

Appendix E  
Comprehensive Analysis of Transportation  
Emissions Reduction Measures

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## Index of Control Measures

<b>State and Local Measures</b>	<b>VOC (kg/day)</b>	<b>NOx (kg/day)</b>
Ride-matching/Commuter Connections	-0.33	-0.31
Park & Ride Lots	-1.77	-1.80
Hagerstown Telework Center	-0.19	-0.22
Telecommuting Outreach Program	-2.87	-3.12
Ozone Action Days	---	---
Clean Air Partners	---	---
Commuter Bus Service Hagerstown	-1.65	-1.75
County Commuter Bus Service	-5.30	-4.19
Turning Point Transit Services	-0.43	-0.41
E-government / E-commerce Enhancements	-1.59	-0.31
New Job Tax Credit	-1.59	-1.85
Growth Management Program	-13.24	-15.42
Signal System Enhancements	-10.22	-3.08
Incident Management - Highway Advisory Radio	-17.59	-7.99
Vehicle Acquisitions – Fleet Replacements	-0.01	-0.01
Vehicle Acquisitions – Bus Replacements	0.02	-13.60
Vehicle Acquisitions – Engine Rebuilds	-1.49	0.00
State Control Measures – VEIP	-480.81	-562.46
OTC Programs – CP, AIM, PFC	-255.47	0.00
Low Emissions Paint	-26.28	0.00
Off-road vehicle replacements	---	---
RACT Controls	0.00	-1312.31
<b>Federal Control Measures</b>		
NLEV, TIER II, HDE Standard	-861.83	-3093.51
Phase I & II Engine Standards	---	---

Engine Standards for diesel powered engines  
 Engine Standards for gasoline powered marine engines  
 Engine Standards for large gasoline-powered engines  
 Engine Standards for locomotive engines  
 NOx SIP Call

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**Contingency Measures**

Government Memo of Understanding  
 Fuel Programs  
 Diesel Vehicle Emission Controls  
 Gas Can Replacement  
 Lawnmower Replacement  
 Traffic Flow Improvements  
 Vehicle Acquisitions – Fleet Replacement  
 Vehicle Acquisitions – Bus Replacement

	<b>VOC (kg/day)</b>	<b>NOx (kg/day)</b>
Government Memo of Understanding	-4.57	-4.24
Fuel Programs	-208.65 to -444.52	-18.14 to -27.22
Diesel Vehicle Emission Controls	-3.24 to -6.48	-102.6 to -205.20
Gas Can Replacement	-4.10	0.00
Lawnmower Replacement	-1.18	-0.03
Traffic Flow Improvements	-19.86	-8.97
Vehicle Acquisitions – Fleet Replacement	-0.08	-0.07
Vehicle Acquisitions – Bus Replacement	0.03	-21.67

## References:

- Six-Year Capital Improvement Program, Fiscal Year 2004-2009, Washington County, Maryland.
- Census Transportation Planning Package 2000.
- Washington County Transportation Development Plan, MTA, July 16<sup>th</sup> 2003.
- MAQONE Version 3.2, Michael Baker Jr., Inc., Maryland Department of Transportation.
- Commuter Connections, State of the Commute 2001, LDA Consulting.
- Washington County Transportation Department – County Commuter Website: [www.washco-md.net](http://www.washco-md.net)
- 2000 Journey to Work Commutation for Maryland, Maryland Department of Planning 2003.
- Comprehensive Plan for Washington County, Maryland 2002, Washington County Planning Department Geographic Information System.
- Baltimore Region Telecommuting Baseline Survey, 1999 BMC.
- Analyzing the travel behavior of home-based workers in 1991, CALTRANS Statewide Travel Survey, Mokhtarian P.L. and Henderson D.K.
- Telework America 2000 research results.
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- Work Program Book 2004, MDE
- Marketing Strategy for Ozone Action Days, Pathway Strategic Communications in partnership with Beverly Silverberg Communications, Inc. PRSolutions Media Vision, 2003.
- Ozone Survey Report, 2002
- Area Workforce Report, Washington County, Maryland, August 2002, The Pathfinders.
- Comprehensive Plan for the County 2002, Washington County, Maryland
- Trip Generation, 6<sup>th</sup> Edition, Institute of Transportation Engineers (ITE).
- Highway Location Reference, Volume 2 – Harford Co. Through Worcester Co., December 31, 2002, Maryland Department of Transportation, State Highway Administration, Highway Information Services Division.
- Maryland State Highway Administration, HPMS reports.
- Regulatory Announcement: Final Rule for the National Low Emission Vehicle Program. EPA420-F-97-047, December 1997.
- Regulatory Announcement: EPA's Program for Cleaner Vehicles and Cleaner Gasoline. EPA420-F-99-051, December 1999.
- Regulatory Announcement: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Content Requirements. EPA420-F-00-057, December 2000.
- Facts About - COMAR 26.11.32: Control of Volatile Organic Compounds from Consumer Products, MDE
- Facts About - Draft - COMAR 26.11.XX: Control of Volatile Organic Compounds from Architectural Coatings, MDE
- Facts About - New Regulations for Portable Gas Cans and Gas Can Spouts, MDE.

- Control of Air Pollution; Emission For New Nonroad Spark-ignition Engines at or Below 19 Kilowatts; Final Rule. 40 CFR Parts 9 and 90.
- Phase 2 Emission Standards for New Nonroad Spark-Ignition Non hand held Engines At or Below 19 Kilowatts; Final Rule. 40 CFR Part 90.
- Regulatory Announcement: New Emission Standards for Nonroad Diesel Engines. EPA420-F-98-034.
- Technical Highlights: Organization of Gasoline and Diesel Marine Engine Emission Standards. EPA420-F-99-046.
- Regulatory Announcement: Final Emissions Standards for Locomotives. EPA420-F-97-048.
- Regulatory Announcement: Emission Standards for New Nonroad Engines. EPA420-F-02-037.
- MDE Technical Support Document: COMAR 26.11.29, NOx Reduction and Trading Program and COMAR 26.11.30, Policies and Procedures Relating to the NOx Reduction and Trading Program.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Rideshare

**Description:**

This measure refers to incentives and support for carpool and vanpool and promoting alternate transport methods.

**Documentation:**

- Maryland Department of Transportation
- Census Transportation Planning Package 2000.

**Assumptions:**

- Carpool occupancy in Washington County = 2.6
- Daily work person trips per employee = 1.8
- Average carpool work trip length = 16.45 miles
- Total commuters ridesharing = 30

**Calculations:**

- Commuters using carpool for ridesharing = 30
- Total work trips made before =  $30 * 1.8 = 54$  trips
- Total carpools =  $30 / 2.6 = 12$
- Total carpool trips made after =  $12 * 2 = 24$  trips
  
- Total work trips reduced =  $54 - 24 = 30$  trips
- Total VMT reduced due to carpool =  $30 * 16.45 = 494$  miles

**Summary of Results:**

VT Benefit: -30 trips  
VMT Benefit: -494 miles

*Emission Benefits:*

VOC -0.33 kg/day  
NOx -0.31 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number: 1  
 Report Title: Washington County EAC  
 Analysis Year: 2007  
 Region: Hagerstown  
 Mobile Version: Mobile 6

Cat.	ID	County	Description	VEHICLE		Yr. Compl.	BUS	Vehicle Emissions kg/day		
				VT	VMT			VOC	NOx	CO
EMO	12	Washington	Ridesharing	-30	-494	2003	0	-0.33	-0.31	-4.19
Total impacts for all projects in this scenario: (kg/day)				-30	-494		0	-0.33	-0.31	-4.19
								0.00	0.00	0.00

(tons/day)

## Emissions Only Analysis

Project ID:  County:  Area Type:  PPMS#:

Option:  Completion Year:

**Cost Benefit Analysis**

Capital Cost:  Service Life (In years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT:

Total Change in work related VT:

Total Change in non-work related VT:

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	21%	21%	20%
Midday	18%	16%	18%
PM	21%	18%	15%
Night	4%	10%	19%
	100%	100%	100%



Washington County EAC Control Measures  
Rideshare

Total Commuters Ridesharing = 30 *(as per COG database)*

Carpool Occupancy in Wash Co. = 2.6 *(as per MAQONE def data)*

Average Vanpool Occupancy = 9 *(as per NJ rideshare data)*

AVO in Wash Co. = 1.21 *(as per MAQONE def data)*

Mode Split for Wash Co:	
DA	76.00%
CP	13.60%
VP	0.20%
Transit	0.20%
Bike	4.60%
Other	5.40%
	100%

*(as per MAQONE def data)*

Commuters using Carpool for rideshare = 30

Commuters using Vanpool for rideshare = 0

Daily Work Person Trips per employee = 1.8 *(as per MAQONE def data)*

Avg. Carpool work trip length (miles) = 16.45 *(as per MAQONE def data)*

Avg. Vanpool work trip length (miles) = 40 *(as per NJ rideshare data)*

Avg. SOV work trip length (miles) = 12.76 *(as per MAQONE def data)*

Total Work Trips made before = 54

Total Carpools = 12

Total Carpool Trips made after = 24

Total Work Trips reduced =	30
Total VMT reduced due to carpool (miles) =	494

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Park and Ride

**Description:**  
Eight park and ride lots in Washington County.

- Documentation:**
- 2000 Journey to Work Commutation for Maryland, Maryland Department of Planning 2003.
  - Census Transportation Planning Package 2000.
  - Maryland State Highway Administration.

- Assumptions:**
- Distance from home to lot is 5 miles.
  - Market share for work trips are represented by Frederick County, Montgomery County, Baltimore City, and Washington D.C.
  - We consider only the benefits along 20 miles traveled within Washington County.
  - From historical data it is estimated 16% increase in Park and Ride lot occupancy from 2003 to 2007.

**Calculations:**  
  
Transportation and emission benefits are calculated using MAQONE.

**Summary of Results:**

VT Benefit: -206 trips  
VMT Benefit: -2,861 miles

*Emission Benefits:*  
VOC -1.77 kg/day  
NOx -1.80 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		BUS VMT	Vehicle Emissions kg/day		
					VI	VMT		VOC	NOx	CO
PR1	1	Washington	US 40 Alternate @ MD 67	2007	-14	-123	0	-0.09	-0.08	-1.14
PR1	2	Washington	I-70 @ US 40	2007	-15	-129	0	-0.09	-0.08	-1.20
PR1	3	Washington	I-70 @ MD 65 (SHA lot)	2007	-30	-256	0	-0.18	-0.17	-2.37
PR1	4	Washington	I-70 @ MD 65 (MVA lot)	2007	-51	-1,534	0	-0.82	-0.94	-12.46
PR1	5	Washington	I-70 @ MD 66	2007	-57	-490	0	-0.35	-0.32	-4.54
PR1	6	Washington	I-70 @ MD 632	2007	-10	-86	0	-0.06	-0.06	-0.80
PR1	7	Washington	MD 144 @ Center Street (Hancock)	2007	-21	-176	0	-0.13	-0.11	-1.63
PR1	8	Washington	I-81 @ MD 58	2007	-8	-67	0	-0.05	-0.04	-0.62
Total impacts for all projects in this scenario: (kg/day)					-206	-2,861	0	-1.77	-1.80	-24.77
								0.00	0.00	-0.03

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)



### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID  County  Area Type  PPMS#   
Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

County	Service Life (in years)	Annual Operating Cost
<input type="checkbox"/>		
<input type="checkbox"/>		
<input checked="" type="checkbox"/> Washington Co	20	100%
<input type="checkbox"/>		
<input type="checkbox"/>		

### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID  County  Area Type  PPMS#   
Location  Completion Year

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Year	Cost	Benefit
2002	80%	20%
2003	20%	80%
2004	80%	20%
2005	20%	80%
2006	80%	20%
2007	20%	80%

### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID:  County:  Area Type:  PPMS#:   
Location:  Completion Year:

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

**Without Transit Service, Carpool Only**

Initial Investment	68
Operating Costs	48%
Annual Operating Cost	14
Annual Operating Cost	15
Annual Operating Cost	16
Annual Operating Cost	17
Annual Operating Cost	18
Annual Operating Cost	19
Annual Operating Cost	20
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Annual Operating Cost	88
Annual Operating Cost	89
Annual Operating Cost	90
Annual Operating Cost	91
Annual Operating Cost	92
Annual Operating Cost	93
Annual Operating Cost	94
Annual Operating Cost	95
Annual Operating Cost	96
Annual Operating Cost	97
Annual Operating Cost	98
Annual Operating Cost	99
Annual Operating Cost	100

Buttons: [Back] [Next] [Print] [Exit] [Help]

### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID  County  Area Type  PPMS#   
Location  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Metric	Value
82	82
79%	79%
131	131
216	216
121	121
133	133
5	5
103%	103%

Buttons: Add New, Links, Copy to New, Delete, Refresh



### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID  County  Area Type  PPMS#   
Location  Completion Year

Cost Benefit Analysis

Capital Cost:  Service Life (In years):  Annual Operating Cost:

The screenshot shows a software window with a dark background and a light-colored text area. The text area contains the following information:

- Without Transit Service, Carpool Only** (highlighted in a box)
- Number of lanes:
- Percentage of lanes:

Below the text area, there are several buttons: **Quit**, **Print**, **Copy**, **Paste**, and **Exit**.

### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID:  County:  Area Type:  PPMS#:   
Location:  Completion Year:

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

**Without Transit Service, Carpool Only**

Initial Investment	109
Annual Operating Cost	20%
Annual Revenue	13
Annual Maintenance	20
Annual Fuel	12
Annual Insurance	1
Annual Taxes	1
Annual Other	1
Annual Total	5
Annual Net	105

### Park and Ride (Carpool, Transit, Fixed Guideway)

Project ID  County  Area Type  PPMS#   
Option  Completion Year

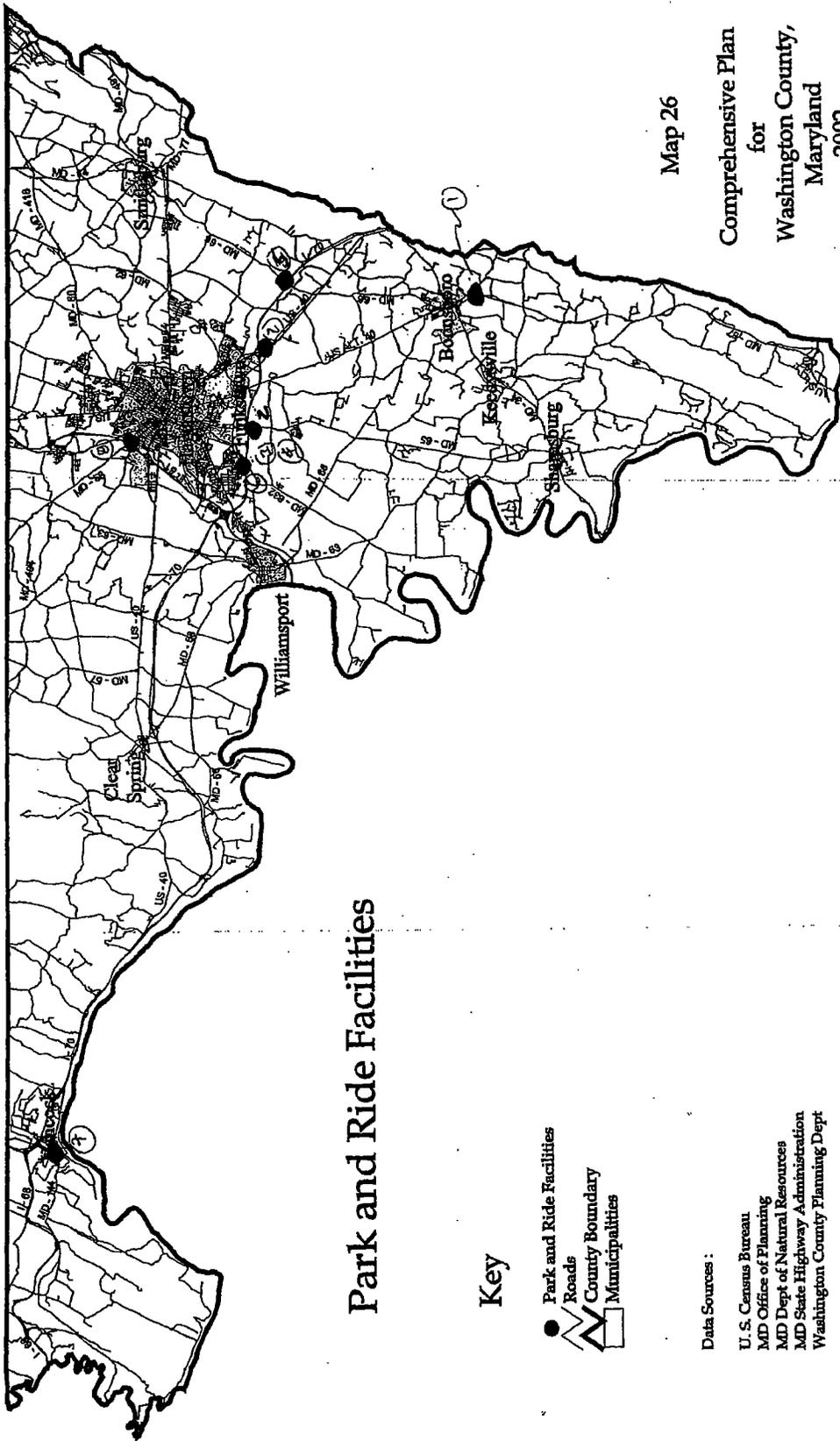
Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

**Without Transit Service, Carpool Only**

Population	12	100
Household	12	100
Vehicle	12	100
Person per household	12	100
Person per vehicle	12	100

Population	49
Household	91%
Vehicle	21
Person per household	21
Person per vehicle	5





# Park and Ride Facilities

## Key

- Park and Ride Facilities
- ▬ Roads
- ▬ County Boundary
- ▭ Municipalities

### Data Sources:

- U.S. Census Bureau
- MD Office of Planning
- MD Dept of Natural Resources
- MD State Highway Administration
- Washington County Planning Dept

Note: This map is prepared for the sole purpose of illustrating the Comprehensive Plan. It should not be used for other purposes. Information shown on this map was compiled from various original sources as listed and is subject to change as sources make changes.

