Highly Automated Systems Safety Center of Excellence (HASS COE)

Staffing Plan

May 2021

U.S. Department
of Transportation

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List of Abbreviations

Abbreviation	Term
COR	Contracting Officer's Representative
DRAP	[USDOT] Departmental Rotational Assignment Program
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTE	Full-Time Equivalent
GAO	Government Accountability Office
HASS COE	Highly Automated Systems Safety Center of Excellence
IAA	Interagency Agreement
IPA	Intergovernmental Personnel Act
IT	Information Technology
MARAD	Maritime Administration
OA	[DOT] Operating Administration
OPM	Office of Personnel Management
OST	Office of the Secretary of Transportation
OST-M	Office of the Assistant Secretary for Administration
OST-R	Office of the Assistant Secretary for Research and Technology
PIF	Presidential Innovation Fellow
PMF	Presidential Management Fellow
SGE	Special Government Employee
STEM	Science, Technology, Engineering, and Math
STIPDG	Summer Transportation Internship Program for Diverse Groups
USDOT	United States Department of Transportation

1. Staffing Plan Overview

1.1 Document Purpose

This document presents the initial plan for staffing the Highly Automated Systems Safety Center of Excellence (HASS COE) in Fiscal Years (FY) 2021 through 2023. It identifies relevant positions, skillsets, grade levels, and position codes, as well as strategies and mechanisms to enable the HASS COE to access, recruit, and hire critical technical experts. These include unconventional or alternative staffing mechanisms (e.g., through the Intergovernmental Personnel Act Mobility Program), as well as recruiting and incentive strategies. Appendix A provides a detailed summary of the proposed positions, including intended grade, series, and order of priority. Appendix B describes a methodology that the HASS COE is following to identify and prioritize core activities, technical areas on which it will focus, and needed skillsets.

In addition to establishing a plan for the HASS COE to follow as it creates and fills positions, this document serves as an informational reference for the HASS COE's stakeholders within the United States Department of Transportation (USDOT) and the Congress.

2. Center of Excellence Overview

2.1 Legislative Basis

The HASS COE is an office within the Office of the Assistant Secretary for Research and Technology (OST-R) directed to be established by Congress "…in order to have a Department of Transportation workforce capable of reviewing, assessing, and validating the safety of automated technologies."[1]

Congress further specified that the HASS COE shall:

1. *Serve as a central location within the Department of Transportation for expertise in automation and human factors, computer science, data analytics, machine learning, sensors, and other technologies involving automated systems;*
2. *Collaborate with and provide support on highly automated systems to all Operating Administrations of the Department of Transportation; and*
3. *Have a workforce composed of Department of Transportation employees, including direct hires or detailees from Operating Administrations of the Department of Transportation and other Federal agencies.*[2]

In its Joint Explanatory Statement, Congress further envisioned the HASS COE serving "…as a dedicated workforce at the Department with the necessary skills and expertise in automation and human behavior, including but not limited to, computer science, machine learning, sensors, and other technologies to audit, inspect, and certify the safety of highly automated systems across all modes of transportation."[3]

In authorizing additional funding for the HASS COE, Congress further specified:

> *To ensure the Department has the necessary expertise and capabilities within the HASS COE to collaborate with and provide support to all operating administrations, the Committee directs the Department to staff the HASS COE with full-time equivalents who have expertise in automation and human factors, computer science, data analytics, machine learning, sensors, and other technologies involving automated systems. This would fulfill the Committee's intent in fiscal year 2020 to allow the Department to hire the best and brightest in these fields, including direct hires from outside the Federal government like industry or academia as well as detailees from operating administrations or other Federal agencies. While section 105 of P.L. 116-94 provides the Department the flexibility to utilize detailees from operating administrations or other Federal agencies, the HASS COE shall not be solely comprised of detailees. Nor shall the HASS COE consist of part-time, fee-for-service experts or be*

[1] Pub. L. 116-94, *Further Consolidated Appropriations Act, 2020*, Division H, Title I, Section 105 (2019).

[2] Id.

[3] H.R. Rep. No. 116-106, at 11 (2019).

staffed on a project-by-project basis. The needs and requests of the operating administrations should drive the work of the HASS COE; however, each new project should not require assembling a staff. The use of part-time, fee-for-service experts shall be limited in scope to emerging issues or incidents requiring capabilities not already provided by the full-time experts within the HASS COE.

The Committee maintains the importance of having a dedicated workforce at the Department through the HASS COE to build internal expertise and capacity in complex transportation-based systems to ensure automated technologies are safe and work as intended.[4]

In subsequent discussions with Congressional staff, they emphasized the importance of staffing the HASS COE with Full-Time Equivalent (FTE) staff, to be complemented with other sources of expertise (e.g., interagency and cooperative agreements, contractors, fellowships, rotational assignments).

2.2 Preliminary Vision, Mission, and Role within USDOT

Based on the legislative language and subsequent discussions, the HASS COE has adopted the following working vision and mission statements:

VISION

NATIONAL RESOURCE FOR EXPERTISE, RESEARCH AND GLOBAL LEADERSHIP IN ADVANCING THE SAFE DEPLOYMENT OF AUTOMATION IN TRANSPORTATION

MISSION

TO BE A NATIONAL CENTER OF EXCELLENCE IN AUTOMATION EXPERTISE AND KNOWLEDGE FOR ALL MODES OF TRANSPORTATION .

TO FACILITATE COLLABORATION AMONG GOVERNMENT, INDUSTRY, LABOR, AND ACADEMIA IN SEEKING CONTINUITY ACROSS TRANSPORTATION MODES TO SAFELY INTEGRATE & RESPONSIBLY DEPLOY AUTOMATION EQUITABLY ACROSS THE TRANSPORTATION ECOSYSTEM

As stated by Congress in its legislation and accompanying explanatory statement, the purpose of the HASS COE is to supplement and complement the resident expertise within USDOT's existing Operating Administrations (OAs) with expertise that is both critical to automated system safety and is not specific to a mode of transportation. While the OAs have extensive expertise in mode-specific fields – e.g., automotive engineering, aerospace engineering – and the application of broader technologies to specific transportation contexts – e.g., automotive electronics, avionics – Congress specified that the HASS COE build a central workforce in cross-cutting areas that are both critical to multimodal automation, and may not justify the hiring of dedicated experts by each OA. This includes the technology areas identified by

[4] H.R. Rep. No. 116-452 (2020).

Congress – computer science, machine learning, sensors, and other technologies to, assess, review and validate the safety of highly automated systems – and other technology disciplines and areas to be identified through early research and stakeholder engagement by the HASS COE and stakeholders within USDOT (the Office of the Secretary of Transportation and USDOT Operating Administrations). The HASS COE's proposed process for identifying and prioritizing these skillsets is outlined in greater detail below.

The HASS COE will strive to form an imaginative, creative, and diverse team that can offer an array of perspectives on critical automation issues, in alignment with the values of USDOT.

