Rail	0.01%	0.04%	0.11%	0.01%	0.07%	0.14%	0.06%	0.13%	0.21%
<i>HOV/Carpool/Vanpool/Commute Strategies</i>									
HOV Lanes	0.04%	0.06%	0.07%	0.06%	0.08%	0.09%	0.16%	0.20%	0.21%
HOV Lanes (24-hour applicability)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Car-Sharing	0.03%	0.05%	0.05%	0.07%	0.10%	0.11%	0.21%	0.23%	0.24%
Employer-Based Commute Strategies	0.20%	0.32%	0.37%	0.40%	0.63%	0.72%	1.04%	1.53%	1.72%

**Table D.8 Percent Cumulative Reductions from Baseline (continued)**  
**(Level A, B, and C)**  
*2020, 2030, 2050*

Percent Cumulative GHG Reduction from Baseline Strategy Description	Expanded Current Practice Percent Cumulative GHG Reduction			More Aggressive Percent Cumulative GHG Reduction			Maximum Percent Cumulative GHG Reduction		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
<i>Regulatory Strategies</i>									
Nonmotorized Zones	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.01%	0.01%
Urban Parking Restrictions	0.00%	0.01%	0.12%	0.00%	0.06%	0.28%	0.08%	0.23%	0.53%
Speed Limit Reductions	0.18%	1.14%	1.83%	1.04%	2.50%	3.43%	1.43%	2.77%	3.59%
<i>System Operations and Management Strategies</i>									
EcoDriving	0.22%	0.50%	1.07%	0.44%	0.90%	1.73%	1.11%	1.90%	2.68%
Ramp Metering	0.01%	0.01%	0.04%	0.01%	0.00%	0.11%	0.00%	0.00%	0.12%
Variable Message Signs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Active Traffic Management	N/A	N/A	N/A	0.01%	0.01%	0.07%	0.01%	0.01%	0.12%
Integrated Corridor Management	N/A	N/A	N/A	0.01%	0.01%	0.07%	0.01%	0.01%	0.12%
Incident Management	0.01%	0.01%	0.08%	0.02%	0.02%	0.11%	0.02%	0.02%	0.12%
Road Weather Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Signal Control Management	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.05%
Traveler Information	0.00%	0.00%	0.01%	0.00%	0.00%	0.04%	0.00%	0.00%	0.05%
Vehicle Infrastructure Integration	0.00%	0.00%	0.10%	0.00%	-0.01%	0.02%	-0.01%	-0.01%	0.01%
<i>Bottleneck Relief and Capacity Expansion Strategies</i>									
Bottleneck Relief <sup>c</sup>	0.03%	0.04%	-0.0074%	0.06%	0.08%	-0.0073%	0.14%	0.17%	-0.0159%
Capacity Expansion <sup>c</sup>	0.05%	0.06%	-0.0109%	0.09%	0.12%	-0.0108%	0.18%	0.23%	-0.0215%
<i>Multimodal Freight Strategies</i>									
Rail Capacity Improvements	0.01%	0.04%	0.06%	0.02%	0.06%	0.10%	0.03%	0.11%	0.19%
Marine System Improvements	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%
Shipping Container Permits	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
LCV Permits	0.00%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%
WIM Screening	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Weigh Station Bypass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Truck Stop Electrification	0.01%	0.01%	0.02%	0.02%	0.03%	0.04%	0.05%	0.06%	0.07%
Truck APUs	0.04%	0.12%	0.20%	0.05%	0.16%	0.22%	0.10%	0.20%	0.24%
Truck-Only Toll Lanes	0.00%	0.02%	0.03%	0.01%	0.05%	0.09%	0.01%	0.08%	0.16%
Urban Consolidation Centers	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%

**Table D.9 Annual Costs and Savings (Level A, B, and C)**  
2015

Included Costs and Vehicle Cost Savings (2015)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Pricing</i>						
CBD/ Activity Center on-street parking	\$0.00	\$0.00	\$0.00	\$0.87	\$0.00	\$1.22
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.00	\$0.00	\$0.00
Residential parking permits	N/A	N/A	\$0.00	\$0.00	\$0.00	\$0.00
Cordon Pricing	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.05
Congestion Pricing	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Intercity Tolls	\$0.00	\$0.00	\$0.00	\$0.00	\$1.91	\$4.07
PAYD Insurance	\$1.43	\$29.70	\$1.43	\$29.54	\$1.43	\$29.54
VMT fee	\$1.43	\$0.00	\$1.43	\$0.00	\$1.43	\$0.00
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$0.00	-	\$0.00	-	\$0.00
Carbon Pricing (Fuel economy impact)	-	\$0.00	-	\$0.00	-	\$0.00
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$0.11	\$0.00	\$0.11	\$0.00	\$0.11	\$0.00
Combined Pedestrian	\$1.04	\$1.18	\$2.08	\$2.71	\$2.89	\$3.61
Combined Bicycle	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$0.56	\$0.00	\$0.99	\$0.00	\$2.62
Transit Frequency/LOS/Extent	\$0.70	\$0.44	\$1.33	\$1.18	\$2.81	\$2.83
Urban Transit Expansion	\$5.23	\$1.81	\$10.00	\$3.69	\$21.22	\$7.39
Intercity Passenger Rail	\$0.69	\$1.77	\$1.38	\$1.85	\$2.75	\$2.02
High-Speed Passenger Rail	\$3.21	\$0.00	\$4.15	\$0.00	\$6.93	\$0.53
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$5.76	\$0.18	\$7.92	\$0.29	\$23.27	\$1.15
HOV Lanes (24-hour applicability)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Car-Sharing	\$0.03	\$0.61	\$0.06	\$1.22	\$0.01	\$4.33
Employer-Based Commute Strategies	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.00	\$0.00	\$0.05	\$0.03	\$0.09	\$0.04
Urban Parking Restrictions	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.24
Speed Limit Reductions	\$0.11	\$0.00	\$0.18	\$7.53	\$0.36	\$12.26

**Table D.9 Annual Costs and Savings (Level A, B, and C) (continued)**  
2015

Included Costs and Vehicle Cost Savings (2015)  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$1.14	\$0.00	\$2.29	\$0.00	\$5.72
Ramp Metering	\$0.07	\$0.05	\$0.16	\$0.07	\$0.39	\$0.08
Variable Message Signs	\$0.04	\$0.00	\$0.10	\$0.01	\$0.25	\$0.01
Active Traffic Management	N/A	N/A	\$0.30	\$0.13	\$0.71	\$0.16
Integrated Corridor Management	N/A	N/A	\$0.30	\$0.13	\$0.71	\$0.16
Incident Management	\$0.08	\$0.12	\$0.19	\$0.20	\$0.46	\$0.24
Road Weather Management	\$0.09	\$0.00	\$0.22	\$0.01	\$0.52	\$0.02
Signal Control Management	\$0.06	\$0.01	\$0.16	\$0.01	\$0.43	\$0.02
Traveler Information	\$0.09	\$0.01	\$0.22	\$0.01	\$0.52	\$0.02
Vehicle Infrastructure Integration	\$1.94	\$0.05	\$1.94	\$0.08	\$1.94	\$0.16
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$1.19	\$6.62	\$2.96	\$11.62	\$5.93	\$25.48
Capacity Expansion <sup>c</sup>	\$14.60	\$9.31	\$27.03	\$17.24	\$54.06	\$34.46
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$0.58	\$0.09	\$0.95	\$0.13	\$1.41	\$0.27
Marine System Improvements	\$0.19	\$0.01	\$0.38	\$0.02	\$1.14	\$0.02
Shipping Container Permits	\$0.00	\$0.02	\$0.00	\$0.03	\$0.00	\$0.06
LCV Permits	\$0.00	\$0.13	\$0.00	\$0.28	\$0.00	\$0.55
WIM Screening	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weigh Station Bypass	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Truck Stop Electrification	\$0.01	\$0.03	\$0.02	\$0.07	\$0.03	\$0.12
Truck APUs	\$0.01	\$0.45	\$0.01	\$0.67	\$0.03	\$1.27
Truck-Only Toll Lanes	\$2.47	\$0.00	\$6.17	\$0.00	\$10.35	\$0.00
Urban Consolidation Centers	\$0.03	\$0.01	\$0.03	\$0.02	\$0.03	\$0.05