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Map 26  
 Comprehensive Plan  
 for  
 Washington County,  
 Maryland  
 2002

Prepared by the  
 Washington County  
 Planning Department  
 Geographic Information System



Adopted 6-27-2002



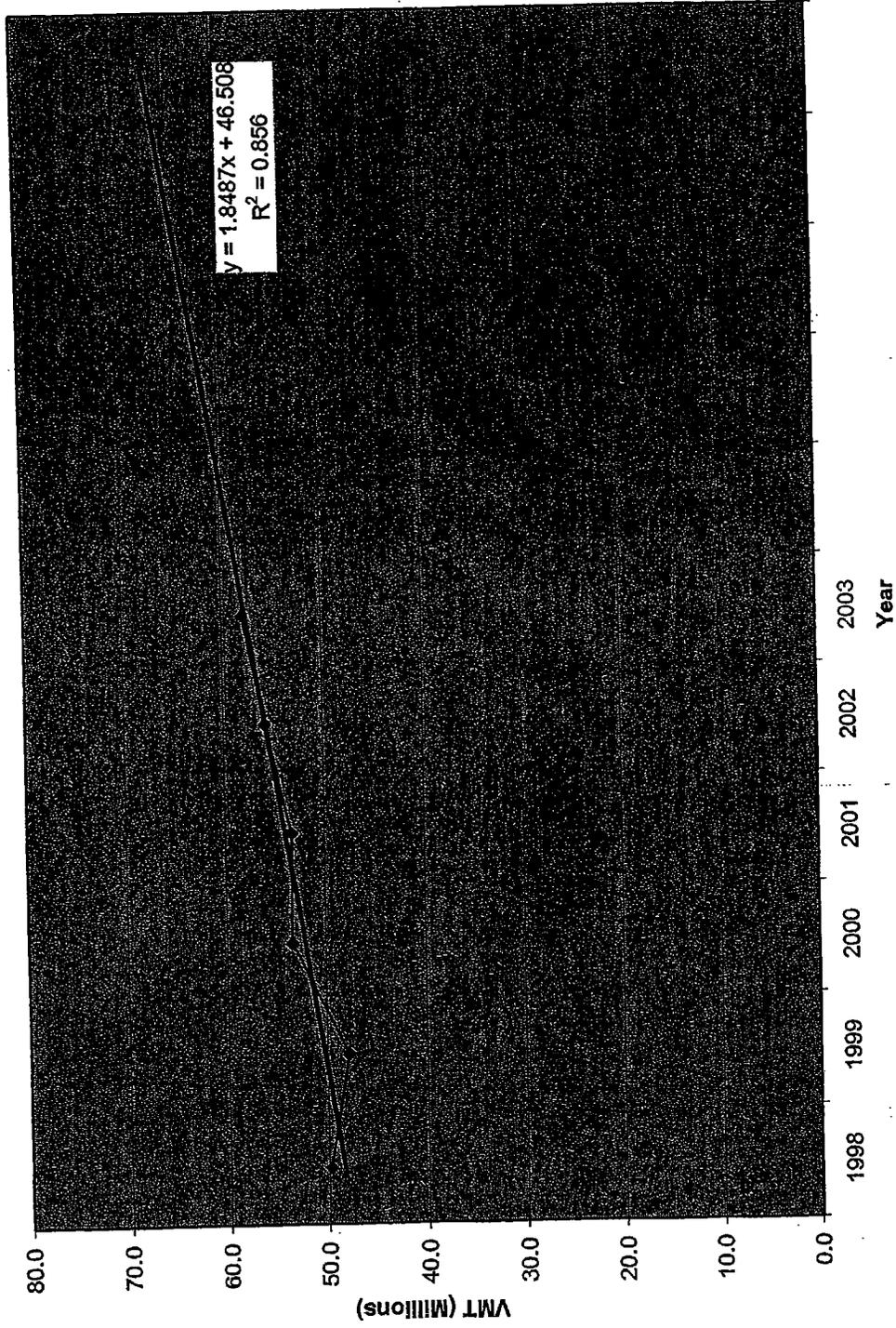
SPRING 2003 PARK RIDE INVENTORY

SITE	COUNTY	SITE NAME/LOCATION	SPACES	SPRING		FALL		YEAR AVERAGE	
				#	%	#	%	#	%
60	HO	I-70 @ MD 32	63	46	73%		0%	23	37%
61	HO	I-70 @ MD 97 (MD 144)	22	19	86%		0%	10	43%
62	HO	US 29 @ MD 108	99	10	10%		0%	5	5%
63	HO	US 29 @ MD 216	421	117	28%		0%	59	14%
64	HO	MD 32 @ Broken Land Parkway (east lot)	325	168	52%		0%	84	26%
65	HO	MD 32 @ Broken Land Parkway (west lot)	318	346	109%		0%	173	54%
66	HO	MD 100 @ Long Gate Parkway	302	56	19%		0%	28	9%
67	HO	MD 175 @ Snowden River Parkway	210	130	62%		0%	65	31%
68	K	US 301 @ MD 291	27	3	11%	4	15%	4	13%
69	M	MD 97 @ MD 28	248	24	10%		0%	12	5%
70	M	I-270 @ MD 124	511	543	106%		0%	272	53%
71	PG	I-95 @ I-495	147	108	73%		0%	54	37%
72	PG	MD 193 @ B/W Parkway (leased)	172	24	14%		0%	12	7%
73	PG	MD 198 @ Van Dusen Road	60	27	45%		0%	14	23%
74	PG	MD 210 @ MD 373	489	98	20%		0%	49	10%
75	Q	US 50 @ MD 8	266	198	74%	173	65%	186	70%
76	Q	US 50 @ MD 404	37	26	70%	49	132%	38	101%
77	Q	US 50 @ Castle Marina Road	82	32	39%	34	41%	33	40%
78	Q	US 301 @ MD 304	13	6	46%	5	38%	6	42%
79	SM	MD 5 @ MD 235	24	7	29%		0%	4	15%
80	SM	MD 234 @ MD 242	17	9	53%		0%	5	26%
81	S	US 13 @ MD 362	19	10	53%		0%	5	26%
82	S	US 13 @ MD 413	12	5	42%		0%	3	21%
83	T	MD 33 @ MD 370	9	2	22%		0%	1	11%
84	W	US 40 Alternate @ MD 67	69	27	39%	←	0%	14	20%
85	W	I-70 @ US 40	68	28	41%	←	0%	14	21%
86	W	I-70 @ MD 65 (SHA lot)	82	56	68%	←	0%	28	34%
87	W	I-70 @ MD 65 (MVA lot) (leased)	168	95	57%	←	0%	48	28%
88	W	I-70 @ MD 66	155	107	69%	←	0%	54	35%
89	W	I-70 @ MD 632 (leased)	109	19	17%	←	0%	10	9%
90	W	MD 144 @ Center Street (Hancock) (leased)	49	38	78%	←	0%	19	39%
91	W	I-81 @ MD 58	17	16	94%	←	0%	8	47%
92	WI	US 50 @ Phillip Morris Drive	16	1	6%		0%	1	3%
<b>Total</b>			<b>10586</b>	<b>5934</b>	<b>56%</b>	<b>290</b>	<b>3%</b>	<b>3112</b>	<b>29%</b>

Washington County EAC  
Park and Ride Lots

Data Used	Percentage Occupancy Park and Ride Lots - Washington County													
	Linear													Rate
	1998	1999	2000	2001	2002	2003	2001	2002	2003	2001	2002	2003	R2	
Year average Wash County	49.8	47.8	53.4	53.3	55.8	57.9	65.0	0.8560						16%
Rate increase 2002 - 2007														
	2000													
	2001													
	2002													
	2003													
Site Name/Location	spring	fall	spring	fall	spring	fall	spring	fall	spring	fall	spring	fall	spring	fall
US 40 Alternate @ MD 67	41	38	32	29	43	29	33	32	28	25	39	na	na	na
I-70 @ US 40	53	49	44	47	81	84	68	74	46	47	41	na	na	na
I-70 @ MD 65 (SHA lot)	58	53	54	47	70	60	66	66	68	72	68	na	na	na
I-70 @ MD 65 (MVA lot)	31	30	29	29	34	30	27	40	50	54	57	na	na	na
I-70 @ MD 66	60	48	49	62	65	64	59	66	65	67	69	na	na	na
I-70 @ MD 632	--	--	--	--	10	8	7	10	16	17	17	na	na	na
MD 144 @ Center Street	--	--	49	69	78	57	73	73	71	73	78	na	na	na
I-81 @ MD 58	71	65	53	76	88	53	82	76	100	94	94	na	na	na
Average (spring/fall)	52.3	47.2	44.3	51.3	58.6	48.1	51.9	54.6	55.5	56.1	57.9			
Year average	49.8		47.8		53.4		53.3		55.8		57.9			
	2003													
Site Name/Location	Spring													
US 40 Alternate @ MD 67	39.0													
I-70 @ US 40	41.0													
I-70 @ MD 65 (SHA lot)	68.0													
I-70 @ MD 65 (MVA lot)	57.0													
I-70 @ MD 66	69.0													
I-70 @ MD 632	17.0													
MD 144 @ Center Street	78.0													
I-81 @ MD 58	94.0													
	2007 Projection													
	% Occupancy													
	45													
	48													
	79													
	66													
	80													
	20													
	91													
	100													

# VMT of Travel By Functional Classification



FC 1  
Linear (FC 1)

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – VMT and Trip Reduction Measures</p>
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**TERM:** Hagerstown Telework Center

**Description:**

The Hagerstown Telework Center provides affordable office space and equipment, including computers and high speed internet access, to people who telecommute to work.

**Documentation:**

- Baltimore Region Telecommuting Baseline Study, 1999, BMC.
- Maryland Department of Transportation.
- Census Transportation Planning Package (CTPP 2000).
- Analyzing the Travel Behavior of Home-based workers in 1991 CALTRANS Statewide Travel Survey, Mokhtarian P.L. and Henderson D.K.
- Telework America 2000: Research Results.
- Commuter Connections: Transportation Emission Reduction Measure Analysis Report by LDA Consulting, 1999.
- Impact Analysis and Improvement Study for the Hagerstown Telework Center. Marketing Solutions, Inc., 2000.

**Assumptions:**

- The telework center provides 32 workspaces /day.
- The center is currently at 60% utilization=  $32 * 0.60 = 19$  workspaces/day.
- Assuming half of Hagerstown telework center are government employees and the other half private-sector clients.
- We will assume an average commute distance of 70 miles for government-sector commutes.  $(50+75+85)/3= 70$  miles daily. We consider 20 miles traveled within Washington County.
- Average work trip distance for private sector telecommuters is 28 miles (from BMC survey – Baltimore Region Telecommuting Baseline Study). We consider 20 miles traveled within Washington County.
- For telecenter-based telecommuters (non-home based), the average VMT reduction per trip was calculated as the non-telecommute day trip distance minus 10 miles, an average distance to a telecenter.  $(28 - 10 = 18$  miles, for private sector;  $70-10 = 60$  miles, for government sector) (Commuter Connections: Transportation Emission Reduction Measure Analysis Report by LDA Consulting, 1999). Only 10 miles are traveled within Washington County.

**Calculations:**

- Workspaces =  $32 * 0.60 = 19$  workspaces
- Private sector telecommuters =  $19/2 = 9.5$
- Government sector telecommuters =  $19/2 = 9.5$

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

*Work trips:*

Total work trips reduced = 0 trips

Total work VMT reduced =  $(9.5 * 2 * 10 + 9.5 * 2 * 10) = 380$  miles

**Summary of Results:**

VT Benefit: 0 trips  
VMT Benefit: -380 miles

*Emission Benefits:*

VOC -0.19 kg/day  
NOx -0.22 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	YMT		VMT	VOC	NOX
EMO	4	Washington	Hagerstown Telework Center	2003	0	-380	0	-0.19	-0.22	-2.63
Total impacts for all projects in this scenario: (kg/day)					0	-380	0	-0.19	-0.22	-2.63
								0.00	0.00	0.00

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

## Emissions Only Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (In years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT

Total Change in work related VT

Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	21%	50%	50%
Midday	36%	0%	0%
PM	25%	50%	50%
Night	19%	0%	0%
	100%	100%	100%



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Telecommuting Outreach Program

**Description:**

This TERM looks into actively encouraging employers (government/private sector) to establish telecommuting programs for their employees, and provide planning assistance and other technical expertise towards successful implementation of telecommuting programs. Telecommuting employees avoid making a trip to work on one or more days per week.

**Documentation:**

- Baltimore Region Telecommuting Baseline Study, 1999, BMC.
- Maryland Department of Transportation.
- Census Transportation Planning Package (CTPP 2000).
- Analyzing the Travel Behavior of Home-based workers in 1991. CALTRANS Statewide Travel Survey, Mokhtarian P.L. and Henderson D.K.
- Telework America 2000: Research Results.
- Impact Analysis and Improvement Study for the Hagerstown Telework Center. Marketing Solutions, Inc., 2000.
- MAQONE Version 3.2, Telework Promotion methodology.

**Assumptions:**

- Assuming all telecommuters will be home base teleworkers.
- Telecommuters telecommute approximately 1.8 days a week. (Impact Analysis and Improvement Study for the Hagerstown Telework Center).
- The number of employers volunteering to offer a telecommuting option depends on the level of effort of the public agency promoting the program. It is assume low promotion level of effort.

**Calculations:**

Transportation and emission benefits are calculated using MAQONE's Telework Promotion module.