2.3 Current Status

2.3.1 Funding

Congress originally appropriated $5 million to establish the HASS COE in FY20, and added another $3 million in FY21 to achieve its intent of prioritizing the hiring of relevant expertise as a dedicated, full-time workforce. This Staffing Plan is based on the $8 million appropriated to date, and assumes the FY22 President's Budget request of an additional $5 million will be appropriated and authorized by Congress. The staffing and spend plans presented below therefore assume DOT has $13 million for FY20 – FY22, while applying carryover funding to fund HASS COE efforts through FY23.

2.3.2 Staffing

The HASS COE officially launched in November 2020 with the hiring of a Director. Additional staff joined on a rotational basis in early 2021 from several OAs, including the Federal Highway Administration (FHWA), the Federal Aviation Administration (FAA), and the Maritime Administration (MARAD); their rotational assignments ended at the end of June 2021 (though the HASS COE plans to continue leveraging the USDOT Departmental Rotational Assignment Program (DRAP) to offer opportunities to additional detailees). The HASS COE has received approval for two additional FTE staff positions (included and referenced in Sections 3.2 and 3.3 below) and has hired two interns through the FHWA Summer Transportation Internship Program for Diverse Groups (STIPDG), provided outside of the HASS COE's budget.[5] STIPDG is a partnership between USDOT and The Washington Center to provide approximately 100 summer internships at DOT that are institutionally funded. Therefore no costs are incurred by an individual DOT office hosting a respective intern.

In March 2021, the HASS COE executed an interagency agreement with the Volpe Center to perform two foundational studies underway that include the development of a Stakeholder Engagement Strategy and of a Transportation Automation Gaps and Opportunities Analysis. While the HASS COE is implementing

[5] See https://www.fhwa.dot.gov/careers/stipdg.cfm and https://twc.edu/programs/summer-transportation-internship-program-diverse-groups for additional information

the hiring outlined in this Staffing Plan, Volpe is additionally providing support in key areas involved the establishment of a new program and office.

3. Proposed Staffing Approach and Organization

This section summarizes the HASS COE's proposed organization, staffing levels, and approach to hiring and recruitment.

3.1 Staffing Projection

Based on the HASS COE's budget current funding level allocated through FY20 and FY21 appropriations and the FY22 budget request, the HASS COE anticipates hiring an additional nine FTE staff in FY21 and an additional three FTE staff in FY22, as follows:

Table 1: Proposed positions, grades, and vacancies

Title	Anticipated Grade Level(s)	Number of Positions Available
Director	GS-15	1
Deputy Director of Program Development and Strategy	GS-15	1
Chief Scientist	GS-15	1
Senior Technical Expert	GS-14/15	2
Technical Expert	GS-13/14	7
Management and Program Support Specialist	GS-14/15	1

Table 2: Cumulative HASS COE Full Time Equivalent (FTE) staff by grade level and fiscal quarter of hire

	Cumulative Staff in FY21				Cumulative Staff in FY22				Cumulative Staff in FY23			
	Q1	*Q2*	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*
GS-15	1	1	3	3	4	4	4	4	4	4	4	4
GS-14				4	6	6	6	6	6	6	6	6
GS-13				3	3	3	3	3	3	3	3	3
Total	1	1	3	10	13	13	13	13	13	13	13	13

Figure 1 outlines the HASS COE's proposed spending for both labor and associated expenses, and Research & Technology initiatives, based on the rate of hiring and anticipated grade levels identified in Table 1 and Table 2.

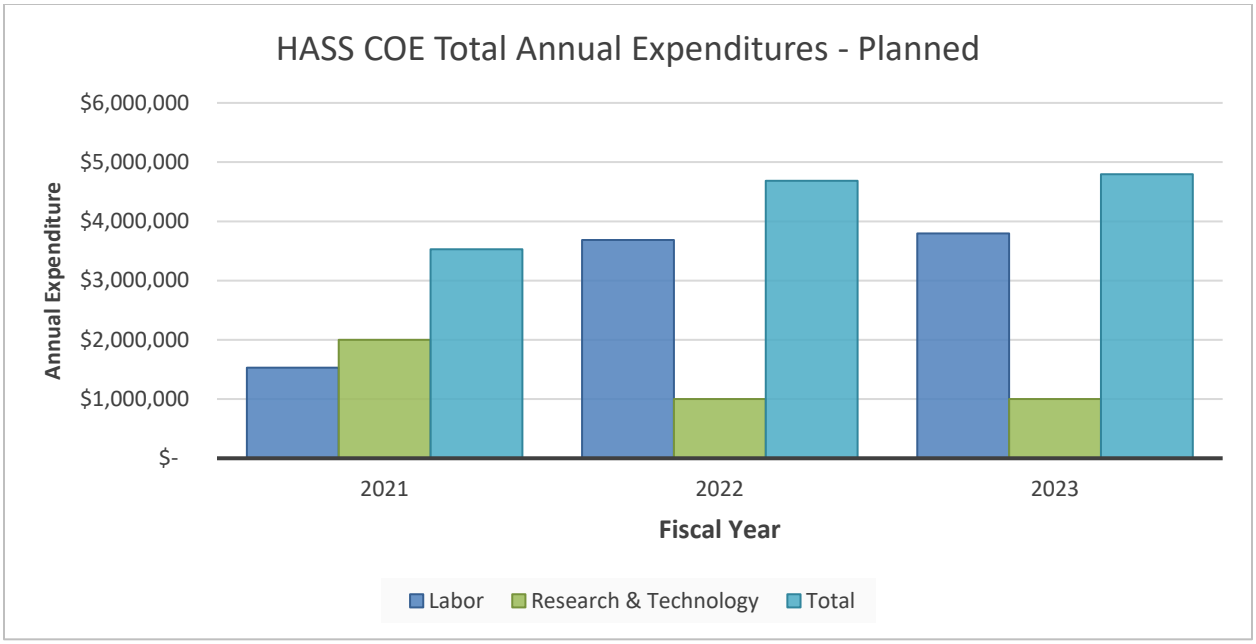

Figure 1: Projected HASS COE expenditures for FY21 through FY23, based on funding levels allocated through FY20 and FY21 appropriations and funding requested in FY2022

3.2 Proposed Positions

This section describes the positions identified above that the HASS COE proposes to fill. While specific duties and required areas of expertise will be refined based on the skillset mapping process described in Appendix B, this section identifies the nature of these positions based on current knowledge. Relevant sections note where these positions have already been filled or position descriptions drafted.

Appendix A provides a more detailed summary of the proposed positions, including their intended grades, series, and order of priority.

