Proposal for Designation as a USDOT Automated Vehicle Proving Grounds

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Submitted by: Dominion Raceway Holdings, LLC (Thornburg, Virginia)

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Authorized by: Mr. Steve Britt, Manager & Owner, Dominion Raceway Holdings, LLC

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EXECUTIVE SUMMARY

Dominion Raceway Holdings, LLC ("Dominion Complex"), is pleased to present this Department of Transportation (DOT) Proposal for formal designation as a USDOT Automated Vehicle (AV) Proving Grounds. The Dominion Complex is the safest, largest, and most modern privately owned motorsports and proving ground facility located near Washington DC. Our 160+ acre secure and fully operational site is conveniently located in Thornburg, VA, exactly 64 miles from DOT headquarters and the National Highway Traffic Safety Administration (NHTSA). With formal support from the Spotsylvania County Department of Economic Development and Tourism, and the Commonwealth of Virginia, our facilities and roadways infrastructure was authorized and approved in May 2013. Our proving grounds infrastructure is already in place and was constructed with $19M of investment, inclusive of $14M of private investment and $5M of a Small Business Administration (SBA) 504 loan. In 2016, the Dominion Complex coordinated and conducted >100 events and safely hosted more than 250,000 people to our location. We thus routinely host formal driving events and safety meetings, and have conducted AV testing using third-party experts and innovative high speed drone aerial imagery.

As a transportation-related enterprise and private employer, Dominion Complex shares DOT's safety mission. We thus employ an internationally recognized Designated Safety Officer who maintains and implements our formal Safety Management Plan (SMP) and Emergency Response Plan (ERP). We also employ a Designated AV Research Officer who leads our testing, research, and communications outreach to support US and international advancement of AV technologies. For our driving events, and this proposal for designation as a USDOT AV Proving Grounds, we selected an exceptional team of experienced companies. Our teammates include representation from service disabled veteran owned small business (SDVOSB), small businesses, a non-profit Center for Vehicle Safety Institute, and large business (Exhibit 1 below). With our chosen teammates, the Dominion Complex team and facilities offers DOT, car manufacturers', and third-party testing organizations an operational, convenient and modern proving grounds. We have already conducted safe testing, demonstration, and information sharing regarding AV technologies and our proving grounds are large enough to test across each area of NHTSA's Highly Automated Vehicle (HAV) 15-point Safety Assessment. For DOT, we can also simulate tests for all 28 of U.C. Berkeley's common "PATH" behavioral driving competencies.

Exhibit 1: Dominion Complex AV Proving Grounds Team

ALTARUM INSTITUTE – SYSTEMS RESEARCH FOR BETTER HEALTH	Oak Grove Technologies	Booz | Allen | Hamilton	MOTORSPORT SERVICES INTERNATIONAL; CDS CAVALRY DRONE SERVICES
Non-profit	**SDVOSB**	**Large Business**	**Small Businesses**

In addition to being the largest and closest privately owned proving grounds and test track to Washington DC, Dominion Complex offers unique amenities to the DOT and AV stakeholders that will expedite safe testing. Specifically, our modern facilities and location permit 24/7, year-round and all-season weather testing to simulate driving in every environment. We have five secure testing venues (i.e., urban city blocks, rural roads, highways, parking lots, off-roading). For testing on public roads, we are located 0.25 miles from Interstate 95's 4- to 8-lane highway system and 400 feet from low-speed driving on two lane rural county roads. Testing events at Dominion can be operated from the comfort of our main multipurpose building. A high-level overview of our facility proving grounds, amenities, and five testing venues is as follows:

Operational Testing and Research Venues

- 120 acres of graded and improved paved roads, gravel roads, off-roads, and buildable lots
- Ten acres of paved and milled parking lots, with fuel storage tanks and service equipment
- Two mile sanctioned road course, with 36 feet wide paved roads of straights and curves
- 0.4 mile NASCAR sanctioned oval, with 8 degree straights and 14 degree corner cambering
- 0.4 mile IHRA sanctioned drag strip (in progress)

Primary Facilities, Buildings and Amenities

- 37,000 ft^2, three-story multipurpose building, with ADA-compliant restrooms and showers
- 20,000 ft^2 of conditioned space with 20+ offices for meetings, conferences, and events
- Full multimedia, including WiFi, room to room & infrastructure to vehicle (I2V) connectivity
- 24/7 restaurant quality food preparation, serving areas, and seating for 3,000+ people
- Conditioned infield building with a 50' tall, 20' by 40' High Definition LED display and stage
- Two helicopter landing and launch pads, with on-site ambulance and fire response

We are excited regarding the potential to become a formally designated USDOT AV Proving Grounds. In this proposal, we will demonstrate how the Dominion Complex and our AV Team meets, or exceeds, all of the Secretary of Transportation's Selection Criteria (Exhibit 2 below).

