MARYLAND APPRENTICESHIP and TRAINING PROGRAM

TRANSPORTATION APPRENTICESHIP WORKGROUP

Interim Report 2022

Maryland
DEPARTMENT OF LABOR

Office of the Secretary
1100 N. Eutaw Street, 6th Floor
Baltimore, MD 21201

December 1, 2022

The Honorable Guy Guzzone
Chairman, Senate Budget and Taxation Committee
3 W Miller Senate Office Building
Annapolis, MD 21401

The Honorable Maggie McIntosh
Chairman, House Appropriations Committee
House Office Building, Room 121
Annapolis, MD 21401-1991

RE: Interim Report on Apprenticeships in Transportation Workgroup – 2022 JCR

Dear Chairmen Guzzone and McIntosh:

In accordance with Pages 153-155 of the 2022 Joint Chairmen's Report, the Maryland Department of Labor is pleased to present this interim report on the Department's efforts to convene a workgroup to explore apprenticeships for public sector transportation careers. In conducting this workgroup, the Department is pleased to have collaborated closely with the Maryland Department of Transportation.

This interim report offers preliminary assessments on Maryland's public sector transportation workforce and considerable discussion of Registered Apprenticeship programs. The workgroup will continue to meet in the coming year and will submit a final report of its activities by June 30, 2023. I look forward to your review of this interim report and will be pleased to respond to any questions.

Sincerely,

Tiffany P. Robinson
Secretary

Enclosure
cc: Members, Senate Budget and Taxation Committee
Members, House Appropriations Committee
Secretary James F. Ports Jr., Maryland Department of Transportation
Emily Haskel, Department of Legislative Services

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SECTION I: INTERIM WORKGROUP REPORT – BACKGROUND

During the 2022 session of the Maryland General Assembly, the Chairmen of the Senate Budget and Taxation Committee and House Appropriations Committee authored the Report on the Fiscal 2023 State Operating Budget (SB 290) and the State Capital Budget (SB 291) and Related Recommendations. The committee narrative on "Apprenticeship Workgroups for Targeted Occupations," outlined the Committees' concern with workforce shortages among government employees in the public safety, health, and transportation sectors. The narrative directed the Maryland Department of Labor to convene workgroups to study and report on the short-term and long-term needs in each respective sector, as well as efforts to:

- identify the extent of vacancies at the State and local level within each sector, specifically including, but not limited to, police officers, correctional officers, parole and probation agents, direct care and public health workers, bus operators, and vehicle maintenance personnel;

- review existing apprenticeships in the United States and elsewhere specifically for occupations in these identified sectors;

- design apprenticeships in the occupations within the identified sectors that have the greatest recruitment challenges and training deficiencies, including estimated costs and potential funding opportunities;

- identify opportunities to start apprenticeships at the high school level consistent with the Blueprint for Maryland's Future;

- identify opportunities, in coordination with the University System of Maryland (USM), the Maryland Association of Community Colleges (MACC), University of Maryland Global Campus (UMGC), the Maryland Career and Technical Education (CTE) Committee, and the Maryland State Department of Education (MSDE), to create degree apprenticeship programs and other ways to incorporate associate and bachelor's degrees in apprenticeships; and

- identify potential apprenticeship sponsors in each occupation.

By request of the Chairmen, the Maryland Department of Labor has authored this interim report on efforts to convene the requested workgroup on transportation. The subsequent sections provide data and information gathered through workgroup sessions, present models and existing programs for transportation apprenticeship, and share opportunities and challenges facing apprenticeship as a tool of workforce development for public sector transportation agencies in Maryland.

SECTION II: WORKGROUP PARTICIPANTS

In June 2022, MD Labor's Division of Workforce Development and Adult Learning (DWDAL) began working with the Maryland Department of Transportation (MDOT) to identify and assign staff designees to serve on a workgroup to study apprenticeships in public sector transportation.

Additional workgroup participants were identified from community organizations, trade groups, education institutions, workforce development system constituents, and legislative representatives. The following roster details agencies and representatives who attended at least one transportation workgroup session in 2022.

Maryland Department of Labor

Office of the Secretary	Andrew Fulginiti, Director of Legislative Affairs Mike Preisinger, Legislative/Policy Assistant Will Grant, Policy Officer
Division of Workforce Development & Adult Learning	Assistant Secretary James Rzepowski Deputy Assistant Secretary Erin Roth Logan Dean, Policy Analyst
Apprenticeship & Training Program	Christopher MacLarion, Director Jeffrey Smith, Program Manager Faith Ramsburg, Apprenticeship Navigator Ginamarie Best, Program Manager Jane Sinclair, Apprenticeship Navigator Jennifer Runkles, Apprenticeship Navigator
Governor's Workforce Development Board	Michael DiGiacomo, Executive Director Kenneth Lemberg, Deputy Director Molly Mesnard, Workforce Engagement Director

Maryland Department of Transportation

Transportation Secretary' s Office	R. Earl Lewis, Jr., Deputy Secretary for Policy Frank Barber, Sr Chief Officer, Organization Development and Employee Training Judy Slater, Director, Office of Human Resources Adrienne Wynn, Manager, Recruitment & Exams Corey Stottlemyer, Director of Innovation & Strategic Initiatives

State Highway Administration	Lynn Neumann, Deputy Director, Office of Administration Walt Cervenka , Division Chief Strategic Workforce Planning Carol Diserio, Assistant Division Chief, Maintenance Training and Certifications
Maryland Port Administration	Joe Nicoles, Deputy Director, Crane, Facility and Fleet Maintenance
Maryland Transit Administration	Brian Hoffmaster, Director, Human Resources Denice R. Clark, Deputy Director Brandee Gross, Data Analyst
Motor Vehicle Administration	John Boden, Deputy Director, Office of Human Resources
Maryland Transportation Authority	Daryl Campbell, Consultant
Maryland Aviation Administration	Diane Walker, Director of Human Resources Shakera Harris, Lead Talent Acquisition Specialist