3.2.1 Director

- *Status*: Filled
- *Grade*: 15
- *Series*: 2101 (Supervisory Transportation Specialist)
- *Number of Openings*: 1
- *Position Summary*: This individual leads a central organization within the Department of Transportation for expertise in automation and human factors, computer science, data analytics, machine learning, sensors, and other technologies involving automated systems across all modes of transportation. The HASS COE Director is responsible for establishing the HASS COE, leading, planning and executing its core functions, coordinating with stakeholders within and outside of USDOT, and assuring that HASS COE activities align with and advance the

priorities of USDOT.

3.2.2 Deputy Director of Program Development and Strategy

- *Status*: FTE has been approved; position description drafted and approved, and awaiting posting.
- *Grade*: 15 (Supervisory)
- *Series*: 340 (Program Management)
- Number of Openings: 1
- *Position Summary*: This position supports the Director of the HASS COE in program design and management, workforce development, policy and standards coordination, and other strategic initiatives related to building expertise and resources within the Department in automation and other technologies critical to the safety and equity of automated systems. The individual in this position demonstrates experience and knowledge in both public sector program management and technical domains central to the safe and equitable deployment of automated technologies and consideration of labor impacts, and serves as a resource to the HASS COE Director, overseeing and managing specific strategic initiatives, including the areas of workforce development, standards coordination, and stakeholder engagement.

3.2.3 Chief Scientist

- *Status*: FTE has been approved; position description drafted and approved, and awaiting posting.
- *Grade*: 15
- *Series*: Interdisciplinary
    - 0801 (General Engineer)
    - 0803 (Safety Engineering)
    - 0854 (Computer Engineering)
    - 0855 (Electronics Engineering)
    - 1310 (Physics)
    - 1501 (General Mathematics and Statistics)
    - 1515 (Operations Research)
    - 1520 (Mathematics)
    - 1550 (Computer Science)
- *Number of Openings*: 1
- *Position Summary*: This position serves as the Chief Scientist for the HASS COE and is responsible for sharing expertise and leading technical projects with implications across the Department of Transportation and general transportation sector in the areas of automation and other technologies critical to the safety and equity of automated systems. The Chief Scientist serves as a thought leader in reviewing, assessing, and validating highly automated systems and is responsible for both leading technical projects managed within the COE and offering technical

expertise to other agencies within and external to the Department. The individual in this position is a technical expert with extensive experience in ensuring that automated technologies in transportation are safe, equitable, and work as intended. They are a recognized leader in a field of expertise central to the safety of highly automated systems.

3.2.4 Senior Technical Expert / Team Leader

- *Status*: Proposed
- *Grade*: 14/15 (Potentially Supervisory)
- *Skillsets and Relevant Job Series*: Vacancies for this position will seek one or more of the following skillsets listed in priority order, and be posted in one or more of the corresponding job series, to be determined based on the skillset mapping exercise described in Appendix B:
    - Artificial Intelligence and Machine Learning
        - Relevant Job Series: Computer Engineering (0854), Computer Science (1550), Electrical Engineering (0850)
    - Cybersecurity
        - Relevant Job Series: Computer Engineering (0854), Computer Science (1550)
    - Data Science
        - Relevant Job Series: Actuarial Science (1510), General Mathematics and Statistics (1501), Operations Research (1515), Mathematics (1520), Statistician Series (1530)
    - Human-Machine Interface, Human Factors Engineering, User Experience Design
        - Relevant Job Series: Psychology Series (0180), General Anthropology Series (0190), Computer Science Series (1550), Industrial Engineering Series (0895), Physiology Series (0413), Safety Engineering Series (0803)
    - Sensor and Autonomy Stack Performance, Modeling & Simulation
        - Relevant Job Series: Electronics Engineering (0855), Physics (1310), Computer Engineering (0854), Computer Science (1550)
    - Risk Analysis and Evaluation
        - Relevant Job Series: General Engineer (0801), Civil Engineering (0810), Safety Engineering (0803), General Mathematics and Statistics (1501), Operations Research (1515), Mathematics (1520), Actuarial Science Series (1510)
- *Number of Openings*: 2
- *Position Summary*: These positions will support the Director, Deputy Director and Chief Scientist in providing technical leadership for the HASS COE and will be responsible for sharing expertise and leading technical projects with implications for the safety of highly automated systems in transportation. The individuals occupying these positions will complement the expertise and experience of the Chief Scientist in the areas of automation and human factors, computer science, data analytics, machine learning, sensors, and other technologies critical to the safety and equity of automated systems. They will lead and staff technical projects and collaborate and provide support to all OAs in USDOT. They will also be expected to serve as team leaders as the

HASS COE reaches its full staffing levels, including coordinating and managing the workload of their team members.

3.2.5 Technical Expert

- *Status*: Proposed
- *Grade*: 13/14
- *Skillsets and Relevant Job Series*: Vacancies for this position will likely seek one or more of the following skillsets listed in priority order, and be posted in one or more of the corresponding job series, to be determined based on the skillset mapping exercise described in Appendix B:
    - Economics, Market Analyst, Labor Analyst, Workforce Analyst
        - Relevant Job Series: Economist (0110), Workforce Research & Analysis (0140), Transportation Specialist (2101), Transportation Industry Analysis (2110), Financial Analysis (1160), Operations Research (1515), General Business and Industry (1101)
    - Safety Engineer
        - Relevant Job Series: Safety Engineering (0803), Civil Engineering (0810), Mechanical Engineering (0830), Electrical Engineering (0850), Industrial Engineering (0896), Railroad Safety (2121), Motor Carrier Safety (2123), Highway Safety (2125),
    - Connectivity, Telecommunications, Network Architecture, Interoperability
        - Relevant Job Series: Telecommunications Engineering (0391), General Telecommunications (0392), Computer Engineering (0854), Electronics Engineering (0855), Physics (1310)
    - Systems Engineering, Systems Architecture
        - Relevant Job Series: General Engineering (0810), Electronics Engineering (0855), Mechanical Engineering (0830), Electrical Engineering (0850), Aerospace Engineering (0861)
    - Environment, Climate, Alternative Energy
        - Relevant Job Series: Environmental Engineering (0819), Social Sciences (0101), Traffic Management (2130)
    - Ethics, Privacy, Legal, Intellectual Property
        - Relevant Job Series: General Attorney (0905), Patent Law (1222)
    - Industry, Labor and Societal Impacts Analysis
        - Relevant Job Series: Social Sciences (0101), Economist (0110), Sociology (0184), Transportation Specialist (2101), Transportation Industry Analysis (2110), General Anthropology Series (0190)
- *Number of Openings*: Up to 7
- *Position Summary*: These positions will support the Chief Scientist, Deputy Director, and Senior Technical Experts in providing technical leadership for the HASS COE and will be responsible for sharing expertise and leading the listed research technical areas with implications for the safety

of highly automated systems in transportation. The individuals occupying these positions will complement the expertise and experience of the Chief Scientist and Senior Technical Experts. The skillsets and occupational codes for these positions will be based on a prioritization schema as described earlier in this document. They will lead and staff technical projects and collaborate and provide support to all OAs in USDOT.