Exhibit 2: Dominion Complex Highlighted Achievements in all Selection Criteria

Mandatory Selection Criteria	
✓	Our **Designated Safety Officer**, Mr. Bob Barnard, is internationally recognized in vehicle safety and safety of motorsports facility operations, and is committed to participating in Community of Practice meetings
✓	Our **Designated AV Research Officer**, Mr. Marshall Contino, is the Director of a non-profit Center for Vehicle Safety, and is committed to sharing our approaches and safety data generated through testing
Other Selection Criteria	
✓	**Proposed Contributions**: With Booz Allen, Altarum and Oak Grove teammates, we have an established AV program and we are making national mobility contributions through support to DOT program offices
✓	**Commitment to Safety**: We have a comprehensive Safety Management Plan (SMP) and Emergency Response Plan (ERP), and we develop specific Safety Hazard Analysis Plans for each AV test and research
✓	**Research, Applications and Data Sharing**: Our extension resources include universities, 50+ Auto-ISAC members, Booz Allen Fusion Center, car manufacturers, fleets, technology vendors, GSA, NETS and VDOT
✓	**Demonstrated Investments**: The Commonwealth of Virginia already authorized Dominion for vehicle motorsports and testing, and we made $19M of investments and capital improvements over 160 acres
✓	**Readiness**: We are fully operational, hosting >250,000 people in 2016 across multiple driving venues, and we tested AV research feasibility at our complex with the support of local community stakeholders
✓	**Adherence to Laws, Regulations and Federal Policy**: Dominion is in compliance with all local, state and federal laws, and we have the ability to test each area of NHTSA's HAV 15-point Safety Assessment

SECTION I: INTRODUCTION

USDOT broadly supports our citizens and economy by ensuring a safe, efficient, accessible and convenient transportation system. The U.S. transport system currently includes a network of four million miles of paved and un-paved highway, urban, and rural roadways used by citizens and commercial fleets for various purposes. DOT's mission will continue to support the safe transport of the American people today and into the future. When the Department was established in 1966, most of today's commonly accepted vehicle safety technologies had yet to be developed and were not incorporated into vehicles (e.g., airbags, automatic electronic braking [AEB], lane change assist [LCA], pedestrian detection systems, rear cameras, speed limiters). Now, exactly 50 years after DOT's formation, technology has advanced so rapidly that society is preparing to become riders, versus drivers, in an AV. To ensure safe deployment of AV technologies for use on public roadways, DOT must conduct testing and evaluations (T&E) to understand the broad societal, ethical and technical benefits and challenges to be encountered. The primary benefits of AV use include:

- Increased safety for vehicle occupants and pedestrians since 94% of all current U.S. vehicle crashes are the result of human error, resulting in 33,000 annual deaths.
- Reclaiming of independence and livelihood for certain sectors of society unable to achieve individual mobility such as the disabled, elder, and young.
- Economic prosperity for the countries, companies, and workers who are first to achieve safe driving AV technologies and AVs for consumer purchase.
- Improved short- and long-term societal benefits of increased access to healthcare, homes, education, employment, events, and travel.
- Reduction in traffic flow, congestion and the funding needed to continually expand transportation routes, purchase oil and gas, or build additional parking lots.

While the potential benefits of AV use are vast, technologies still require significant development improvements prior to AVs being openly deployed on public roadways. Luckily, vehicle manufacturers are expending significant funds for testing and evaluation (T&E) that is rapidly producing viable AVs, and USDOT has led the regulatory framework updates needed to help advance AV technologies and vehicles. Specifically, in 2015 NHTSA ruled that certain software within AVs could be considered the driver (versus requiring a human driver, per the prior definition). Then, in September 2016 NHTSA published vehicle performance guidelines documenting a 15-point Safety Assessment that HAVs must meet. The HAV guidelines contain 11 specific 'cross-cutting' safety areas and four specific 'automation' areas manufacturers' must report to NHTSA's Office of Chief Counsel to detail how they meet the guidelines. Once HAVs meet or surpass these safety guidelines, mass production and use of AVs is a certainty.

