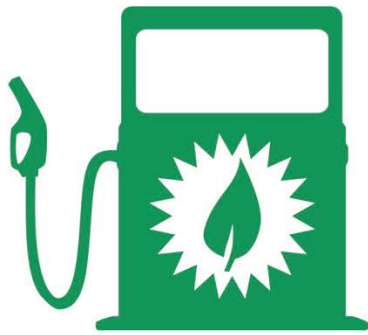




Mid-Atlantic Biofuel Infrastructure Partnership

2019 Project Completion Report



Prepared by Alleyn Harned, Virginia Clean Cities – August 15, 2019

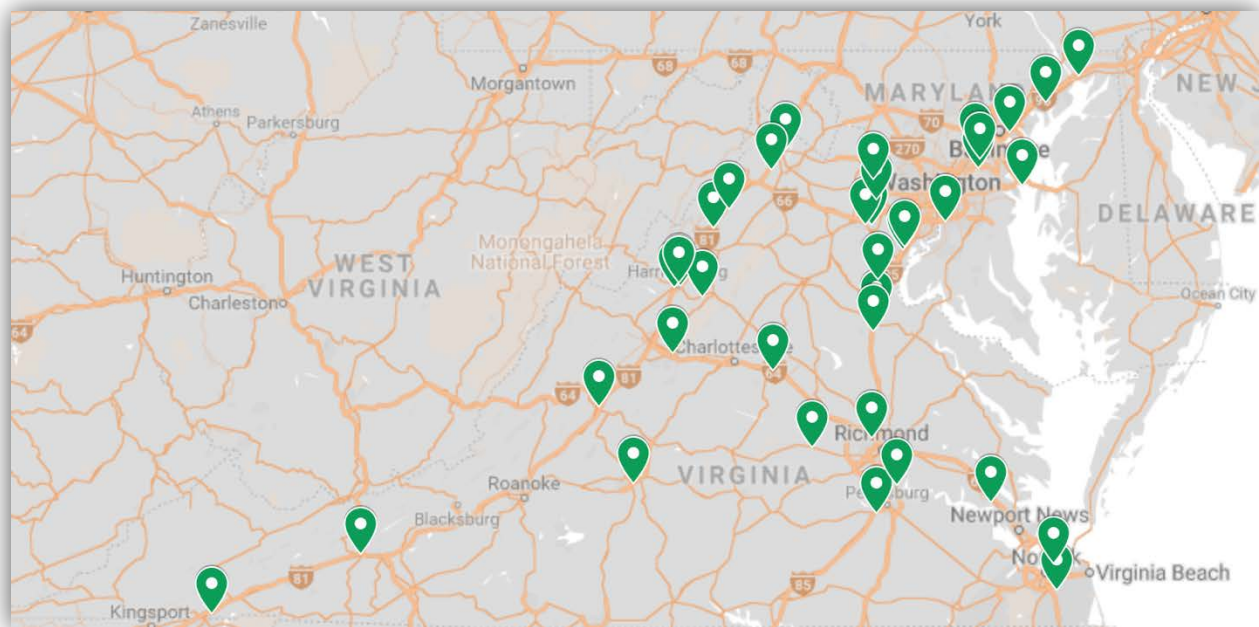
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Project Summary

In 2015, Virginia and Maryland responded to a funding opportunity from the U.S. Department of Agriculture (USDA) under the Biofuels Infrastructure Program to form a two-state, Mid-Atlantic Biofuels Infrastructure Partnership (BIP) to install biofuel fueling pumps at 40 fueling stations. The Virginia Department of Mines, Minerals and Energy (DMME) administered the Program with assistance of Virginia Clean Cities. Program partners included experienced retail partners, Protec Fuels and Sheetz, Inc.; U.S. Department of Energy-designated Clean Cities Coalitions from Virginia and Maryland; state agriculture and energy offices, grain associations, and other agricultural entities; along with private sector marketing and infrastructure concerns. Al Christopher of DMME served as the principal investigator, with staff support from Robin Jones and Barbara Simcoe; and Alleyn Harned and Chris Mueller of Virginia Clean Cities, managers of day-to-day project activities on behalf of the Commonwealth. Jill Hamilton of Sustainable Strategies, Incorporated, (SESI), led the marketing components of the project, primarily in Maryland.