**Table D.10 Annual Costs and Savings (Level A, B, and C)**  
2020

Included Costs and Vehicle Cost Savings (2020)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Pricing</i>						
CBD/Activity Center on-street parking	\$0.00	\$0.50	\$0.00	\$1.27	\$0.00	\$1.35
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.00	\$0.00	\$1.09
Residential parking permits	N/A	N/A	\$0.00	\$0.00	\$0.00	\$1.45
Cordon Pricing	\$0.87	\$0.92	\$0.87	\$0.92	\$1.12	\$1.92
Congestion Pricing	\$8.39	\$7.90	\$8.39	\$11.85	\$10.87	\$21.50
Intercity Tolls	\$0.00	\$0.00	\$1.57	\$2.13	\$1.68	\$3.55
PAYD Insurance	\$1.26	\$26.07	\$1.26	\$51.43	\$1.26	\$72.86
VMT fee	\$1.26	\$9.71	\$1.57	\$29.12	\$1.26	\$116.48
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$12.25	-	\$37.07	-	\$156.69
Carbon Pricing (Fuel economy impact)	-	\$7.05	-	\$20.36	-	\$68.43
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$0.09	\$1.08	\$0.09	\$7.47	\$0.09	\$12.82
Combined Pedestrian	\$0.86	\$2.31	\$1.71	\$5.32	\$2.38	\$7.06
Combined Bicycle	\$0.25	\$0.96	\$1.36	\$1.91	\$2.54	\$2.87
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$0.56	\$0.00	\$0.99	\$0.00	\$2.28
Transit Frequency/LOS/Extent	\$1.00	\$0.90	\$1.91	\$1.77	\$4.18	\$4.07
Urban Transit Expansion	\$5.76	\$2.61	\$11.22	\$5.35	\$24.85	\$10.90
Intercity Passenger Rail	\$1.18	\$1.56	\$1.76	\$1.64	\$3.53	\$1.85
High-Speed Passenger Rail	\$3.47	\$0.32	\$4.51	\$0.45	\$7.60	\$1.03
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$6.46	\$0.36	\$8.86	\$0.51	\$20.67	\$1.18
HOV Lanes (24-hour applicability)	\$0.00	\$0.00	\$0.00	\$0.01	\$0.00	\$0.01
Car-Sharing	\$0.00	\$0.94	\$0.00	\$2.56	\$0.00	\$5.13
Employer-Based Commute Strategies	\$4.71	\$8.69	\$0.65	\$16.75	\$0.65	\$39.65

**Table D.10 Annual Costs and Savings (Level A, B, and C) (continued)**  
2020

Included Costs and Vehicle Cost Savings (2020)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.02	\$0.01	\$0.19	\$0.08	\$0.38	\$0.12
Urban Parking Restrictions	\$0.00	\$0.00	\$0.00	\$0.45	\$0.00	\$3.96
Speed Limit Reductions	\$0.17	\$6.05	\$0.27	\$18.83	\$0.25	\$23.98
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$2.19	\$0.00	\$4.38	\$0.00	\$10.96
Ramp Metering	\$0.05	\$0.02	\$0.12	-\$0.01	\$0.29	-\$0.03
Variable Message Signs	\$0.03	\$0.00	\$0.07	\$0.00	\$0.17	\$0.00
Active Traffic Management	N/A	N/A	\$0.29	\$0.03	\$0.70	\$0.03
Integrated Corridor Management	N/A	N/A	\$0.29	\$0.03	\$0.70	\$0.03
Incident Management	\$0.07	\$0.04	\$0.16	\$0.03	\$0.39	\$0.02
Road Weather Management	\$0.06	\$0.00	\$0.16	\$0.00	\$0.39	\$0.01
Signal Control Management	\$0.06	\$0.00	\$0.16	\$0.01	\$0.45	\$0.01
Traveler Information	\$0.06	\$0.00	\$0.16	\$0.00	\$0.39	\$0.00
Vehicle Infrastructure Integration	\$1.44	-\$0.06	\$1.44	-\$0.09	\$1.44	-\$0.18
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$0.97	\$6.12	\$2.44	\$10.74	\$4.87	\$23.57
Capacity Expansion <sup>c</sup>	\$12.00	\$8.60	\$22.22	\$15.93	\$44.44	\$31.88
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$0.75	\$0.32	\$1.23	\$0.47	\$1.83	\$0.95
Marine System Improvements	\$0.19	\$0.02	\$0.38	\$0.04	\$1.13	\$0.06
Shipping Container Permits	\$0.00	\$0.04	\$0.00	\$0.06	\$0.00	\$0.07
LCV Permits	\$0.00	\$0.25	\$0.00	\$0.56	\$0.00	\$0.61
WIM Screening	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weigh Station Bypass	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Truck Stop Electrification	\$0.02	\$0.08	\$0.04	\$0.17	\$0.06	\$0.28
Truck APUs	\$0.01	\$0.79	\$0.02	\$1.18	\$0.01	\$1.34
Truck-Only Toll Lanes	\$0.06	\$0.08	\$0.15	\$0.19	\$0.26	\$0.30
Urban Consolidation Centers	\$0.02	\$0.04	\$0.02	\$0.06	\$0.02	\$0.07