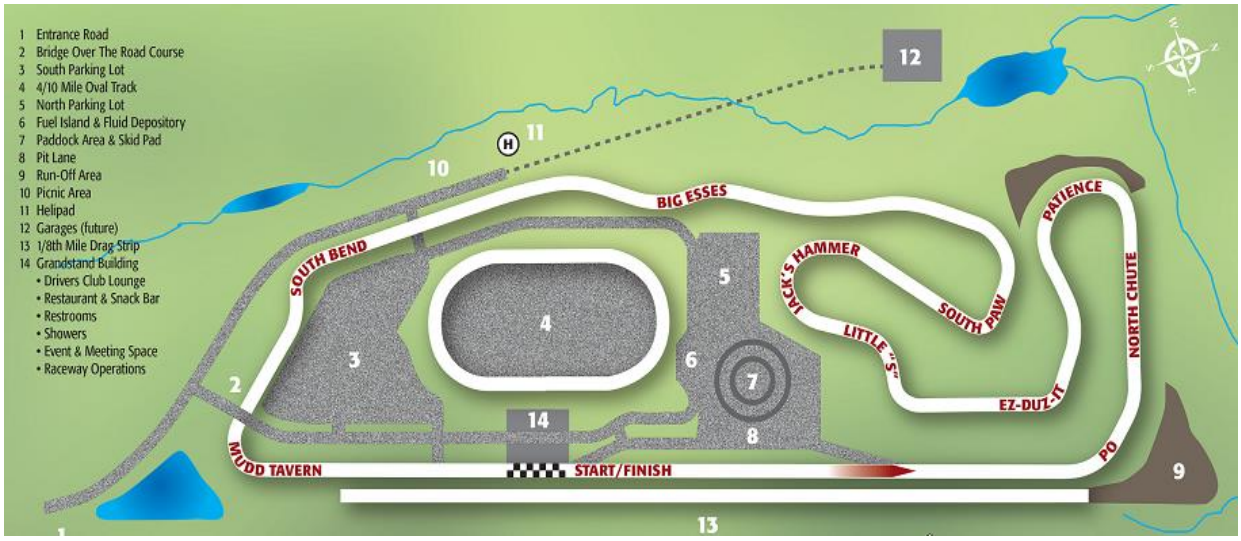
Since our team of vehicle safety researchers, consultants, engineers, builders, and data scientists analyze the trend of U.S. and international technology advancement and vehicle crashes, we have been predicting exciting mobility, safety and economic benefits of AV use. In fact, we attended Volvo's public announcement stating their deployment of 100 AVs onto Swedish roads by 2017 -- which forced most U.S. manufacturers to begin playing catch-up. Our team is expertly familiar with the current Federal AV Policy (*Accelerating the Next Revolution In Roadway Safety*), and we were present for NHTSA's Public Hearing on HAV Policy when

stakeholders requested that AV's meet rigorous third-party testing for the 15-point Safety Assessment. A few of the Dominion Complex AV-related capabilities include that we:

1) Have working relationships with multiple DOT program offices including Intelligent Transportation Systems Joint Program Office, Impaired Driving Division, Office of Vehicle Crash Avoidance and Electronic Controls Research, Office of the Assistant Secretary for Research and Technology, and Federal Highway Administration Office of Operations.
2) Conducted broad, expert third-party tests at our five driving venues and documented our proving grounds are safe and viable for AV T&E by drivers, riders, and spectators.
3) Partnered with a leading AV Engineering University to identify the safety, technology and economic challenges of AV use across the US federal fleet of 630,000 vehicles.
4) Helped test and advise on pre-cursor autonomous sensor and software technologies, including AEB, LCA, parking assist, pedestrian identification, and seat belt interlocks.
5) Selected as Key Note speaker for the 2016 Network of Employers for Traffic Safety (NETS) annual meeting, and presented on AV and vehicle Cybersecurity best practices.
6) Innovated new 'real-time' AV tracking and aerial photo-documentation by building and using high-speed drones that sustain, and exceed, 70-mph vehicle highway speeds.

Our team has been supporting the research efforts of both the public and private sectors in advancing AV sensors and software towards the reality of safe AV ridership. Our facility and staff are excited to continue our research, testing, and safety reviews that will make ridership a possibility. By formal designation as a USDOT AV Proving Grounds, Dominion Complex can help expedite the improvement of AV technologies through advanced research. Through our professional collaborations and inspections of other potential test locations, we are aware that certain vehicle manufacturers fund tests at various sites. As detailed further in the following sections, Dominion Complex's $19M investment and vast roadways infrastructure (Exhibit 3 below), can be leveraged by DOT and AV stakeholders in an unbiased way to use our facility as an AV Proving Grounds. With great pride, Dominion Complex and our expert selection of AV T&E teammates, provides this proposal to DOT in hopes of assisting our citizens to be safer in transport, gain mobility independence, and increase the intensity of AV technology innovation.

Exhibit 3: Dominion Complex Research and Testing Venues



SECTION II: DOMINION CAPABILTIES FOR ALL SELECTION CRITERIA

In this section, Dominion Complex will demonstrate how we meet both of the mandatory selection criteria, and how we also meet all of the other six selection criteria of: 1) Proposed Contributions, 2) Commitment to Safety, 3) Research, Application and Data Sharing, 4) Demonstrated Investments, 5) Readiness, and 6) Adherence to Laws, Regulations and Federal Policy. As presented below, we are hopeful that based upon our facilities, teammates and capabilities, that the Senior Review team will advance this application to the Secretary of Transportation for us to be selected and formally designated as a USDOT AV Proving Grounds.

Mandatory Selection Criteria

Dominion Complex's Designated Safety Officer is Mr. Bob Barnard, and he is supported by our (Deputy) Safety Officer, Mr. Amjad Qureshi. Mr. Barnard and Mr. Qureshi, along with our safety staff, are recognized experts in managing safety operations for employees, facilities, and driving events. They authored our comprehensive Safety Management Plan (SMP), and companion Emergency Response Plan (ERP). For this USDOT AV Proving Grounds effort, they are fully committed to participating as Safety Officers in the Community of Practice (CoP) regular quarterly meetings. Our Designated Safety Officers are also fully committed to openly sharing Dominion Complex's tested and proven approaches to safety, along with sharing all of the safety data and defensible statistical findings we will generate through T&E and operations. Because our Safety Officers are passionate about safety compliance, they are committed to being accessible to the Department and related AV stakeholders for ad-hoc and more frequent teleconferences, video teleconferencing (VTC), in-person meetings, as needed. A brief overview of Mr. Barnard and Mr. Qureshi's worker safety and vehicle safety credentials are as follows:

MR. BOB BARNDARD, DOMINION COMPLEX'S DESIGNATED SAFETY OFFICER, *has 40+ years of expertise in driving safety and facilities operation. Mr. Barnard is the founder of our small business teammate company, Motorsports Services International (MSI). MSI is an internationally recognized vehicle safety and motorsports facility consultancy. Mr. Barnard is a qualified Civil Engineer and renowned motor race facility owner and designer. He has worked on four continents, authored numerous SMPs/ERPs, and provides nationally accepted safety inspection and expert witness services for motorsport litigation. MSI helped to design, build, review, and operate iconic vehicle testing and racing facilities including Charlotte Speedway, Daytona Speedway, and Road Atlanta. Mr. Barnard frequently presents safety briefings to U.S. and international vehicle safety organizations, and his 'voice of driving safety' is recognized in the industry. He has presented papers to conferences in New York, Orlando, Long Beach, and Cologne, and he has provided safety designs to F1, GoPro, Toyota, and VW. He also supported urban road improvements for the Australian highways department.*

MR. AMJAD QURESHI, DOMINION COMPLEX'S DEPUTY SAFETY OFFICER*, is a national board Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH), and a Certified Hazardous Materials Manager (CHMM) with 40+ years of management, leadership and technical experience. Mr. Qureshi is with our non-profit business teammate, Altarum Institute, where he is the Director of the Center for Worker Safety and Industrial Hygiene. He has authored dozens of Safety Management Plans (SMPs) for multiple world-class organizations. His scope of experience spans Chemical, Construction, HealthCare, Manufacturing, and Transportation sectors, in the U.S. and with foreign governments. He served as a career Naval Officer, and Safety Director for private companies and the federal government. He has a strong record of integrating effective loss prevention controls and managing risks in operations, administrative programs, and project costs. He specializes in Safety Management Systems (SMS), Behavior-Based Safety (BBS), Voluntary Protection Program (VPP), and Organizational Risk Management (ORM).*

Proposed Contributions Selection Criteria Achievements

With our chosen teammates, Dominion Complex already administers an established AV program that involves technical research, T&E, and policy review. Dominion Complex's Designated AV Research Officer is Mr. Marshall Contino, and he is supported by our Deputy AV Research Officer, Mr. Ram Kandarpa. Mr. Contino is with our non-profit teammate, Altarum Institute, where he is the Director of the Center for Vehicle Safety. Mr. Kandarpa is with our large business teammate, Booz Allen, where he helps lead their AV and Intelligent Transportation Systems (ITS) business. Mr. Contino and Mr. Kandarpa, along with their staff, are experts in vehicle safety and AV technologies. Our Team is working both independently and with multiple nationally recognized partners to foster the safe deployment of AV technologies. Specifically, Altarum Institute's Center for Vehicle Safety was selected to partner with a leading AV Engineering University to identify the broad realm of benefits and challenges (e.g., safety, mobility, policy, economic), of AV use across the U.S. federal government. For this academic partnership, multiple of our teammates supported demonstration tests for AV 'pre-cursor' technologies including LCA, AEB, parking assist, and pedestrian protection identification tools. Via the use of Booz Allen's Fusion Center and Innovation Center, our AV Research Officers are providing national and international AV contributions to help solve immediate and long-range mobility challenges. For DOT, the Fusion and Innovation Centers can apply transportation analytics, modeling and simulation tools, and traffic micro- and meso-simulations.

Our Designated AV Research Officers have demonstrated expertise in coordinating, supporting, and leading valuable Communities of Practices. Specifically, they organized a Safety CoP across Booz Allen's 23,000 employees that was used to establish clients and the Firm's safety plans. Booz Allen also formed and helps oversee the Automotive Information Sharing and Analysis Center ("Auto-ISAC"). The Auto-ISAC Best Practices Working Group now includes more than 50 Auto-ISAC member company subject matter experts (SMEs) from design, engineering, safety, legal, public policy, and other disciplines. These SMEs also represent 15 automakers from three continents and their industry recommendations align to cybersecurity frameworks created by the National Institute of Standards and Technology (NIST), International Organization for Standardization (ISO), and Society of Automotive Engineers (SAE) International.

The Dominion Complex team has established productive and 'trusted-advisor' working relationships with DOT's relevant research program offices and modes (see Exhibit 4). If designated as an AV Proving Grounds, we commit to maintaining and strengthening these working relationships. At DOT's direction, our experts also commit to participating in conferences, meetings, and research efforts. To ensure DOT receives timely AV-related testing data and information, we offer to coordinate and lead a weekly 'Status Update' teleconference with your research program offices. Additionally, we commit to developing and submitting a comprehensive AV Proving Grounds activity report to DOT every month that will detail the outcome of relevant T&E initiatives and data.