This Program worked to transform the market, strategically placing ethanol fueling in sites expecting market growth, access, and increased use, and which would justify private sector investment. While 53 sites were identified in the proposal, 40 sites were ultimately completed, many with a larger number of pumps installed per site. [See the location map, below, and the detailed project station chart at the end of this report].



BIP project station sites (📍) as of December 31, 2018

Monthly biofuels sales at project close were 450,000 gallons of E85 and 525,000 gallons of E15, representing nearly 12 million gallons a year from the project sites. This is a win for Virginia and Maryland farmers, as it results from nearly 2 million bushels of corn. The E85 emissions reductions were 12,000 tons of carbon dioxide, with per-gallon emissions improvements expected to triple over the next decade, as compared to gasoline. Program results will continue to be collected through 2022, as to fuel use and other metrics.

The BIP Program began in 2015 with agreements between DMME, USDA, and other partners. Marketing partners began their outreach, while fueling partners worked to identify stations and prepare environmental documentation for each site. Once environmental documents were reviewed and approved by the USDA Farm Services Administration, station construction began.

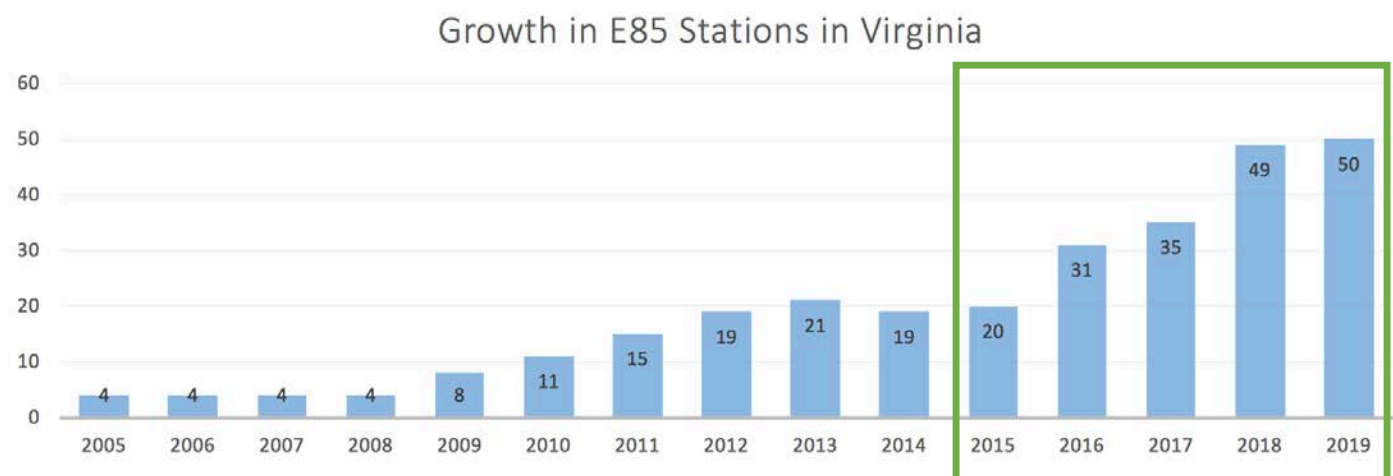
As stations were completed and became operational, these were visually audited and eligible to request reimbursement of grant funds. Federal grant funds supported the costs of dispensers and tanks. Non-Federal match funds were used for dispensers, tanks, other installation costs, administration, and marketing. Marketing efforts produced considerable additional consumer awareness of the fuel.

The total BIP project cost was \$8,942,994.92. The Federal portion, \$4,716,501.46 in USDA funds, was spent towards the construction of 188 ethanol dispensers at 40 fueling stations. A cost match of \$4,226,493.46 was contributed by project partners. Additional stations that were advanced through BIP partnerships beyond this project are not included in these figures.

Station Expansion: New Project Stations and Virginia Impact

The BIP project has been a success. This significant expansion in E15 fueling is a major milestone for the Commonwealth. It has enabled wider consumer fuel choices, expanding the availability of ethanol for most gasoline vehicles and presenting benefits that will be felt in the Commonwealth and Maryland for years to come. At project start, there was only one E15-capable station (a Navy facility primed to pump fuel at a later date), and now numerous project sites have E15 fueling technology which is compatible with more than 80% of vehicles in the Region.

Every year, Virginia tracks the number of clean fuel stations, and during the 2015-2018 project period, the number of stations in Commonwealth more than doubled, as can be seen, below.