**Table D.11 Annual Costs and Savings (Level A, B, and C)**  
2030

Included Costs and Vehicle Cost Savings (2030)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Pricing</i>						
CBD/Activity Center on-street parking	\$0.00	\$1.03	\$0.00	\$1.03	\$0.00	\$1.03
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.60	\$0.00	\$0.83
Residential parking permits	N/A	N/A	\$0.00	\$0.69	\$0.00	\$1.38
Cordon Pricing	\$0.67	\$1.67	\$1.13	\$2.66	\$1.16	\$3.53
Congestion Pricing	\$6.51	\$21.07	\$10.96	\$29.97	\$11.21	\$38.99
Intercity Tolls	\$1.14	\$1.08	\$1.22	\$1.62	\$1.31	\$2.71
PAYD Insurance	\$0.98	\$20.12	\$0.98	\$49.01	\$0.98	\$65.35
VMT fee	\$0.98	\$7.54	\$0.98	\$22.61	\$0.98	\$90.43
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$9.44	-	\$28.80	-	\$128.22
Carbon Pricing (Fuel economy impact)	-	\$8.10	-	\$22.90	-	\$71.10
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$0.02	\$2.89	\$0.02	\$19.94	\$0.02	\$34.20
Combined Pedestrian	\$0.06	\$1.96	\$0.12	\$4.50	\$0.16	\$5.98
Combined Bicycle	\$0.17	\$1.82	\$0.92	\$3.65	\$1.72	\$5.47
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$0.44	\$0.00	\$0.78	\$0.00	\$1.74
Transit Frequency/LOS/Extent	\$1.45	\$1.32	\$2.84	\$2.60	\$6.64	\$6.26
Urban Transit Expansion	\$6.86	\$3.69	\$13.80	\$7.62	\$32.96	\$16.15
Intercity Passenger Rail	\$0.85	\$1.12	\$1.71	\$1.22	\$4.27	\$1.52
High-Speed Passenger Rail	\$3.83	\$0.84	\$5.00	\$1.19	\$1.33	\$1.38
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$5.31	\$0.32	\$7.04	\$0.40	\$16.58	\$0.85
HOV Lanes (24-hour applicability)	\$0.00	\$0.01	\$0.00	\$0.01	\$0.00	\$0.01
Car-Sharing	\$0.00	\$0.98	\$0.00	\$1.96	\$0.00	\$3.91
Employer-Based Commute Strategies	\$3.19	\$6.62	\$0.44	\$12.77	\$0.44	\$30.23

**Table D.11 Annual Costs and Savings (Level A, B, and C) (continued)**  
2030

Included Costs and Vehicle Cost Savings (2030)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.12	\$0.05	\$0.19	\$0.12	\$0.38	\$0.17
Urban Parking Restrictions	\$0.00	\$0.92	\$0.00	\$3.19	\$0.00	\$8.00
Speed Limit Reductions	\$0.11	\$15.59	\$0.18	\$26.52	\$0.17	\$26.70
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$3.95	\$0.00	\$6.53	\$0.00	\$11.00
Ramp Metering	\$0.02	\$0.05	\$0.06	\$0.02	\$0.14	\$0.02
Variable Message Signs	\$0.02	\$0.00	\$0.04	\$0.00	\$0.10	\$0.00
Active Traffic Management	N/A	N/A	\$0.29	\$0.08	\$0.68	\$0.06
Integrated Corridor Management	N/A	N/A	\$0.29	\$0.08	\$0.68	\$0.06
Incident Management	\$0.05	\$0.09	\$0.14	\$0.11	\$0.33	\$0.11
Road Weather Management	\$0.04	\$0.00	\$0.11	\$0.01	\$0.26	\$0.01
Signal Control Management	\$0.07	\$0.01	\$0.16	\$0.01	\$0.45	\$0.02
Traveler Information	\$0.04	\$0.01	\$0.11	\$0.01	\$0.26	\$0.01
Vehicle Infrastructure Integration	\$1.17	\$0.02	\$1.17	\$0.03	\$1.17	\$0.02
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$0.66	\$3.71	\$1.65	\$6.52	\$3.29	\$14.35
Capacity Expansion <sup>c</sup>	\$8.11	\$5.22	\$15.01	\$9.67	\$30.02	\$19.40
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$0.52	\$0.72	\$0.85	\$1.08	\$1.27	\$2.17
Marine System Improvements	\$0.07	\$0.03	\$0.13	\$0.05	\$0.26	\$0.07
Shipping Container Permits	\$0.00	\$0.05	\$0.00	\$0.05	\$0.00	\$0.05
LCV Permits	\$0.00	\$0.32	\$0.00	\$0.48	\$0.00	\$0.47
WIM Screening	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weigh Station Bypass	\$0.00	\$0.01	\$0.00	\$0.01	\$0.00	\$0.01
Truck Stop Electrification	\$0.02	\$0.10	\$0.04	\$0.22	\$0.08	\$0.37
Truck APUs	\$0.01	\$1.00	\$0.01	\$1.00	\$0.01	\$1.00
Truck-Only Toll Lanes	\$0.04	\$0.17	\$0.10	\$0.42	\$0.17	\$0.76
Urban Consolidation Centers	\$0.00	\$0.06	\$0.00	\$0.08	\$0.00	\$0.09

**Table D.12 Annual Costs and Savings (Level A, B, and C)**  
2050

Included Costs and Vehicle Cost Savings (2050)	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Strategy Description</b>						
<i>Pricing</i>						
CBD/ Activity Center on-street parking	\$0.00	\$0.60	\$0.00	\$0.60	\$0.00	\$0.60
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.35	\$0.00	\$0.49
Residential parking permits	N/A	N/A	\$0.00	\$0.40	\$0.00	\$0.81
Cordon Pricing	\$0.41	\$2.18	\$0.68	\$2.18	\$0.70	\$2.18
Congestion Pricing	\$3.92	\$13.16	\$6.60	\$20.09	\$6.76	\$23.13
Intercity Tolls	\$0.68	\$0.63	\$0.73	\$0.95	\$0.79	\$1.59
PAYD Insurance	\$0.59	\$12.01	\$0.59	\$28.64	\$0.59	\$38.19
VMT fee	\$0.59	\$4.54	\$0.59	\$13.63	\$0.59	\$54.50
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$5.60	-	\$17.21	-	\$80.46
Carbon Pricing (Fuel economy impact)	-	\$4.93	-	\$13.84	-	\$41.56
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$0.01	\$5.71	\$0.01	\$26.04	\$0.01	\$42.49
Combined Pedestrian	\$0.03	\$1.14	\$0.05	\$2.63	\$0.07	\$3.50
Combined Bicycle	\$0.04	\$1.07	\$0.08	\$2.13	\$0.11	\$3.20
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$0.26	\$0.00	\$0.46	\$0.00	\$1.02
Transit Frequency/LOS/Extent	\$1.72	\$1.65	\$3.50	\$3.86	\$9.05	\$12.83
Urban Transit Expansion	\$7.00	\$4.48	\$14.46	\$9.52	\$37.59	\$22.45
Intercity Passenger Rail	\$0.05	\$0.56	\$0.11	\$0.61	\$0.27	\$0.77
High-Speed Passenger Rail	\$0.70	\$0.70	\$0.88	\$0.74	\$1.33	\$0.81
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$2.51	\$0.17	\$3.41	\$0.21	\$8.42	\$0.45
HOV Lanes (24-hour applicability)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Car-Sharing	\$0.00	\$0.57	\$0.00	\$1.14	\$0.00	\$2.29
Employer-Based Commute Strategies	\$1.45	\$3.87	\$0.20	\$7.46	\$0.20	\$17.67
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.00	\$0.03	\$0.00	\$0.07	\$0.00	\$0.10
Urban Parking Restrictions	\$0.00	\$3.83	\$0.00	\$7.55	\$0.00	\$10.49
Speed Limit Reductions	\$0.05	\$8.57	\$0.08	\$14.70	\$0.08	\$14.82