In the first step of the analysis, the employment base for the affected region is estimated from area business patterns and local information that is available. The calculated employment base is then corrected for the level of public agency effort (high, medium, or low) to estimate the number of employees eligible for telecommuting. The estimated number of telecommuters is multiplied by a daily factor to account for the fact that telecommuting is not available on all days of the week. This value is divided by the average car occupancy in the region to estimate the number of trips removed due to the telecommuting program. This methodology also takes into account the increase in midday non-work trips the telecommuter makes.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**Summary of Results:**

VT Benefit: -82 trips  
VMT Benefit: -5,276 miles

*Emission Benefits:*  
VOC -2.87 kg/day  
NOx -3.12 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number: 1  
 Report Title: Washington County EAC  
 Analysis Year: 2,007  
 Region: Hagerstown  
 Mobile Version: Mobile 6

Cat. ID	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	VMT		VMT	VOC	NOx
TWK	1	Washington	Telecommuting Outreach Program	2007	-82	-5,276	0	-2.87	-3.12	-40.62
Total impacts for all projects in this scenario: (kg/day)					-82	-5,276	0	-2.87	-3.12	-40.62
(tons/day)								0.00	0.00	-0.04

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

## Telework Promotion - TWK

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Group Type  Non-work trip length (in miles)

**Voluntary Employer Participation**

Promotion level of effort

**Only NEW employers REQUIRED to offer TWK**

Percent of all employers who are new to the program

**ALL employers REQUIRED to offer TWK**

Percent employers actually participating

Percent of all employers able to offer TWK

Employment base

Ratio of work trips to employees

**Time Period Distribution (must equal 100%)**

Time period	AM	50%
<input checked="" type="radio"/> Peak	Midday	50%
<input type="radio"/> Off-Peak	PM	50%
<input type="radio"/> Daily	Night	0%
		100%

**Market Share for tele-work trips**

	Dist to Dest. (mi)	% Trips to Dest
<input checked="" type="checkbox"/> Baltimore	00.36	0%
<input checked="" type="checkbox"/> Washington,DC	00.48	0%
<input checked="" type="checkbox"/> Other1		0%
<input type="checkbox"/> Other2		0%
<input type="checkbox"/> Other3		0%
Must equal 100%		100%

**Mode split for trips**

SOV	Carpool	Vanpool	Transit	Bike/Walk	Other	Total
75%	0%	0%	0%	0%	0%	100%



<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – VMT and Trip Reduction Measures</p>
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**TERM:** Ozone Action Days

**Description:**

The Ozone Action Program currently in place in Baltimore and Washington DC will expand to Washington County. The Ozone Action Days program is a voluntary initiative by government, environmental groups, and business leaders working with the general public to take extra action to prevent air pollution when high ozone levels are predicted. Because ground level ozone forms under certain weather conditions, a regional team of meteorologists can predict days when ground-level ozone concentrations may exceed health standards. When the air quality is predicted to be poor in both the Baltimore and Washington areas, MDE will call for an Ozone Action Day.

In the event of an Ozone Action Day, MDE and the Metropolitan Washington Council Of Governments will fax an air quality message to media outlets, government agencies and Ozone Action Day participants. In addition, daily forecasts and Ozone Action Day messages will be available on MDE's Ozone Forecast page and on the Air Quality Hotline.

There are many simple actions that people and businesses can take to help reduce air pollution on Ozone Action Days. Example Air Quality CODE RED day volunteer programs include:

- Refuel cars after dusk and limit driving.
- Put off any painting until later.
- Don't use aerosol consumer products.
- Avoid mowing lawns with gasoline-powered mowers.
- Start charcoal with an electric or chimney-type fire starter instead of lighter fluid.
- Take public transportation.
- Try telecommuting

**Documentation:**

- Work Program Book 2004, MDE
- Marketing Strategy for Ozone Action Days, Pathway Strategic Communications in partnership with Beverly Silverberg Communications, Inc. PRSolutions Media Vision, 2003.
- Ozone Survey Report, 2002

**Summary of Results:**

Voluntary Program – no credit taken.



**Sample Fax**

## Air Quality Forecast

Maryland Department of the Environment  
1800 Washington Blvd, Suite 730  
Baltimore, MD 21230-1720

For Immediate Release  
March 8, 2004

**Contact: Robert Maddox (410) 537-3265**

### **Air Quality "CODE RED" Forecast for May 1, 2003 Air Quality Expected to be UNHEALTHY**

2:54 PM, Baltimore, MD

**Tomorrow's Forecast:** An Air Quality **CODE RED** forecast has been issued for the **Baltimore** metropolitan region. Air quality is expected to be **UNHEALTHY**.

**Today's Conditions:** As of 3:00 p.m. today, today's air quality in the Baltimore metropolitan region was moderate.

**Health Warning:** Ground-level ozone can cause lung damage, breathing difficulties, coughing, and chest pain. Should air quality exceed the federal health standard, an Air Quality **Code Red Health Advisory** will be issued advising the following precautions:

- Children should reduce outdoor activities.
- Healthy individuals should limit strenuous outdoor work or exercise.
- Individuals with respiratory and heart ailments, emphysema, asthma, or chronic bronchitis should limit their outdoor activities. If breathing becomes difficult, move indoors.

**Prevention Tips:** About 60-70% of pollutants that cause ground-level ozone are created from vehicles, lawnmowers, other garden equipment, and common household products. In order to prevent high levels of ozone from forming, residents are strongly urged to:

- Limit driving and, when possible, combine errands.
- Use area bus and rail lines, or share a ride to work.
- Avoid mowing lawns with gasoline-powered mowers.
- Refuel vehicles after dusk.

**Forecast Updates:** MDE provides the daily air quality conditions and next-day forecast at 3:30 p.m. during the summer ozone season. For more information, call the Air Quality Hotline at (410) 537-3247 or visit <http://www.mde.state.md.us/arma> on the Internet.



[www.mde.state.md.us](http://www.mde.state.md.us)

**CLEAN AIR PARTNERS™**

[www.cleanairpartners.net](http://www.cleanairpartners.net)

## Survey says....

*By : Lizz Rogers, Northrop Grumman*

This year, the Clean Air Partners piloted a new tool to use, the Ozone Action Day Employee Survey. The survey was designed by Northrop Grumman and hosted as a web page by Chesapeake Computer Technology. The purpose of the survey is to gather information from an employee's perspective on notification of a Code Red Ozone Action Day. The information could then be used by the employer to improve their Ozone Action Day plans. This information is also important to Clean Air Partners, as it provides a gauge in how our message is getting across.

The survey is e-mailed the day of a forecasted Code Red Ozone Action Day and this year it has been deployed 5 times. Nearly 1200 responses have been received and are currently being analyzed. From the first episode back of June 11 th, 2002, the following statistics have been learned:

- 94.69% reporting knowing it was a "Code Red, Bad Air Alert, or OAD" day.
- 87.97% reporting hearing the "Code Red, Bad Air Alert, or OAD" phrase from their employer.
- 69.38% reported that they had been asked by their employer to reduce ozone by change in activities.
- 42.03% had altered their normal routine to reduce air pollution.
- Less than 10% use mass transit, carpool, or telecommute on a regular basis.
- The most significant reason for change was because of the air quality.

The survey can be found at: <http://www.ccomt.com/OAD/oadsurvey.asp>.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Clean Air Partners

**Description:**

Clean Air Partners is a volunteer, nonprofit, public-private partnership chartered by the Metropolitan Washington Council of Governments (MWCOC) and the Baltimore Metropolitan Council (BMC) and will be expanded to include Washington County. The Partnership seeks to improve health and the quality of life in the region by educating the public to take voluntary action to reduce ground-level ozone and to reduce exposure to ozone. It will build and broaden awareness of how individuals contribute to air pollution while informing them about the adverse effects of ground level ozone.

Transportation grants from the District of Columbia, MDOT, VDOT, and grants from private sector partners and MWCOC fund the operation. BMC, MDE and private sector partners contribute large amounts of in kind services

**Documentation:**

- Work Program Book 2004, MDE

**Summary of Results:**

Voluntary Program – no credit taken.

<p><b>Washington County Early Action Compact</b>          Review of Transportation Emissions Reduction Measures (TERMs)          HIGHWAY – VMT and Trip Reduction Measures</p>
--

**TERM:** Commuter Bus Service

**Description:**

Commuter Bus Service from Hagerstown to the Shady Grove Metro Station.

**Documentation:**

- Maryland Transit Administration (Bus Route No. 991).
- Commuter Connections, State of the Commute 2001, LDA Consulting.

**Assumptions:**

- We will assume an average ridership of 20 passengers per bus per route-trip. This assumption is consistent with data received.
- The distance between Hagerstown (MVA) and Shady Grove Metro Station is 51 miles. We are using 20 miles traveled within Washington County to calculate the transportation and emission benefits for Washington County only.
- Distance from home to Park and Ride Lot is 5 miles.
- For transit riders, the mode split for alternative mode from home to meeting place is as follows:

Walk	39.3%
Pick up at home	16.4%
Drive SOV to meeting point	23.6%
Bus / transit	10.6%
Vanpool driver	9.0%
Other	1.1%

October 16, 2001, LDA Consulting.

- We are going to discount the transportation and emission benefits already calculated for MVA Park and Ride lot by considering only the walk access mode for total trips saved.

**Calculations:**

Total trips = 20 riders/bus/route-trip \* 4 buses \* 2 route-trips = 160 trips  
 Total trips saved = 160 \* 0.393 = 63 trips

To calculate VMT:

VMT1 = 160 \* (0.393 + 0.164 + 0.106 + 0.011) \* 20 = 160 \* 0.674 \* 20 = 2157 miles  
 VMT2 = 160 \* (0.236 + 0.09) \* (20-5) = 160 \* 0.326 \* 15 = 782 miles  
 Total VMT saved = 2157 + 782 = 2,939 miles

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**Summary of Results:**

VT Benefit: -63 trips  
VMT Benefit: -2,939 miles

*Emission Benefits:*  
VOC -1.65 kg/day  
NOx -1.75 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat. ID	County	Description	Yr. Compl.	VEHICLE		BUS VMT	Vehicle Emissions kg/day		
				VT	VMT		VOC	NOx	CO
EMO 8	Washington	Commuter Bus Service	2003	-63	-2,939	0	-1.65	-1.75	-21.96
Total impacts for all projects in this scenario: (kg/day)				-63	-2,939	0	-1.65	-1.75	-21.96
							0.00	0.00	-0.02

(tons/day)

### Emissions Only Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (In years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT

Total Change in work related VT

Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period

Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	21%	20%	20%
Midday	36%	36%	36%
PM	25%	25%	25%
Night	19%	19%	19%
	100%	100%	100%



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** County Commuter.

**Description:**

County Commuter operates nine fixed routes. Service is provided along the major corridors in the Hagerstown and surrounding areas.

**Documentation:**

- Washington County Transportation Development Plan, MTA, July 16, 2003.
- Census Transportation Planning Package 2000.
- Maryland Transit Administration.

**Assumptions:**

- Emissions are calculated using MAQONE.
- Analysis is made for each bus route separately.
- 80.6 % of the commuters are from SOV (CTPP 2000, Washington County)

**Calculations:**

See Attached spreadsheet.

Example: Valley Mall Route

VT= 179 \* 0.806 = 145 trips

VMT= 145 \* 7 = 1,012 miles

**Summary of Results:**

VT Benefit: -756 trips  
VMT Benefit: -6,183 miles

*Emission Benefits:*

VOC -5.30 kg/day  
NOx -4.19 kg/day



**Transportation and Emissions Impacts: Projects ordered by Project Type**

Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl	VEHICLE		BUS	Vehicle Emissions kg/day		
					VI	VMT		VOC	NOx	CO
EMO	11	Washington	County Commuter	2003	-756	-6,183	0	-5.30	-4.19	-62.30
Total impacts for all projects in this scenario: (kg/day)					-756	-6,183	0	-5.30	-4.19	-62.30
								-0.01	0.00	-0.07

(tons/day)

### Emissions Only Analysis

Project ID:  County:  Area Type:  PPMS#:   
 Location:  Completion Year:

**Cost Benefit Analysis**  
 Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT:   
 Total Change in work related VT:   
 Total Change in non-work related VT:

**Distributions by time period (must equal 100%)**

Time period:  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	21%	21%	21%
Midday	15%	6%	15%
PM	21%	25%	25%
Night	19%	19%	19%
	100%	100%	100%

Analysis    Data    Conversion    Defaults    Traffic Flow

County Commuter

sov factor  
0.806

	Service Name	Total Boarding	Vehicle Revenue Hours	Average Person/hour	No. Hours of Service	Average Trips/day	SOV Trips/day	Route Distance miles	VMT	
1	Valley Mall	85,001	6,752	13	14.25	179	145	7	1,012	
2	Long Meadow	35,334	3,479	10	15	152	123	8	982	
3	Robinwood	31,367	3,060	10	12	123	99	8	793	
4	Smithsburg	6,329	1,483	4	5	21	17	13	224	
5	Funkstown	32,739	1,944	17	6.5	109	88	8	706	
6	Salem Ave./West End	33,974	1,816	19	6	112	90	6	543	
7	Williamsport	31,190	3,632	9	12	103	83	11	914	
8	Maugansville	26,047	3,448	8	12.5	94	76	11	837	
9	Prime Outlets	3,197	768	4	10.25	43	34	5	172	
<b>TOTAL</b>							<b>756</b>	<b>6,183</b>		

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Turning Point

**Description:**

Turning Point provides specialized curb to curb transportation for eligible persons with disabilities who are not able to access regular fixed route transit service.

**Documentation:**

- Washington County Coordination Plan, MTA, July 16, 2003.
- Washington County Transportation Department "County Commuter" web site.

**Assumptions:**

- When data is not available we are assuming a minimum of 4 riders /day /bus.
- By the nature of the service, one rider is making 1 trip.

**Calculations:**

From Table 2-3 Human Service Agency Vehicle Utilization Table, Washington County Coordination Plan, the usual number of trips / day are:

$$VT = 4+4+4+6+4+18+18 = 58 \text{ trips}$$

Multiplying trips by one-way trip length:

$$VMT = 4*17+4*7+4*5+6*14+4*49+18*12+18*4=684 \text{ VMT}$$

**Summary of Results:**

VT Benefit: -58 trips  
VMT Benefit: -684 miles

*Emission Benefits:*

VOC -0.43 kg/day  
NOx -0.41 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	VMT		VOC	NOx	CO
EMO	7	Washington	Turning Point - Transit	2003	-58	-684	0	-0.43	-0.41	-4.92
Total impacts for all projects in this scenario: (kg/day)					-58	-684	0	-0.43	-0.41	-4.92
								0.00	0.00	-0.01

(tons/day)

### Emissions Only Analysis

Project ID  County  Area Type  PPMS#   
Location  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT   
Total Change in work related VT   
Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	20%	10%	20%
Midday	16%	16%	35%
PM	26%	26%	26%
Night	10%	10%	10%
	100%	100%	100%

Buttons: [Back] [Home] [Print] [Default] [Refresh]



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** E-government / E-commerce

**Description:**

Trips reduced or eliminated by using on-line services from MVA (Motor Vehicle Administration) website and Washington County's programs such as IVR (Interactive Voice Response) system and the proposed Permits Plus program which will allow the inspectors to work from their homes/trucks without the need for them to come into the office everyday.

**Documentation:**

- The MVA website offers a number of services online.
- Information received from Washington County's Information Technology Department.

**Assumptions:**

- The MVA website provides a number of services online such as registration renewal, VEIP extension, title replacements, driving records, change of address, etc. MVA has only one office location in Washington County. The website eliminates the need for trips to the MVA office and allows anyone with access to a computer to carry out these tasks from a computer.
- There is a web page for Washington County Government's On-line Services that includes real property data search, receive notification on job postings, subscribe to County E-mail lists, etc.
- Since December 1, 2003 the IVR system has been implemented to assist contractors/homeowners to schedule, cancel and check on status of inspections, check on the status of building permits and obtain information via fax from the County. This system will not only cut down on the number of phone calls made to the inquiry department but also will cut down many trips made for routine inquiries.
- Assuming average non-work trip length of 5 miles.

**Calculations:**

Without data available, we calculated benefits for 100 users/day by 2007.

For 100 users/day:

VT = 100 \* 2 = 200 trips

VMT = 200 \* 5 = 1,000 miles

**Summary of Results:**

VT Benefit: -200 trips

VMT Benefit: -1,000 miles

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

*Emission Benefits:*

VOC	-1.59 kg/day
NOx	-0.31 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	YMT		VMT	VOC	NOx
EMO	13	Washington	E-government / E-commerce	2007	-1,000	-200	0	-1.59	-0.31	-4.68
Total impacts for all projects in this scenario: (kg/day)					-1,000	-200	0	-1.59	-0.31	-4.68
								0.00	0.00	-0.01

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

# Emissions Only Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT

Total Change in work related VT

Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

Trip Distributions

	VMT	Work	Non-work
AM	20%	0%	20%
Mtdday	16%	76%	36%
PM	20%	24%	25%
Night	44%	0%	19%
	100%	100%	100%



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** New Jobs Tax Credit

**Description:**

The new jobs tax credit program provides eligible companies with a six-year tax credit against County real and personal property taxes. The business must either expand or relocate its operations within Washington County. Transportation and emission benefits will be calculated by the reductions in trip length to work by employees working in Washington County instead of other county.