During the construction phase of the project, individual stations were visited and audited, and allowed the project management team to build a portfolio of images for the project. Following are some of these photographs.

Station Images



It was possible to achieve a cost savings over gasoline. This fuel price marquee sign shows Sheetz retailing E85 at a lower cost than regular 87 octane E10 gasoline.



E85 Flex Fuel Dispenser at a Harris Teeter station with ethanol and octane information



E85+E15 Blender Pump at a Sheetz station



Educational flier introducing the fuel at this pump at a Sheetz station



E15 fueling – good for 2001 or newer vehicles



Retailers like Sheetz installed E15 and E85 on nearly all pumps, allowing consumers to pull up anywhere for biofuel rather than having to find a specific dispenser



E85 available yard sign announcing fuel



Royal Farms pricing signs showing Flex Fuel and E15 “Unleaded 88” pricing – low priced biofuels set stations apart with clean domestic option



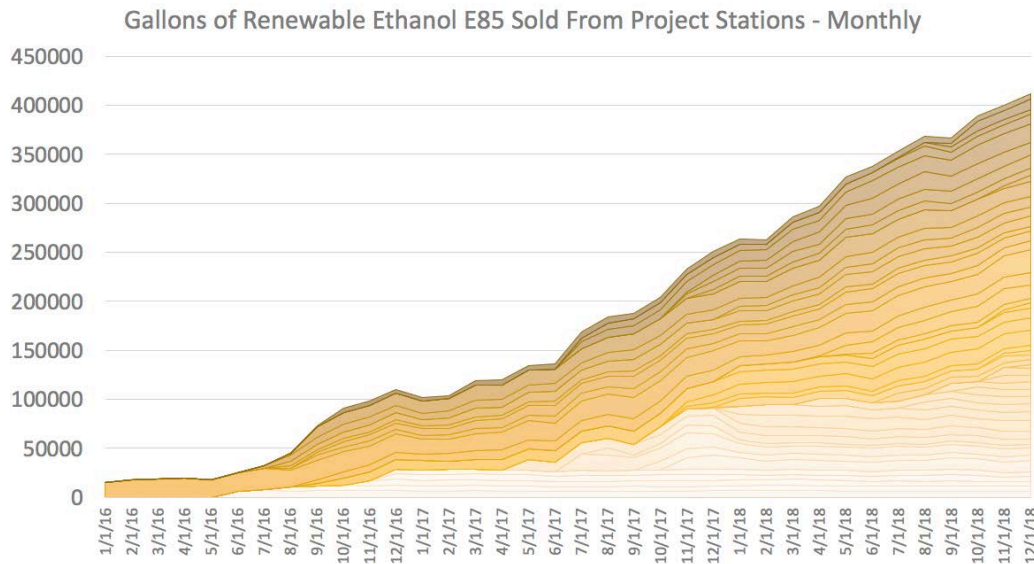
E85 announcement with temporary sign



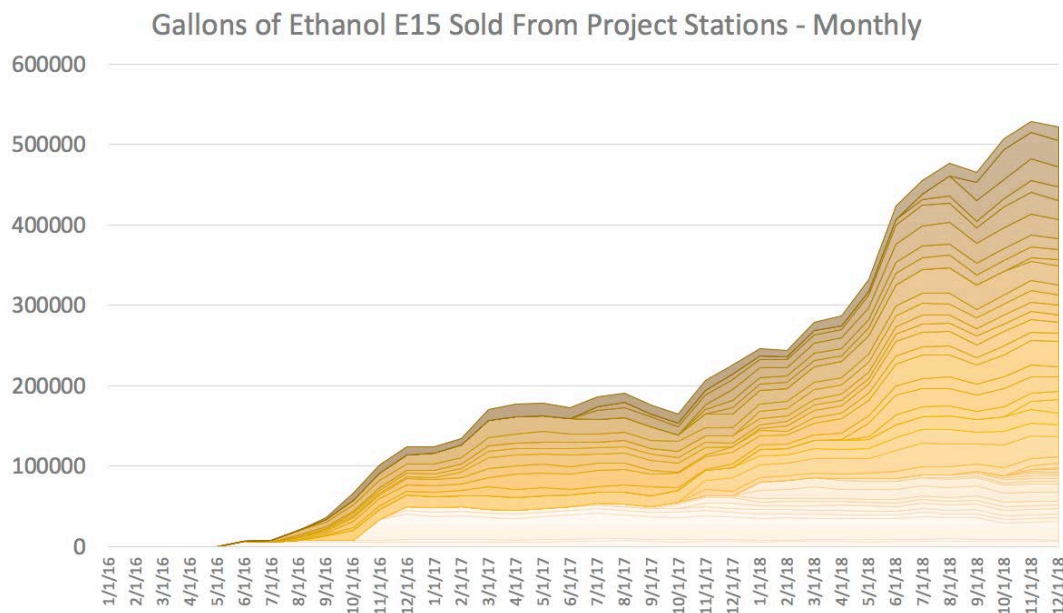
Chesapeake fleet fueling site

Fuel Use Growth: Graphs from Project Stations

Participating stations in the Program reported per month sales and prices of fuels including E85 and E15 blends. While USDA has enlisted the National Renewable Energy Laboratory (NREL) for analysis, Virginia also reviewed and analyzed the data. The graph below shows monthly sales of E85 renewable ethanol.

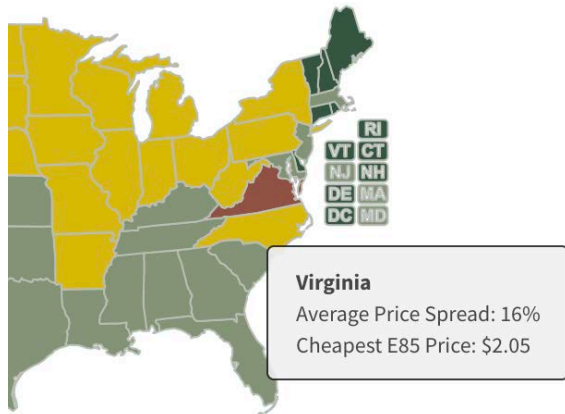


Prior to this project, zero gallons of E15 were sold in Virginia or Maryland. Only one facility was capable of vending but had not yet begun to sell the fuel. Throughout the project, as many additional stations came online with affordable blends often labeled as “88 octane”, these were widely accepted by consumers. The graph below shows monthly sales across all project stations for E15 blend of fuel.