Education & Workforce Agencies

Cecil College	Tina Durborow, Program Manager
Hagerstown Community College	Jack Drooger, Program Manager
University of Maryland	Connie Tang, Faculty Specialist, Civil and Environmental Engineering

Labor and Trade Organizations

AFSCME Council 3	Denise Gilmore, Legislative Director Ben Maynard, Local 1606
Maryland Motor Truck Association	Louis Campion, President Armand Patella, Executive Vice President

Legislative Participants

Maryland District 21	Senator James Rosapepe Owen Khan, Chief of Staff
Office of the Senate President	Jody Sprinkle, Deputy Chief of Staff

Damian Lang, Public Policy Fellow

Guest Presenters

Virginia Department of Transportation	Jameo Pollock, Acting Assistant Division Administrator

Session Schedule & Attendance Record

	Date	Time	Session Location	Attended / Invited
Session 1	08/15/2022	1 PM - 2:30 PM	Virtual	35 / 41
Session 2	09/19/2022	1 PM - 2:30 PM	Virtual	40 / 41
Session 3	10/21/2022	1 PM - 2:30 PM	Virtual	36 / 41
Session 4	11/21/2022	1 PM - 2:30 PM	MDOT TSO	31 / 41

SECTION III: BACKGROUND, DEFINITIONS, & INFORMATION FOR APPRENTICESHIP

Background on Apprenticeship & The Registered Apprenticeship Program

Apprenticeship is a centuries old practice of employee training that has been widely practiced in countries around the world, primarily in the skilled trades. Registered Apprenticeship pairs trainees (apprentices) with skilled tradespeople (journeyworkers) and utilizes mentorship and on-the-job learning to confer occupation specific skills that become more complex over the course of training. Unlike other forms of training, apprentices are considered full time, W-2 employees from the outset and are paid for their work and for progressive skill gains throughout their apprenticeship.

In the United States, apprenticeship was formalized by the National Apprenticeship Act (NAA) of 1937, also known as the Fitzgerald Act. The NAA established the basis for America's modern leading model for apprenticeship, the Registered Apprenticeship Program. The Act also gave the US Department of Labor (USDOL) the authority to issue regulation protecting the health, safety, and general welfare of apprentices (29 CFR Part 29) as well as preventing racial, ethnic, religious, age, disability and gender discrimination in apprenticeship programs (29 CFR Part 30). In the 2021 fiscal year, the US Department of Labor reported 593,690 active Registered Apprentices across the United States.

Registered Apprenticeship is a structured approach to apprenticeship that requires sponsor organizations or employers to develop program standards and register with either USDOL or an authorized State Apprenticeship Agency. The process of registration provides opportunities for technical assistance, validation, and oversight which ensures that all apprentices receive a consistent and comprehensive standard of training and related instruction, and secures the health

and safety of all apprentices. In the state of Maryland, the Maryland Department of Labor (MD Labor) is the State Apprenticeship Agency which has been authorized by USDOL since 1962 to register and oversee Registered Apprenticeship Programs.

Within MD Labor, Registered Apprenticeship is administered by the Maryland Apprenticeship and Training Program (MATP), an office of the Division of Workforce Development and Adult Learning (DWDAL). MATP provides technical assistance to sponsors seeking to register an apprenticeship program in Maryland. Once a sponsor has created apprenticeship standards and an organized program curriculum that meets Maryland's requirements, it goes before the Maryland Apprenticeship and Training Council (MATC) for approval. MATC approved programs are registered with the State. The employer or sponsor is also responsible for registering their apprentices with MATP.

As of September 2022, there were more than 12,000 apprentices registered in Maryland, across 182 active Registered Apprenticeship programs, encompassing 3,879 employers.

Key Definitions & Components for Registered Apprenticeship in Maryland

In order to register an apprenticeship program in Maryland, sponsors must typically present the Maryland Apprenticeship and Training Council with apprenticeship standards and a curriculum that include at least the following key components:

National Occupational Credential	Every graduate of a Registered Apprenticeship program must receive a nationally recognized credential referred to as a certificate of completion. The portable credential signifies that the apprentice is fully qualified to perform the essential functions of the occupation.
On the Job Learning (OJL)	A foundational component of Registered Apprenticeship, OJL refers to the hands-on training an apprentice receives while engaging in the functions of the registered occupation during paid employment. OJL is supervised and led on a 1:1 basis by an experienced mentor referred to as a journeyworker. Apprenticeship standards submitted by a sponsor will specify which skills an apprentice learns on the job and whether the skills are validated by accrued work hours, demonstration of competency, or both. Programs registered in Maryland generally must include at least 2,000 of OJL for each year of the apprenticeship.
Registered Apprenticeship Sponsor	An entity, business, committee, or organization that manages a Registered Apprenticeship program that has been approved by the Maryland Apprenticeship and Training Council (MATC). Employers can serve as sponsors, but sponsors may also be committees of employers and labor unions, community organizations, colleges and universities, local workforce boards, or other entities that earn approval from MATC.
Related Instruction (RI)	Another required component of Registered Apprenticeship, RI refers to the more formalized classroom-style instruction that is offered in conjunction with OJT. Related instruction is often provided by a

	community college, trade school, labor union, virtual learning platform, correspondence school, or third party, but can also be provided in-house by the employer. Programs registered in Maryland must include at least 144 hours of related instruction for each year of the apprenticeship. .
Rewards for Skill Gains	As apprentices gain experience and progress through their training schedule they must earn progressive wage increases. Progressive wage increases and the skill gains associated are outlined in the standards for a proposed Registered Apprenticeship.

Youth Apprenticeship in Maryland

In 2015, the Maryland Youth Apprenticeship Advisory Committee (YAAC) authored its first report on Youth Apprenticeship in Maryland and set into motion plans for a statewide system for implementing Youth Apprenticeship as a means of training and developing the State's young workers. While Registered Apprenticeship programs typically require that apprentices be at least 18 years of age and in possession of a high school diploma or its equivalent, or able to earn one during the course of the apprenticeship, Youth Apprenticeship establishes standards that can be embedded in secondary education, reaching apprentices as young as 16 or 17 years of age with parent or guardian consent.