**Table D.12 Annual Costs and Savings (Level A, B, and C) (continued)**  
2050

Included Costs and Vehicle Cost Savings (2050)  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$4.62	\$0.00	\$6.93	\$0.00	\$8.31
Ramp Metering	\$0.00	\$0.31	\$0.01	\$0.84	\$0.02	\$0.92
Variable Message Signs	\$0.01	\$0.02	\$0.01	\$0.03	\$0.03	\$0.03
Active Traffic Management	N/A	N/A	\$0.21	\$0.53	\$0.50	\$0.89
Integrated Corridor Management	N/A	N/A	\$0.21	\$0.53	\$0.50	\$0.89
Incident Management	\$0.03	\$0.67	\$0.08	\$0.85	\$0.19	\$0.95
Road Weather Management	\$0.02	\$0.00	\$0.05	\$0.01	\$0.12	\$0.01
Signal Control Management	\$0.05	\$0.03	\$0.13	\$0.18	\$0.34	\$0.32
Traveler Information	\$0.02	\$0.05	\$0.05	\$0.30	\$0.12	\$0.31
Vehicle Infrastructure Integration	\$0.61	\$0.78	\$0.61	\$0.28	\$0.61	\$0.09
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$0.30	-\$0.04	\$0.75	-\$0.06	\$1.50	-\$0.14
Capacity Expansion <sup>c</sup>	\$3.70	-\$0.05	\$6.85	-\$0.09	\$13.70	-\$0.19
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$0.24	\$0.42	\$0.39	\$0.63	\$0.58	\$1.26
Marine System Improvements	\$0.03	\$0.02	\$0.06	\$0.03	\$0.12	\$0.04
Shipping Container Permits	\$0.00	\$0.03	\$0.00	\$0.03	\$0.00	\$0.03
LCV Permits	\$0.00	\$0.19	\$0.00	\$0.29	\$0.00	\$0.28
WIM Screening	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weigh Station Bypass	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Truck Stop Electrification	\$0.01	\$0.06	\$0.02	\$0.12	\$0.04	\$0.20
Truck APUs	\$0.00	\$0.46	\$0.00	\$0.46	\$0.00	\$0.46
Truck-Only Toll Lanes	\$0.02	\$0.13	\$0.05	\$0.32	\$0.08	\$0.59
Urban Consolidation Centers	\$0.00	\$0.04	\$0.00	\$0.05	\$0.00	\$0.06

**Table D.13 Cumulative Costs and Savings (Level A, B, and C)**  
2015

Cumulative 2015 Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)
<i>Pricing</i>						
CBD/ Activity Center on-street parking	\$0.00	\$0.00	\$0.00	\$2.71	\$0.00	\$3.79
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.00	\$0.00	\$0.00
Residential parking permits	N/A	N/A	\$0.00	\$0.00	\$0.00	\$0.00
Cordon Pricing	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.27
Congestion Pricing	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Intercity Tolls	\$0.00	\$0.00	\$0.00	\$0.00	\$14.77	\$16.99
PAYD Insurance	\$133.05	\$156.70	\$133.05	\$156.29	\$133.05	\$156.29
VMT fee	\$133.05	\$0.00	\$133.05	\$0.00	\$133.05	\$0.00
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$0.00	-	\$0.00	-	\$0.00
Carbon Pricing (Fuel economy impact)	-	\$0.00	-	\$0.00	-	\$0.00
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$0.58	\$0.00	\$0.58	\$0.00	\$0.58	\$0.00
Combined Pedestrian	\$5.64	\$3.03	\$11.27	\$6.98	\$15.66	\$9.27
Combined Bicycle	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$2.99	\$0.00	\$5.25	\$0.00	\$13.87
Transit Frequency/LOS/Extent	\$2.46	\$0.44	\$4.66	\$1.18	\$9.73	\$2.83
Urban Transit Expansion	\$20.21	\$7.07	\$38.43	\$14.39	\$80.44	\$28.66
Intercity Passenger Rail	\$2.16	\$9.29	\$4.31	\$9.56	\$8.62	\$10.09
High-Speed Passenger Rail	\$16.05	\$0.00	\$20.75	\$0.00	\$34.64	\$1.35
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$26.48	\$0.47	\$35.32	\$0.74	\$92.79	\$2.97
HOV Lanes (24-hour applicability)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.06
Car-Sharing	\$0.16	\$2.21	\$0.32	\$4.43	\$0.08	\$18.06
Employer-Based Commute Strategies	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**Table D.13 Cumulative Costs and Savings (Level A, B, and C) (continued)**  
2015

Cumulative 2015 Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)	Implementation Costs (2010- 2015)	Vehicle Cost Savings (2010- 2015)
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.00	\$0.00	\$0.25	\$0.08	\$0.50	\$0.11
Urban Parking Restrictions	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.19
Speed Limit Reductions	\$0.39	\$0.00	\$0.62	\$19.44	\$1.27	\$29.96
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$2.96	\$0.00	\$5.91	\$0.00	\$14.79
Ramp Metering	\$0.38	\$0.16	\$0.95	\$0.26	\$2.27	\$0.29
Variable Message Signs	\$0.22	\$0.01	\$0.55	\$0.02	\$1.31	\$0.02
Active Traffic Management	N/A	N/A	\$1.38	\$0.42	\$3.32	\$0.54
Integrated Corridor Management	N/A	N/A	\$1.38	\$0.42	\$3.32	\$0.54
Incident Management	\$0.38	\$0.38	\$0.95	\$0.67	\$2.27	\$0.84
Road Weather Management	\$0.45	\$0.01	\$1.13	\$0.03	\$2.72	\$0.07
Signal Control Management	\$0.29	\$0.02	\$0.72	\$0.04	\$1.99	\$0.07
Traveler Information	\$0.45	\$0.02	\$1.13	\$0.04	\$2.72	\$0.06
Vehicle Infrastructure Integration	\$6.54	\$0.14	\$6.54	\$0.22	\$6.54	\$0.44
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$6.42	\$16.97	\$16.05	\$29.78	\$32.10	\$65.33
Capacity Expansion <sup>c</sup>	\$61.99	\$23.86	\$114.79	\$44.18	\$229.58	\$88.35
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$2.47	\$0.17	\$4.05	\$0.25	\$6.00	\$0.50
Marine System Improvements	\$0.75	\$0.02	\$1.51	\$0.03	\$4.52	\$0.05
Shipping Container Permits	\$0.00	\$0.05	\$0.00	\$0.08	\$0.00	\$0.16
LCV Permits	\$0.00	\$0.32	\$0.00	\$0.72	\$0.00	\$1.41
WIM Screening	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Weigh Station Bypass	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Truck Stop Electrification	\$0.02	\$0.07	\$0.04	\$0.15	\$0.07	\$0.25
Truck APUs	\$0.03	\$1.42	\$0.04	\$2.11	\$0.10	\$3.88
Truck-Only Toll Lanes	\$13.37	\$0.00	\$33.43	\$0.00	\$56.06	\$0.00
Urban Consolidation Centers	\$0.12	\$0.03	\$0.12	\$0.04	\$0.12	\$0.09