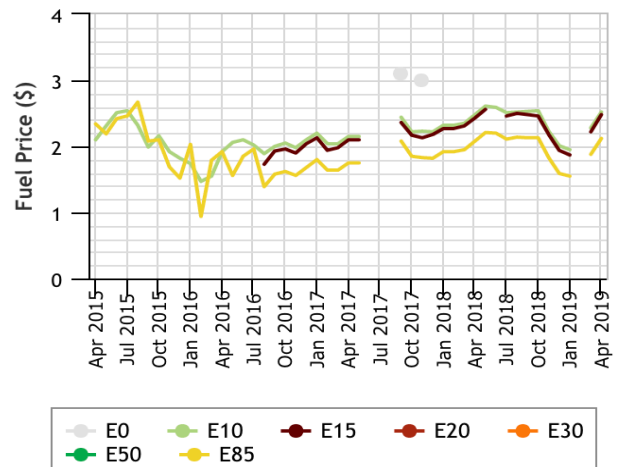


Biofuel Cost Reduction from Program

One goal of this Program was to move the ethanol market forward, to allow costs at the pump to more reasonably reflect biofuel prices, thereby reducing soft costs and overall transportation costs and allowing bulk delivery of fuels similar to what is experienced in the U.S. Midwest. To good effect, the Program was successful at biofuels expansion, increased fuel use, and reduced costs. Reduced costs are critical for biofuels acceptance, as ethanol contains less energy than gasoline and must cost less in order to meet the drop-in fuel efficiency, yielding consumer break-even or fuel savings. With a spot price spread of 16% less cost per gallon, Virginia's E85 renewable biofuel sales may take off.



State average prices on the e85prices.com consumer site reviewed April 18, 2019 show the Commonwealth in the pack with many other states which have achieved a 15% or greater discount on ethanol over E10 gasoline.



Virginia average fuel chart from e85prices.com shows a split emerging in Virginia's retail average prices from gasoline prices, with a solid reduction in price seen by consumers. E85 is shown in yellow as reduced price over gasoline.

Project Extensions

This project was intended to be a one-year project, but a series of delays and complications added additional time to the Program. Therefore, the Program performance period was extended two times, first in 2016 as a no-cost extension and again in 2017 where an extension request brought additional resources to the project, even as other states scaled back their programs. The Program ultimately closed in 2018, with final invoicing occurring in Q1 2019.

