

**Baltimore-Washington SCMaglev Project  
– NEC Ridership Study and  
Environmental Benefit Review**

Response  
to the Federal Railroad Administration  
Notice of Funding Opportunity for the  
FY 2023–FY 2024 Consolidated Rail  
Infrastructure and Safety  
Improvements Program  
FR Doc. 2024-06710

May 24, 2024

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# Project Narrative

## I. Cover Page

Project Title	Baltimore-Washington SCMaglev Project – SCMaglev EIS Completion
Applicant Name	Maryland Department of Transportation (MDOT) [Baltimore Washington Rapid Rail (BWRR) is the Project Sponsor]
Amount of CRISI Program Funding Requested under this NOFO	\$7,000,000
Amount of Proposed Non-Federal Match	\$1,750,000                      In-Kind: \$0
Other Sources of Federal funding, if applicable	n/a \$0
Source(s) of Proposed Non-Federal Match	The Project Sponsor (BWRR) is the source for the non-Federal match, through a reimbursement process administered by MDOT.
Total Project Cost	\$8,750,000
Was a Federal Grant Application Previously Submitted for this Project?	The SCMaglev project has received numerous Federal Grant awards, but no funding has been expended on the scope described in this application, and no work in the attached SOW has been reimbursed by a Federal grant.
City(ies), County(ies), State(s) Where the Project is Located	The project will review ridership projections and conceptualizations for a right of way proposed between Washington, DC and New York City. The proposed Maglev line would have stops in Washington, DC, BWI Airport, Baltimore City, Wilmington, DE, Philadelphia Airport, Philadelphia, Newark Airport, and New York City.
Is the Project Located in a Rural Area?	No.
Congressional District(s) Where the Project is Located	The study would review data from New York City to Washington, DC, and would likely include these congressional districts. <u>Proposed Baltimore to NYC study:</u> NY-10, NY-12 NJ-12, NJ-3, NJ-6, NJ-7, NJ-8 PA-5, PA-1, DE-At large MD-2, MD-1 <u>DC to Baltimore review:</u> MD-7, MD-5, MD-4, MD-3 DC-At large

Application Track(s) proposed to be funded by this NOFO?	Track 5—Deployment of Magnetic Levitation Transportation Projects
Lifecycle Stage(s) proposed to be funded by this NOFO?	The proposed scope would include tasks from the Systems Planning Stage as it would include planning, gathering empirical data, studying demand, and identifying the needs, challenges, and opportunities for the Baltimore to New York City leg of the larger Maglev implementation project. The Washington, DC to Baltimore leg of this proposal would be a post-pandemic review of metrics, and would update the needs and opportunities taking into account the systemic changes in transportation challenges and opportunities post-Covid while developing the system as a whole.
Current Lifecycle Stage and Anticipated completion of current Lifecycle Stage?	The System Planning for the Baltimore to New York City has many years of work ahead, as it would eventually involve conceptual engineering and NEPA work for roughly 180 miles of new right of way. As noted above, a separate phase of this project is currently undergoing the NEPA process, and is approximately 2 years from beginning Final Design. While that is a component of this, the work involved in this scope would be to study demand, opportunities, and challenges as a whole.
Is the Project located on real property owned by someone other than the applicant?	A component of this project is currently developing an EIS and does not have a preferred alignment. The scope of work for this application would be ridership and alignment studies which would involve reviewing real property owned by entities other than the applicant, but the activity in the proposed scope of this application will be based on surveys, desktop analysis, and data; these would be preliminary studies and would not immediately impact property owners.
Host Railroad/Infrastructure Owner(s) of Project Assets;	Project is currently developing an EIS, and ownership structures will be determined at a later time
Other impacted Railroad(s)	n/a
Tenant Railroad(s), if applicable	n/a
If applicable, is a 49 U.S.C. 22905-compliant Railroad Agreement executed or pending?	n/a
Is the project currently programmed in ANY medium- or long-range planning document: <i>For example, State rail plan, or interregional intercity passenger rail systems planning study, State Freight Plan, TIP, STIP, MPO Long Range Transportation Plan, State Long Range Transportation Plan, etc. ?</i>	The Maglev project is noted in the following long-range plans: <ul style="list-style-type: none"> <li>• Cherry Hill Transformation Plan (2020)</li> <li>• Move Anne Arundel County Transportation Master Plan (2019)</li> <li>• Baltimore Region Transportation Improvement Program 2022-2025</li> </ul>