**Documentation:**

- Washington County website.
- Commuter Connections, State of the Commute 2001, LDA Consulting.

**Assumptions:**

- Assuming ranges of 10%, 20% and 30% of new jobs will be generated by the new jobs tax credit.
- These 10%, 20%, and 30% of employees will reduced their work trip length by 10 miles due to new jobs created in Washington County.
- 1600 jobs will be created in Washington County in 2004.

**Calculations:**

10% new jobs:

$$VT = 1600 * 0.10 * 2 = 320 \text{ trips}$$

$$VMT = 320 * 10 = 3,200 \text{ miles}$$

20% new jobs:

$$VT = 1600 * 0.20 * 2 = 640 \text{ trips}$$

$$VMT = 640 * 10 = 6,400 \text{ miles}$$

30% new jobs:

$$VT = 1600 * 0.30 * 2 = 960 \text{ trips}$$

$$VMT = 960 * 10 = 9,600 \text{ miles}$$

**Summary of Results:**

Reduction in trip length in 10% new jobs:

VT Benefit: 0 trips

VMT Benefit: -3,200 miles

*Emission Benefits:*

VOC -1.59 kg/day

NOx -1.85 kg/day

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

Reduction in trip length in 20% new jobs:

VT Benefit: 0 trips  
VMT Benefit: -6,400 miles

*Emission Benefits:*

VOC -3.18 kg/day  
NOx -3.70 kg/day

Reduction in trip length in 30% new jobs:

VT Benefit: 0 trips  
VMT Benefit: -9,600 miles

*Emission Benefits:*

VOC -4.77 kg/day  
NOx -5.55 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	YMT		VOC	NOx	CO
EMO	14	Washington	New jobs tax credit - 10%	2007	0	-3,200	0	-1.59	-1.85	-22.14
EMO	15	Washington	New jobs tax credit - 20%	2007	0	-6,400	0	-3.18	-3.70	-44.29
EMO	16	Washington	New jobs tax credit - 30%	2007	0	-9,600	0	-4.77	-5.55	-66.43
Total impacts for all projects in this scenario: (kg/day)					0	-19,200	0	-9.54	-11.11	-132.86
								-0.01	-0.01	-0.15

Total impacts for all projects in this scenario: (kg/day)  
 (tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

# Emissions Only Analysis

Project ID:  County:  Area Type:  PPMS#:

Description:  Completion Year:

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT:

Total Change in work related VT:

Total Change in non-work related VT:

**Distributions by time period (must equal 100%)**

Time period:  Peak  Off-Peak  Daily

	Trip Distributions	
	VMT	Work Non-work
AM	20%	20% 20%
Midday	16%	16% 31%
PM	24%	24% 25%
Night	40%	40% 19%
	100%	100% 100%

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- Summary

# Emissions Only Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT

Total Change in work related VT

Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	20%	20%	20%
Midday	30%	30%	30%
PM	20%	20%	20%
Night	30%	30%	30%
	100%	100%	100%



# Emissions Only Analysis

Project ID  County  Area Type  PPMIS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT

Total Change in work related VT

Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	20%	20%	20%
Midday	36%	36%	36%
PM	27%	27%	27%
Night	17%	17%	17%
	100%	100%	100%



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**TERM:** Growth Management Program – Hopewell Valley Promotion

**Description:**

Growth Management refers to policies that integrate transportation and land use decisions. Washington County has previously targeted investment to encourage economic development to occur in several primary areas within the Urban Growth Area, including Hopewell Valley, a moderate-heavy industrial area that has seen significant development, primarily low-tech in nature with emphasis on manufacturing, warehouse/distribution centers and freight transportation support facilities.

**Documentation:**

- Comprehensive Plan for the County 2002. Washington County, Maryland.
- Washington County website.
- Trip Generation, 6<sup>th</sup> edition. Institute of Transportation Engineers (ITE).

**Assumptions:**

- No data available.
- Trips length will be reduced by 10 miles due to growth management program.
- Ten percent of total trip generated/attracted by Hopewell Valley project will be considered to reduce trip length.
- Out of 912 acres of Hopewell Valley undeveloped land, 200 acres will be developed by 2007 using a growth management program.
- Weekday average vehicle trip ends is calculated using the weighted average trip generation rates from ITE. Number of Acres is the independent variable.
- A proposed scenario includes a mixed-used development consisting of 50 acres of offices, retail/commercial, 50 acres of housing, 50 acres of industrial park, 50 acres of general heavy industrial.

**Calculations:**

T = average vehicle trip ends.

T offices, retail/commercial (business park) =  $149.79 * 50 = 7,490$

T housing (residential planned unit development) =  $46.78 * 50 = 2,339$

T industrial park =  $63.11 * 50 = 3,156$

T general heavy industrial =  $6.75 * 50 = 338$

T total =  $7490+2339+3156+338 = 13,323$

VT =  $13323 * 2 = 26,646$  trips

VT considered reducing trip length by growth management program  
=  $26646 * 0.10 = 2,665$

VMT =  $2665 * 10 = 26,650$  miles

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – VMT and Trip Reduction Measures

**Summary of Results:**

VT Benefit: 0 trips  
VMT Benefit: -26,650 miles

*Emission Benefits:*  
VOC -13.24 kg/day  
NOx -15.42 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number: 1  
 Report Title: Washington County EAC  
 Analysis Year: 2,007  
 Region: Hagerstown  
 Mobile Version: Mobile 6

Cat.	ID	County	Description	Yr. Compl	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	VMT		VOC	NOx	CO
EMO	17	Washington	Growth Management - Hopewell Valley	2007	0	-26,650	0	-13.24	-15.42	-184.41
Total impacts for all projects in this scenario: (kg/day)										
					0	-26,650	0	-13.24	-15.42	-184.41
								-0.01	-0.02	-0.20

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

### Emissions Only Analysis

Project ID  County  Area Type  PPMS#   
Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Enter base transportation impact data for emissions analysis

Total Change in VMT   
Total Change in work related VT   
Total Change in non-work related VT

**Distributions by time period (must equal 100%)**

Time period  
 Peak  Off-Peak  Daily

**Trip Distributions**

	VMT	Work	Non-work
AM	20%	20%	20%
Midday	35%	35%	35%
PM	25%	25%	25%
Night	19%	19%	18%
	100%	100%	100%

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – Traffic Flow Improvements</p>
--

**TERM:** Signalization Improvements

**Description:**

This TERM includes computer-controlled system enhancement under construction and a signal re-optimization project.

**Documentation:**

- 2002 Highway Location Reference, Maryland State Highway Administration.

**Assumptions:**

- US 40 – Cleveland Av to Edgewood Dr computer controlled system, under construction, estimate completion 2003.
- MD 65 – Doub Way to Henry Douglas Dr, to be re-optimized in FY 2004.

**Calculations:**

Emission benefits are calculated using MAQONE's Arterial Improvement methodology.

**Summary of Results:**

VT Benefit:	0 trips
VMT Benefit:	0 miles

*Emission Benefits:*

VOC	-10.22 kg/day
NOx	-3.08 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		Vehicle Emissions kg/day		
					VT	VMT	VOC	NOx	CO
HI1	1	Washington	US 40 / Cleveland Ave to Edgewood Dr.	2007	0	0	-6.00	-1.81	-19.62
HI1	2	Washington	MD 65 / Doub Way to Henry Douglas Dr.	2007	0	0	-4.22	-1.27	-13.75
Total impacts for all projects in this scenario: (kg/day)					0	0	-10.22	-3.08	-33.37
							-0.01	0.00	-0.04

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

11/14/2008

### Arterial Improvements

Project ID  County  Area type  PPMS#

Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Initial Investment	18125	Initial Investment	18125
Annual Operating Cost	0	Annual Operating Cost	0
Service Life (Years)	35	Service Life (Years)	35
Number of Lanes	2	Number of Lanes	2
Volume (AADT)	18125	Volume (AADT)	18125
Initial Investment	18125	Initial Investment	18125
Annual Operating Cost	0	Annual Operating Cost	0
Service Life (Years)	35	Service Life (Years)	35
Number of Lanes	2	Number of Lanes	2
Volume (AADT)	18125	Volume (AADT)	18125

Submit    Delete    Cancel    Help    Home

### Arterial Improvements

Project ID  County  Area type  PPMS#

Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Number of Lanes 8	Number of Lanes 4	
0	0	
8	4	

**Favorable Progression**

Number of Lanes

- Lane
- Lane
- Lane
- Lane

[ Buttons: Back, Forward, Home, Print, Help ]

### Arterial Improvements

Project ID  County  Area type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Item	Yes	No
Interchange Improvements		
Partial Interchange (AV)		<input type="text" value="N"/>
Turns of Right Hand Interchange		<input type="text" value="D"/>
Winged Interchange (AV)		<input type="text" value="D"/>
Signalized Interchange (AV)		<input type="text" value="N"/>
Roundabout Interchange (AV)		<input type="text" value="N"/>
Grade Separation (AV)		<input type="text" value="N"/>
Grade Separation (AV)		<input type="text" value="N"/>
Grade Separation (AV)		<input type="text" value="N"/>

### Arterial Improvements

Project ID  County  Area type  PPMS#

Option  Completion Year

**Cost Benefit Analysis**  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Item	Value	Item	Value
Number of lanes	<input type="text" value="1"/>	Volume (veh/day)	<input type="text" value="10675"/>
Speed limit (mph)	<input type="text" value="35"/>	Number of lanes	<input type="text" value="D"/>
Number of lanes in use	<input type="text" value="1"/>	Annual road closure	<input type="text" value="123"/>
		Annual road closure	<input type="text" value="123"/>

### Arterial Improvements

Project ID  County  Area type  PPMS#

Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Arterial Improvements and Intersections

Arterial Improvements

Number of Signal Intersections	4	8
Number of T-intersections	0	0
Number of Roundabouts	4	8

Impact of this project on

- None
- Moderate
- Significant

Impact of this project on

- None
- Moderate
- Significant

**Favorable Progression**

Go Back    Next    Cancel    OK    Help

### Arterial Improvements

Project ID  County  Area type  PPMS#

Description  Completion Year

Cost Benefit Analysis

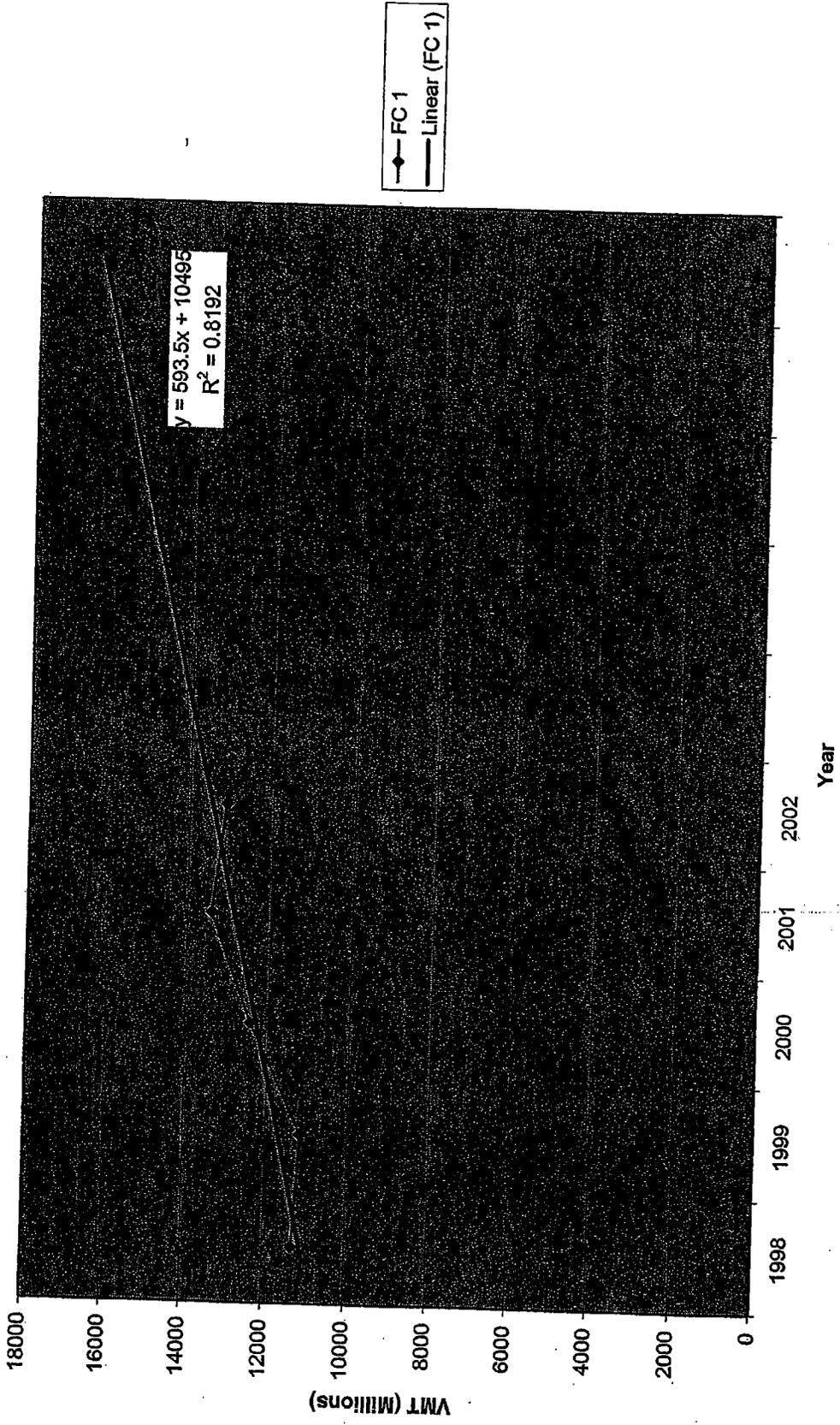
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Item	Value
Number of lanes added	N
Number of lanes removed	0
Number of lanes widened	0
Number of lanes narrowed	N
Number of lanes repaved	N
Number of lanes resurfaced	N
Number of lanes reconstructed	N

Washington County EAC  
Signalization Improvements

Data Used		AADT FOR ATR STATIONS: Station P0002						
Station\ Year	1998	1999	2000	2001	2002		Linear Trend 2007	R2
P0002	11284	11141	12418	13420	13112		16,429	0.8192
US 40 / Cleveland Ave of Edgewood Dr					18125	one way	22,711	
MD 65 / Doub Way to Henry Douglas Dr.					10675	one way	13,376	

# VMT of Travel By Functional Classification



Maryland State Highway Administration  
 Highway Information Services Division  
 AADT For All ATR Stations