After a successful pilot program, the Apprenticeship Maryland Program (AMP) was launched as a statewide program in 2018 to administer Youth Apprenticeship through joint oversight by MD Labor and the Maryland State Department of Education (MSDE). Youth Apprentices involved in AMP work a minimum of 450 hours with a certified employer while receiving Related Instruction through their school district, a community college, or other trade school. The program allows apprentices to make progress toward their diploma while also earning a wage and developing industry-recognized vocational skills. As of November 2022, 22 of Maryland's 24 school districts participated in AMP, enrolling 423 students across 368 employers.

While AMP has posted year-over-year gains in apprentice participation and business and school district engagement since its inception, the program is expected to expand rapidly to meet the State's goals for career and technical education. The Blueprint for Maryland's Future sets a goal for 45 percent of high school graduates completing apprenticeships or industry-recognized occupational credentialing by the 2030-2031 school year. Based on 2021-22 school year enrollments, around 25,800 high school graduates will need to be engaged in apprenticeship or other CTE programming by 2030-2031 to meet the Blueprint's goal. Currently only about 7 percent of Maryland high school graduates meet the Blueprint's CTE criteria.

Potential Strengths of Registered Apprenticeship & Youth Apprenticeship

Despite its long history, Registered Apprenticeship in the United States has a fairly limited body of comprehensive longitudinal research. The USDOL Office of Apprenticeship and many State Apprenticeship Agencies, including MD Labor, are working to expand and improve data systems to better study the potential benefits of apprenticeship. Existing data, primarily from the building trades and skilled crafts indicate strong lifetime wage outcomes for apprentices and improved

retention and training outcomes for employers.

A November 2021 report by the Maryland Longitudinal Data System Center[1] (MLDS) examined five-year outcomes from apprentices that completed the MATP in 2012-2013. The analysis found that the cohort reported median quarterly wages of $20,725, equating to a median annual salary of $82,900. Findings from this cohort demonstrate that apprenticeship completers, while a minority of the workforce, earn median quarterly wages that are nearly double those of associate's degree holders.

Case studies published by the USDOL Office of Apprenticeship[2] on long term federally Registered Apprenticeships indicate that apprenticeship completers see a $300,000 lifetime earning advantage over peers not involved in apprenticeship, and that apprentice employers retain as many as 93 percent of their apprentice employees after training.

SECTION IV: OCCUPATION PROFILES

The Chairmen requested that the Workgroup identify the extent of vacancies in the transportation sector. As Maryland's largest public sector transportation employer, the Workgroup focused particular attention on analyzing and assessing various MDOT staff classifications. This section presents summary vacancy statistics and background information on several of the six MDOT transportation business units (TBUs) which employ in-demand and difficult to hire staff classifications. Each subsection identifies and profiles high vacancy and highly-apprenticeable occupations across MDOT's operations, as well as existing efforts to implement apprenticeship training within the TBU.

Included on pages 19-20, Figure 2 reports comprehensive vacancy rate statistics for a wide range of MDOT classifications spanning January 2022 to October 2022. Figure 1, below, presents a summary view of high-vacancy MDOT classifications (greater than 25%) based on vacancy rates calculated for October 2022.

Figure 1 – Summary Table: High-Vacancy Skilled Trade Classifications within MDOT, as of October 2022

Classification	Vacancy Rate for October 2022
MPA Electro-Mechanical Crane Tech I	66%
MTA Repairman - Mason/Carpentry	50%
MTA Repairman C - Rail	42%
MDTA Police	40%

[1] Exploring Workforce Outcomes Of Maryland Apprenticeship And Training Program Completers. (2021). Maryland Longitudinal Data System Center.
[2] USDOL OA Apprenticeship Case Studies. (2022). USDOL.

Heavy Equipment Maintenance Tech (Apprentice)	33.3%
Heavy Equipment Maintenance Tech I	33.3%
MTA Repairman - Electrician Skilled	33.3%
Facilities Maintenance Tech I	32.2%
Skilled Trades Specialist III	31.5%
MTA Repairman - Plumber	28.5%
Heavy Equipment Maintenance Tech II	28%
MTA Repairman B - Bus	25%

Source: MDOT Human Resources Information System (HRIS)

The MPA Electro-Mechanical Crane Tech I has the highest vacancy rate of skilled trades position class specifications at MDOT (66%). This classification specification is unique to the Maryland Port Administration. Positions in this classification have historically been categorized as "hard to fill" due primarily to the specialized nature of work, required work experience, and higher compensation offered for similar positions in the private sector.

MDOT reported that MTA has particular challenges in recruiting for positions and retaining staff in the Repairman class specifications, especially for masons, carpenters, rail and bus repair and maintenance techs, and plumbers. In the skilled trades classifications overall, there are a total of 24 vacant positions across MDOT as of October 2022.

The MDOT MTA additionally reports 66 open positions for Bus Operators and 10 open positions for Light Rail Operators as of October 2022.

MDOT police classifications were discussed in greater detail in the interim report authored for the Maryland Apprenticeships in Public Safety Workgroup. There are a total 43 vacant positions in the police classification that are presently being recruited for by the MDTA and MTA as of October 2022. Twenty police officer positions are open at the MDTA and 23 police officer positions are open at the MTA.

Positions in the Facilities Maintenance Technician (FMT) and Heavy Equipment Maintenance Technician class specification series are utilized across most MDOT TBUs. The State Highway Administration (SHA), MTA, MDTA, and the MPA have expressed critical concern in attracting and retaining talent to fill these positions. As of October 2022, there are 157 positions open in the FMT I-IV class specifications that were being recruited for. Positions in this classification continue to be MDOT's greatest recruitment and retention challenge. Additional discussion of FMT vacancy and training is provided in subsection B.