These positions may be filled through a typical competitive process or through alternative hiring programs to directly access candidates with critical expertise. These alternative hiring programs are outlined in Section 3.5.

3.2.6 Management and Program Analyst

- *Status*: Proposed
- *Grade*: 14/15
- *Series (one or both of the following)*:
    - 0301 (Miscellaneous Administration and Program)
    - 0343 (Management and Program Analysis)
    - 0505 (Financial Management)
- *Number of Openings*: 1
- *Position Summary*: As the HASS COE reaches its projected near-term staffing levels, it will seek to hire a management and program analyst who can support the Director and Deputy Director in areas that potentially include personnel management, budgeting and finance, administrative and management processes, procurement and acquisitions (potentially serving as a COR), and communications.
    - 0301: This series covers positions with duties to perform, supervise, or manage administrative or program work. The work requires analytical ability, judgment, discretion, and knowledge of a substantial body of administrative or program principles, concepts, policies, and objectives.
    - 0343: This series covers positions that primarily serve as analysts and advisors to management on the evaluation of the effectiveness of government programs and operations or the productivity and efficiency of the management of Federal agencies or both. Positions in this series require knowledge of: the substantive nature of agency programs and activities; agency missions, policies, and objectives; management principles and processes; and the analytical and evaluative methods and techniques for assessing program development or execution and improving organizational effectiveness and efficiency. The position also requires an understanding of advanced budgetary and financial management principles and techniques as they relate to long range planning of programs and objectives. The work requires skills in: application of fact-finding and investigative techniques; oral and written communications; and development of presentations and reports.

3.3 Organizational Structure

The HASS COE anticipates expanding in three phases as it builds toward a target capacity of 13 FTE positions by the end of FY22:

- In Phase 1 (anticipated present through the end of FY2021), the Director will supervise a staff of two deputies and two senior technical experts.
- In Phase 2 (anticipated FY2022 Q1 and Q2), as the staff of technical experts expands, they will begin reporting to the Deputy Director.
- In Phase 3 (anticipated to begin in FY2022 Q3), team leads will be identified (likely the senior technical experts). These team leads may serve as official supervisors and will help to manage and direct the workloads of their respective team.

These phases only identify the dedicated, full-time positions assigned to the HASS COE, and therefore, do not reflect the roles or positions of staff serving temporary rotational assignments, internships, or detail assignments.