	<ul style="list-style-type: none"> <li>• District of Columbia State Rail Plan (2017)</li> <li>• Maryland Statewide Rail Plan (2015)</li> <li>• Maryland Statewide Transit Plan (Draft, 2022)</li> </ul>
Is the project located on a potential corridor selected for the Corridor Identification and Development Program?	The project is planning to apply for the next round of the Corridor ID program, but is not currently a selected corridor.
Is this a project eligible under 49 U.S.C. 22907(c)(2) that supports the development of new intercity passenger rail service routes including alignments for existing routes?	Yes
Is this a project eligible under 49 U.S.C. 22907(c)(11) that supports the development and implementation of measures to prevent trespassing and reduce associated injuries and fatalities?	No, but it will not have any at-grade crossings.
If YES to the previous question, is this project located in a county identified in FRA's National Strategy to Prevent Trespassing on Railroad Property?	n/a
Is the application seeking consideration for funding under the Maglev Grants Program?	Yes.

## II. Project Summary

The Baltimore-Washington Maglev Project intends to build a high-speed, superconducting maglev (SCMaglev) system between downtown Washington, DC and New York City, allowing passengers to travel between DC and New York in an hour. The scope of work (the work) in this NOFO response is to develop system planning, an understanding of demand, and some desktop engineering framework around the entire Washington, DC to New York City route for the proposed project. The scope would include an updated ridership study for the route that would incorporate updated post-pandemic metrics, and a preliminary view of the route north of Baltimore. The larger report would also flesh out induced travel preferences and habits, impacts of the aging population and ridership preferences of younger generations (Millennials and Gen Z), and include an updated focus on the Baltimore to Washington, DC ridership study performed prior to 2020. The study for the route north of Baltimore would include preliminary alignment alternatives, and station location study areas for each stop. This would involve some conceptual engineering work to include desktop surveying, GIS mapping, city pair statistical analysis, and surveying riders along the current Northeast corridor region.

## III. Grant Funds, Sources and Uses of Project Funds

### Project Funding Table

Task #	Task Name/Project Component	Cost	Percentage of Total Cost	Source of funds and citation as applicable
1	Project Administration and Management	\$1,500,000	17%	
2	Corridor Study	\$6,200,000	71%	
3	Ridership Update	\$1,050,000	12%	
Total Project Cost		\$8,750,000	100%	
Federal Funding Requested in this Application (CRISI Program Request)		\$7,000,000	80%	
Non-Federal Funding (Private Sector) Cash:		\$1,750,000	20%	BWRR
Other Committed Federal Funding		\$0	0%	
Other Pending Federal Funding Requests		n/a		
Amount (if any) of funding request eligible for set-aside funds as described in section B(1)		\$7,000,000	80%	\$2M – MDP \$5M – 2023 Aprops
Portion of Total Project Costs Spent in a Rural Area, if applicable		n/a		

Beginning in 2010, Baltimore Washington Rapid Rail (BWRR) began work on developing the underlying analysis and design engineering to establish the feasibility of

the Project and promote it to the public and key stakeholders. Since then, \$141.6 million in non-Federal funding has been expended on various project-related engineering, environmental, economic analyses and other activities. Of that amount, the Government of Japan has provided the project with approximately \$10.9 million to conduct project-related studies and, the Japan Bank for International Cooperation (JBIC) spent \$1.3 million to conduct its own study on the project. Future funding from the Government of Japan is subject to appropriations.

In terms of prior and future Federal funding, MDOT, with BWRR as the Project Sponsor, was awarded \$27.8 million in 2015 as authorized in the SAFETEA-LU Technical Corrections Act. BWRR provided approximately \$7 million in matching funds for this \$27.8 million grant. In 2020, MDOT, with BWRR as the Project Sponsor, received two separate awards: \$24,027,500 (a combination of funding from the SAFETEA-LU Technical Corrections and FY2019 Appropriations); and \$2,000,000 from FY2020 Appropriations.

#### **IV. Applicant Eligibility Criteria**

The Applicant is The State of Maryland, by and through the Maryland Department of Transportation (MDOT), and therefore meets the eligibility criteria as defined in section C(1)(a) of the NOFO. MDOT designates Baltimore-Washington Rapid Rail (BWRR) as a project partner and as the project sponsor, who holds a Maryland Railroad Franchise for the proposed service, both in sponsoring the grant administration, and in providing the matched funding required by the grant in section C(2) of the NOFO. The parties anticipate entering an intergovernmental agreement (through the Maryland Economic Development Corporation) to facilitate the fiduciary duties of the grant.