SUBSECTION A: MARYLAND PORT ADMINISTRATION (MPA)

The Port is an economic engine for Greater Baltimore, the State of Maryland, and the Mid-Atlantic region. It is a major contributor to the economy in the provision of employment and income to individuals; revenues to businesses engaged in handling, shipping, and receiving cargo; tax revenues to State and local governments; and customs fees to the federal government.

The MPA manages the six, state-owned public marine terminals of the Port of Baltimore. The public terminals include the Seagirt Marine Terminal, Dundalk Marine Terminal, South Locust Point Marine Terminal, North Locust Point Marine Terminal, and the Masonville and Fairfield auto terminals. The MPA terminals handle containers, autos/light trucks, roll-on/roll-off farm and construction machinery, forest products, passengers and breakbulk cargos. Under the MPA, the Port of Baltimore has become the top port in the U.S. for handling autos and roll on/roll off cargo, one of the few East Coast ports able to accommodate ultra-large container ships, and one of Maryland's leading economic generators.

MDOT has identified two skilled trade classifications that are in high demand with the MPA specifically:

MPA Marine Terminal Repair Technician

The MPA Marine Terminal Repair Technician is the experienced level of specialized corrective and emergency maintenance and construction work on various underground utility systems and infrastructure specific to marine terminal operation located throughout the MPA marine terminals and associated facilities such as potable water distribution, sanitary waste water, storm water drainage, potable water distribution systems for vessels, pier/berth fendering, pier/berth backing beams, perimeter security and cargo gate operating systems, and seasonal facility maintenance and upkeep tasks. Employees utilize various tools (i.e., hand and power), operate motorized equipment, and perform manual tasks essential to the upkeep and appearance of a facility. Employees work independently or as members of a crew.

MPA Electro-Mechanical Crane Technician

The MPA Electro-Mechanical Crane Technician I is the entry-level of work maintaining, inspecting, and repairing cranes at MPA facilities. Employees in this class learn the unique electrical, electronic and mechanical components of container, whirly and mobile cranes as well as passenger boarding bridges utilized during cruise operations. Electro-Mechanical Crane Technicians provide oversight to crane operations in order to troubleshoot mechanical and electrical problems and minimize down time. Employees in this classification do not supervise others.

Additionally, the following skilled trade classification, not specific to the MPA, are in high demand:

- Skilled Trade Specialist/ Plumber
- Skilled Trade Specialist/ HVAC
- Skilled Trade Specialist/ High Voltage Electrician
- Skilled Trade Specialist/ Welder
- Skilled Trade Specialist/ Carpenter
- Facility Maintenance Technician
- Heavy Equipment Maintenance Technician

The MPA has worked to develop MDOT's first Registered Apprenticeship program for the Heavy Equipment Maintenance Technician (HEMT) classification. The program is offered in partnership with the Community College of Baltimore County (CCBC). Apprentices entering the program will be assigned the newly created HEMT Apprentice class specification. The MPA Auto/Diesel Apprenticeship is a comprehensive two-year Apprenticeship program including 4,000 hours of OJL and 330 hours of related instruction provided by CCBC. This program design was completed in 2021 and positioned to be presented to MATC for approval and registration. However, the program was placed on hold by MDOT due to turnover in the MPA Auto Repair and Maintenance shop, leading to an inability to meet the one-to-one mentor to apprentice ratio requirement. MPA is actively recruiting to fill critical positions to support the program and plans to move forward with pursuing MATC approval and registration.

Due to immediate recruitment difficulties and high turnover rates, the MPA has implemented an informal apprenticeship or cross training program for the skilled trades. As of October 2022, the MPA reports success with improving FMT I recruitments.

SUBSECTION B: STATE HIGHWAY ADMINISTRATION (SHA)

SHA is responsible for the State's numbered, non-tolled roads and works to deliver transportation projects and solutions that improve Maryland's roads and bridges. SHA has a demanding portfolio of projects and operates in jurisdictions all across Maryland. As noted for other TBUs, the SHA has experienced significant hiring and retention difficulty for FMT and HEMT classifications. Additional vacancy and training profiles presented in this subsection provide training and staffing data for FMT and HEMT classifications with the SHA.

Facility Maintenance Technician Classifications

MDOT SHA's vacancy rate for the FMT I-III is 11.7 percent as of October 2022. MDOT SHA reports experiencing notably high turnover among the FMT positions within its District Shops. In 2021, MDOT SHA faced a particularly high turnover rate of 21.2 percent for FMT positions and as of June 2022, the FMT turnover rate was 12.1 percent, on track to meet or exceed 2021's unusually high percentage by year end. SHA reports that high FMT turnover has decreased productivity within District Shops, increased recruitment costs, increased training costs, and led to lost staff time for employee training.

MDOT SHA reports spending approximately $6,500 on required certifications for a single FMT

I position, approximately $14,000 on required certifications for one FMT II position, and approximately $31,000 on required certifications for a single FMT III position. The approximate cost to SHA to provide the required certifications for one position from the FMT I classification to the FMT III classification is $51,000. The total certification cost does not include the additional costs of both the supervisor and employee's time during on-the-job training, instruction materials, equipment and time for formal training, or the loss of productivity until the new hire masters the job.

In addition to vacancy and turnover data, SHA provided recruitment information for FMT positions in the District Shops. Since October 2021, MDOT SHA received 862 applications for vacant FMT positions. Of those 862 individuals who applied, 609 moved on to the interview process, and only 75 were hired. Only 12 percent of the 609 individuals who were selected for interviews were converted to hires. Some sources have stated that the average interview to hire ratio for most organizations is approximately 4.8:1, with 3:1 or better being the ideal level to indicate a strong candidate pool and competitive offers.[3] Currently the SHA FMT interview to hire ratio is 12.8:1; meaning approximately 12.8 candidates must be interviewed to yield one successful hire. SHA HR reports that salary is often the largest factor driving attrition from the interview to hire process.