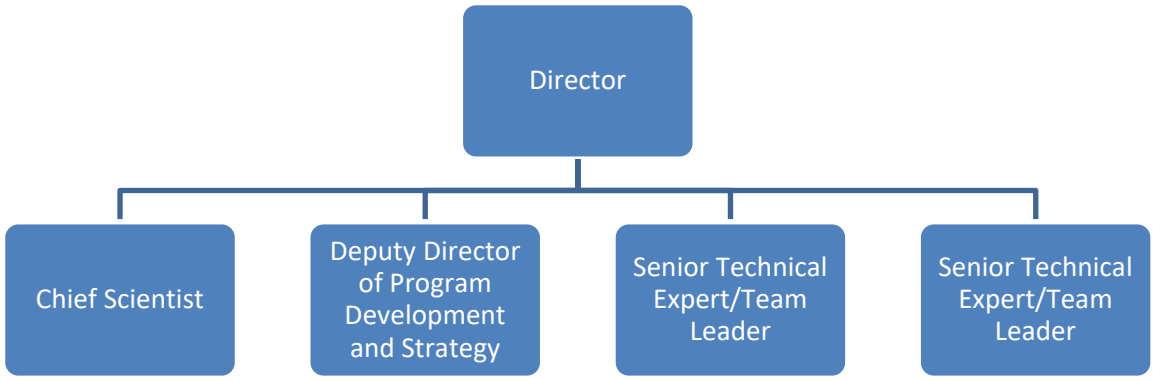

Figure 2: Proposed Phase 1 Organizational Structure

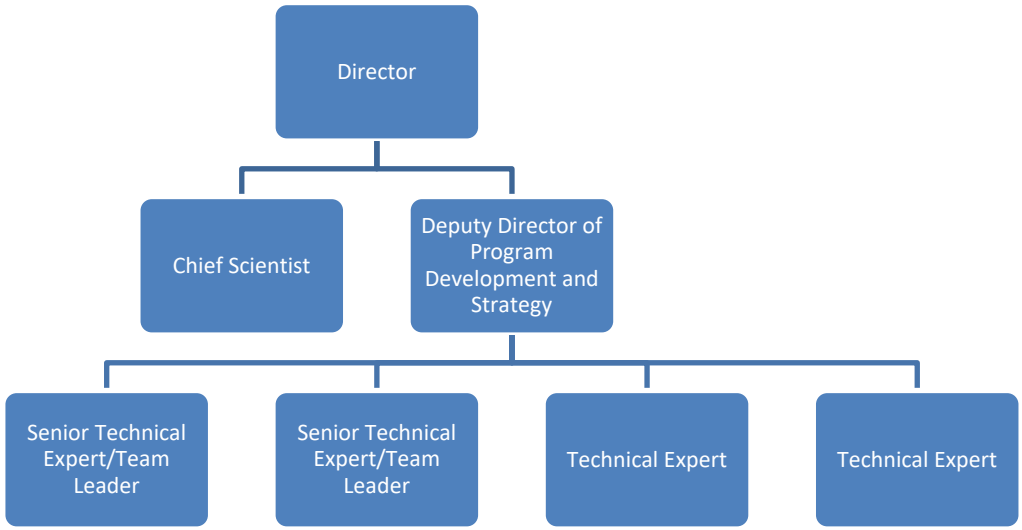

Figure 3: Proposed Phase 2 Organizational Structure

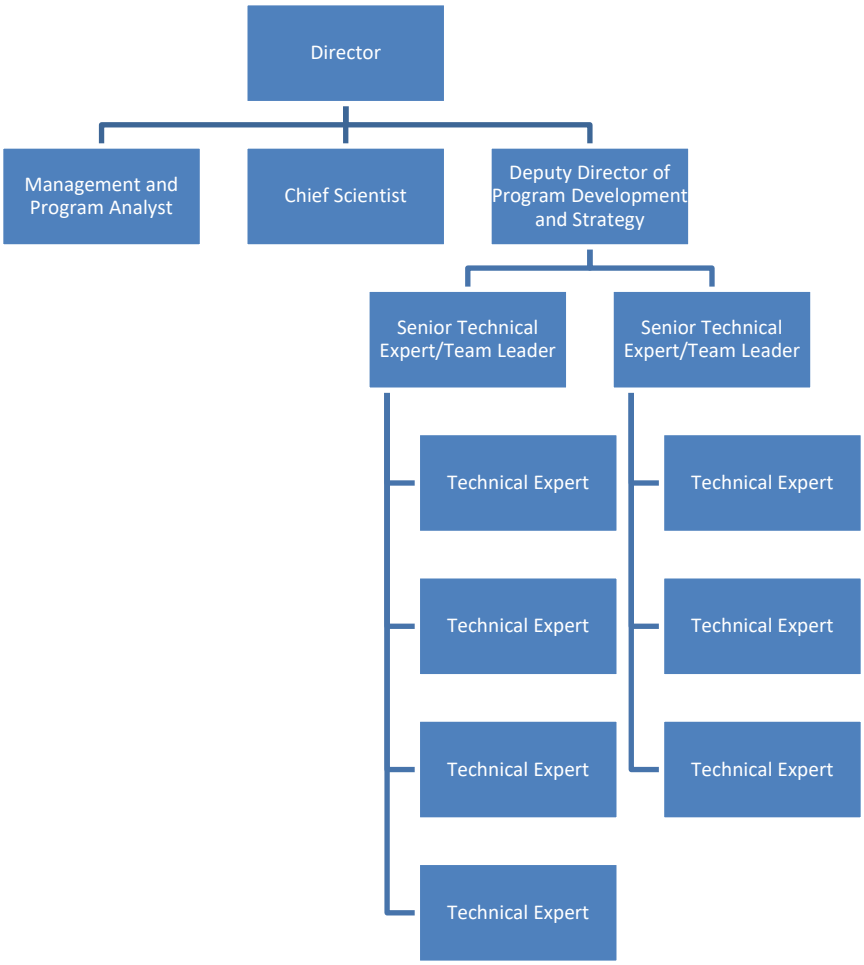

Figure 4: Proposed Phase 3 Organizational Structure

3.4 Proposed Occupational Codes

The HASS COE anticipates hiring the majority of its Technical Experts using the following job series (to be updated based on the skillset mapping exercise described in Appendix B):

- 0854 (Computer Engineering)* (includes cybersecurity)
- 1550 (Computer Science)* (includes cybersecurity)
- 0855 (Electronics Engineering)*
- 0805 (Electrical Engineering)
- 1501 (General Mathematics and Statistics)*
- 1515 (Operations Research) (includes data science)
- 1520 (Mathematics)*
- 1530 (Statistician Series) (includes data science)
- 1310 (Physics)*
- 0803 (Safety Engineering)

- 0801 (General Engineer)*
- 2101 (Transportation Specialist)
- 2110 (Transportation Industry Analysis)
- 1510 (Actuarial Science Series) (includes data science)
- 0110 (Economist)
- 0180 (Psychology)

**Direct hire authorities may be applicable to positions under these series, per https://www.opm.gov/policy-data-oversight/hiring-information/direct-hire-authority/#url=Governmentwide-Authority.*

The HASS COE may also consider hiring using the following job series, depending on future needs and priorities:

- 0020 (Community Planning)
- 0101 (Social Sciences)
- 0140 (Workforce Research & Analysis)
- 0184 (Sociology)
- 0190 (General Anthropology Series)
- 0391 (Telecommunications Engineering)
- 0392 (General Telecommunications)
- 0810 (Civil Engineering)
- 0819 (Environmental Engineering)
- 0830 (Mechanical Engineering)
- 0861 (Aerospace Engineering)
- 0896 (Industrial Engineering)
- 0905 (General Attorney)
- 1101 (General Business and Industry)
- 1160 (Financial Analysis)
- 1222 (Patent Law)
- 2101 (Transportation Specialist)
- 2110 (Transportation Industry Analyst)
- 2121 (Railroad Safety)
- 2123 (Motor Carrier Safety)
- 2125 (Highway Safety)
- 2130 (Traffic Management)

3.5 Staffing Mechanisms

Filling some of the HASS COE's key positions will likely require use of alternative hiring programs and authorities to access and recruit not only the caliber of expertise needed, but also to build a team that

can offer the diversity of thought and experience required to fulfill the multidisciplinary and futurist nature of the HASS COE's mission.

The HASS COE will explore the use of one or more of the following programs for both part-time and full-time opportunities, to access expertise within academia, industry, and other organizations, and to offer opportunities to candidates who can offer diverse perspectives on critical issues affecting highly automated systems safety:

- Direct Hire – Pursuant to 5 U.S.C. Section 3304 and 5 CFR Part 337, Subpart B, agencies may appoint candidates to positions without regard to the requirements in title 5 U.S.C. 3309 through 3318. The Office of Personnel Management (OPM) has made several series relevant to the HASS COE eligible for Direct Hire, including:
    - 0801 (General Engineer)
    - 0810 (Civil Engineer)
    - 0854 (Computer Engineering)
    - 0855 (Electronics Engineering)
    - 1310 (Physics)
    - 1520 (Mathematics)
    - 1529-1530 (Mathematics Statistician and Statistician)
    - 1550 (Computer Science)
- Intergovernmental Personnel Act (IPA) – The IPA facilitates cooperation between the Federal Government and a non-Federal entity through the temporary assignment of skilled personnel, where there is mutual benefit for the Federal Government and the non-Federal entity. Assignments may be for up to two years initially, with the option to extend the assignment by another two years and may therefore be most appropriate for the (non-supervisory/non-team lead) Technical Expert positions described above. IPA appointments may be particularly useful for accessing expertise from other (non-Federal) government agencies or academic institutions. IPA appointments may also be used to leverage expertise from relevant private sector organizations, albeit with a likely greater sensitivity to conflict-of-interest provisions.
- Special Government Employees (SGEs) – The SGE category was created by Congress as a way to apply an important, but limited, set of conflict of interest requirements to a group of individuals who provide important, but limited, services to the Government. SGEs are Government employees for purposes of the conflict of interest laws and can serve for a period not to exceed 130 days during any period of 365 consecutive days. Therefore, this authority can only be leveraged to hire HASS COE staff on a part-time basis. Moreover, the SGE category is generally suited for experts who will help to advise the Government on a temporary basis, as opposed to conducting more in-depth research or other work.
- Pathways Internship Program – The Pathways Program is intended to streamline the process for agencies to hire students and recent graduates for internships and full-time positions. The recent graduate component may be particularly relevant to the HASS COE (as well as the Presidential Management Fellowship Program described below). The Recent Graduates Program is a dynamic, one-year developmental program (with option to extend to two years) that promotes careers in the Federal Government to recent graduates. Individuals must apply within two years of receiving a qualifying degree or certificate, with the exception of veterans, who

have up to six years to apply to the Recent Graduates Program due to military service obligations. Students may also apply up to nine months prior to completing their academic requirements, depending upon agency-specific policies. The Recent Graduates Program is limited to GS-9 through 12 positions and, while the HASS COE's current staffing plan calls for predominantly GS-13 and above positions in the next three years, it may consider opening a small number of positions to recent graduates in the near- to medium-term future to support building a qualified pipeline of experts in relevant fields.