**Table D.14 Cumulative Costs and Savings (Level A, B, and C)  
2020**

Cumulative 2020  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)
<i>Pricing</i>						
CBD/ Activity Center on-street parking	\$0.00	\$1.57	\$0.00	\$8.79	\$0.00	\$10.31
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$0.00	\$0.00	\$4.56
Residential parking permits	N/A	N/A	\$0.00	\$0.00	\$0.00	\$3.72
Cordon Pricing	\$6.19	\$2.85	\$6.19	\$2.85	\$7.92	\$11.25
Congestion Pricing	\$59.82	\$20.31	\$59.82	\$30.47	\$76.55	\$73.96
Intercity Tolls	\$0.00	\$0.00	\$12.14	\$8.87	\$23.62	\$35.73
PAYD Insurance	\$139.70	\$294.06	\$139.70	\$404.88	\$139.70	\$518.15
VMT fee	\$139.70	\$51.09	\$139.70	\$153.27	\$139.70	\$613.06
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$64.57	-	\$194.74	-	\$807.06
Carbon Pricing (Fuel economy impact)	-	\$28.20	-	\$82.04	-	\$288.85
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$1.05	\$2.79	\$1.05	\$19.21	\$1.05	\$32.95
Combined Pedestrian	\$10.27	\$12.44	\$20.54	\$28.66	\$28.53	\$38.09
Combined Bicycle	\$1.34	\$2.46	\$7.37	\$4.92	\$13.77	\$7.38
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$5.96	\$0.00	\$10.48	\$0.00	\$25.93
Transit Frequency/LOS/Extent	\$6.85	\$4.91	\$13.04	\$11.34	\$27.82	\$26.73
Urban Transit Expansion	\$48.08	\$18.61	\$92.33	\$37.98	\$197.87	\$76.39
Intercity Passenger Rail	\$7.13	\$17.52	\$12.42	\$18.16	\$24.84	\$19.68
High-Speed Passenger Rail	\$32.78	\$0.81	\$42.44	\$1.15	\$71.03	\$5.56
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$57.61	\$1.95	\$78.92	\$3.00	\$201.15	\$8.75
HOV Lanes (24-hour applicability)	\$0.00	\$0.00	\$0.00	\$0.05	\$0.00	\$0.13
Car-Sharing	\$0.16	\$6.51	\$0.32	\$15.49	\$0.08	\$43.65
Employer-Based Commute Strategies	\$25.54	\$41.27	\$3.54	\$80.69	\$3.54	\$209.59
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$0.06	\$0.03	\$1.29	\$0.36	\$2.58	\$0.55
Urban Parking Restrictions	\$0.00	\$0.00	\$0.00	\$0.72	\$0.00	\$17.04
Speed Limit Reductions	\$1.13	\$15.62	\$1.81	\$93.02	\$2.65	\$129.21

**Table D.14 Cumulative Costs and Savings (Level A, B, and C) (continued)**  
**2020**

Cumulative 2020  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)	Implementation Costs (2010- 2020)	Vehicle Cost Savings (2010- 2020)
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$11.97	\$0.00	\$23.95	\$0.00	\$59.87
Ramp Metering	\$0.66	\$0.32	\$1.65	\$0.34	\$3.95	\$0.26
Variable Message Signs	\$0.38	\$0.02	\$0.95	\$0.03	\$2.27	\$0.03
Active Traffic Management	N/A	N/A	\$2.82	\$0.73	\$6.77	\$0.86
Integrated Corridor Management	N/A	N/A	\$2.82	\$0.73	\$6.77	\$0.86
Incident Management	\$0.73	\$0.70	\$1.82	\$1.06	\$4.36	\$1.22
Road Weather Management	\$0.81	\$0.02	\$2.01	\$0.05	\$4.83	\$0.12
Signal Control Management	\$0.60	\$0.03	\$1.51	\$0.07	\$4.16	\$0.14
Traveler Information	\$0.81	\$0.04	\$2.01	\$0.08	\$4.83	\$0.09
Vehicle Infrastructure Integration	\$14.27	-\$0.08	\$14.27	-\$0.14	\$14.27	-\$0.34
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$11.70	\$52.36	\$29.25	\$91.85	\$58.49	\$201.57
Capacity Expansion <sup>c</sup>	\$126.97	\$73.60	\$235.13	\$136.29	\$470.26	\$272.59
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$5.93	\$1.26	\$9.72	\$1.89	\$14.41	\$3.78
Marine System Improvements	\$1.70	\$0.12	\$3.40	\$0.18	\$10.20	\$0.27
Shipping Container Permits	\$0.00	\$0.22	\$0.00	\$0.32	\$0.00	\$0.51
LCV Permits	\$0.00	\$1.33	\$0.00	\$2.98	\$0.00	\$4.60
WIM Screening	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01
Weigh Station Bypass	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01
Truck Stop Electrification	\$0.08	\$0.38	\$0.18	\$0.81	\$0.31	\$1.37
Truck APUs	\$0.09	\$4.75	\$0.11	\$7.07	\$0.16	\$10.98
Truck-Only Toll Lanes	\$16.03	\$0.19	\$40.07	\$0.48	\$67.20	\$0.77
Urban Consolidation Centers	\$0.24	\$0.17	\$0.24	\$0.27	\$0.24	\$0.45

**Table D.15 Cumulative Costs and Savings (Level A, B, and C)**  
 2030

Cumulative 2030  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)
<i>Pricing</i>						
CBD/ Activity Center on-street parking	\$0.00	\$11.05	\$0.00	\$20.44	\$0.00	\$22.00
Tax/higher tax on free private parking	N/A	N/A	\$0.00	\$5.55	\$0.00	\$14.02
Residential parking permits	N/A	N/A	\$0.00	\$5.36	\$0.00	\$19.37
Cordon Pricing	\$13.76	\$18.09	\$18.54	\$21.94	\$21.37	\$41.13
Congestion Pricing	\$133.00	\$178.50	\$179.24	\$276.83	\$206.62	\$429.01
Intercity Tolls	\$15.96	\$10.88	\$25.82	\$27.27	\$38.28	\$66.39
PAYD Insurance	\$150.71	\$520.80	\$150.71	\$929.98	\$150.71	\$1,228.35
VMT fee	\$150.71	\$135.76	\$150.71	\$407.29	\$150.71	\$1,629.16
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$171.01	-	\$518.41	-	\$2,219.71
Carbon Pricing (Fuel economy impact)	-	\$109.72	-	\$314.20	-	\$1,030.96
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$1.27	\$24.52	\$1.27	\$168.94	\$1.27	\$289.73
Combined Pedestrian	\$14.39	\$34.59	\$28.78	\$79.67	\$39.98	\$105.88
Combined Bicycle	\$3.35	\$19.77	\$18.41	\$39.53	\$34.39	\$59.30
<i>Public Transportation Strategies</i>						
Transit Fare Measures	\$0.00	\$10.99	\$0.00	\$19.34	\$0.00	\$45.63
Transit Frequency/LOS/Extent	\$19.48	\$16.74	\$37.55	\$33.92	\$83.55	\$79.35
Urban Transit Expansion	\$111.55	\$51.18	\$218.34	\$104.98	\$489.39	\$215.91
Intercity Passenger Rail	\$17.04	\$30.57	\$31.13	\$32.27	\$64.94	\$36.34
High-Speed Passenger Rail	\$69.74	\$7.15	\$90.64	\$10.08	\$117.53	\$19.14
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$116.65	\$5.53	\$157.01	\$7.55	\$384.26	\$18.65
HOV Lanes (24-hour applicability)	\$0.00	\$0.10	\$0.00	\$0.16	\$0.00	\$0.24
Car-Sharing	\$0.16	\$17.02	\$0.32	\$37.64	\$0.08	\$87.96
Employer-Based Commute Strategies	\$63.78	\$116.31	\$8.84	\$225.34	\$8.84	\$552.06
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$1.05	\$0.37	\$4.23	\$1.43	\$8.47	\$2.15
Urban Parking Restrictions	\$0.00	\$3.47	\$0.00	\$18.90	\$0.00	\$81.02
Speed Limit Reductions	\$2.51	\$158.67	\$4.01	\$359.29	\$4.90	\$407.85