#### **V. Project Eligibility Criteria**

The Baltimore-Washington Maglev Project intends to build a high-speed, superconducting maglev (SCMaglev) system between downtown Washington, DC and Baltimore, Md. with an intermediate stop at Thurgood Marshall Baltimore-Washington International Airport (BWI), and eventually extend to New York City, allowing passengers to travel between DC and New York in an hour. The scope for this application will collect and analyze high-level data on the demand, the challenges, and the opportunities that would be addressed for a Maglev route between Washington, DC and New York City. The SCMaglev Project is eligible to apply for funding through this notice as designated by section C(3)(a)(xvii) "Deployment of Magnetic Levitation Transportation Projects." The work is further categorized under Track 5: "Deployment of Magnetic Levitation Transportation Projects" among the application tracks in C(3)(c)(v) and will include the eligible costs of System Planning Lifecycle stage activities.

The overall project for the Maglev deployment between Washington, DC and New York City has been under development since 2010. As with a project of this magnitude, the applicant and project sponsor have worked on, and expect to continue to work on, the project in separate components that allow for independent analysis and decision-making. These components can occur sequentially or in parallel, and each have their

own separate utility, without restrictions on further alternatives for this or other rail projects. As such, the scope proposed in this narrative will outline the demand, possibilities, benefits, and options for a Maglev route from Washington, DC to New York City. This will not only give perspective for the current SCMaglev project moving forward, but will also hone possibilities for any next generation transit project of this type, in a mega-region that will need this type of transit in the future.

Under the guidelines, Track 5 projects “involve a segment or segments of a high-speed ground transportation corridor” and include “preconstruction planning activities.” The work will study demand, environmental benefits, possible options for station investigation areas and routes while investigating the market and environmental benefits through data analysis and survey work. As early as 2005, FRA noted in its report to Congress that “Maglev’s projected benefits exceeded its costs in... the Northeast Corridor.”<sup>1</sup> Given this identification of the project region and the technology solution, the Statement of Work (SOW) attached to this NOFO response illustrates that the work for this application will fall within the System Planning Lifecycle, and include pre-construction planning activities surrounding the high-level analyses of a possible Maglev route plan that will outline the demand and benefits of certain route and station options along a multi-state corridor.

As outlined in the Article 4: Statement of Work (SOW) attached to this NOFO response, this work will fund data collection, station location and alignment analysis, and a review of economic and environmental effects of a Maglev corridor between Washington, DC and New York City. The work is positioned to phase in parallel to but separate from other awards and will include some new analysis on the Washington, DC to Baltimore section, which has completed the Draft Environmental Impact Statement (DEIS)<sup>2</sup>.

## VI. Detailed Project Description

The overall SCMaglev Project will develop a new right of way between Washington, DC and New York City, employing the Superconducting Maglev technology that is currently operating in Yamanashi prefecture, Japan. The first leg of the route from Washington, DC to Baltimore includes terminals in Washington, DC and Baltimore City, an intermediate stop underneath the BWI Airport terminal, and will provide-much needed relief to one of the country’s most congested corridors. The Project will complement existing intercity rail, transit, air and road systems, and integrate them with the fastest, most reliable technology available. This segment will be extended up to New York City with major city and airport stops along the way, and potentially to points north of New York City. The work will address key challenges along the planned right of way by identifying traffic habits between city pairs, market segment demand for world-class high speed rail, economic and environmental benefits, and possible routes and station locations that would optimize benefits and mitigate disruption.

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<sup>1</sup> [https://railroads.dot.gov/sites/fra.dot.gov/files/fra\\_net/1176/maglev-sep05.pdf](https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/1176/maglev-sep05.pdf)

<sup>2</sup> <https://www.bwmaglev.info/index.php/project-documents/deis>



Rail traffic between Washington, DC and New York City consists of a network of regional rail carriers running heavy rail over host railroads owned by either freight or Amtrak, but Amtrak is the only passenger rail service that runs a continuous route from Washington, DC to New York City. While the “Northeast Corridor” can be anecdotally referred to as the contiguous region between Washington, DC and Boston, MA, 49 USC §24911 defines the Northeast Corridor (NEC) as “the main rail line between Boston, Massachusetts and the District of Columbia”, along with the main branch lines and the facilities and services used for operation and maintenance thereof. As of FY2023, ridership on the NEC spine (which includes both the Northeast Regional line and Acela) has returned to pre-pandemic levels<sup>3</sup>, and has recently increased capacity on the Northeast Regional by 1 million seats.<sup>4</sup> While these developments are a much welcome boon to transit on the Eastern Seaboard, incremental improvements to capacity may not meet all the demand.