- OPM Open Opportunities – Open Opportunities is a program that provides professional development opportunities for current Federal employees. Leveraging Open Opportunities can offer the HASS COE an avenue to access expertise from technical experts outside of the transportation sector, particularly in fields that may not be specific to transportation such as autonomy, artificial intelligence, cybersecurity, data science, and computer science.
- Presidential Management Fellows (PMF) Program – The PMF Program was established to attract outstanding men and women to Federal service from a variety of academic disciplines and career paths, who have a clear interest in, and commitment to, excellence in the leadership and management of public policies and programs. The PMF Program draws graduate students from diverse social and cultural backgrounds and from an array of fields including public policy; science, technology, engineering, and math (STEM); finance; business; public health; international affairs; law; and cybersecurity. OPM conducts initial screenings and narrows several thousand applicants down to several hundred finalists, who are pre-qualified at the GS-9 level based on their advanced degrees, and agencies have the option to initially appoint at the GS-9/11/12.
- Presidential Innovation Fellows (PIF) – Established by the White House Office of Science and Technology Policy in 2012, PIF unites industry's brightest technologists with forward-thinking Federal leaders to improve the way government builds, designs and delivers services. Today the program operates within Technology Transformation Services, an organization in the General Services Administration with a mission to design and deliver a digital government with and for the American public. The PIF Program seeks diverse cohorts of mid-to-senior-level experts in data and AI; engineering; product, design and experience; and digital strategy who can also bring different lived experiences and perspectives to problems.
- USDOT Departmental Rotational Assignment Program (DRAP) – DRAP offers rotational opportunities to current DOT staff at any grade level. DRAP participants must: 1. Be a full-time career Departmental employee at the GS-15 level and below or equivalent level; 2. Be in their current position for at least one year at the time the selection is made; 3. Have received Exceeded Expectations or higher on their annual performance appraisal; 4. Have demonstrated a commitment to leadership development and the potential and desire to become a future leader (i.e., exhibits strength in communication, leadership, political savvy, etc.); and 5. Benefit from a broader view of DOT. Rotational assignments: 1. Are limited to six months in length; 2. Should provide a high-level meaningful assignment that broadens a potential future leader's perspective; 3. Can be project or function based, group or individual, cross cutting or specific role; 4. Can be supervisory, technical, and/or operational; and 5. Should be clearly described in

terms of specific duties and performance criteria.

- FHWA Summer Transportation Internship Program for Diverse Groups (STIPDG) – STIPDG Program provides a unique summer opportunity for college/university students to gain valuable professional experience and skills to complement student's academic pursuits. The STIPDG Program is open to undergraduate, graduate, and law students and runs for ten weeks each summer. The program is open to undergraduates entering into their junior year or above, all students enrolled in a graduate program for the upcoming fall semester, and law students entering their second or third year; the program encourages students from underrepresented backgrounds to apply. While the program is coordinated and hosted by FHWA, offices across DOT can apply to host students through STIPDG.
- Interagency Agreements/Fee-for-Service Technical and Management Support – The HASS COE may secure support from the Volpe Center and other fee-for-service government organizations on an as-needed basis, both to address specific technical needs and to provide overall management support, particularly while full-time staff are being added.
- Additional Hiring Programs and Authorities – The HASS COE may consider a variety of other hiring mechanisms and authorities, especially to build a staff who can offer a diversity of thought, expertise, and experience. These may include:
    - Intermittent and Faculty Fellow Appointments;
    - Excepted Service Appointing Authorities (Schedule A);
    - 30 Percent or More Disabled Veterans authority and other authorities specific to veterans; and
    - Authority to hire individuals to serve as Experts and Consultants under 5 CFR part 304.

3.6 Recruitment, Relocation, and Retention Incentives

Recruitment will be paramount to attracting qualified and motivated candidates for key positions. The HASS COE will work with the Office of the Assistant Secretary for Administration (OST-M) to advertise and promote open positions in traditional fora, but also plans to work with external stakeholders in academia and industry. This may include exploring options to advertise positions through organizations such as SAE International, sharing positions through industry and academic communications platforms, and conducting direct outreach through events and speaking opportunities. While the grade levels of the proposed positions may limit eligibility for current students and recent graduates, the HASS COE will target academic institutions to advertise positions among alumni groups and within programs that include cohorts of mid-career professionals.

The HASS COE may seek to leverage Recruitment, Relocation, and Retention Incentives administered under 5 U.S.C. 5753 and 5754 and 5 CFR part 575, subparts A, B, and C, particularly with respect to positions requiring skillsets and/or experience that are in high demand, for which limited supply of candidates exist, or where public sector salaries are far lower than equivalent positions in the private sector.

As an alternative to relocation incentives, the HASS COE may consider offering the option for certain

non-supervisory positions (potentially including Chief Scientist and Technical Experts) to serve at alternate duty locations, potentially extending the pool of applicants to include candidates who would not consider relocating to the Washington, DC area (for example, candidates currently employed in the automotive or technology sectors).

Appendix A: Detailed Staffing Plan

Position Title	Pay Plan - Series	Grade - Step	Division	Appointment Type	Status F:Filled V:Vacant R: In Process	Target Fill Date[6]	Funding S&E OR WCF	DOT Vacancy Approval Status	Priority (1=most urgent)	Successor Position (Y OR N)	Notes (± Recruitment Incentives, Upcoming Outreach Event, etc.,)
Director	GS -2101	15	HASS COE	Full-Time/Term (NTE 3 Years)	F	Nov. 2020		Approved	1	N	
Deputy Director of Program Development and Strategy	GS-0340	15-10	HASS COE	Full-Time/Term (NTE 3 Years)	V	2021 Q3		FTE Approved Position Description Not Yet Approved	2	Y (Successor to Director)	
Chief Scientist	GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550	15-10	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	V	2021 Q3		FTE Approved Position Description Not Yet Approved	2	N	Will likely need recruitment and/or relocation incentives
Senior Technical Expert/Team Leader	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550	14/15-10	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	3	Y (Successor Candidate to Deputy Director)	
Senior Technical Expert/ Team Leader	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550	14/15-10	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	3	Y (Successor Candidate to Deputy Director)	
Technical Expert 1	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	4	N	

[6] Achieving target fill date subject to internal and external reviews and approvals of position

Position Title	Pay Plan - Series	Grade - Step	Division	Appointment Type	Status F:Filled V:Vacant R: In Process	Target Fill Date[6]	Funding S&E OR WCF	DOT Vacancy Approval Status	Priority (1=most urgent)	Successor Position (Y OR N)	Notes (± Recruitment Incentives, Upcoming Outreach Event, etc.,)
Technical Expert 2	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	4	N	
Technical Expert 3	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	4	N	
Technical Expert 4	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	5	N	
Technical Expert 5	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2022 Q1		FTE Not Yet Approved	5	N	
Technical Expert 6	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	May be staffed through alternative staffing program (IPA, SGE)	R	2022 Q1		FTE Not Yet Approved	5	N	
Technical Expert 7	May include one or more: GS-0801, 0803, 0854, 0855, 1310, 1501, 1515, 1520, 1550, 0110, 0180, 0184, 2101, 2110, 0190	13/14-5	HASS COE	May be staffed through alternative staffing program (IPA, SGE)	R	2022 Q1		FTE Not Yet Approved	5	N	