Heavy Equipment Maintenance Technician Classifications

SHA additionally reports experiencing notably high turnover among the HEMT positions in its District Shops. In 2021, MDOT SHA reported a 27.9 percent vacancy rate for HEMT positions, indicating trouble hiring and retaining HEMTs. As of June 2022, the HEMT turnover rate is 2.9 percent, which, while currently low, has potential to increase dramatically near the end of the year.

MDOT SHA spends approximately $6,000 on required certifications for a single HEMT I position, approximately $3,500 on an HEMT II position, and approximately $4,000 on an HEMT III position. The approximate cost to SHA to provide the required certifications for one position from the HEMT I classification to the HEMT III classification is $13,500.

Since September 2021, MDOT SHA has lost 15 HEMTs, hired an additional 12, and continues to have a total of 13 vacancies. SHA reports that HEMT turnover has persistently exceeded the rate at which the agency is able to onboard new staff. In April of 2022, The Secretary's Office (TSO) posted an HEMT I job announcement which has garnered 43 applications, of which 12 were eligible (27.9%). TSO posted an HEMT II announcement in September of 2020 with a re-issue in September of 2021. This posting captured 237 applicants, of which 75 were eligible (31.6%). SHA reports that HEMT position postings average 2-3 qualified candidates per month, inadequately covering new and existing vacancies across the agency.

[3] Recruiting Metrics: Applicant and Interview to Hire Ratios. (2022). Jessica Miller-Merrell.

SUBSECTION C: MARYLAND TRANSIT ADMINISTRATION (MTA)

The Maryland Transit Administration (MTA) is a division of the Maryland Department of Transportation, and one of the largest multi-modal transit systems in the United States. MTA operates Local Buses (CityLink and LocalLink), Commuter Buses, Light RailLink, Metro SubwayLink, Maryland Area Regional Commuter (MARC) Train Service, and a comprehensive Paratransit (MobilityLink) system. MTA also manages the Taxi Access system and directs funding and statewide assistance to Locally Operated Transit Systems (LOTS) in each of Maryland's 23 counties, Baltimore City, Annapolis and Ocean City.

The MTA reported several TBU-specific classifications where hiring demand is high and apprenticeship may be an appropriate tool for training:

Bus Operations
- Maintenance
- Operator

Light Rail Operations
- Light Rail Car Maintenance
- Operator
- System Maintenance

Metro Rail
- Rail Car Maintenance
- Operator

Skilled Trades Specializations
- HVAC
- Plumbing
- Electrical
- Carpentry
- Maintenance of Way

Automotive Shops
- Truck Shop

Developing a Bus Maintenance Apprenticeship Program

MTA has previously worked to develop standards for a Registered Apprenticeship in Bus Maintenance for the A Repairman classification. MTA is revisiting the program development and plans to launch a Program by the end of 2023. MTA has established a Joint Apprenticeship Council (JAC) composed of ATU Local 1300 and management personnel. The Council is also supported by technical assistance resources from the International Transportation Learning Center/Transit Workforce Center and an Apprenticeship Navigator from MD Labor. The Bus

Maintenance Apprenticeship Program will additionally extend to battery electric propulsion systems to prepare employees for the incoming fleet of electric buses. Utilizing MTA's existing partnerships with Baltimore City Public Schools, the Mayor's Office of Employment and Development, and the YouthWorks Program, MTA plans to phase in youth involvement with the Bus Maintenance Apprenticeship. Pending MATC approval for the pilot, MTA also plans to pursue additional Apprenticeship programs for Bus Operators, FMTs, and System Maintenance occupations.

SUBSECTION D: TRANSPORTATION SECRETARY'S OFFICE (TSO)

The Office of The Secretary of MDOT is an inward-looking business group that supports the Secretary of Maryland Department of Transportation (MDOT) and serves the MDOT transportation business units (TBUs) with support in areas such as Information Technology, Human Resources, Strategic Communications, Organizational Development, Equal Opportunity and Minority Business Enterprise, Homeland Security and Cybersecurity.

The Secretary's Office (TSO) provides policy and administrative oversight to MDOT's six TBUs – the State Highway Administration, Maryland Transit Administration, Motor Vehicle Administration, Maryland Aviation Administration, Maryland Port Administration and the Maryland Transportation Authority – and leads operations and maintenance of state highways and bridges, tollways, transit systems, motor vehicle licensing, Baltimore/Washington International Thurgood Marshall Airport and the Helen Delich Bentley Port of Baltimore.

MDOT TSO also serves and plays an integral role in participating and leading the Maryland Transportation Authority Board, the Maryland Port Commission and the Maryland Aviation Commission, and is a member of the Washington Metropolitan Area Transit Authority Board of Directors.

Developing Cyber Security Apprenticeship

MDOT is partnering with CCBC's Cybersecurity Institute to design and develop an apprenticeship program for cybersecurity positions. MDOT has prepared an on the job training (OJT) schedule that covers policy and protocol development, network security and compliance, systems installs, configuration, testing and implementation; network confidentiality, integrity and availability, network assessment and mitigation, business continuity, security risk and vulnerabilities and review of network data for patterns and suspicious activity. The MDOT TSO Classification and Compensation Unit recently conducted an advisory study of the apprenticeship role and has determined that the position is classified as IT Technical Support Tech / grade 15. Pending further development, MDOT plans to submit this new Apprenticeship program for MATC approval.

SECTION V: APPRENTICESHIP IN TRANSPORTATION & RELATED SECTORS – CASE STUDIES

CASE STUDY A: MISSION COLLEGE AND SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

With over 90,000 apprentices, California has the largest Registered Apprenticeship Program in the United States by total enrollment. Apprenticeships in California are registered by the USDOL-approved California Division of Apprenticeship Standards (DAS), a state body largely equivalent to Maryland's Apprenticeship and Training Program (MATP).