Station	Historical Data - 10 Years										Percent Change		
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	1992/2002(%)	2001/2002(%)
P0001	7621	7880	7999	7979	8126	8202	8231	8111	8248	8364	8447	10.84	0.99
P0002	10063	10426	10752	10745	10899	10729	11284	11141	12418	13420	13112	30.30	-2.30
P0003	2414	2494	2497	2568	2615	2669	0	0	2753	3063	3183	31.86	3.92
P0004	64349	66712	68507	69834	71929	73417	75629	0	0	0	0	0.00	0.00
P0005	33827	35460	36801	37493	37103	37608	38138	38869	38637	41709	0	0.00	0.00
P0006	39390	40185	41195	41692	42026	42116	43967	43688	45228	46903	47920	21.66	2.17
P0007	37041	38591	40317	42339	42562	44061	47350	0	0	0	0	0.00	0.00
P0008	1856	1940	1978	2096	2099	2281	2404	2589	2613	2706	2834	52.69	4.73
P0009	30073	31033	31413	32592	33181	34002	34863	35802	36141	36632	37834	25.81	3.28
P0010	5629	5643	5750	5860	5913	6174	6288	6326	6633	6746	6929	23.09	2.71
P0011	20804	20639	20427	20378	24083	20770	21329	21563	21948	21505	21996	5.73	2.28
P0012	20319	20368	19659	19192	19356	19210	19610	17341	0	0	0	0.00	0.00
P0013	23579	24802	26051	26877	25503	25586	25269	26231	26534	27096	26939	14.25	-0.58
P0014	12431	12954	13655	13694	13024	12502	13212	14055	14216	15176	15415	24.00	1.57
P0015	5282	5257	5239	5208	5003	5206	5459	5352	5176	5228	5351	1.31	2.35
P0016	14838	15574	15656	15990	16550	16766	18691	16679	18001	18653	19035	28.29	2.05
P0017	18060	18805	19430	20380	20713	21308	21308	25215	23072	21760	23213	28.53	6.68
P0018	25364	24597	26660	25299	24911	25426	23856	24752	24374	24782	25652	1.14	3.51
P0019	14367	15068	15383	15874	15995	16542	14390	18010	19299	20867	21836	51.99	4.64
P0020	21136	21193	21166	21571	21164	19861	10413	0	0	0	0	0.00	0.00
P0021	42094	44123	44940	46728	47704	47569	52868	53539	54540	56120	0	0.00	0.00
P0022	23468	24180	25154	26015	25966	26380	27562	28276	29102	32846	0	0.00	0.00
P0023	23718	26066	27721	28630	30212	30150	31295	30017	0	0	0	0.00	0.00
P0024	52236	53850	0	28630	84500	0	67497	74221	76256	79134	79880	0.00	0.00
P0025	61782	58951	57985	64045	65889	69533	67972	78946	81253	83955	0	52.92	0.94
P0026	13145	13563	13513	13828	13960	14172	14316	13736	13292	13562	13810	0.00	0.00
P0027	42213	43949	44402	46539	47584	48876	50352	50121	50219	56215	57156	5.06	1.83
P0028	10592	11272	11607	12436	12909	14179	15119	15250	15126	15899	16401	35.40	1.67
P0029	40087	46271	48014	52086	55719	54935	52137	57086	60009	59293	0	54.84	3.16
P0030	28941	29809	31850	32972	33897	35222	34627	36858	37742	39635	41176	0.00	0.00
P0031	168208	177023	178696	183134	188650	192555	196200	0	0	0	0	42.28	3.89
P0032	161429	166362	166226	0	0	0	0	187862	176305	175812	176007	0.00	0.00
P0033	13209	14136	14223	14611	14837	14867	15777	16236	17263	17458	18242	9.03	0.11
P0034	119717	115104	114306	118257	120680	123178	119540	117953	116441	121825	0	38.10	4.49
P0035	7300	7892	7972	8232	8693	8922	9008	9177	7590	9772	10500	0.00	0.00
P0036	12991	13649	13993	14288	14270	15151	15249	15800	16312	16793	17663	43.84	7.45
P0037	16306	16499	16780	17230	16730	17323	18209	18521	18792	19526	19996	35.96	5.18
P0038	42998	41525	41572	40260	43587	58479	61294	66996	66878	70273	72253	22.63	2.41
P0039	138257	149271	155654	158938	163279	179457	171139	175920	188440	194847	196895	68.04	2.82
P0040	177330	189266	195309	199996	200671	205559	205595	197537	203988	210162	211242	42.41	1.05
P0041	178164	186429	189702	196458	198833	193642	194000	203999	198089	206841	0	16.10	0.51
P0042	57237	56977	56329	56482	60176	61421	48246	57046	57188	59500	59915	4.68	4.42
P0043	152366	157555	157423	167373	172324	165213	182167	178745	170891	0	0	0.00	0.00

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – Traffic Flow Improvements</p>
--

**TERM:** Incident Management / Intelligent Transportation Systems (ITS)  
[Highway Advisory Radio – 3 locations]

**Description:**

From CHART ITS devices, only Highway Advisory Radio (HAR) is being used or will be used in Washington County before 2007.

**Documentation:**

- 2002 Highway Location Reference, Maryland State Highway Administration
- Atlantic City Expressway – DVRPC CMAQ Analysis, Feb 2003.

**Assumptions:**

- Locations with HAR are I-70 @ South Mountain Rest Area, US 522 @ I-70 (Hancock), and I-81 @ US 11 (Williamsport).
- Average Incidents per day in both directions of the 44 mile expressway = 20 (for Atlantic City Expressway – DVRPC CMAQ Analysis). For 10 miles it is used 5 incidents/day.
- Average accidents per day in both directions of the 44 mile expressway = 0.43 (for Atlantic City Expressway – DVRPC CMAQ Analysis). For 10 miles it is used 0.11 accidents/day.
- 2002 AADT were projected to year 2007 based on historical data.

**Calculations:**

Emission benefits are calculated using MAQONE's Incident Management methodology.

**Summary of Results:**

VT Benefit:	0 trips
VMT Benefit:	231 miles

*Emission Benefits:*

VOC	-17.59 kg/day
NOx	-7.99 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE VT	YMT	BUS VMT	Vehicle Emissions kg/day VOC	NOx	CO
ITS	1	Washington	Highway Advisory Radio (HAR) 1	2007	0	98	0	-3.39	-0.90	-6.37
ITS	2	Washington	Highway Advisory Radio (HAR) 2	2007	0	52	0	-10.19	-5.01	-40.09
ITS	3	Washington	Highway Advisory Radio (HAR) 3	2007	0	81	0	-4.01	-2.08	-14.78
Total impacts for all projects in this scenario: (kg/day)					0	231	0	-17.59	-7.99	-61.24
								-0.02	-0.01	-0.07

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

# Incident Management

Project ID:  County:  Area Type:  PPMS#:   
Description:  Completion Year:

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

**I-70 @ South Mountain Rest Area**

- Summary
- Details
- How to Use
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- Home

# Incident Management

Project ID:  County:  Area Type:  PPMS#:   
Description:  Completion Year:

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

**Project Details**

Project Name:  /day

Project Type:

Project Location:

Project Status:

Project Description:

Project Start Date:  Project End Date:  Project Duration:

Project ID:  Project Name:  Project Location:  Project Status:  Project Description:

# Incident Management

Project ID  County  Area Type  PPMS#   
Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Item	Quantity	Unit	Material
<b>Item 1: Incident Management Improvement</b>			
<input type="checkbox"/>			Item 1.1
<input type="checkbox"/>			Item 1.2
<input type="checkbox"/>			Item 1.3
<input type="checkbox"/>			Item 1.4
<input type="checkbox"/>			Item 1.5
<b>Item 2: Incident Response System</b>			
<input type="checkbox"/>			Item 2.1
<input type="checkbox"/>			Item 2.2
<input checked="" type="checkbox"/>			Item 2.3
<input type="checkbox"/>			Item 2.4

### Incident Management

Project ID  County  Area Type  PPMS#   
Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Field Name	Value
Location	I-70 @ US 522 (Hancock)
Length (miles)	10
Width (feet)	20765
Number of lanes	2
Speed limit (mph)	60
Designation	D
Access	RD
Access Type	Freeway

# Incident Management

Project ID  County  Area Type  PPMS#   
Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

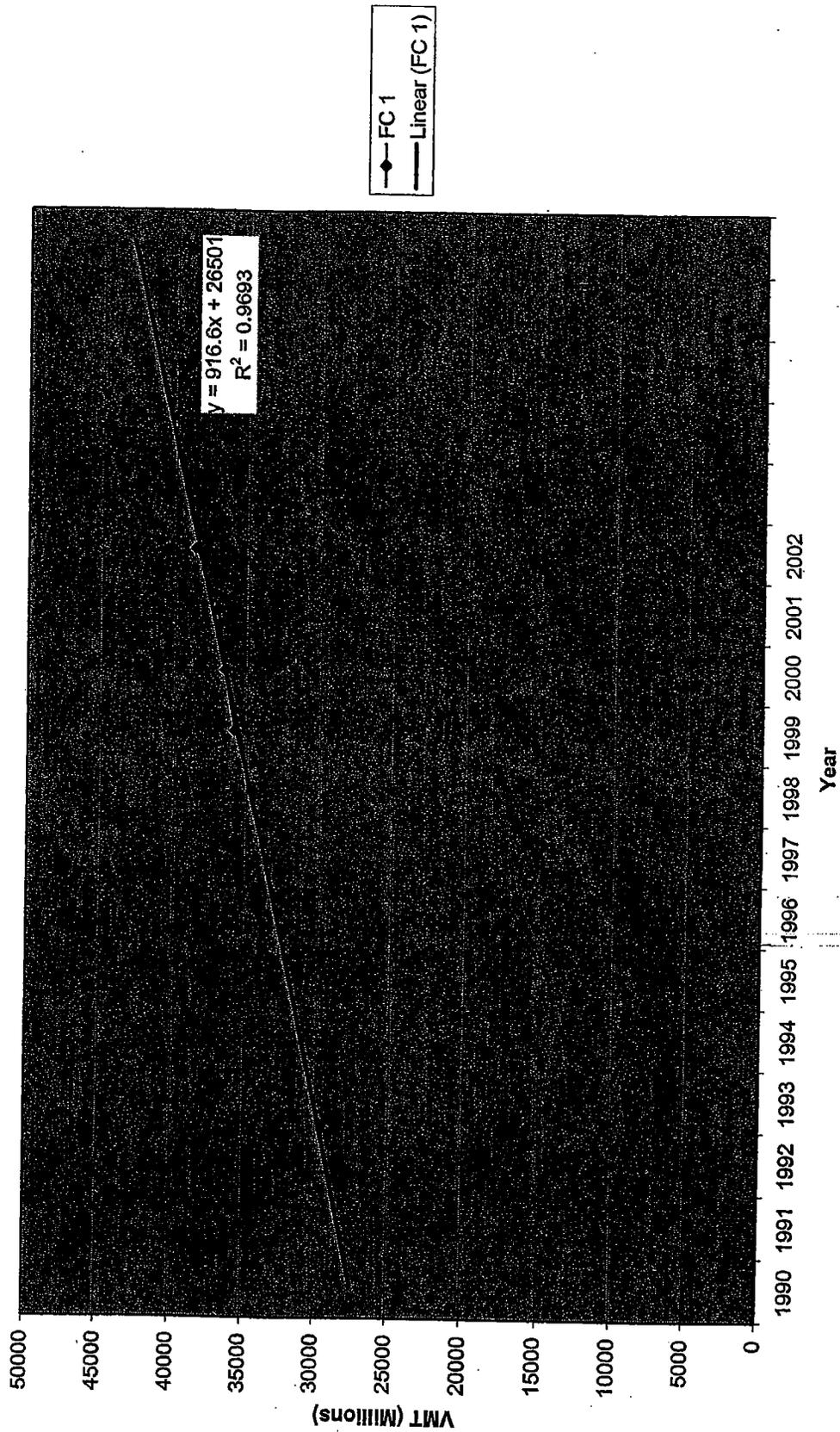
Field Name	Value
Location	I-81 @ US 11 (Williamsport)
Length (Miles)	10
Number of Lanes	28164
Number of Lanes in Use	2
Speed Limit (MPH)	50
Direction of Travel	D
Group Name	102
Group Type	Arterial

Save Cancel Print Copy to Clipboard Print to PDF

Washington County EAC  
Incident Management

Data Used	AADT FOR ATR STATIONS: Station P0045						Linear Trend 2007	R2
	1998	1999	2000	2001	2002			
P0045	34669	35895	36603	37107	38646		43,000	0.9693
I-70 @ South Mountain Rest Area					32187	one way	35,813	
I-70 @ US 522					18662	one way	20,765	
I-81 @ US 11					25312	one way	28,164	

# VMT of Travel By Functional Classification



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – Vehicle Acquisitions

**TERM:** On-Road Vehicle Replacements – Fleet Replacement (2 vehicles)

**Description:**

Purchase of 2 Pickups that are programmed and budgeted for Fiscal Years 2005.

**Documentation:**

- Maryland State Highway Administration.

**Assumptions:**

- New Low Emission Vehicles (LEV) will replace old ones.
- MAQONE is used to calculate emission benefits.

**Calculations:**

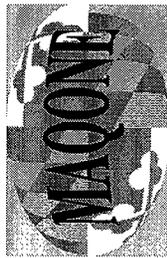
In 2005, SHA will replace two pickups (MY 1999,2000).

**Summary of Results:**

VT Benefit: -0 trips  
VMT Benefit: -0 miles

*Emission Benefits:*

VOC -0.01 kg/day  
NOx -0.01 kg/day  
CO -0.19 kg/day



**Transportation and Emissions Impacts: Projects ordered by Project Type**

Report ID Number 1  
 Report Title Washington County EAC - Bus Replacements  
 Analysis Year 2007  
 Region Hagerstown  
 Mobile Version Mobile 6.2

Cat	ID	County	Description	Yr. Compl 2005	VEHICLE		BUS		Vehicle Emissions kg/day		Cost Effectiveness Ratio (\$/kg)			
					VT	VMT	VMT	VMT	VOC	NOx	CO	Total	VOC	NOx
ATV	1	Washington	Fleet Replacement 2005	0	0	0	0	0	-0.01	-0.01	-0.19			

Total impacts for all projects in this scenario: (kg/day)  
 (tons/day)

## Advanced Technology Vehicles

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

**Retired Fleet Information:**

Check box to use default ages.

Age of Retired Veh	# of Passenger Cars Retired	# of Light Duty Trucks Retired
3	<input type="text" value="0"/>	<input type="text" value="0"/>
4	<input type="text" value="0"/>	<input type="text" value="0"/>
5	<input type="text" value="0"/>	<input type="text" value="1"/>
6	<input type="text" value="0"/>	<input type="text" value="1"/>
7	<input type="text" value="0"/>	<input type="text" value="0"/>
8	<input type="text" value="0"/>	<input type="text" value="0"/>
<b>Total =</b>	<b>0</b>	<b>2</b>

+      =      2

**Replacement Fleet Information:**

Replacement Vehicle Type	Replaced # of Vehicles
<input type="text" value="LEV Type Vehicles"/>	<input type="text" value="2"/>
<input type="text" value=""/>	<input type="text" value="0"/>
<input type="text" value=""/>	<input type="text" value="0"/>
<b>Total =</b>	<b>2</b>

Annualization Factor (days)   
 Annual Average Miles/Veh   
 Average Speed (mph)   
 Total Daily Current Fleet miles/day

Annualization Factor (days)   
 Annual Average Miles/Veh   
 Average Speed (mph)   
 Total Daily Future Fleet miles/day

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – Vehicle Acquisitions</p>
---

**TERM:** On-Road Vehicle Replacements – Bus Replacement (6 vehicles)

**Description:**

Purchase of 6 buses programmed and budgeted for Fiscal Years 2003 through 2005.

**Documentation:**

- Washington County Transportation Development Plan, MTA, July 16, 2003.
- Maryland Transit Administration.

**Assumptions:**

- New diesel buses will replaced old ones.
- MAQONE will be used to calculate the emissions benefits.

**Calculations:**

Turning Point:

In 2003, Turning Point received one replacement vehicle.

County Commuter:

In 2004, two replacement vehicles; 2005 three replacements are scheduled.