**Table D.15 Cumulative Costs and Savings (Level A, B, and C) (continued)**  
2030

Cumulative 2030  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)	Implementation Costs (2010- 2030)	Vehicle Cost Savings (2010- 2030)
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$44.40	\$0.00	\$81.34	\$0.00	\$174.20
Ramp Metering	\$1.01	\$0.58	\$2.51	\$0.33	\$6.04	\$0.19
Variable Message Signs	\$0.60	\$0.04	\$1.51	\$0.05	\$3.62	\$0.05
Active Traffic Management	N/A	N/A	\$5.78	\$1.21	\$13.87	\$1.16
Integrated Corridor Management	N/A	N/A	\$5.78	\$1.21	\$13.87	\$1.16
Incident Management	\$1.32	\$1.25	\$3.30	\$1.64	\$7.92	\$1.75
Road Weather Management	\$1.35	\$0.05	\$3.37	\$0.09	\$8.10	\$0.21
Signal Control Management	\$1.28	\$0.07	\$3.19	\$0.16	\$8.78	\$0.26
Traveler Information	\$1.35	\$0.09	\$3.37	\$0.13	\$8.10	\$0.14
Vehicle Infrastructure Integration	\$26.15	-\$0.37	\$26.15	-\$0.60	\$26.15	-\$1.15
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$19.60	\$94.50	\$49.00	\$165.78	\$98.01	\$364.14
Capacity Expansion <sup>c</sup>	\$224.28	\$132.84	\$415.33	\$245.99	\$830.67	\$492.44
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$12.84	\$7.18	\$21.01	\$10.77	\$31.19	\$21.55
Marine System Improvements	\$3.08	\$0.45	\$6.17	\$0.68	\$14.11	\$1.02
Shipping Container Permits	\$0.00	\$0.74	\$0.00	\$0.91	\$0.00	\$1.10
LCV Permits	\$0.00	\$4.56	\$0.00	\$8.38	\$0.00	\$9.89
WIM Screening	\$0.01	\$0.04	\$0.01	\$0.04	\$0.01	\$0.04
Weigh Station Bypass	\$0.02	\$0.08	\$0.02	\$0.08	\$0.02	\$0.08
Truck Stop Electrification	\$0.30	\$1.43	\$0.63	\$2.99	\$1.08	\$5.09
Truck APUs	\$0.19	\$14.80	\$0.20	\$18.55	\$0.24	\$22.46
Truck-Only Toll Lanes	\$16.52	\$1.69	\$41.31	\$4.22	\$69.27	\$7.25
Urban Consolidation Centers	\$0.36	\$0.71	\$0.36	\$1.00	\$0.36	\$1.29

**Table D.16 Cumulative Costs and Savings (Level A, B, and C)**  
2050

Cumulative 2050  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)
<i>Pricing</i>						
CBD/ Activity Center on-street parking	-	\$26.80	-	\$36.20	-	\$37.75
Tax/higher tax on free private parking	N/A	N/A	-	\$14.70	-	\$26.75
Residential parking permits	N/A	N/A	-	\$15.90	-	\$40.44
Cordon Pricing	\$24.20	\$66.01	\$36.10	\$76.30	\$39.34	\$97.90
Congestion Pricing	\$233.90	\$522.77	\$348.99	\$792.92	\$380.31	\$1,033.76
Intercity Tolls	\$33.56	\$27.44	\$44.69	\$52.11	\$58.51	\$107.79
PAYD Insurance	\$165.90	\$831.16	\$165.90	\$1,678.04	\$165.90	\$2,225.77
VMT fee	\$165.90	\$252.53	\$165.90	\$757.60	\$165.90	\$3,030.38
Carbon Pricing (VMT impact) <sup>b</sup>	-	\$316.13	-	\$962.80	-	\$4,246.18
Carbon Pricing (Fuel economy impact)	-	\$236.66	-	\$671.68	-	\$2,121.06
<i>Land Use and Smart Growth Strategies/Nonmotorized Strategies</i>						
Combined Land Use	\$1.51	\$117.99	\$1.51	\$655.51	\$1.51	\$1,098.49
Combined Pedestrian	\$15.18	\$64.43	\$30.35	\$148.40	\$42.17	\$197.21
Combined Bicycle	\$4.56	\$47.62	\$20.64	\$95.24	\$37.71	\$142.86
<i>Public Transportation Strategies</i>						
Transit Fare Measures	-	\$17.77	-	\$31.27	-	\$72.18
Transit Frequency/LOS/Extent	\$52.48	\$46.98	\$102.61	\$99.27	\$243.77	\$265.42
Urban Transit Expansion	\$255.03	\$135.47	\$502.97	\$281.67	\$1,197.29	\$611.55
Intercity Passenger Rail	\$19.26	\$46.47	\$35.58	\$49.61	\$76.05	\$58.02
High-Speed Passenger Rail	\$99.55	\$24.70	\$108.15	\$29.53	\$144.20	\$40.17
<i>HOV/Carpool/Vanpool/Commute Strategies</i>						
HOV Lanes	\$171.78	\$10.15	\$231.92	\$13.41	\$569.08	\$30.99
HOV Lanes (24-hour applicability)	\$0.00	\$0.23	\$0.00	\$0.30	\$0.00	\$0.38
Car-Sharing	\$0.16	\$31.94	\$0.32	\$67.48	\$0.08	\$147.64
Employer-Based Commute Strategies	\$107.06	\$217.40	\$14.84	\$420.20	\$14.84	\$1,013.42
<i>Regulatory Strategies</i>						
Nonmotorized Zones	\$1.39	\$1.26	\$4.23	\$3.24	\$8.47	\$4.86
Urban Parking Restrictions	\$0.00	\$55.48	\$0.00	\$135.57	\$0.00	\$276.08
Speed Limit Reductions	\$4.06	\$389.76	\$6.50	\$753.64	\$7.46	\$805.12