In 2015, the California State legislature passed the California Apprenticeship Initiative (CAI) which provided funding for the expansion of new apprenticeship programs across the state. One of the largest groups of beneficiaries of CAI funding were community colleges and employer partners. In 2019, Social Policy Research Associates and the Foundation for California Community Colleges authored a briefing paper on a CAI-funded apprenticeship program spanning several transportation occupations.[4]

Beginning in 2012, Mission College in Santa Clara, California began engaging area employers around the topic of Registered Apprenticeship and, in 2015, it secured a USDOL American Apprenticeship Initiative grant to begin developing new Registered Apprenticeship programs in key sectors. Mission College partnered with the Santa Clara Valley Transportation Authority (VTA) and the Amalgamated Transit Union (ATU) Local 265 to develop a new program: the Transportation Apprenticeships for Professional Career Advancement (TAPCA).

The program received CAI funding in 2016, and by 2018, it had enrolled 388 apprentices and completed 140. The program's central occupation is that of coach (bus) operator and the Apprenticeship serves as the training method for all new VTA coach operators employed by the Authority. Coach Operator Apprentices undergo 10 weeks of full-time classroom instruction, which is taught on site at VTA facilities by VTA staff. The VTA staff trainers are all approved by Mission College and the Apprentices' classroom instruction confers 10 course credits from Mission College. Apprentices are paid (as of 2018) $17.53 an hour during their classroom training period. During training, Apprentices are paired with a staff mentor who further trains the Apprentice during a 15.5 month on the job training period. Based on collective bargaining agreements, Apprentices are paid $43,000–$72,000 (annualized salary) for their OJT period. Overall, the Apprenticeship spans around 18 months and enrolls Apprentices on a cohort basis. The VTA Coach Operator Apprenticeship was registered with the USDOL in 2015 and the California DAS in 2016.

[4] "Behind the Wheel: A case study of Mission College and Santa Clara Valley Transportation Authority's Coach Operator Apprenticeship Program." (2019). Wolf, K., Dunham, K., Hebbar, L., and Oettinger, J.

As the authors of the 2019 briefing paper explained, one of the central value propositions of restructuring coach operator training into a formalized credit-bearing Registered Apprenticeship program, was that it professionalized the occupation of coach operator and acknowledged the significant amount of technical and technological knowledge that is expected of modern transit workers. The SPRA paper reported that VTA averaged approximately 30 lasting coach operators hires annually in 2014 but by 2019, following the implementation of TAPCA, new operator hires were exceeding 100.

The initial success of the Coach Operator Apprenticeship was encouraging enough that VTA has since added four new apprentice occupations: Track Worker Apprentice, Overhead Line Worker Apprentice, Service Mechanic Apprentice, and Light Rail Operator Apprentice. Where the initial Coach Operator Apprenticeship presented an entry level pathway that mostly engaged new VTA employees, these subsequent occupations have largely captured existing VTA employees; allowing them to move laterally or advance into more highly-skilled occupations.

CASE STUDY B: VIRGINIA DEPARTMENT OF TRANSPORTATION

On September 19, 2022, Jameo Pollock, Acting Assistant Division Administrator for the Virginia Department of Transportation (VDOT) presented to the Maryland Apprenticeships in Transportation Workgroup on VDOT's work implementing apprenticeships, primarily in the agency's Construction Division. While VDOT does not employ a significant number of apprentices, and not all of their apprenticeship programs are formal Registered Apprenticeship programs. Pollock's work and VDOT's expansion into Registered Apprenticeship demonstrated a model for public sector led apprenticeship adoption in the transportation industry.

Pollock highlighted that VDOT staff were able to use comprehensive HR data from the agency's construction units to better understand how workforce challenges are impacting in-demand positions. Pollock found that among VDOT construction staff positions he sampled, as many as 80 percent of current employees had less than 5 years of service with the agency. Compounding this issue of high turnover was a considerably long training period needed to on board new employees; generally around 18 months.

In assessing the need for a secure pipeline of incoming talent and a means of training that addressed persistent turnover and dissatisfaction, Pollock and other VDOT staff worked to connect their workforce assessment to a central plan for apprenticeships across numerous occupations. For some occupations, VDOT considered Industry Recognized Apprenticeship Programs (IRAPs) - a form of apprenticeship that the USDOL has indicated an intention to abrogate in 2022 - but VDOT has also established Registered Apprenticeship programs in some construction and trade occupations and is registered as a sponsor with the Virginia Department of Labor and Industry.

One Registered Apprenticeship occupation sponsored by VDOT is the occupation of Land Surveyor. Pollock pointed out in his analysis that surveyors, who play a crucial role in the

construction and planning projects carried out by VDOT, experienced significant turnover and lengthy training processes that indicated cause for concern and intervention. VDOT Surveyor Apprentices must complete two years of OJT, including 120 hours of related instruction (referred to as "related technical instruction" in Virginia) and 27 credit of curricular education, in congruence with the requirements of the Virginia Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA).

VDOT's Land Surveyor Apprentices enroll in surveyor coursework through Tidewater Community College, earning a career studies certificate that exposes Apprentices to highly specialized and in demand skills required of modern surveyors working in the transportation construction sector. VDOT has leveraged its partnership with both community colleges and local school districts to develop pipelines that help introduce students to Apprenticeship as a means to pursue careers in engineering, operations, and construction management.

SECTION VI: OUTLOOK ON TRANSPORTATION APPRENTICESHIPS IN MARYLAND

The Chairmen requested that the workgroup report on potential transportation sector Registered Apprenticeship sponsors and opportunities for program support, connection with other institutions, and integration with degree-bearing and high school-level Registered Apprenticeship initiatives in Maryland. As Maryland's largest employer in public sector transportation, MDOT will play a crucial role in any plans for transportation Registered Apprenticeships in the state. Beyond sheer workforce size, however, MDOT additionally has a number of organizational qualities that make the agency an ideal sponsor and system builder in the advancement of Registered Apprenticeship.