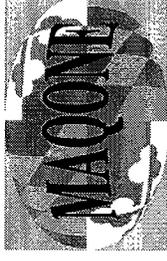
**Summary of Results:**

VT Benefit: 0 trips  
VMT Benefit: 0 miles

*Emission Benefits:*

VOC 0.02 kg/day  
NOx -13.6 kg/day (*reduction*)  
CO 0.01 kg /day

# Transportation and Emissions Impacts: Projects ordered by Project Type



Report ID Number: 1  
 Report Title: Washington County EAC - Bus Replacements  
 Analysis Year: 2007  
 Region: Hagerstown  
 Mobile Version: Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		BUS VMT	Vehicle Emissions kg/day			Cost Effectiveness Ratio (\$/kg)		
					VT	VMT		VOC	NOx	CO	Total	VOC	NOx
TR7	1	Washington	Bus Replacement 2003	2003	0	0	0	0.00	-0.82	0.00	N/A	N/A	N/A
TR7	2	Washington	Bus Replacement 2004	2004	0	0	0	0.01	-5.11	0.00	N/A	N/A	N/A
TR7	3	Washington	Bus Replacement 2005	2005	0	0	0	0.01	-7.67	0.01	N/A	N/A	N/A
Total impacts for all projects in this scenario: (kg/day)					0	0	0	0.02	-13.60	0.01			
								0.00	-0.01	0.00			

(tons/day)

## Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Annualization Factor (days) =

Associated Transit Agency:

### Retired Buses

### Replacement Buses

Bus Model Year

Bus Model Year

Number of Buses

Number of Buses

Fuel Type -- Assume Diesel

Fuel Type

Annual Vehicle Revenue Miles per Bus

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Average Bus Speed (mph)

Deadhead Factor

Deadhead Factor

### Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Annualization Factor (days) =

Associated Transit Agency:

#### Retired Buses

#### Replacement Buses

Bus Model Year

Bus Model Year

Number of Buses

Number of Buses

Fuel Type -- Assume Diesel

Fuel Type

Annual Vehicle Revenue Miles per Bus

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Average Bus Speed (mph)

Deadhead Factor

Deadhead Factor

## Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Annualization Factor (days) =

**Associated Transit Agency:**

### Retired Buses

Bus Model Year

Number of Buses

Fuel Type -- Assume Diesel

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor

### Replacement Buses

Bus Model Year

Number of Buses

Fuel Type

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor

[Add New](#)

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<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) HIGHWAY – Vehicle Acquisitions</p>
---

**TERM:** On-Road Vehicle Replacements – Installation of Emissions Reduction Devices on Engine Re-build Buses.

**Description:**

This project seeks to help fund the installation of emissions reduction devices on 6 engine re-build buses that are programmed and budgeted for Fiscal Years 2003 through 2005.

**Documentation:**

- Washington County Transportation Development Plan, MTA, July 16, 2003.
- Maryland Transit Administration.
- Environmental Protection Agency.

**Assumptions:**

- The EPA has certified the proposed Englehard DPX system to eliminate 60% of HC's and CO emissions, with no benefit to NOX emissions. Using MAQONE, the emissions of the buses without the system installed were calculated, and 60% of the VOC emissions recorded as the benefit.

**Calculations:**

In 2003, County Commuter had three engines re-built.  
In 2004, County Commuter has three engines re-build scheduled.

Calculated emissions without the devices:

VOC=2.49 kg/day

NOx=26.93 kg/day

Benefits of installing the emission reduction devices:

VOC=2.49 \* 0.60 = -1.49 kg/day

NOx= 26.93 \* 0 = 0.00 kg/day

**Summary of Results:**

VT Benefit: 0 trips

VMT Benefit: 0 miles

*Emission Benefits:*

VOC -1.49 kg/day

NOx 0.00 kg/day

CO -13.98 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat.	ID	County	Description	Yr. Compl.	VEHICLE		Vehicle Emissions kg/day		
					VT	VMT	VOC	NOx	CO
TR7	4	Washington	Engine re-build 2003/2004	2004	0	0	2.49	26.93	13.98
Total impacts for all projects in this scenario: (kg/day)					0	0	2.49	26.93	13.98
							0.00	0.03	0.02

(tons/day)

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

# Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Annualization Factor (days) =  
**Retired Buses**

Bus Model Year   
Number of Buses   
Fuel Type - Assume Diesel  
Annual Vehicle Revenue Miles per Bus   
Average Bus Speed (mph)   
Deadhead Factor

Associated Trans Agency

**Replacement Buses**

Bus Model Year   
Number of Buses   
Fuel Type   
Annual Vehicle Revenue Miles per Bus   
Average Bus Speed (mph)   
Deadhead Factor

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – State Control Measures

**TERM:** Vehicle Emissions Inspection Program (VEIP) [OBD, IM240]

**Description:**

This program requires inspection of vehicle emission systems every two years and repair of vehicles that fail to meet emissions standards.

**Documentation:**

- Maryland State Highway Administration, HPMS reports.

**Assumptions:**

- Highway Program Monitoring System data is used as input.

**Calculations:**

The emission benefits were calculated with MOBILE6 in tons/day (tpd).

I/M:

VOC =  $-0.53 \text{ tpd} * 907.1858 = -480.81 \text{ kg/day}$

NOx =  $-0.62 \text{ tpd} * 907.1858 = -562.46 \text{ kg/day}$

**Summary of Results:**

*I/M Emission Benefits:*

VOC -480.81 kg/day

NOx -562.46 kg/day

2007	VMT	Speed mph	Voc tpd	Nox tpd	Emissions Benefits	
Base	6,454,810	40.3	4.04	8.60		
RFG	6,454,810	40.3	4.78	8.65	-0.74	-0.05
NLEV	6,454,810	40.3	4.13	8.71	-0.09	-0.11
Tier2	6,454,810	40.3	4.90	11.71	-0.86	-3.11
HDE std	6,454,810	40.3	4.04	8.79	0.00	-0.19

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
AREA SOURCES – OTC Programs

**TERM:** OTC Programs [CP, AIM & PFC]

**Description:**

Ozone Transport Commission programs to achieve emission reductions of VOC includes Consumer Products (CP), Architectural & Industrial Maintenance (AIM), and Portable Fuel Containers (PFC).

1. Consumer Products (CP): Beginning in January 2005, the rule will establish limits, expressed as percent VOC by weight, upon the concentration of VOCs contained in approximately 80 categories and subcategories of consumer products.
2. Architectural and Industrial Maintenance (AIM): The rule sets specific VOC content limits (in grams/liter) for 46 AIM coating categories. It requires compliance with the limits by January 1, 2005. In most cases, these limits are more stringent than existing Federal AIM rules.
3. Portable Fuel Containers (PFC): The regulation applies to new gas cans and spouts sold in Maryland starting January 1, 2003. The rule applies to any person or entity that sells, supplies, offers for sale, or manufactures for sale gas cans and/or spouts; and is intended to reduce VOC emissions from storage, transport, and refueling activities.

**Documentation:**

- Table IV-4: "County Assignments for Analyzing Emission Reduction Benefits from within 100 km of NAA" (p.45), Pechan.
- "Other OTC Counties Emission Reduction", data spreadsheet from Pechan.
- "OTC\_PFC", data spreadsheet from Pechan.
- MDE, Facts About - COMAR 26.11.32: Control of Volatile Organic Compounds from Consumer Products.
- MDE, Facts About - Draft - COMAR 26.11.XX: Control of Volatile Organic Compounds from Architectural Coatings
- MDE, Facts About - New Regulations for Portable Gas Cans and Gas Can Spouts

**Assumptions:**

- Data received from Pechan & MDE.

**Calculations:**

CP:

VOC = -0.12 tpd \* 907.1858 = -108.86 kg/day

NOx = 0.00

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
AREA SOURCES – OTC Programs

AIM:

VOC = -92.1793 kg/day

NOx = 0.00

PFC:

VOC = 0.06 tpd \* 907.1858 = -54.43 kg/day

NOx = 0.00

**Summary of Results:**

*CP Emission Benefits:*

VOC -108.86 kg/day

NOx 0.00 kg/day

*AIM Emission Benefits:*

VOC -92.18 kg/day

NOx 0.00 kg/day

*PFC Emission Benefits:*

VOC -54.43 kg/day

NOx 0.00 kg/day

County Name	State/County FIPs	SCC	SCC Description	2002 Emissions (tpd)	2002 Emissions (kg/day)	Reductions (kg/day)	% Control
Kent	24029	2401002000	AIM (solvent based)	0.047887091	43.44243629	13.4672	31.00%
Queen Annes Washington	24035	2401002000	AIM (solvent based)	0.104585915	94.87874157	29.4124	31.00%
Kent	24043	2401002000	AIM (solvent based)	0.327774967	297.3524347	<del>92.1793</del>	31.00%
Queen Annes Washington	24029	2465000000	Commercial & Consumer Products	0.18968189	172.0765088	27.2152	15.82%
Kent	24035	2465000000	Commercial & Consumer Products	0.41426726	375.8169202	54.4305	14.48%
Queen Annes Washington	24043	2465000000	Commercial & Consumer Products	1.298324329	1177.819967	<u>108.8600</u>	9.24%
Queen Annes Washington	24029	2401008000	Traffic Markings	0.020214603	18.33837838		
Queen Annes Washington	24035	2401008000	Traffic Markings	0.021910134	19.87653865		
Queen Annes Washington	24043	2401008000	Traffic Markings	0.038021028	34.49209491	26.2800	76.19%

As received from MDE on 3/10/2004

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
AREA SOURCES – Low Emissions Paint

**TERM:** Low Emissions Paint

**Description:**  
Use of low emissions paint will reduce VOC emissions for all line-striping paint used in Washington County.

- Assumptions:**
- Line-striping paint used for Washington County on an average:
    - White Paint usage/year = 19,450 gallons
    - Yellow Paint usage/year = 13,225 gallons
  - Emissions benefits per liter of pavement marking paint:
    - White Paint = 82 grams of VOC per liter
    - Yellow Paint = 71 grams of VOC per liter

**Calculations:**  
VOC emissions reduced due to usage of low emissions white paint = 19,450 gallons \* 3.785 liters \* 82 grams = 6,036,697 grams of VOC reduced

VOC emissions reduced due to usage of low emissions yellow paint = 13,225 gallons \* 3.785 liters \* 71 grams = 3,554,020 grams of VOC reduced

Total annual VOC benefit = 9,590,717 gms/year  
Total daily VOC benefit = 26,276 gms/day = 26.28 kg/day

**Summary of Results:**

*Emission Benefits:*  
VOC - 26.28 kg/day  
NOx - 0 kg/day

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) OFF-ROAD SOURCES – Vehicle Acquisitions</p>
--

**TERM:** Off-Road Vehicle Replacements - Landfill Vehicle Replacement

**Description:**

Two off-road heavy-duty vehicle replacements were replaced by Washington County in 2002 and one is scheduled to be replaced in 2004.

**Documentation:**

- Air Quality Control Report 2003-2004, Washington County Solid Waste Department.
- A 1998 Dozer was replaced by a 2002 model year.
- A 1994 Compactor was replaced by a 2002 model year Compactor Series 2.
- A Tractor Mower is scheduled to be replaced in 2004. Replacement vehicle is not yet chosen.

**Assumptions:**

- The Dozer usage will be approximately 9235 hours/year and will cost \$254,631.
- The Compactor usage will be approximately 9607 hours/year and will cost \$447,685.
- The Tractor mower usage will be approximately 138 hours/year and will cost \$35,272.

**Calculations:**

It is difficult to calculate the emissions difference between the old vehicle and the new vehicle. The benefits will be very low due to the small number of vehicles replaced and the low usage of the vehicles per day.

**Summary of Results:**

*Emission Benefits:*

Credit not taken, as it is unquantifiable



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
STATIONARY SOURCES – RACT

**TERM:** RACT Controls

**Description:**

Washington County sources subject to RACT:

- R. Paul Smith/Allegheny Energy

**Documentation:**

- Data received from MDE.
- RACT credit can only be taken for post-1999 controls.

**Calculations:**

VOC Reduction kg/day 0.00  
NOx Reduction kg/day = - (528/365) \* 907.185  
= -1312.31 kg/day

**Summary of Results:**

*Emission Benefits:*

VOC 0.00 kg/day  
NOx -1312.31 kg/day

## WASHINGTON COUNTY SOURCE REDUCTIONS

Name	Emission Reductions Tons /Year		Applicable Regulations
	VOC	NOx	
Amcor/Stevens	60		Installed oxidizer on plastic flexographic printing
Cushwa Brick			No applicable regulation
Fil-Tec	60		Oxidizer on fabric coating
Fleetwood	10		Miscellaneous metal coating
Garden State Tanning	45		
Engineered Polymer	30		Scrubber on resin manufacturing
Mack Truck	30	20	Miscellaneous metal coating
Phoenix Color	40		Complied with sheet fed lithographic printing
R. Paul Smith		528	Low NOx Burner and Over Fire Air
Rayloc	10		Complied with brake shoe VOC limit
Rust Oleum	5		Paint regulations
St. Lawrence Cement		846	Automated temperature control and tire injection
Xerexes	90		Fiberglass manufacturing- reduced styrene content

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – Federal Control Measures

**TERM:** NLEV, Tier II, HDE Standard

**Description:**

- Under the National Low Emission Vehicle (NLEV) program auto manufacturers have agreed to comply with tailpipe standards that are more stringent than EPA can mandate prior to model year 2004. The NLEV program was instituted by the OTC states in 2001. Maryland opted into the program in 1999, two years prior to the OTC adoption.
- Tier II program includes more protective tailpipe emissions standards for all passenger vehicles, and lower standards for sulfur in gasoline. Tailpipe standards are set at an average standard of .07 grams per mile for NOx for all classes of passenger vehicles beginning in 2004. Vehicles weighing less than 6,000 pounds will be phased-in to this standard between 2004 and 2007. Beginning in 2004, the nation's refiners and importers of gasoline will have the flexibility to manufacture gasoline with a range of sulfur levels as long as all of their production is capped at 300 ppm. By 2006, refiners will meet a 30 ppm average sulfur level with a maximum cap of 80 ppm.
- Heavy-Duty Engine and Vehicle Standards (HDE) is a comprehensive national control program that will regulate the heavy-duty vehicle and its fuel as a single system. A PM emissions standard of .01 grams per brake-horsepower-hour for new heavy-duty engines is scheduled to take full effect in the 2007 model year. In addition, refiners will be required to start producing diesel fuel for use in highway vehicles with a sulfur content of no more than 15 ppm, beginning on June 1, 2006.

**Documentation:**

- Maryland State Highway Administration, HPMS reports.
- Regulatory Announcement: Final Rule for the National Low Emission Vehicle Program. EPA420-F-97-047, December 1997.
- Regulatory Announcement: EPA's Program for Cleaner Vehicles and Cleaner Gasoline. EPA420-F-99-051, December 1999.
- Regulatory Announcement: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Content Requirements. EPA420-F-00-057, December 2000.

**Assumptions:**

- Highway Program Monitoring System data is used as input.

**Calculations:**

The emission benefits were calculated with MOBILE6 in tons/day (tpd).

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
HIGHWAY – Federal Control Measures

**NLEV:**

VOC = -0.09 tpd \* 907.1858 = -81.65 kg/day

NOx = -0.11 tpd \* 907.1858 = -99.79 kg/day

**Tier II:**

VOC = -0.86 tpd \* 907.1858 = -780.18 kg/day

NOx = -3.11 tpd \* 907.1858 = -2821.35 kg/day

**HDE Standard:**

VOC = 0.00 tpd \* 907.1858 = 0.00 kg/day

NOx = -0.19 tpd \* 907.1858 = -172.37 kg/day

**Summary of Results:**

*NLEV Emission Benefits:*

VOC -81.65 kg/day

NOx -99.79 kg/day

*Tier II Emission Benefits:*

VOC -780.18 kg/day

NOx -2,821.35 kg/day

*HDE Standard Emission Benefits:*

VOC 0.00 kg/day

NOx -172.37 kg/day

Hourly Percent of Traffic by Month - Weekday

July

FC Beginning Hour	Rural						Urban					
	1	2	6	7	8	9	11	12	14	16	17	19
0	1.19	0.76	0.76	0.76	0.76	0.76	1.31	0.91	0.91	0.91	0.91	0.91
1	0.84	0.46	0.46	0.46	0.46	0.46	0.90	0.52	0.52	0.52	0.52	0.52
2	0.71	0.39	0.39	0.39	0.39	0.39	0.73	0.40	0.40	0.40	0.40	0.40
3	0.75	0.41	0.41	0.41	0.41	0.41	0.72	0.42	0.42	0.42	0.42	0.42
4	1.16	0.87	0.87	0.87	0.87	0.87	1.15	0.96	0.96	0.96	0.96	0.96
5	2.86	2.22	2.22	2.22	2.22	2.22	2.84	3.16	3.16	3.16	3.16	3.16
6	4.96	4.24	4.24	4.24	4.24	4.24	5.07	5.45	5.45	5.45	5.45	5.45
7	6.03	5.65	5.65	5.65	5.65	5.65	6.49	6.44	6.44	6.44	6.44	6.44
8	5.81	5.18	5.18	5.18	5.18	5.18	6.22	5.73	5.73	5.73	5.73	5.73
9	5.11	4.98	4.98	4.98	4.98	4.98	5.23	4.69	4.69	4.69	4.69	4.69
10	5.11	5.29	5.29	5.29	5.29	5.29	4.97	4.54	4.54	4.54	4.54	4.54
11	5.28	5.68	5.68	5.68	5.68	5.68	5.14	4.85	4.85	4.85	4.85	4.85
12	5.39	6.03	6.03	6.03	6.03	6.03	5.36	5.21	5.21	5.21	5.21	5.21
13	5.52	6.08	6.08	6.08	6.08	6.08	5.37	5.33	5.33	5.33	5.33	5.33
14	6.12	6.43	6.43	6.43	6.43	6.43	5.88	5.97	5.97	5.97	5.97	5.97
15	6.77	7.20	7.20	7.20	7.20	7.20	6.51	7.01	7.01	7.01	7.01	7.01
16	7.21	7.87	7.87	7.87	7.87	7.87	6.73	7.72	7.72	7.72	7.72	7.72
17	7.13	7.85	7.85	7.85	7.85	7.85	6.78	7.81	7.81	7.81	7.81	7.81
18	6.01	6.26	6.26	6.26	6.26	6.26	5.75	6.35	6.35	6.35	6.35	6.35
19	4.67	4.83	4.83	4.83	4.83	4.83	4.55	4.86	4.86	4.86	4.86	4.86
20	3.78	4.10	4.10	4.10	4.10	4.10	3.84	3.93	3.93	3.93	3.93	3.93
21	3.25	3.35	3.35	3.35	3.35	3.35	3.42	3.39	3.39	3.39	3.39	3.39
22	2.51	2.34	2.34	2.34	2.34	2.34	2.90	2.56	2.56	2.56	2.56	2.56
23	1.83	1.53	1.53	1.53	1.53	1.53	2.14	1.79	1.79	1.79	1.79	1.79
	100	100	100	100	100	100	100	100	100	100	100	100