EXHIBIT 4:

PROGRAM OFFICE RELATIONSHIPS

- ✓ Office of Vehicle Crash Avoidance and Electronic Controls Research
- ✓ Office of the Assistant Secretary for Research and Technology
- ✓ Intelligent Transportation Systems Joint Program Office
- ✓ Impaired Driving Division
- ✓ FHWA Office of Operations

Commitment to Safety Selection Criteria Achievements

Dominion's formal SMP and ERP contain robust safety precautions that help to identify and control operational risks on our roadways and at our proving grounds. On a daily basis, our staff demonstrate their commitment to Dominion Complex's SMP and safety culture. They also adhere to our stated Safety Culture policy, which is formally documented as follows:

> ***DOMINION SAFETY POLICY STATEMENT:*** *Dominion team is completely committed to the safety of workers, clients and processes, during testing and operations – consistent with Dominion's Safety Management Plan (SMP). We regard safety to be our Number One Ethic, deeply embedded within our core values. We are committed to developing a pervasive culture of Health Safety and Environmental (HSE) excellence by striving for zero injuries, zero illnesses and zero property damage, through comprehensive employee engagement, safety management systems (SMS) based HSE hazard evaluation and control approach, rigorous monitoring of our processes, contractual engagements, and routine review and oversight of processes to ensure continuous improvement. Our goal is sustainability of our human, environmental and business resources.*

During AV research and driving events, we leverage the SMP and expertise of our Designated Safety Officers to ensure the well-being of our staff, clients, and infrastructure. In addition to Dominion Complex's Safety Policy Statement, our SMP contains 9 additional elements:

Dominion Complex Safety Management Plan (Main Elements)		
Policy Statement and Scope	Training and Instruction	Regulatory Compliance
Roles and Responsibilities	Incident Management Process	Communication and Recordkeeping
Hazard Assessment and Control	Emergency Response Plan	Continuous Improvement Process

Our SMP is designed to continually identify and eliminate (or control/manage) hazardous conditions. Through our AV work, we know that certain vehicle testing protocols present unique safety hazards. Dominion Complex would thus develop and provide to DOT a specific Safety Hazard Analysis Plan to be tailored and used for each individual AV test, or research requested. To date, our AV research and testing has been conducted without incident, and our SMP policy elements are annually reviewed to ensure relevancy to Dominion's operations. If DOT or stakeholders request the conduct of AV tests on public roads, we would review the relevant safety standards and concerns (e.g., ISO 26262 "Road vehicles – Functional safety", Virginia DOT Rules of the Road), and we would develop tailored safety protocols for use.

Research, Application and Data Sharing Criteria

The Dominion Complex team has worked collaboratively with the Virginia DOT (VDOT), the Spotsylvania County Department of Economic Development and Tourism (CDEDT), and the Fredericksburg Regional Alliance (FRA). These organizations, along with our local Senator, enthusiastically support our operations, and expansion if ever needed. They foresee the benefits of how the USDOT and Dominion Complex's AV research will help increase the safety and mobility of citizens using the East Coast I-95 highway corridor, rural roads, urban city centers, and unpaved or gravel roads across the U.S. Dominion has built professional working relationships with extended traffic safety and AV technology research resources that we can leverage to help DOT with these test and research efforts. Reach-back beyond our current team members includes, but is not limited to: Academic universities, 50+ Auto-ISAC members, car manufacturers, commercial fleet managers (e.g., Coca-Cola, Johnson & Johnson, Shell),

CellControl, Driversiti, e-Driving/FICO, the FIA Foundation, General Services Administration fleet managers, NETS, ROSCO Collision Avoidance, and the World Bank's Global Road Safety Facility.

The Dominion Complex team, along with our vehicle safety partners, routinely analyze, present and provide data that have national implications regarding the benefits and challenges of AV technology deployment. Our formal teammates of Altarum Institute, Booz Allen and Oak Grove Technologies are recognized providers of premiere 'client-ready' vehicle safety training and educational tools. Their instructional design experts can assist DOT with the development and delivery of various AV educational programs for state, regional, nation-wide, or international audiences. Our data scientists also commit to openly sharing our data, performance metrics, and T&E results through USDOT's Research Data Exchange, or directly with stakeholders.