**Table D.16 Cumulative Costs and Savings (Level A, B, and C) (continued)**  
2050

Cumulative 2050  Strategy Description	Expanded Current Practice Billion Dollars		More Aggressive Billion Dollars		Maximum Billion Dollars	
	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)	Implementation Costs (2010- 2050)	Vehicle Cost Savings (2010- 2050)
<i>System Operations and Management Strategies</i>						
EcoDriving	\$0.00	\$134.91	\$0.00	\$221.76	\$0.00	\$366.91
Ramp Metering	\$1.25	\$4.46	\$3.11	\$12.33	\$7.47	\$13.17
Variable Message Signs	\$0.81	\$0.29	\$2.02	\$0.41	\$4.84	\$0.42
Active Traffic Management	N/A	N/A	\$10.80	\$7.74	\$25.93	\$12.96
Integrated Corridor Management	N/A	N/A	\$10.80	\$7.74	\$25.93	\$12.96
Incident Management	\$2.15	\$9.43	\$5.37	\$11.82	\$12.88	\$13.22
Road Weather Management	\$1.97	\$0.12	\$4.91	\$0.21	\$11.79	\$0.38
Signal Control Management	\$2.46	\$0.48	\$6.14	\$2.97	\$16.88	\$6.08
Traveler Information	\$1.97	\$0.67	\$4.91	\$4.77	\$11.79	\$5.00
Vehicle Infrastructure Integration	\$42.62	\$9.91	\$42.62	\$2.16	\$42.62	\$0.82
<i>Bottleneck Relief and Capacity Expansion Strategies</i>						
Bottleneck Relief <sup>c</sup>	\$28.55	\$124.81	\$71.37	\$218.97	\$142.74	\$481.62
Capacity Expansion <sup>c</sup>	\$334.43	\$175.45	\$619.32	\$324.92	\$1,238.64	\$651.30
<i>Multimodal Freight Strategies</i>						
Rail Capacity Improvements	\$19.93	\$18.49	\$32.62	\$27.73	\$48.46	\$55.49
Marine System Improvements	\$3.98	\$0.96	\$7.96	\$1.43	\$17.69	\$2.15
Shipping Container Permits	\$0.00	\$1.55	\$0.00	\$1.72	\$0.00	\$1.90
LCV Permits	\$0.00	\$9.56	\$0.00	\$15.82	\$0.00	\$17.17
WIM Screening	\$0.02	\$0.10	\$0.02	\$0.10	\$0.02	\$0.10
Weigh Station Bypass	\$0.03	\$0.19	\$0.03	\$0.19	\$0.03	\$0.19
Truck Stop Electrification	\$0.61	\$2.94	\$1.28	\$6.18	\$2.19	\$10.50
Truck APUs	\$0.30	\$28.82	\$0.31	\$32.57	\$0.35	\$36.48
Truck-Only Toll Lanes	\$17.08	\$4.62	\$42.70	\$11.54	\$71.61	\$20.67
Urban Consolidation Centers	\$0.36	\$1.62	\$0.36	\$2.33	\$0.36	\$2.66

**Table D.17 Annual Reductions (Aggressive and Maximum)**  
*Short-Term: 2015, 2020*

Annual Reductions (Short Term) Bundle	Aggressive Deployment GHG Reduction (mmt)		Maximum Deployment GHG Reduction (mmt)	
	2015	2020	2015	2020
Near Term/Early Results	56.22	116.73	110.36	196.78
Long Term/Max Results	38.75	117.52	76.04	206.28
Land Use/Transit/Nonmotorized	19.37	55.27	37.60	97.20
System/Driver Efficiency	24.09	78.30	52.49	129.02
Facility Pricing	5.92	19.20	11.48	36.09
Low Cost	30.61	102.46	59.40	171.85

**Table D.18 Annual Reductions (Aggressive and Maximum)**  
*Long-Term: 2030, 2040, 2050*

Annual Reductions (Long-Term) Bundle	Aggressive Deployment GHG Reduction (mmt)			Maximum Deployment GHG Reduction (mmt)		
	2030	2040	2050	2030	2040	2050
Near Term/Early Results	199.41	233.04	269.46	257.36	284.45	317.00
Long Term/Max Results	218.73	256.91	308.55	308.62	344.15	411.95
Land Use/Transit/Nonmotorized	105.93	130.82	150.78	175.20	214.74	246.02
System/Driver Efficiency	147.61	163.12	194.45	175.54	174.24	250.84
Facility Pricing	46.01	43.52	54.69	57.94	45.02	69.93
Low Cost	213.06	260.53	305.76	278.35	323.32	369.72

**Table D.19 Percent Annual Reductions from Baseline  
(Aggressive and Maximum)**  
*Short-Term: 2015, 2020*

Annual % Reductions from Baseline (Short Term) Bundle	Aggressive Deployment Annual Percent Reduction		Maximum Deployment Annual Percent Reduction	
	2015	2020	2015	2020
Near Term/Early Results	3.24%	6.82%	6.36%	11.49%
Long Term/Max Results	2.23%	6.86%	4.38%	12.05%
Land Use/Transit/Nonmotorized	1.12%	3.23%	2.17%	5.68%
System/Driver Efficiency	1.39%	4.57%	3.03%	7.53%
Facility Pricing	0.34%	1.12%	0.66%	2.11%
Low Cost	1.76%	4.98%	3.42%	8.04%

**Table D 20 Percent Annual Reductions from Baseline  
 (Aggressive and Maximum)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from Baseline (Long-Term) Bundle	Aggressive Deployment Annual Percent Reduction			Maximum Deployment Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050
Near Term/Early Results	11.8%	14.0%	14.3%	15.2%	17.0%	17.4%
Long Term/Max Results	13.0%	15.4%	18.7%	18.3%	20.6%	24.9%
Land Use/Transit/Nonmotorized	6.3%	7.8%	9.1%	10.4%	12.9%	14.9%
System/Driver Efficiency	8.7%	9.8%	10.8%	10.4%	10.4%	12.2%
Facility Pricing	2.7%	2.6%	3.3%	3.4%	2.7%	4.2%
Low Cost	10.9%	15.6%	15.5%	14.4%	19.4%	18.4%

**Table D.21 Percent Annual Reductions from 2005  
 (Aggressive and Maximum)**  
*Short-Term: 2015, 2020*

Annual Percent Reductions from 2005 (Short Term) Bundle	Aggressive Deployment Annual Percent Reduction		Maximum Deployment Annual Percent Reduction	
	2015	2020	2015	2020
Near Term/Early Results	3.4%	2.0%	6.7%	8.1%
Long Term/Max Results	2.4%	3.1%	4.6%	9.0%
Land Use/Transit/Nonmotorized	1.2%	-1.0%	2.3%	2.5%
System/Driver Efficiency	1.5%	1.3%	3.2%	4.4%
Facility Pricing	0.4%	-3.2%	0.7%	-2.2%
Low Cost	1.9%	2.2%	3.6%	6.2%

**Table D.22 Percent Annual Reductions from 2005  
(Aggressive and Maximum)**  
*Long-Term: 2030, 2040, 2050*

Annual Percent Reductions from 2005 (Long-Term) Bundle	Aggressive Deployment Annual Percent Reduction			Maximum Deployment Annual Percent Reduction		
	2030	2040	2050	2030	2040	2050
Near Term/Early Results	9.1%	14.1%	14.4%	12.3%	17.3%	17.4%
Long Term/Max Results	11.3%	15.6%	18.3%	16.7%	20.9%	24.0%
Land Use/Transit/Nonmotorized	4.4%	7.9%	9.2%	7.6%	13.0%	14.4%
System/Driver Efficiency	6.0%	9.9%	11.8%	7.7%	10.6%	12.2%
Facility Pricing	0.2%	1.6%	3.3%	1.5%	2.7%	4.2%
Low Cost	8.9%	12.3%	15.8%	11.9%	15.6%	18.4%

**Table D.23 Cumulative Reductions (Aggressive and Maximum)**  
*2020, 2030, 2050*

Cumulative GHG Reduction Bundle	Aggressive Deployment Cumulative GHG Reduction (mmt)			Maximum Deployment Cumulative GHG Reduction (mmt)		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
Near Term/Early Results	635.61	2,348.48	7,056.11	1,144.45	3,535.89	9,273.58
Long Term/Max Results	564.14	2,410.20	7,630.16	1,061.46	3,818.18	10,835.60
Land Use/Transit/Nonmotorized	284.80	1,132.23	3,759.68	524.59	1,972.78	6,280.38
System/Driver Efficiency	353.74	1,620.82	4,950.81	652.14	2,302.26	6,011.65
Facility Pricing	90.53	464.14	1,365.43	180.89	708.78	1,697.94
Low Cost	458.48	2,199.51	7,453.12	822.02	3,241.02	9,762.23