Position Title	Pay Plan - Series	Grade - Step	Division	Appointment Type	Status F:Filled V:Vacant R: In Process	Target Fill Date[6]	Funding S&E OR WCF	DOT Vacancy Approval Status	Priority (1=most urgent)	Successor Position (Y OR N)	Notes (± Recruitment Incentives, Upcoming Outreach Event, etc.,)
Management and Program Support Specialist	0343 or 0301	14/15-10	HASS COE	Full-Time/Term (NTE 3 Years) May be able to use Direct Hire, depending on relevant series	R	2021 Q4		FTE Not Yet Approved	4	N	

Appendix B: Gap and Opportunity Assessment Methodology, Implications for Staffing and Workforce Planning

Overview

The HASS COE created a methodology and is currently conducting a process to identify and establish its core activities and the technical areas on which it will focus. This process began with identifying the HASS COE's core Mission and Vision, and then outlining critical research areas – or "threads" – that encompass the principal technologies and challenges associated with transportation automation. Cross-modal transportation automation research threads (hereafter referred to as *automation research threads*) are an initial pass at broad research themes relevant to highly automated transportation systems. These automation research themes are a means to characterize, organize and understand the transportation automation research and operational space. The automation research threads are also technological areas that may constitute opportunities to achieve continuity and consistency in transportation automation research, policies, regulatory framework, and standards across transportation domains or modes.

Additionally, the automation research threads are intended to provide a means to explore mechanisms for USDOT and its stakeholders to manage and oversee the transportation system of the future from a holistic perspective, as an integrated system-of-systems. In this regard the threads can be viewed as the 'ties that bind' the seams of the transportation system into a cohesive ecosystem. The automation research threads are intended to be independent of any particular mode (i.e., cross-modal). Although in developing the cross-modal transportation automation research threads, the HASS COE considered the relationships between the modes of transportation as well as the organizational boundaries, roles and responsibilities of the different USDOT Operating Administrations (OAs).

Figure 5 below provides an overview of the research threads identified to date, while Figure 6 illustrates the broader context of how these research themes will inform the HASS COE's core work streams.

Critical Research Areas (Preliminary)

The HASS COE has identified a preliminary list of critical research areas, outlined in Figure 5. This list is current as of May 2021 and will be refined, updated, and prioritized based on input and feedback from USDOT's OAs and the broader transportation stakeholder community.

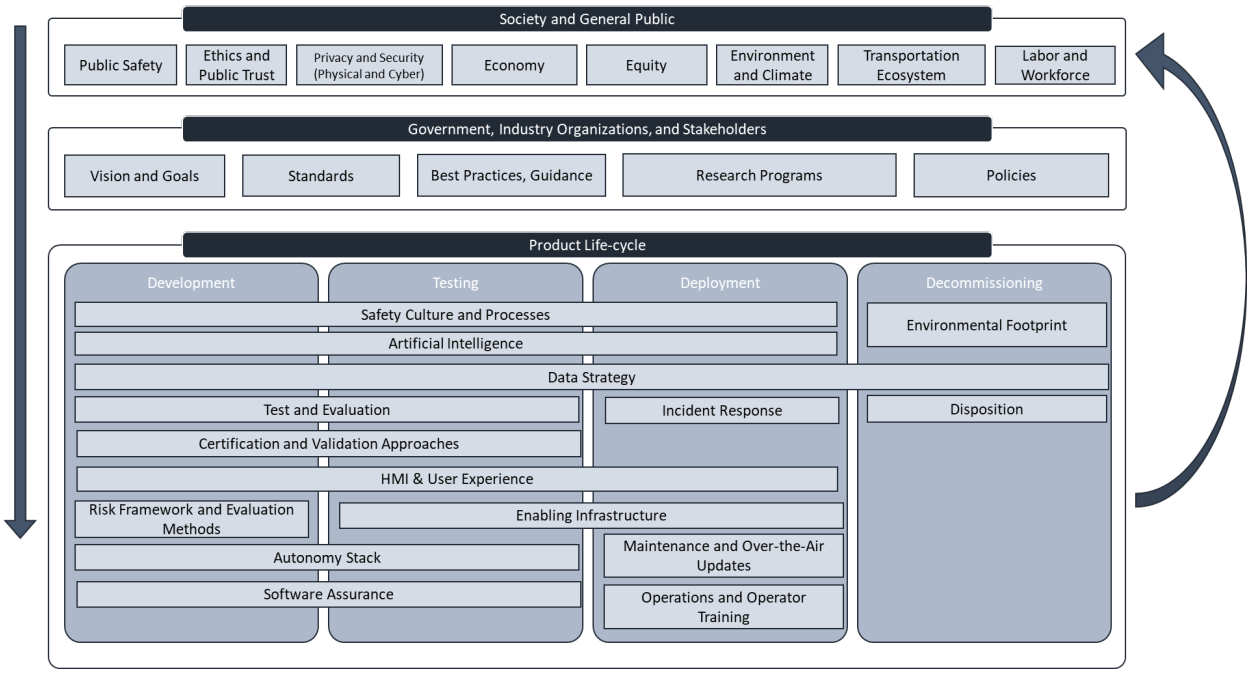

Figure 5: Preliminary list of critical research areas identified by the HASS COE (as of May 2021)

As illustrated in Figure 6, the cross-modal transportation automation research threads will serve as a basis for the HASS COE to pursue two key workstreams within its mission: *Workforce Planning & Development* and *Research & Technology*. To achieve the Workforce objectives, these research threads will guide the HASS COE, in coordination with OST-M and the OAs, to identify skillsets and occupational codes that are necessary for the HASS COE specifically, and USDOT in general, to fulfill its mission as the transportation system includes greater automation and intelligence. Moreover, this mapping will inform both the USDOT and the transportation sector on areas to focus workforce development efforts in order to raise the knowledge base and intellectual capital of the transportation workforce to meet the expertise demands of the future transportation system.

In addition, the automation research threads will serve as input to inform preliminary HASS COE activities. Currently, the HASS COE is performing a Gap and Opportunity Assessment to understand the current cross-modal landscape with respect to the goals, policies, research areas, standards, best practices and guidance for highly automated transportation platforms and systems. These cross-modal transportation automation research threads also form the basis for a skillset mapping and this Staffing Plan to identify areas of expertise needed when initially staffing the HASS COE.