Demonstrated Investment Selection Criteria Achievements

Dominion Complex has demonstrated a strong commitment to our small business partners and vehicle safety through our private investment of $19M. Our investment purchased 160+ acres of land, and helped to build, operate and maintain our modern, state-of-the-art facilities. Our complex was inspected by third-party reviewers who proved that we have the necessary infrastructure to safely test AV technologies. Based upon third-party suggestions, we made additional capital investments to improve our networks of roadways, parking areas, and facilities such that we can conduct comprehensive AV T&E from within our gated and privately controlled facility. Our facility now includes infrastructure for use in performing tests to simulate driving on rural roads, city blocks, parking and garage areas, unpaved off-roading, and 3 lanes of 36 feet wide highway. Our capital improvements include a $1M bridge overpass and underpass, $2.5M of mobile concrete construction barricades (i.e., 3,000+ individual FIA type barriers weighing 9,000 pounds each), 2,000+ safety tires, and maintenance bays to service or test AVs. We employ trained vehicle safety experts and we already own both fixed and mobile Audio-Video recording technologies that our researchers can use to track vehicle's behavioral competencies. Our team members are routinely invited to test the feasibility of pre-cursor and new AV technologies, and our complex is fully capable of testing performance of Infrastructure to Vehicle (I2V), Vehicle to Infrastructure (V2I), and/or Vehicle to Vehicle (V2V) technologies. Our teammate, Booz Allen, also employs CyberHacking experts who can help DOT test the fortitude of AV communication and security systems. The Dominion Complex is already authorized and supported by the Commonwealth of Virginia as a vehicle motorsports and testing facility. We expect minimal to no alteration of our zoning permits needed to address any additional regulatory challenges associated with higher levels of automation or AV testing at our facility. In the event that the Operational Design Domain (ODD), or the Object and Event Detection and Response (OEDR) protocol requires driving to be done on public roadways, we will obey all governing traffic laws and road rules. In addition to the demonstrated financial investments we have already made, the Department has our ongoing commitment to making necessary facility improvements to enable future testing for evolving AV technologies.

Readiness Selection Criteria Achievements

The Dominion Complex is fully operational and we have already conducted AV T&E on our roadways. If needed, we can begin DOT or stakeholder sponsored research and testing immediately upon formal designation as an AV Proving Grounds. Since we routinely conduct driving events that have multiple simultaneous users, we can accommodate the various federal

or private stakeholder tests, meetings, and planned data gathering efforts. If requested, Dominion Complex will also open up our controlled facility to the public such that proving ground tests or meetings are transparent to interested parties. Our Designated Point of Contact for facility operations and readiness is our owner and manager, Mr. Steve Britt. Mr. Britt works directly with our AV Research Officer (Mr. Contino), regarding all AV-related T&E research conducted at Dominion, and they both will be 'real-time' accessible to USDOT officials for any needs. As noted above in our achievements of the Research, Application and Data Sharing Selection Criteria, if AV testing is required on local state and public roads, we will engage and gain support via our existing local, state and regional partnerships. Most notably we have established collaborative working relationships with VDOT, and local community advocates including CDEDT, FRA, and the Spotsylvania Chamber of Commerce.

Adherence to Laws, Regulations, and Federal Policy Selection Criteria Achievements

Dominion Complex's modern facility was designed to fully comply with all local, state and federal laws and regulations (e.g., DOT-49 CFR, Environmental Protection Agency-40 CFR, Occupational Safety and Health Administration 29-CFR), and we also apply applicable motorsports or vehicle safety standards (e.g., Federal Motor Vehicle Safety Standards, International Building Code, National Fire Protection Association). Additionally, as noted above in our achievements of Demonstrated Investments Selection Criteria that we had independent third-party testing completed, Dominion Complex made capital improvements that further help us comply with regulatory standards and add protective measures to safeguard our staff and visitors. For DOT, we will ensure that AV testing complies with the governing traffic safety laws and testing protocols. We will systematically ensure that our safety protocols require AV occupants (i.e., riders and/or drivers), follow all laws and regulations when testing vehicles at our facility, or on public roads for Level 3 through Level 5 HAV systems (i.e., L3-L5).
Where a test ODD or the OEDR protocol dictates, we will test the AVs abilities for making intelligent decisions under safety-critical situations. These situations may include temporarily violating certain motor vehicle driving laws when faced with safety-critical situations (e.g., crossing double lines on roadways to pass broken-down vehicles, safely move away from oncoming objects). We will have a documented process for independent assessment, T&E, and validation of these plausible cases. We can also use our data scientists and research staff to record the data necessary to prove that AV actions were for justified safety reasons. Understanding that traffic laws vary between localities, our testing will ensure that the AV is able to follow all laws (that apply to the ODD, or OEDR protocol). These include speed limits, traffic control devices, one-way streets, access restrictions (e.g., crosswalks, bike lanes), U-turns, right-on-red decisions, metering ramps, and related traffic circumstances.

SECTION III: DOMINION COMPLEX PROVING GROUNDS DESCRIPTION

In this section, we will provide DOT with a description and photos documenting the proving grounds available at our 160+ acre facility. A typical day at Dominion Complex has our team of 110+ staff hosting multiple events on our driving venues and we routinely host up to 3,000 attendees for weekday and/or weekend events. In managing this volume of traffic (e.g., people, cars, trucks, tractor trailers, emergency response), we have honed our skills in coordinating and conducting safe events, while delivering memorable experiences for all guests. Our Thornburg VA location is the second track our ownership has successfully

managed. We thus bring a team of experienced and dedicated staff who are responsive to our clients and spectator needs. Dominion Complex is specifically located close to Washington DC, and I-95, to ensure our spectators, driving enthusiasts, researchers and suppliers have easy access to our facility. Within a short one hour drive, our ownership and management can be in downtown DC to meet with our vehicle safety partners and federal officials, as needed. Additionally, business partners and guests traveling from afar have ready access to four nearby airports, including Ronald Regan (DCA, Dulles International (IAD), Richmond International (RIA), and Baltimore-Washington International (BWI). We are also located within two minutes of existing lodging, food, service stations, and shopping, and buildable sites are on property.