MDOT Organizational Qualities which Favor Registered Apprenticeship

High Demand for Highly-Apprenticeable Occupations – While fostering new Apprenticeships in "non-traditional" occupations remains a significant priority both in Maryland and nationally, there is an implementation advantage for more traditional Registered Apprenticeship programs in the building trades. With diverse business units responsible for constructing and maintaining built facilities all across the state, MDOT is a significant employer of skilled tradespeople. All of MDOT's self-identified high demand and hard to fill positions are skilled trades positions, many of which reported 25 percent or higher position vacancy rates in 2022.

The building trades have relied on apprenticeship as the foundation of their skilled labor pipeline for centuries and Registered Apprenticeship is ostensibly designed to train Apprentices in this tradition. Additionally, highly skilled positions that require extensive job-specific knowledge, such as those identified by the MPA and MAA, are excellent candidates for the structured outcomes-based system of Registered Apprenticeship. MDOT is well positioned to take advantage of existing training infrastructure and MD Labor technical assistance if the agency

decides to pursue registering Apprenticeships for skilled trade classifications.

Centralization of Classification, Compensation, and Management Systems – Unlike many Maryland State agencies which have their employee classifications and salaries governed by the Department of Budget and Management (DBM), MDOT has independent control over its personnel systems. Registered Apprenticeships may require some flexibility in an Apprentices's job classification, particularly as it relates to progressive wage increases and the increasing level of responsibilities Apprentices take on throughout their training. MDOT's independent personnel system could potentially reduce or mitigate the administrative barriers posed by the public sector's classification and compensation systems.

Additionally, MDOT TSO and many of the TBUs have staff devoted to analysis and strategic planning around training, hiring, and professional development. With the commitment of additional resources or reconfiguration of existing systems, MDOT may be able to formalize a permanent office or committee to oversee Registered Apprenticeships across the Department. Centralizing Registered Apprenticeship responsibilities into a committee or other body that has close ties with MDOT's existing personnel management, training, and strategic planning units could provide the necessary infrastructure for rapid scaling of Apprenticeships across multiple TBUs.

Related Instruction Delivery Capacity – In addition to being a major employer, MDOT TBUs often provide much of their staff's training and required certifications in-house. As demonstrated in the SHA profile offered in Section IV, many TBUs already expend considerable resources on staff training. Whereas the provision of Related Instruction in conjunction with Registered Apprenticeship can sometimes be a barrier or a point of implementation challenges for new program sponsors, MDOT's existing capacity and training resources position the agency well to formalize their existing training structures as Registered Apprenticeships.

Apprenticeship as a Leadership Priority – In addition to participating in the Maryland Apprenticeships in Transportation Workgroup with MD Labor, MDOT has undertaken considerable initiatives to refocus on staff training, recruitment, and retention. MDOT leadership has strongly signaled a commitment to leveraging Apprenticeships as a tool for achieving the agency's workforce goals, both through the creation of new pilot programs as described in this report and through continued outreach and engagement of partners and job seekers.

On September 22, 2022, MDOT Secretary James F. Ports, Jr. hosted a Skilled Trades Partnership event at MDOT TSO to promote the agency, its apprenticeship program initiatives, career opportunities, and employment benefits. Over 100 representatives were invited from Maryland high schools, community colleges, workforce programs, and training centers. Secretary Ports encouraged attendees to connect with MDOT to further explore partnering with skilled trades apprenticeship initiatives. MDOT has subsequently continued to engage with local school districts across Maryland by partnering to deliver career fairs, trade exploration events, and information sessions.

MDOT's substantial operational presence across Maryland and growing relationships with

school districts, community colleges, and universities position the agency well to be a system leader as well as an employer and sponsor for Registered Apprenticeship. This factor could be particularly valuable for driving integration with local school districts and expansion of career and technical education. With strategic investment and organization incited by MDOT's leadership and supported through partnership with MD Labor, the agency could play a major role in scaling traditional, non-traditional, and innovative Registered Apprenticeships statewide.

Potential Implementation Challenges and Additional Considerations for MDOT Registered Apprenticeships

Securing Staffing for Apprentice Mentorship – Direct mentorship throughout training is a cornerstone of Registered Apprenticeship and programs Registered in Maryland are generally required to provide a one to one mentor to Apprentice ratio. In the face of persistent staff shortages and high turnover among some positions, it may be challenging for certain TBUs or individual shops to offer the required capacity for Registered Apprenticeship. As discussed elsewhere in this report, mentorship shortfalls have already delayed the implementation of MDOT's HEMT Apprenticeship program.

While MDOT reports success with hiring incentives and informal training measures aimed at reducing the impact of chronic vacancy and turnover, the issue should be carefully analyzed and figured into future plans for Registered Apprenticeship programs. Where possible, MDOT and MD Labor may be able to examine and implement additional programs to spur mentor support and secure retention among trainers and supervisors.

Integration of Organized Labor and Collective Bargaining Agreements – Labor unions and collective bargaining agreements (CBAs) are constituent parts of Registered Apprenticeships in the industries where they operate. Many of the most successful and longest running Apprenticeship programs came about through labor-management partnerships or joint agreements that secured mutual support and ownership of the Apprenticeship program. As a large employer with diverse occupations, MDOT spans numerous labor organizations with several CBAs and memoranda of understanding (MOUs).

Successful coordination and partnership with organized labor can be a galvanizing feature of Registered Apprenticeship, but it can also pose another implementation roadblock. MDOT will need to carefully examine occupations across the various TBUs to better understand how CBAs and MOUs may impact the process of developing Apprenticeship standards. MDOT has already reported initial success in exploring Apprenticeship creation with the Amalgamated Transit Union (ATU) and International Transportation Learning Center (ITLC).

SECTION VII: WORKGROUP OUTLOOK

In the short time since the Maryland Apprenticeships in Transportation Workgroup convened, MDOT, MD Labor, and the Workgroup's many participants and contributors have made considerable progress in better understanding Maryland's public sector transportation workforce. While the conversations, presentations, and analysis have yielded the observations and areas of progress discussed in this report, the Workgroup acknowledges additional priorities for future sessions.