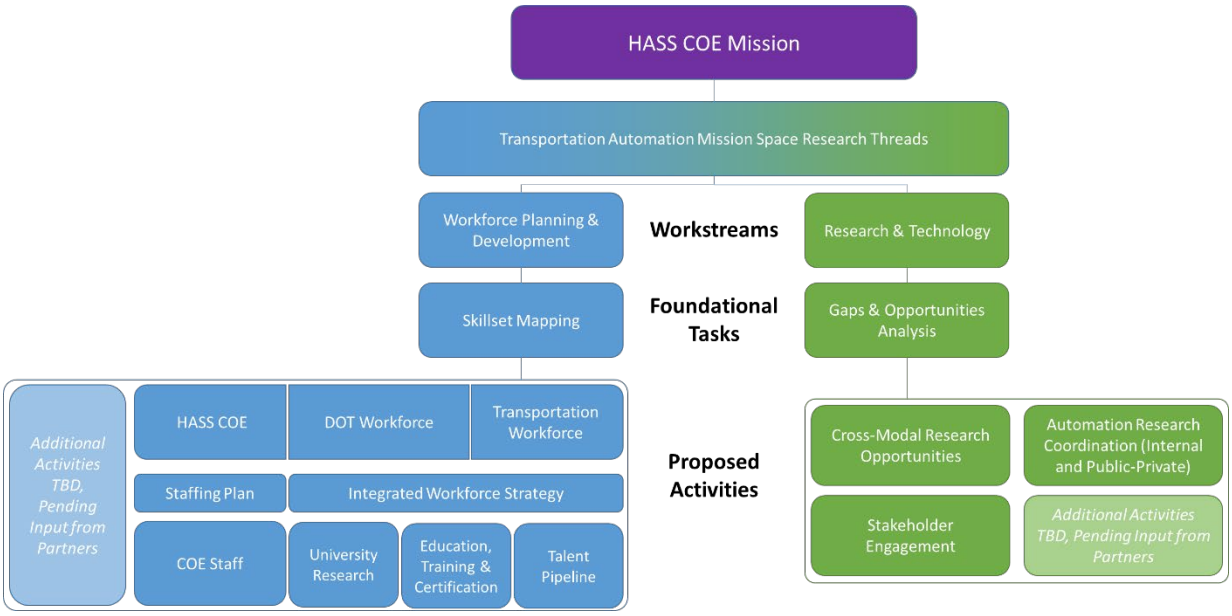

Figure 6: HASS COE methodology for identifying, prioritizing, and informing critical activities

Mapping Critical Skillsets to Areas of Expertise

This Staffing Plan identifies positions that the HASS COE intends to fill along with an initial set of relevant skillsets, areas of expertise, and job series. As described above, the HASS COE is also currently conducting a preliminary Gap and Opportunity Analysis to identify critical research areas applicable to automation across transportation modes. These topics will serve as input to inform both preliminary HASS COE activities and needed critical areas of expertise (see Figure 7 for an example).

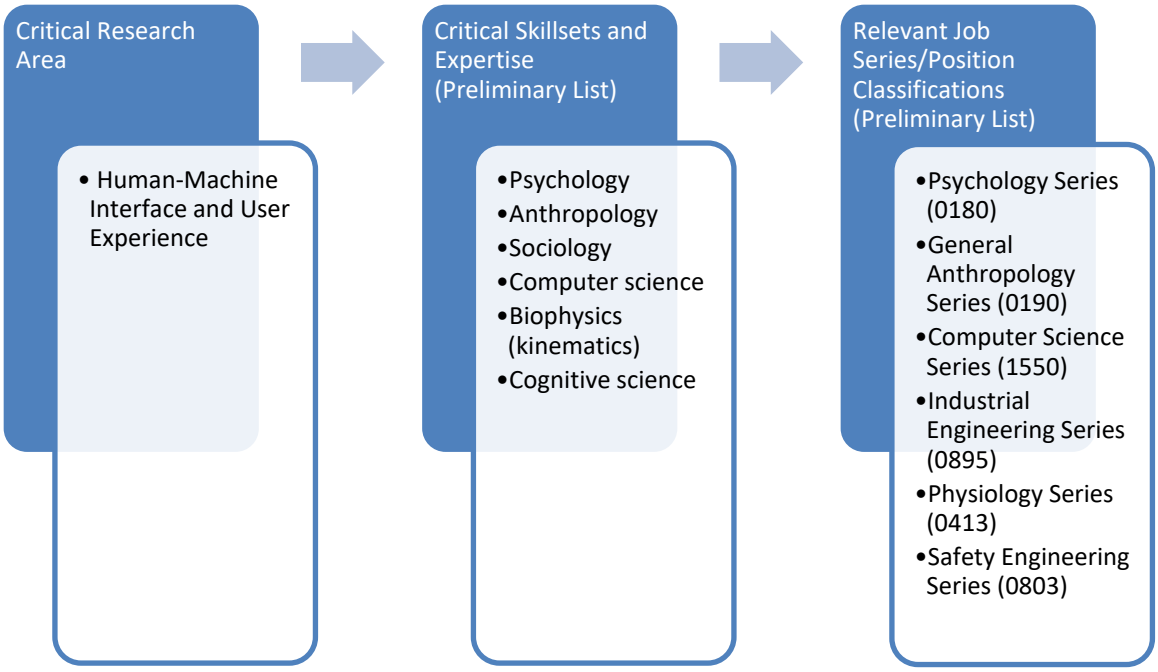

Figure 7: Example (preliminary) mapping of critical research area to skillsets/expertise and relevant job series/position classifications

Input and feedback from USDOT's OAs and OST offices are critical to refining and adopting these research priorities and skillset needs. OST-M established a partnership with the HASS COE to determine competencies and assess skill gaps in key occupational groups that are involved in overseeing the safety of automated technologies, in response to a recommendation from a December 2020 U.S. Government Accountability Office (GAO) report entitled, *Automated Technologies: DOT Should Take Steps to Ensure Its Workforce Has Skills Needed to Oversee Safety* (GAO-21-197).[7] OST-M, in collaboration with the HASS COE, plans to create a plan and a timeline for completing these actions by December 31, 2021. Moreover, the HASS COE will support USDOT actions supporting implementation of the *Foundations for Evidence-Based Policymaking Act of 2018* ("Evidence Act").[8]

This research topic/skillset mapping exercise is necessarily occurring while the HASS COE begins hiring its initial staff, particularly the Chief Scientist and Deputy Director positions. Hiring for these positions, particularly the Chief Scientist, will be informed by several overarching needs that are immediately apparent, having been identified by the HASS COE team and Congress. These include computer science, artificial intelligence and machine learning, data science, sensing and perception. The skillset mapping exercise will help to pinpoint areas in which the HASS COE should build concentrated expertise.

[7] Automated Technologies: DOT Should Take Steps to Ensure Its Workforce Has Skills Needed to Oversee Safety, GAO-21-19, December 2020.

[8] Pub. L. No. 115-435, 132 Stat. 5529.