**Table D.24 Percent Cumulative Reductions from Baseline  
 (Aggressive and Maximum)  
 2020, 2030, 2050**

Percent Cumulative GHG Reduction from Baseline Bundle	Aggressive Deployment			Maximum Deployment		
	Percent Cumulative GHG Reduction			Percent Cumulative GHG Reduction		
	2010-2020	2010-2030	2010-2050	2010-2020	2010-2030	2010-2050
Near Term/Early Results	3.7%	6.9%	10.4%	6.6%	10.3%	13.7%
Long Term/Max Results	3.3%	7.0%	11.3%	6.1%	11.1%	16.0%
Land Use/Transit/Nonmotorized	1.6%	3.3%	5.6%	3.0%	5.8%	9.3%
System/Driver Efficiency	2.0%	4.7%	7.3%	3.8%	6.7%	8.9%
Facility Pricing	0.5%	1.4%	2.0%	1.0%	2.1%	2.5%
Low Cost	2.6%	6.4%	11.0%	4.7%	9.5%	14.4%

**Table D.25 Annual Costs and Savings (Aggressive and Maximum)  
 2015**

Included Costs and Vehicle Cost Savings (2015) Bundle	Aggressive Deployment		Maximum Deployment	
	Billion Dollars		Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
Near Term/Early Results	\$13.43	\$53.64	\$22.34	\$107.42
Long Term/Max Results	\$79.17	\$26.96	\$165.24	\$52.34
Land Use/Transit/Nonmotorized	\$25.09	\$24.07	\$45.14	\$47.32
System/Driver Efficiency	\$60.40	\$4.47	\$127.48	\$7.63
Facility Pricing	\$71.01	-\$3.89	\$138.75	-\$7.76
Low Cost	\$4.64	\$16.70	\$7.63	\$35.58

**Table D.26 Annual Costs and Savings (Aggressive and Maximum)  
 2020**

Included Costs and Vehicle Cost Savings (2020) Bundle	Aggressive Deployment		Maximum Deployment	
	Billion Dollars		Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
Near Term/Early Results	\$17.34	\$85.73	\$25.79	\$148.58
Long Term/Max Results	\$80.71	\$97.17	\$156.93	\$172.86
Land Use/Transit/Nonmotorized	\$42.48	\$65.37	\$66.27	\$117.24
System/Driver Efficiency	\$60.92	\$43.55	\$110.88	\$66.19
Facility Pricing	\$69.62	\$9.55	\$133.86	\$20.11
Low Cost	\$17.18	\$67.39	\$20.68	\$121.52

**Table D.27 Annual Costs and Savings (Aggressive and Maximum)**  
2030

Included Costs and Vehicle Cost Savings (2030)	Aggressive Deployment Billion Dollars		Maximum Deployment Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Bundle</b>				
Near Term/Early Results	\$17.64	\$98.67	\$23.57	\$139.59
Long Term/Max Results	\$70.57	\$154.28	\$129.69	\$236.89
Land Use/Transit/Nonmotorized	\$44.15	\$101.66	\$66.45	\$174.67
System/Driver Efficiency	\$48.02	\$77.17	\$82.16	\$93.40
Facility Pricing	\$64.53	\$40.99	\$113.13	\$56.62
Low Cost	\$17.84	\$115.00	\$17.55	\$163.81

**Table D.28 Annual Costs and Savings (Aggressive and Maximum)**  
2050

Included Costs and Vehicle Cost Savings (2050)	Aggressive Deployment Billion Dollars		Maximum Deployment Billion Dollars	
	Implementation Cost	Vehicle Cost (Savings)	Implementation Cost	Vehicle Cost (Savings)
<b>Bundle</b>				
Near Term/Early Results	\$12.35	\$71.69	\$19.24	\$94.13
Long Term/Max Results	\$42.33	\$139.51	\$89.24	\$215.19
Land Use/Transit/Nonmotorized	\$29.71	\$97.48	\$58.99	\$171.09
System/Driver Efficiency	\$24.17	\$57.55	\$41.00	\$66.20
Facility Pricing	\$39.59	\$35.90	\$81.27	\$59.44
Low Cost	\$10.11	\$99.53	\$9.93	\$133.43

**Table D.29 Cumulative Costs and Savings (Aggressive and Maximum)**  
 2020

Included Costs and Vehicle Cost  Savings Cumulative 2010-2020 Bundle	Aggressive Deployment Billion Dollars		Maximum Deployment Billion Dollars	
	Implementation Cost (2010-2020)	Vehicle Cost Savings (2010- 2020)	Implementation Cost (2010-2020)	Vehicle Cost Savings (2010- 2020)
Near Term/Early Results	\$183.47	\$548.20	\$275.59	\$1,007.88
Long Term/Max Results	\$833.07	\$475.85	\$1,648.55	\$919.32
Land Use/Transit/Nonmotorized	\$335.41	\$348.17	\$530.34	\$652.42
System/Driver Efficiency	\$655.39	\$168.33	\$1,265.58	\$278.34
Facility Pricing	\$734.22	\$10.99	\$1,411.87	\$39.06
Low Cost	\$127.03	\$296.96	\$167.87	\$584.50

**Table D.30 Cumulative Costs and Savings (Aggressive and Maximum)**  
 2030

Included Costs and Vehicle Cost  Savings Cumulative 2010-2030 Bundle	Aggressive Deployment Billion Dollars		Maximum Deployment Billion Dollars	
	Implementation Cost (2010-2030)	Vehicle Cost Savings (2010- 2030)	Implementation Cost (2010-2030)	Vehicle Cost Savings (2010- 2030)
Near Term/Early Results	\$382.41	\$1,531.62	\$521.67	\$2,496.10
Long Term/Max Results	\$1,604.58	\$1,853.72	\$3,083.81	\$3,112.97
Land Use/Transit/Nonmotorized	\$793.32	\$1,232.21	\$1,218.99	\$2,213.55
System/Driver Efficiency	\$1,211.36	\$856.89	\$2,226.55	\$1,162.79
Facility Pricing	\$1,433.85	\$325.41	\$2,651.64	\$491.99
Low Cost	\$331.93	\$1,319.92	\$375.99	\$2,126.33

**Table D.31 Cumulative Costs and Savings (Aggressive and Maximum)**  
 2050

Included Costs and Vehicle Cost  Savings Cumulative 2010-2050 Bundle	Aggressive Deployment Billion Dollars		Maximum Deployment Billion Dollars	
	Implementation Cost (2010-2050)	Vehicle Cost Savings (2010- 2050)	Implementation Cost (2010-2050)	Vehicle Cost Savings (2010- 2050)
Near Term/Early Results	\$676.31	\$3,211.42	\$945.24	\$4,779.30
Long Term/Max Results	\$2,611.31	\$4,846.04	\$5,104.62	\$7,667.75
Land Use/Transit/Nonmotorized	\$1,438.97	\$3,269.58	\$2,389.73	\$5,740.16
System/Driver Efficiency	\$1,869.94	\$2,213.63	\$3,337.93	\$2,736.52
Facility Pricing	\$2,371.22	\$1,121.27	\$4,483.58	\$1,656.42
Low Cost	\$599.32	\$3,499.01	\$634.30	\$5,102.68