Specifically, the Workgroup will seek to pursue additional participation and consultation with labor groups representing MDOT classifications being considered for Registered Apprenticeships. Broadening union participation in this group will be an important step to initiating strong labor-management foundations for future Apprenticeship program development in the sector. The Workgroup also plans to extend the conversations and analyses of these initial sessions beyond the scope of MDOT, to eventually include the local transportation departments operating across Maryland, the Washington Metropolitan Area Transportation Authority (WMATA), Amtrak, and other public and private sector employers operating in the transportation labor market.

Additionally, several MDOT TBUs, including the MDTA, MVA, and MAA, supplied data to the workgroup and expressed strong support for Registered Apprenticeship within their units. Their data and contributions, which largely echoed trends and needs discussed elsewhere, were only excluded from this interim report in the interest of concision. All MDOT TBUs will be included in future sessions, reviews, and planning associated with Registered Apprenticeship in transportation.

Building on the findings of this interim report, the Workgroup plans to reconvene in 2023 to continue operationalizing transportation Apprenticeships in Maryland. As the work becomes more focused on system building and program creation, the Workgroup will likely spur the creation of smaller subgroups more narrowly focused on individual occupations, priorities, or TBUs. All progress and additional findings stemming from future sessions will be presented to the Chairmen and the General Assembly in a final report by June 1, 2023.

Figure 2 - Vacancy Rates for MDOT Skilled Trades and Operator Classifications – Monthly, January 2022 to October 2022 (data presented as percentage (%) of vacant positions per classification)

Rows shaded in gray denote classifications where average month-to-month vacancy was greater than 25%

CLASSIFICATION	JAN 22	FEB 22	MAR 22	APR 22	MAY 22	JUN 22	JUL 22	AUG 22	SEP 22	OCT 22	AVERAGE
Heavy Equip Maint Tech Apprentice	0	66.6	66.6	75	62.5	37.5	42.8	42.8	50	33.3	47.7
MPA Electro-Mech Crane Tech I - Elect Opt	33.3	33.3	33.3	33.3	33.3	33.3	33.3	66.6	66.6	66.6	43.3
Facility Maint Tech I	41.9	41.4	41.7	42.4	39.4	40.3	41.2	57.9	39.6	32.2	41.8
Aviation High Voltage Electrical Tech I	100	100	100	0	100	0	0	0	0	0	40.0
Heavy Equip Maint Tech II	50	46.6	50	42.4	36.3	37.1	31.2	28.1	30.3	28.1	38.0
MTA A Repairman - Mason/Carpentry - Skilled							0	50	50	50	37.5
MTA A Repairman - Electrician - Skilled							33.3	33.3	33.3	33.3	33.3
Skilled Trade Specialist III	31.4	33.3	29.4	38.2	35.2	31.2	31.2	30.3	27.7	31.5	31.9
MTA Repairman C - Rail							0	0	60	60	30.0
Skilled Trade Specialist I	33.3	33.3	22.2	22.2	20	20	26.6	38.4	38.4	35.7	29.0
MTA A Repairman - Plumber							16.6	28.5	28.5	28.5	25.5
Heavy Equip Maint Tech I	0	0	0	25	50	25	25	25	50	33.3	23.3
Skilled Trade Specialist II	23.3	27.5	23.7	25.4	27.1	22.9	22.7	19.4	20.3	19.3	23.2
MTA Repairman A - Rail							20	25	21	16.6	20.7
Transportation Facilities Maintenance Worker II	50	50	50	50	0	0	0	0	0	0	20.0
Aircraft Service Worker	28.5	28.5	28.5	14.2	14.2	14.2	14.2	14.2	14.2	14.2	18.5
MTA A Repairman - Electrician							16.6	16.6	16.6	16.6	16.6
MTA Repairman B - Rail							13	13	17.3	21.7	16.3
MTA Operator - Rail							50	0	0	0	12.5
MTA Repairman B - Bus							0	0	25	25	12.5
Heavy Equip Maint Tech III	14.8	11.7	10.6	13.1	12	12	11.2	12.3	12.3	10.2	12.0
MTA A Repairman - Electrical/Mechanical							16.6	11.1	11.7	6.2	11.4
MTA Operator - Light Rail							12	9	10.3	12.9	11.1
MTA Operator - Metro							12.9	12.9	12.9	5.5	11.1

CLASSIFICATION	JAN 22	FEB 22	MAR 22	APR 22	MAY 22	JUN 22	JUL 22	AUG 22	SEP 22	OCT 22	AVERAGE
Facility Maint Tech II	10.3	11.3	11.3	8.4	9.8	11.5	12.1	12.4	11.1	8.3	10.7
MTA A Repairman - Mechanic							8.4	10.1	10.1	12	10.2
Facility Maint Tech III	7.3	9	10.5	11.2	11.5	9.5	10.9	10	7.7	7.3	9.5
MTA A Repairman - Track/Way							10	10	10	7.1	9.3
Technician - Bus							8.3	9	9	8.3	8.7
MTA Repairman A - Bus							11.1	10.3	4.7	5.5	7.9
MTA Repairman C - Bus							11.3	6.8	8.8	4.5	7.9
Transportation Facilities Maintenance Worker III	0	0	0	0	0	0	14.2	14.2	28.5	16.6	7.4
MTA A Repairman - Welder - Skilled							8.3	8.3	8.3	2.2	6.8
Aviation High Voltage Electrical Tech II	6.2	6.2	12.5	12.5	12.5	12.5	0	0	0	0	6.2
Facility Maint Tech IV	7.4	4.9	4.9	4.9	4.4	4.4	5.5	5.5	5.5	6	5.3
MTA Operator - Bus							5	4.5	4.9	5	4.9
Technician - Rail							5	5	5	4.1	4.8

Source: MDOT Human Resources Information System (HRIS)