Since driving events and vehicle T&E presents unique safety challenges, we designed the Dominion Complex such that we control all access channels to our location. Specifically, we maintain a large paved main access road with two gated and secure access points to the property. Both gates and access points are wholly owned and controlled by us. To minimize risk and document 'on-track' events, all participants are required to sign and date our formal "Adult Event Motorsports Waiver" (of which we track and maintain all records).

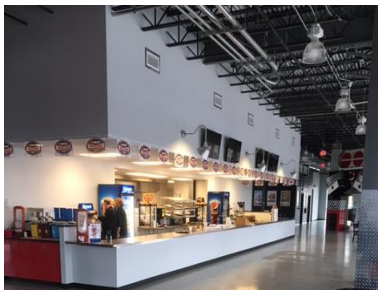
Dominion Complex will make available to USDOT, car manufacturers, and third-party testers, the breadth our facility infrastructure. A unique proving ground differentiator that we provide include the ability to research and test across five driving environments (i.e., urban city blocks, rural roads, highways, parking lots, off-roading). Since our modern facility is routinely used by companies to host events during all weather conditions, and for both day and nighttime driving, T&E can occur by researchers and guests "on-track", or from the comfort of our 37,000 ft^2, three story multipurpose main building. The design of our facility and advanced multi-media and audiovisual capabilities allow us and clients to watch, monitor and track all testing events from any of our 20+ inside rooms positioned on the exterior facing walls of the main building. Each of these spaces are conditioned with 24/7 WiFi, plush carpeting, floor to ceiling glass, and are finished to an "executive office" standard. Dominion Complex can also provide to DOT and AV stakeholders the dedicated use of a 4,000 square foot office space for part-time, or full-time needs. We will include additional descriptions and photos highlighting relevant aspects of our existing in-use facilities, infrastructure and testing (Exhibit 5 below, and Exhibit 6 on Page 13).

Exhibit 5: Dominion Complex Roadways, Infrastructure, and Testing Venues

Proving Ground Venues, Infrastructure, and Equipment: Including 36' wide high-speed 3-lane highway asphalt, 36' wide winding paved roads, $1M bridge/overpass, expansive paved and unpaved parking lots with controlled lighting, unpaved gravel roads with tree canopies, 2,000+ bolted and banded safety tires, $2.5M worth of 3,000+ reconfigurable construction barriers, safety Armco, 50' tall 20' by 40' LED billboard, aboveground gas refueling tanks, ambulance, LifeCare services, and on-site tire & maintenance shops.

Meeting Spaces, Restaurant, and Offices: Includes 37,000 ft^2 three story conditioned building, office and meeting spaces with floor to ceiling windows, wall to wall carpet, WiFi, and public announcement systems. Office spaces available in the main building for dedicated on-site USDOT, car manufacturer, or third party testing presence. Professional chef's kitchen, dining and seating areas, with service for up to 3,000 simultaneous users.

EXHIBIT 6: PHOTOS of DOMINION COMPLEX, AV THIRD-PARTY TESTING, and VENUES



SECTION IV: DOMINION COMPLEX TEAM AND EXPERTISE

In this section, we will document the detailed capabilities our team can offer the DOT and stakeholders wanting to conduct AV testing at our proving grounds. As the Prime for this work, Dominion Complex selected five trusted companies to join our team. Each company is experienced in certain aspects of AV research, data recording, information sharing, vehicle safety policies, proving ground demonstrations, or T&E. If needed, we also have significant reach-back abilities to related nationally recognized domestic and international AV and vehicle safety technology partners. Currently, the companies we have been collaborating with to conduct AV T&E research, and the "best-in-class" teammates we will provide if designated a USDOT Proving Grounds include representation from an SDVOSB, small businesses, a non-profit Institute, and large business. Dominion Complex's AV Proving Grounds team includes the Prime (Dominion LLC), and five specialized subcontractor companies, as below and in Exhibit 7.

PRIME: **Dominion Complex Raceway & Entertainment, Thornburg VA**
Subcontractor: **Altarum Institute Center for Vehicle Safety,** non-profit, 501(c)(3)
Subcontractor: **Oak Grove Technologies**, Service Disabled Veteran Owned Business
Subcontractor: **Booz Allen Hamilton,** large business
Subcontractor: **Cavalry Drone Services (CDS)**, small business
Subcontractor: **Motorsport Services International,** small business

Exhibit 7: Dominion Complex Proving Grounds Team and Expertise

Dominion Complex, the Prime contractor for this proposal, is nationally recognized as a premiere motor sporting facility and test track. Our Team manages a facility encompassing 160+ acres of improved high-speed roadways, with 3 lanes of 36 feet wide driving lanes, paved parking lots, paddock areas, gravel roads, and off-road areas. Our facility was designed to accommodate up to 3,000 daily participants and spectators at multiple driving venues. Our location can be used by public or private companies (e.g., federal or state agencies, car manufactures, technology vendors). With our vehicle safety expertise and mission, our clients use Dominion's controlled and secure complex to test vehicles, and record and monitor driving characteristics. Our facility was designed to meet all relevant federal, state and local regulations for transportation, building code, worker safety, and environmental rules. Our roadways and parking lots were built to withstand the weight of tractor trailer's transporting vehicles for testing, and our test tracks are continually inspected and improved to safeguard on-track drivers, occupants and spectators. We routinely conduct vehicle safety meetings on-track and within our newly constructed, technologically advanced, 37,000 square foot multi-purpose facility. In support of this proposal Dominion LLC will provide to DOT and stakeholders the use of our proving grounds, raceway operations expertise, Safety Management Plan, test equipment, and access to our teammate's experts.