2007	VMT	Speed mph	Voc tpd	Nox tpd	Emissions Benefits	
Base	6,454,810	40.3	4.04	8.60		
RFG	6,454,810	40.3	4.78	8.65	-0.74	-0.05
I/M	6,454,810	40.3	4.57	9.22	-0.53	-0.62
NET					0.05	0.00
CO2					0.00	0.00
CO					0.00	0.00

**Millions of Annual Vehicle Miles  
Washington County - All Systems**

FC Year	Rural						Urban						Grand Total		
	1	2	6	7	8	9	Total Rural	11	12	14	16	17		19	Total Urban
1997	645	19	141	131	32	88	1056	219	0	168	114	34	61	596	1652
1998	656	18	146	139	33	91	1083	239	0	171	114	38	62	624	1707
1999	678	21	158	148	40	91	1136	246	0	182	125	40	62	655	1791
2000	680	22	162	152	55	96	1167	242	0	184	124	42	64	656	1823
2001	694	23	162	155	56	100	1190	247	0	191	129	41	66	674	1864
2002	689	24	167	156	59	104	1199	250	0	187	136	46	68	687	1886
2007 Projection	746	30	195	185	93	119	1,367	278	0	214	157	55	74	779	2,146
Seasonal Factor (%AADT) 2007	115.07	105.6	105.6	105.6	105.6	105.6	---	108.12	107.85	107.85	107.85	107.85	107.85	---	---
Average July Summer Weekday	858	32	206	195	98	126	1,514	301	0	231	169	60	80	840	2,355
Functional Classification Codes															
Rural	Urban														
1 Interstate	11 Interstate														
2 Other Principal Arterial	12 Other Freeway & Expressway														
6 Minor Arterial	14 Other Principal Arterial														
7 Major Collector	16 Minor Arterial														
8 Minor Collector	17 Collector														
9 Local	19 Local														



**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
**OFF-ROAD SOURCES – PHASE I & II ENGINE STANDARDS**

**TERM:** Phase I & II Engine Standards

**Description:**

Phase I emission standards for nonroad, handheld and nonhandheld engines operating at or below 19 kW took effect in model year 1997. Phase II standards for nonroad, nonhandheld Class I and II engines operating at or below 19 kW will be phased in beginning in model year 2002 and will be complete by 2007. A 30% reduction in VOC emissions is expected by 2005.

**Documentation:**

- Control of Air Pollution; Emission For New Nonroad Spark-ignition Engines at or Below 19 Kilowatts; Final Rule. 40 CFR Parts 9 and 90.
- Phase 2 Emission Standards for New Nonroad Spark-Ignition Nonhandheld Engines At or Below 19 Kilowatts; Final Rule. 40 CFR Part 90.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
OFF-ROAD SOURCES – ENGINE STANDARDS FOR DIESEL POWERED ENGINES

**TERM:** Engine Standards for Diesel Powered Engines

**Description:**

A three-tiered process, beginning in 1996 and continuing through 2008, will increase emissions standards for nonroad diesel powered engines used for a variety of purposes such as construction & agriculture. A 25% reduction in NOx emissions is expected by 2005.

**Documentation:**

- Regulatory Announcement: New Emission Standards for Nonroad Diesel Engines. EPA420-F-98-034.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
OFF-ROAD SOURCES – Engine Standards for Gasoline Powered Marine Engines

**TERM:** Engine Standards for Gasoline Powered Marine Engines

**Description:**

Outboard engine standards began in 1998 and will be phased in through 2006. Inboard standards were set in 2000. Auxiliary Marine engines that operate at less than 25hp were subject to emission standards beginning in 1997. A second phase of emission standards for these engines will be phased in between 2001 and 2005. Auxiliary engines that operate above 25hp will need to meet the requirements for the same size land-based nonroad spark-ignition engines. A 25% reduction in VOC emissions is expected by 2005.

**Documentation:**

- Technical Highlights: Organization of Gasoline and Diesel Marine Engine Emission Standards. EPA420-F-99-046.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
OFF-ROAD SOURCES – Engine Standards for Large Gasoline Powered Engines

**TERM:** Engine Standards for Large Gasoline Powered Engines

**Description:**

A two-tiered standard with Tier 1 beginning in 2004 and Tier 2 beginning in 2007. These standards will regulate nonroad gasoline powered engines rated over 19kW. A 20% reduction in both VOC and NOx emissions is expected by 2005.

**Documentation:**

- Regulatory Announcement: Emission Standards for New Nonroad Engines. EPA420-F-02-037.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
**OFF-ROAD SOURCES – ENGINE STANDARDS FOR LOCOMOTIVE ENGINES**

**TERM:** Engine Standards for Locomotive Engines

**Description:**

A three-tiered emission standard for new or remanufactured locomotive engines. A 30% reduction of both VOC and NOx emissions is expected by 2005.

**Documentation:**

- Regulatory Announcement: Final Emissions Standards for Locomotives. EPA420-F-97-048.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
STATIONARY SOURCES – NOx SIP Call

**TERM:** NOx SIP Call

**Description:**

This federal rule and state regulation will be implemented to further reduce NOx emissions from major NOx sources. In Maryland these regulations affect electric generators, paper mills, cement plants, and large internal combustion engines located at natural gas pumping stations. Under these regulations, the NOx control systems are to be installed by 2003 to meet a NOx emissions budget established by EPA by 2007. This phase III NOx reduction program is projected to reduce NOx emissions by 23 percent from 1995 levels.

**Documentation:**

- MDE Technical Support Document: COMAR 26.11.29, NOx Reduction and Trading Program and COMAR 26.11.30, Policies and Procedures Relating to the NOx Reduction and Trading Program.

**Calculations:**

Calculations were not performed, as benefits were difficult to quantify.

**Summary of Results:**

*Emission Benefits:*

Credit is not taken.

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Government MOU

**TERM:** Government Memo of Understanding

**Description:**

A government Memo of Understanding (MOU) can be used to encourage flextime work schedules for employees in the county. Incentives can also be offered to employers who agree to voluntarily adjust work schedules in order to reduce peak travel.

**Documentation:**

- The compressed work week methodology in MAQONE Ver 3.5 was used to analyze the benefits from the project. MAQONE uses MOBILE6.2 to estimate the emission benefits.

**Assumptions:**

- A voluntary program to encourage alternate work schedules will be implemented throughout the county.
- Promoting agency level of efforts are assumed to be “low”.
- Default county employment, market share for work trips and time period distributions were used.
- 10% of employers are assumed to be able to offer Alternate work schedules to their employees.
- Daily work trips per employee = 1.8

**Summary of Results:**

VT reduced            =     483 trips  
VMT reduced         =     6,757 miles

*Emission Benefits:*

VOC                    =     -4.57 kg/day  
NOx                    =     -4.24 kg/day

## Compressed Work Week - CWW

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Schedule Type

**Voluntary Employer Participation**

Promoting agency level of effort

**Only NEW employers REQUIRED to offer CWW**

Percent of all employers who are new

**ALL employers REQUIRED to offer CWW**

Percent employers actually participating

Percent of all employers able to offer CWW

Regional employment base

Daily work trips per employee

**Time Period Distribution (must equal 100%)**

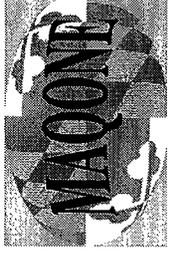
Time period	AM	50%
<input checked="" type="radio"/> Peak	Midday	0%
<input type="radio"/> Off-Peak	PM	50%
<input type="radio"/> Daily	Night	0%
		100%

**Market Share for work trips**

	Dist to Dest. (mi)	% Trips to Dest
<input checked="" type="checkbox"/> Baltimore	75.3	0%
<input checked="" type="checkbox"/> Washington, DC	77.9	1%
<input checked="" type="checkbox"/> Other1	13.29	99%
<input type="checkbox"/> Other2	0	0%
<input type="checkbox"/> Other3	0	0%
Must equal		100%
100%		

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.5



Report ID Number: 1  
 Report Title: Washington County EAC - Bus Replacements  
 Analysis Year: 2007  
 Region: Hagerstown  
 Mobile Version: Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		BUS	Vehicle Emissions kg/day			Cost Effectiveness Ratio (\$/kg)		
					VT	VMT		VOC	NOx	CO	Total	VOC	NOx
CW	1	Washington	Flexitime/Alt Work Schedule	2007	-483	-6,757	0	-4.57	-4.24	-50.80	N/A	N/A	N/A
Total impacts for all projects in this scenario: (kg/day) (tons/day)													
					-483	-6,757	0	-4.57	-4.24	-50.80			
								-0.01	0.00	-0.06			

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Fuel Programs

**TERM:** Fuel Programs

**Description:**

Fuel program options include reformulated gasoline (RFG) or low Reid vapor pressure (RVP) programs. Currently, both Washington DC and Baltimore areas mandate federal RFG. A low RVP program would be state regulated and would mandate low RVP of 7.8psi or 7.2psi for the summer ozone season. Both fuel options have significant emissions benefits, VOC and NOx for RFG and VOC for low RVP. The state and county could only select one fuel program from the two options.

**Documentation:**

- Countywide emission calculation process for different values of RVP and for using reformulated gasoline in the county.

**Assumptions:**

- 

**Summary of Results:**

*Emission Benefits:*

RVP 7.8

VOC	- 208.65 kg/day
NOx	- 18.14 kg/day

RVP 7.2

VOC	- 444.52 kg/day
NOx	- 27.22 kg/day

RFG

VOC	- 743.89 kg/day
NOx	- 36.29 kg/day

Benefits of implementing a low RVP program may range from 444.52 kg/day to 208.65 kg/day for VOC and may range between 27.22 kg/day to 18.14 kg/day for NOx.

## Washington County Early Action Compact

Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Diesel Vehicle Emission Controls

**TERM:** Diesel Vehicle Emission Controls

### **Description:**

Washington County will support state regulated diesel vehicle emissions controls. A large percentage of heavy-duty diesel trucks operate on the interstates and to local businesses in Washington County are not registered in the county or in Maryland. Therefore, any diesel controls will have to be regulated at the state or regional level. Possible diesel emission controls include:

- Vehicle idling policies/restrictions (Maryland currently has a 5 minute idling limit). There are 6 commercial truck stops with a total of 365 parking spaces and one rest area/welcome center in Washington county. Moreover, truck idling at warehouses, distribution centers, etc., during truck loading/unloading can also be targeted.
- Voluntary public outreach programs

Opacity Testing: Most of the recent activity is in the area of diesel emissions. Maryland has a diesel smoke inspection program that is conducted by the Maryland State Police. This random roadside smoke opacity test requires a failed vehicle to be repaired and retested within 30 days. The program is seeing about a 70 % improvement in smoke levels on failed vehicles that have been retested.

### **Documentation:**

- Guidance for quantifying and using long duration truck idling emissions reductions – US-EPA.
- Private source data on Travel Centers / Truck Stops

### **Assumptions:**

- Trucks idle 8 hours/day on an average and using truck idling reduction technologies or other methods this can be reduced.
- Assume a 50% utilization of commercial truck stops parking spaces.
- Rest area truck parking spaces = 15

### **Calculations:**

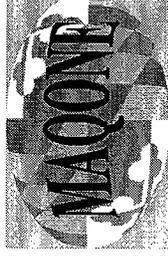
- Total Truck stops/Rest areas parking spaces = 380
- Average utilization = 50% - 25%
- Average hours of idling reduced per truck per day = 8
- Total Truck idling hours reduced per day =  $380 \times 8 \times 0.5 = 1520$
- Total Truck idling hours reduced per day =  $380 \times 8 \times 0.25 = 760$

### **Summary of Results:**

#### *Emission Benefits:*

VOC:	- 6.48 kg/day	to	- 3.24 kg/day
NOx:	- 205.20 kg/day	to	- 102.60 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type



Report ID Number 1  
 Report Title Washington County EAC - Bus Replacements  
 Analysis Year 2007  
 Region Hagerstown  
 Mobile Version Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		Vehicle Emissions kg/day		Cost Effectiveness Ratio (\$/kg)			
					VT	VMT	VOC	NOx	CO	Total	VOC	NOx
TTR	2	Washington	Washington EAC - Truck Idling Redn	2007	0	0	-3.24	-102.60	-27.90	N/A	N/A	N/A
Total impacts for all projects in this scenario: (kg/day) (tons/day)												
					0	0	-3.24	-102.60	-27.90			
							0.00	-0.11	-0.03			

## Truck Idling Reduction Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Total Parking Spaces at the Truck Stop

Total Truck Idling Hours Per Day

Utilization Factor (Default = 75%)

Average Truck Idling Time (Default = 8 hrs)

[Add New](#)

[Delete](#)

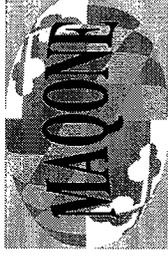
[Copy to New](#)

[Defaults](#)

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# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.5



Report ID Number 1  
 Report Title Washington County EAC - Bus Replacements  
 Analysis Year 2007  
 Region Hagerstown  
 Mobile Version Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		BUS	Vehicle Emissions kg/day			Cost Effectiveness Ratio (\$/kg)		
					VT	VMT		VOC	NOx	CO	Total	VOC	NOx
TIR	1	Washington	Washington EAC - Truck Idling Redn	2007	0	0	0	-6.48	-205.20	-55.80	N/A	N/A	N/A
Total impacts for all projects in this scenario: (kg/day)													
(tons/day)													
0      0      0      -6.48      -205.20      -55.80													
-0.01      -0.23      -0.06													

Cost Effectiveness represents the \$ spent versus the Kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

## Truck Idling Reduction Analysis

Project ID  County  Area Type  PPMS#

Description  Completion Year

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Total Parking Spaces at the Truck Stop

Total Truck Idling Hours Per Day

Utilization Factor (Default = 75%)

Average Truck Idling Time (Default = 8 hrs)

# Washington County EAC - SIP

## Contingency Measures

### Truck Stops & Rest Areas in Washington County:

#	Truck Stop	City	Spaces
1	Big Pool AC&T	Big Pool	15
2	Sharpsburg Pike AC&T	Hagerstown	0
3	Pilot Travel Center #150	Hagerstown	100
4	AC&T Fuel Center	Hagerstown	170
5	Little Sandy's Hancock Truck Stop	Hancock	80
6	Williamsport Sunoco	Williamsport	0

Total Truck Stop Parking Spaces in Wash Co.: 365

#	Rest Areas	City	Spaces
1	Sideling Hill Interpretive Center	Sideling Hill Cut	15 <i>Assumed</i>

### Truck Loading/Unloading locations in Washington County:

Warehouses, distribution centers, and port terminals are key locations where truck idling related to loading and unloading occur on a regular basis.