Marketing

Marketing for the project consisted of investments made with the Maryland Grain Association for wide-ranging awareness campaigns. Mailers went out to vehicle owners in areas where stations would be built, and bus and radio advertisements directed consumers to an informational website. Additional marketing included portions of the national campaign run, showcasing the fuel with NASCAR and other auto enthusiasts.

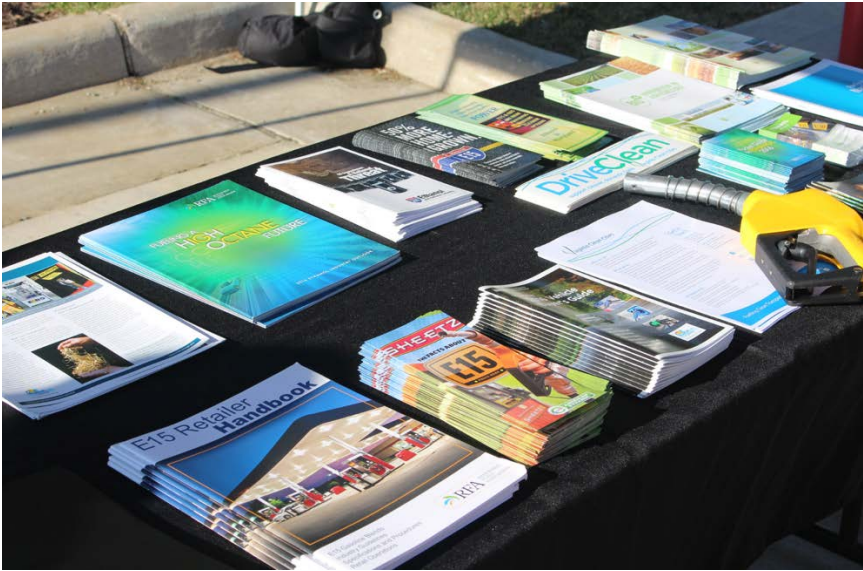
Marketing Images



American ethanol racing press image of 2019 NASCAR Paint Scheme



Fuel door of all NASCAR vehicles mentioning the domestic biofuel blend



Ethanol outreach materials used at events like Sheetz opening



Postcard sent to Maryland flex fuel vehicle owners



Bus graphic displayed in Maryland areas with new stations. Not pictured: radio advertisement.

Challenges and Lessons Learned

Over the course of the Program, there were several challenges resulting from bad weather, ethanol production interruptions, laws governing station pump labeling, and tight partner construction timelines. Program partners hit with hurricanes, logistical issues, and limited staffing at Protec Fuels delayed the completion of our project. Another unforeseen element was that the participating ethanol facility in Hopewell Virginia, capable of producing more than 60 million gallons of ethanol was closed in 2018. Finally, federal law requires that E15 sold during summer months in the United States must be labeled “flex fuel only”, with stickers applied at the pump, due to fuel evaporation. This summer labeling could be extremely confusing to customers, arduous for station managers who must apply new stickers during those months, and a potential impact to sales.



The “flex fuel vehicles only” sticker to the right was used at the start of the project in the summer in the United States due to evaporative emissions policy.

On the right, octane numbers and Regular 88 branding are applied for E15 blend.



Conclusions and Future Actions

There remain many opportunities for continued advancement of biofuels use. Biofuels are available at a number of stations but still need to be extended to more than 450 stations in Virginia in order to reach 10% market availability in the Commonwealth. To this end, additional stations must be built and expanded consumer awareness is necessary to further the use of this clean domestic fuel. There is the wide potential for additional fuel sales beyond this project, as Holtzman and Sheetz are advancing some stations with private investments, and stations in Maryland are being built, supported by that state’s infrastructure funding programs.

The project concluded with a Station opening event in Maryland on April 23, 2019 at the National Harbor. Following are pictures from the Virginia and Maryland station opening events.



Project partners celebrate Sheetz ribbon cutting in Manassas VA.

From right to left – Hayes Framme, Virginia Deputy Secretary of Commerce and Trade, Michael Scuse Under-Secretary for Farm and Foreign Agricultural Services at USDA, Mike Lorenz of Sheetz, Jill Hamilton representing the Maryland Grain Association, and Alleyn Harned with Virginia Clean Cities.



Chris Mueller, Program Coordinator at Virginia Clean Cities and Katina Hanson of USDA further celebrate the Sheetz station opening.



USDA and Royal Farms celebrate National Harbor station's E85 and E15 pumps on April 23, 2019.