Altarum Institute is a nonprofit, 501(c)(3) research and consulting institute that employs 450 experts and has been in business for 70+ years. The Institute operates a Center for Vehicle Safety that is working with policymakers and commercial enterprise to help minimize and end vehicle-related crashes, injuries and fatalities. Altarum is currently conducting directly relevant AV research and testing with U.S. based and international vehicle safety stakeholders. Altarum staff have conducted AV research and testing at Dominion Complex, are collaborating with academic universities to document AV implementation challenges, and are providing national leadership in communicating AV's mobility solutions. In support of this proposal they will provide the Designated AV Research Officer and the Deputy Designated Safety Officer. Their expertise will be leveraged across AV technologies they have tested, AV testing coordination, research analysis, data sharing, safety and environmental compliance, and Community of Practice leadership and participation.

Oak Grove Technologies, is an award winning SDVOSB, offering training, e-learning information technology, and intelligence services. Oak Grove is an established provider of vehicle safety and law enforcement training and manages a 200-acre training site and conducts more than 75 annual exercises in support of the U.S. Government across five states. Oak Grove has 175 employees and is providing the full range of instructional training services to NHTSA for the Ignition Interlock Course for Law Enforcement. Oak Grove staff have assisted the AV research and testing at Dominion Complex, and used innovative high-speed drone aerial-tracking exercises for vehicle testing. They have completed research on the Cybersecurity implications of AV technology and were selected by an AV Engineering University to guide a project exploring the challenges of AV implementation across the federal fleet. In support of this team, Oak Grove's expertise will be leveraged to design and construct 'mock' city blocks, develop testing videos, and produce AV training.

Booz Allen, a large international business, employs 23,000+ staff and has been at the forefront of strategy and technology for 100+ years. Their Intelligent Transportation Systems team delivers multi-modal services and solutions for federal, state, local, and commercial partners through a combination of consulting, analytics, mission operations, technology, systems delivery, cybersecurity, engineering, and innovation expertise. They have been involved in unmanned systems and AV technology research and development for multiple clients including DOT, Department of Defense, Department of Energy, and the National Cooperative Highway Research Program. In support of this team, Booz Allen will offer a breadth of AV expertise and use of their various indoor T&E facilities (i.e., Center for Robotic Systems & Simulation, Fusion Center, Internet of Things Lab). They will also provide capabilities in AV systems development, T&E, modeling and simulation, cybersecurity, architecture and standards, data recording, and information sharing similar to their Auto-ISAC leadership which includes reach-back to 50+ members.

Motorsport Services International (MSI), a small business, assists facility and track owners with professional services from conception through operation. MSI's founder (Bob Barnard), is an internationally recognized vehicle and facility safety expert, a qualified Civil Engineer, and renowned motor race facility owner and designer that has worked on four continents. MSI's expertise spans designing, building and operating race facilities, and promoting events. They provide nationally accepted track inspection and expert witness services in motorsport litigation. MSI helped to design, build, and operate iconic vehicle testing and racing facilities including the Adelaide F1 Circuit, Road Atlanta and Daytona Speedway. MSI has won awards for excellence in design and operations. In support of this team, MSI is our Designated Safety Officer and will participate in regular COP meetings and conferences.

Cavalry Drone Services (CDS), a small business, provides a full range of innovative drone services to provide and operate aerial video capture platforms for stationary and moving objects. CDS conducts aerial surveys and provides advanced technical analysis of imagery data. They design and fabricate drone aircraft that can carry high definition video capture platforms in excess of 4k resolution and non-literal video payloads (infrared or multi-spectral sensors). CDS specifically designed AV research and testing drones that will travel up to 70 mph, have maximum flight times, can fly semi-autonomously, or tethered for long testing durations. CDS conducted drone-testing at Dominion Complex and their technology is proven for use in test tracks, inner city blocks, urban, rural, and highway driving (see: *http://www.cavalrydrone.com/dominion-raceway.html*). In support of this team, CDS will provide FAA-licensed pilots to provide aerial video services in compliance with all local, state, and federal UAS/drone laws.

SECTION V: CONCLUSION

Dominion Complex meets all of the mandatory and six other selection criteria. Our facility and chosen teammates have already performed nationally recognized AV technology services and we are ready to begin requested AV testing and research upon USDOT's direction. In this proposal, we demonstrated $19M of capital improvements we made to our 160+ acre facility, and the AV capabilities of our distinguished teammates. Our Team is hopeful the Secretary of Transportation will formally designate Dominion Complex as a USDOT AV Proving Grounds.