<p style="text-align: center;"><b>Washington County Early Action Compact</b> Review of Transportation Emissions Reduction Measures (TERMs) CONTINGENCY MEASURES – Gas Can Replacement</p>
---

**TERM:** Gas Can Replacement

**Description:**

650 Old gas cans will be exchanged for new CARB compliant cans that are designed to prevent spillage and decrease evaporative emissions. In addition to reducing VOC emissions, these exchange programs also create public awareness. In an unprecedented public outreach and emission reduction effort, the Maryland Department of Transportation, partnered with the Maryland Department of Environment, and the Home Depot, exchanged 4,392 cans at 12 Home Depot locations across the D.C. nonattainment area of Maryland. In addition, 1,823 cans were exchanged during county household hazardous waste collection events. Similar programs can be easily implemented in Washington County.

**Documentation:**

- Environmental Protection Agency, "Draft NONROAD2002a Model," EPA Office of Transportation and Air Quality, Ann Arbor, MI, December 2002.
- California Air Resources Board, "Public Meeting to Consider Approval of California's Portable Gasoline-Container Emissions Inventory," Mailout MSC 99-25. Mobile Source Control Division, September 1999.
- U.S. Census Bureau, American Fact Finder, Accessed October 22, 2004, <http://factfinder.census.gov>

**Assumptions:**

- Approximately 1,000 cans were exchanged in Charles County during a combination of County run events (at Household Hazardous Waste events) and events held at a Home Depot location within the County in 2004.
- Approximately 550 cans were exchanged in Frederick County during a combination of County run events and events held at a Home Depot Location within the County in 2004.
- Washington County's population is comparable to that of Charles and Frederick County.

**Calculations:**

Emission benefits were calculated using methodologies obtained from California Air Resource Board's documentation and EPA's Draft NONROAD2002a Model.

**Summary of Results:**

Cans Exchanged:	650
VOC Benefit per Can:	.0063 kg/day

*Emission Benefits:*

VOC	-4.10 kg/day
-----	--------------

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Lawnmower Replacement

**TERM:** Lawnmower Replacement

**Description:**

100 old gasoline powered lawnmowers will be exchanged for new electric mowers, resulting in VOC and NOx benefits. Lawnmower exchanges have been a very popular and successful tool for raising public awareness as well as offering both VOC and NOx reductions. High polluting, old gasoline powered mowers are exchanged for electric mowers which have zero emissions. The Maryland Department of Transportation, partnered with MDE, Black & Decker and Home Depot, held a lawnmower exchange event for the D.C. nonattainment area in June of 2004. 662 gasoline-powered lawnmowers were replaced with electric mowers. MDE and MDOT, having sponsored successful events in the past, can provide logistical support for implementation in Washington County.

**Documentation:**

- Environmental Protection Agency, "Draft NONROAD2002a Model," EPA Office of Transportation and Air Quality, Ann Arbor, MI, December 2002.
- Environmental Protection Agency, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," NR-005b, December 2002.
- Environmental Protection Agency, "Final Regulatory Impact Analysis. Phase 2: Emission Standards for New Nonroad Nonhandheld Spark-Ignition Engines at or Below 19 kilowatts," March 1999.

**Assumptions:**

- Based on an exchange held in Prince George's County in 2004, it is assumed that 44% of the mowers exchanged will have 2-stroke engines.

**Calculations:**

Benefits were calculated using methodologies obtained from EPA documents list above.

**Summary of Results:**

*Emission Benefits:*

VOC: - 1.18 kg/day  
NOx: - 0.03 kg/day

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Traffic Flow Improvements

**TERM:** Incident Management / Intelligent Transportation Systems [CCTV – 2 locations & Dynamic Message Signs – 1 location]

**Description:**

From CHART ITS list of proposed devices, CCTV Camera and Dynamic Message Sign (DMS) are considered in Washington County by 2007.

**Documentation:**

- 2002 Highway Location Reference, Maryland State Highway Administration
- Atlantic City Expressway – DVRPC CMAQ Analysis, Feb 2003.

**Assumptions:**

- CCTV Camera Locations are I-70 @ I-81, and I-68 @ I-70.
- DMS location is I-70 (WB) @ I-68.
- Average Incidents per day in both directions of the 44 mile expressway = 20 (for Atlantic City Expressway – DVRPC CMAQ Analysis). For 10 miles it is used 5 incidents/day.
- Average accidents per day in both directions of the 44 mile expressway = 0.43 (for Atlantic City Expressway – DVRPC CMAQ Analysis). For 10 miles it is used 0.11 accidents/day.
- 2002 AADT were projected to year 2007 based on historical data.

**Calculations:**

Emission benefits are calculated using MAQONE's Incident Management methodology.

**Summary of Results:**

VT Benefit: 0 trips  
VMT Benefit: 155 miles

*Emission Benefits:*

VOC -19.86 kg/day  
NOx -8.97 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.2



Report ID Number 1  
 Report Title Washington County EAC  
 Analysis Year 2,007  
 Region Hagerstown  
 Mobile Version Mobile 6

Cat	ID	County	Description	Yr. Compl.	VEHICLE		BUS	Vehicle Emissions kg/day		
					VT	YMT		YMT	VOC	NOx
ITS	4	Washington	CCTV Camera FY07 - 1/2	2007	0	0	0	-4.48	-2.16	-16.08
ITS	5	Washington	CCTV Camera FY07 - 2/2	2007	0	0	0	-3.58	-1.03	-11.31
ITS	6	Washington	Dynamic Message Sign FY07 - 1/1	2007	0	155	0	-11.79	-5.78	-47.18
Total impacts for all projects in this scenario: (kg/day)										
					0	155	0	-19.86	-8.97	-74.57
								-0.02	-0.01	-0.08

(tons/day)

Cost Effectiveness represents the \$ spent versus the kg of emissions benefits (lower values represent higher levels of cost effectiveness; no benefit = N/A)

### Incident Management

Project ID  County  Area Type  PPMS#   
Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Section Name	<input type="text" value="I-70 @ I-81"/>
Section Number	<input type="text" value="10"/>
Section Code	<input type="text" value="27663"/>
Number of Lanes in Way (In miles)	<input type="text" value="2"/>
Speed (In miles per hour)	<input type="text" value="60"/>
Real Time Clock	<input type="text" value="D"/>
Control System	<input type="text" value="100"/>
Control System	<input type="text" value="Freeway"/>

# Incident Management

Project ID:  County:  Area Type:  PPMS#:   
Option:  Completion Year:

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Basic Information	Daily Incident Information	Incident Clearance Information
Number of cameras per day: <input type="text" value="/day"/>	Number of cameras per day: <input type="text" value="5"/>	Number of lanes: <input type="text" value="1 Lane"/>
Number of cameras per day: <input type="text" value="0.11"/>	Number of cameras per day: <input type="text" value="16"/>	Number of lanes: <input type="text" value="20%"/>
Number of cameras per day: <input type="text" value="Low"/>	Number of cameras per day: <input type="text" value="Low"/>	Number of lanes: <input type="text" value="Low"/>

Buttons: [Back] [Print] [Go to Top] [Search] [Home]



# Incident Management

Project ID  County  Area Type  PMS#   
Description  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Location	<input type="text" value="I-68 @ I-70"/>
Countdown	<input type="text" value="10"/>
Speed Limit (mph)	<input type="text" value="1363"/>
Number of Lanes	<input type="text" value="1"/>
Number of Lanes	<input type="text" value="35"/>
Number of Lanes	<input type="text" value="D"/>
Number of Lanes	<input type="text" value="10"/>
Number of Lanes	<input type="text" value="Arterial"/>

# Incident Management

Project ID  County  Area Type  PPMS#   
Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Days/Week	<input type="text" value="/day"/>	Number of Lanes	<input type="text" value="1 Lane"/>
Days/Year	<input type="text" value="5"/>	Estimated Annual Cost	<input type="text" value="20%"/>
Days/Year	<input type="text" value="0.11"/>	Estimated Annual Cost	<input type="text" value="20%"/>
Area	<input type="text" value="Low"/>	Area	<input type="text" value="Low"/>
Area	<input type="text" value="Low"/>	Area	<input type="text" value="Low"/>

# Incident Management

Project ID  County  Area Type  PPM#   
Option  Completion Year

Cost Benefit Analysis

Capital Cost:  Service Life (In years):  Annual Operating Cost:

Incident Management

Level 1 Incident Management

Level 2 Incident Management

Level 3 Incident Management

Level 4 Incident Management

Level 5 Incident Management

Level 6 Incident Management

Level 7 Incident Management

Level 8 Incident Management

Level 9 Incident Management

Level 10 Incident Management

Level 11 Incident Management

Level 12 Incident Management

Level 13 Incident Management

Level 14 Incident Management

Level 15 Incident Management

Level 16 Incident Management

Level 17 Incident Management

Level 18 Incident Management

Level 19 Incident Management

Level 20 Incident Management

Level 21 Incident Management

Level 22 Incident Management

Level 23 Incident Management

Level 24 Incident Management

Level 25 Incident Management

Level 26 Incident Management

Level 27 Incident Management

Level 28 Incident Management

Level 29 Incident Management

Level 30 Incident Management

Level 31 Incident Management

Level 32 Incident Management

Level 33 Incident Management

Level 34 Incident Management

Level 35 Incident Management

Level 36 Incident Management

Level 37 Incident Management

Level 38 Incident Management

Level 39 Incident Management

Level 40 Incident Management

Level 41 Incident Management

Level 42 Incident Management

Level 43 Incident Management

Level 44 Incident Management

Level 45 Incident Management

Level 46 Incident Management

Level 47 Incident Management

Level 48 Incident Management

Level 49 Incident Management

Level 50 Incident Management

# Incident Management

Project ID  County  Area Type  PPMS#   
Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (In years):  Annual Operating Cost:

Project Location	Primary Incident Information	Incident Management Algorithm
Section Name	<input type="text" value="I-70 (WB) @ I-68"/>	
Section Length (Miles)	<input type="text" value="10"/>	
Section Length (Feet)	<input type="text" value="17371"/>	
Number of Lanes	<input type="text" value="2"/>	
Section Description	<input type="text" value="60"/>	
Section ID	<input type="text" value="D"/>	
Section Type	<input type="text" value="10"/>	
Section Class	<input type="text" value="Freeway"/>	



# Incident Management

Project ID  County  Area Type  PPMS#   
Option  Completion Year

Cost Benefit Analysis  
Capital Cost:  Service Life (in years):  Annual Operating Cost:

Project Details | Incident Information | Incident Management (Current)

System/Component Information

- Video
- Sign and Message
- Message Message Matrix
- Dynamic Message Matrix
- Dynamic Message Matrix

System/Component Information

- Video
- Sign and Message
- Message Message Matrix
- Dynamic Message Matrix

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Vehicle Acquisitions

**TERM:** On-Road Vehicle Replacements – Fleet Replacement (5 vehicles)

**Description:**

Purchase of 4 Pickups and one SUV that are programmed and budgeted for Fiscal Year 2007.

**Documentation:**

- Maryland State Highway Administration.

**Assumptions:**

- New Low Emission Vehicles (LEV) will replace old ones.
- MAQONE is used to calculate emission benefits.

**Calculations:**

In 2007, SHA will replace one SUV (2001), three pickups (1998, 2001, 2002) and one utility pickup (1994).

**Summary of Results:**

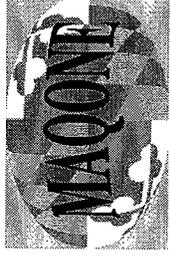
VT Benefit: -0 trips  
VMT Benefit: -0 miles

*Emission Benefits:*

VOC -0.08 kg/day  
NOx -0.07 kg/day  
CO -0.83 kg/day

# Transportation and Emissions Impacts: Projects ordered by Project Type

MAQONE Version 3.5



Report ID Number: 1  
 Report Title: Washington County EAC - Bus Replacements  
 Analysis Year: 2007  
 Region: Hagerstown  
 Mobile Version: Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		Vehicle Emissions kg/day		Cost Effectiveness Ratio (\$/kg)		
					VT	VMT	VOC	NOx	Total	VOC	NOx
ATV	2	Washington	Fleet Replacement 2007	2007	0	0	-0.08	-0.07	-0.83		

Total impacts for all projects in this scenario: (kg/day)  
 (tons/day)

0	0	-0.08	-0.07	-0.83
0	0	0.00	0.00	0.00

## Advanced Technology Vehicles

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

**Retired Fleet Information:**

Check box to use default ages.

Age of Retired Veh	# of Passenger Cars Retired	# of Light Duty Trucks Retired
5	<input type="text" value="0"/>	<input type="text" value="1"/>
6	<input type="text" value="1"/>	<input type="text" value="1"/>
7	<input type="text" value="0"/>	<input type="text" value="0"/>
8	<input type="text" value="0"/>	<input type="text" value="0"/>
9	<input type="text" value="0"/>	<input type="text" value="1"/>
<b>Total =</b>	<b>1</b>	<b>4</b>

+ = 5

Annualization Factor (days)   
 Annual Average Miles/Veh   
 Average Speed (mph)   
 Total Daily Current Fleet miles/day

**Replacement Fleet Information:**

Replacement Vehicle Type	Replaced # of Vehicles
<input type="text" value="LEV Type Vehicles"/>	<input type="text" value="5"/>
<input type="text"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>
<b>Total =</b>	<b>5</b>

Annualization Factor (days)   
 Annual Average Miles/Veh   
 Average Speed (mph)   
 Total Daily Future Fleet miles/day

**Washington County Early Action Compact**  
Review of Transportation Emissions Reduction Measures (TERMs)  
CONTINGENCY MEASURES – Vehicle Acquisitions

**TERM:** On-Road Vehicle Replacements – Bus Replacement (7 vehicles)

**Description:**

Purchase of 7 buses programmed and budgeted for Fiscal Years 2006 & 2007.

**Documentation:**

- Washington County Transportation Development Plan, MTA, July 16, 2003.
- Maryland Transit Administration.

**Assumptions:**

- New diesel buses will replaced old ones.
- MAQONE will be used to calculate the emissions benefits.

**Calculations:**

County Commuter:

Three bus replacements in 2006 and four in 2007 scheduled.

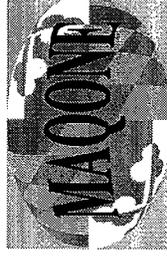
**Summary of Results:**

VT Benefit: 0 trips  
VMT Benefit: 0 miles

*Emission Benefits:*

VOC 0.03 kg/day  
NOx -21.67 kg/day  
CO -4.32 kg /day

# Transportation and Emissions Impacts: Projects ordered by Project Type



Report ID Number 1  
 Report Title Washington County EAC - Bus Replacements  
 Analysis Year 2007  
 Region Hagerstown  
 Mobile Version Mobile 6.2

Cat	ID	County	Description	Yr. Compl	VEHICLE		BUS VMT	Vehicle Emissions kg/day		Cost Effectiveness Ratio (\$/kg)			
					VT	YMT		VOC	NOx	CO	Total	VOC	NOx
TR7	4	Washington	Bus Replacement 2006	2006	0	0	0	0.01	-7.67	0.01	N/A	N/A	N/A
TR7	5	Washington	Bus Replacement 2007	2007	0	0	0	0.02	-14.00	-4.33	N/A	N/A	N/A
Total impacts for all projects in this scenario: (kg/day) (tons/day)								0.03	-21.67	-4.32			
								0.00	-0.02	0.00			

## Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

**Cost Benefit Analysis**

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Associated Transit Agency:

Annualization Factor (days) =

### Retired Buses

Bus Model Year

Number of Buses

Fuel Type -- Assume Diesel

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor

### Replacement Buses

Bus Model Year

Number of Buses

Fuel Type

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor

## Bus Replacements

Project ID  County  Area Type  PPMS#

Description  Completion Year (Purchase Year)

Cost Benefit Analysis

Capital Cost:  Service Life (in years):  Annual Operating Cost:

Annualization Factor (days) =

Associated Transit Agency:

### Retired Buses

Bus Model Year

Number of Buses

Fuel Type -- Assume Diesel

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor

### Replacement Buses

Bus Model Year

Number of Buses

Fuel Type

Annual Vehicle Revenue Miles per Bus

Average Bus Speed (mph)

Deadhead Factor