USDA, Royal Farms, Maryland Energy Office, Prime the Pump, VCC, and Protec celebrate the National Harbor station opening of E85 and E15 pumps on April 23, 2019,

Project Station Location Chart

<i>Station ID</i>	<i>Name</i>	<i>Address</i>	<i>Dispensers</i>
MD-1	Nexcom MD	Building 178 Kincaid, Rd. Annapolis, MD	1
MD-2	Fort Meade Auto	3240 Ft. Meade Rd. Laurel, MD	2
MD-25	Royal Farms #111	1200 S Ponca St Baltimore, MD	6
MD-26	Royal Farms #54	8268 Lark Brown Rd. Elkridge, MD	8
MD-27	Royal Farms #267	1825 Perryville Road, Perryville, MD	8
MD-28	Royal Farms #77	2603 Philadelphia Rd. Edgewood, MD	8
MD-32	Royal Farms #278	100 Monument Ave. National Harbor, MD	8
MD-36	Carroll Fuels - High	2861 Jessup Rd. Jessup, MD	2
VA-7	East Coast	6460 Boydton Plank Rd., Petersburg, VA	6
VA-11	Sheetz #207	1683 Berryville Pike Winchester VA	6
VA-12	Sheetz #403	3927 Wards Road Lynchburg VA	8
VA-13	Sheetz #407	1340 North 4th Street Wytheville VA	5
VA-14	Sheetz #408	2156 West Main Street Waynesboro VA	6
VA-15	Sheetz #491	135 Market Street Zion Crossroads VA	4
VA-16	Sheetz #514	600 East Nelson Street Lexington VA	4
VA-17	Sheetz #532	2807 Lafayette Blvd Fredericksburg, VA	4
VA-18	Sheetz #565	4201 Anderson Highway Powhatan VA	4
VA-19	Sheetz #579	11774 Sudley Manor Dr Manassas, VA	5
VA-20	Sheetz #701	227 Conicville Rd Mt. Jackson, VA	4
VA-21	Mobil Potomac Hills	14496 Gideon Drive, Woodbridge, VA 23112	2
VA-24	East Coast	13200 Kingston Ave Chester, VA	6
VA-27	City of Chesapeake	956 Greenbrier Pkwy Chesapeake, VA	1
VA-29	Sheetz #197	747 Fairfax St Stephens City, VA	4
VA-39	Sheetz #590	1175 Garrisonville Rd Stafford, VA	5
VA-32	Sheetz #350	7035 W Broad St Richmond, VA	7
VA-30	Sheetz #198	111 W Reservoir Rd Woodstock, VA	4
VA-35	Sheetz #545	8533 Jefferson Davis Hwy Fredericksburg, VA	5
VA-40	Sheetz #595	13039 Ballsford Rd Gainesville, VA	5
VA-41	Sheetz #599	2415 Lee Hwy Bristol, VA	4
VA-43	Sheetz #606	2500 Caton Hill Rd Prince William, VA	4
VA-44	Holtzman Purcellville Shell	Berlin Turnpike 287/Business RT 7 Purcellville, VA	2
VA-46	Holtzman Exxon Market St Harrisonburg	1001 East Market St Harrisonburg, VA	2
VA-47	Holtzman Exxon McGaheysville	11473 Spotswood Trail McGaheysville, VA	3
VA-48	Holtzman Exxon Virginia Ave Harrisonburg	1168 Virginia Ave Harrisonburg, VA	4
VA-49	Holtzman Exxon High Street Harrisonburg	1911 S High St Harrisonburg, VA	3
VA-51	Rockingham Petroleum	981 N Liberty St Harrisonburg, VA	6
VA-52	Harris Teeter	1470 Quarterpath Rd Williamsburg, VA	2
VA-53	NEXCOM VA	U-79B Norfolk, VA	2
VA-54	Royal Farms #152	25451 Lizzo Center Dr Chantilly, VA	8
VA-55	Royal Farms #249	43101 Van Metre Drive, Ashburn, VA	10

Recognition



Virginia Clean Cities and SESI recognizing Mike Lorenz and Sheetz, Inc with the **Biofuel Station Partner 2018 Award**, April 4, 2019.

Virginia Clean Cities expresses sincere appreciation to the dozens of incredible partners in Virginia and Maryland on this project. Individuals and organizations worked tirelessly over the entire project period and will continue to work together to move this fuel forward.

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