The NEC is not only popular with Amtrak passengers. The company notes that the NEC “is the busiest railroad in North America, with approximately 2,000 Amtrak, commuter and freight trains operating over some portion of the Washington-New York City-Boston route each day.”<sup>5</sup> That level of traffic is not only carrying passengers from major cities and airports, but also between commuter and regional rail stops. Furthermore, this level of traffic increasingly strains the aging infrastructure, which is why the significant—and long overdue—improvements for stations (New York, Philadelphia, Baltimore, Washington, DC,) and other infrastructure (Hudson Tunnel, Portal and Sawtooth Bridges, Harrison fourth track) are critical. While those improvements will be able to increase capacity, overall passenger capacity for intercity rail in the region will still be limited by the curvature of the track, the technology of the equipment, and the rest of the rail traffic on the NEC. The work proposed for this solicitation will analyze the market demand for a completely dedicated, limited stop, SCMaglev right of way traveling at over 300 mph, enabling a one-hour trip time between Washington, DC and New York City, NY. A focal point of this would be a new ridership demand study for Baltimore to New York City, and include an updated ridership demand for the DC to Baltimore leg (originally published pre-pandemic, in 2018), in order to provide contiguous study data. In addition, the ridership demand data for Baltimore to NYC would be used to analyze environmental benefits, and possible routes and station locations for a service that would connect the major metropolitan areas and airports from Baltimore, MD to New York City, NY. The overall project would result in substantial travel time savings and provide the public with a highly reliable transportation alternative. Moreover, the eventual route would divert millions of automobile passengers, thereby resulting in a significant reduction of air pollutant emissions, noise, vehicular crashes, roadway maintenance and other state of good repair costs. It would also create hundreds of thousands of construction jobs and operations & maintenance jobs.

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<sup>3</sup> <https://media.amtrak.com/wp-content/uploads/2023/11/Copy-of-FY23-Year-End-Ridership.pdf>

<sup>4</sup> <https://media.amtrak.com/2024/03/amtrak-adds-more-service-throughout-the-northeast-corridor-to-meet-growing-customer-demand/>

<sup>5</sup> <https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/nationalfactsheets/Amtrak-Company-Profile-FY2023-041824.pdf>

The work for which MDOT is applying for grant funding through the CRISI opportunity will include these main components.

### **Corridor Study**

In coordination with the FRA and MDOT, the project team will prepare a corridor study to include new alignments and station locations for the SCMaglev service north of Baltimore. The goal will be to assess the feasibility and understand the impacts and benefits of the proposed service in the region. This will include an initial look at the variety of operating condition options that would be used in the project area, such as tunnels, viaducts, and connection to other transit modes. Among the components and elements under this task will be:

- Data collection – GIS mapping and database research to study land patterns, existing transit infrastructure, and environmental considerations to examine possible routes; integration points with other transit to study feasibility; may include salient community impacts, field studies at key locations, and identification of critical ROW acquisition areas.
- Alignment analysis – a review of possible alignments based on data collected, and an evaluation of and comparison between possible alignments; identification of optimal alignments based on possible run times, costs, and a minimization of environmental and social impacts.
- Station location analysis – identifying up to 3 potential areas of further study for each station; review of land availability, transit integration, pedestrian and vehicular access; review opportunities for economic development.
- Environmental effects – preliminary review of environmental effects of auto diversion to SCMaglev;
- Economic analysis – analysis of potential economic benefits, including job creation, property value increases, and business opportunities resulting from SCMaglev adoption; survey of direct and indirect economic impacts; evaluation of accessibility, connectivity, and time savings impacts.
- Other technical analysis – SCMaglev specific analysis of operations and infrastructure, including capacity, runtimes, and headway; preliminary review of options for Train Maintenance Facilities, Maintenance of Way facilities, Fresh Air/Emergency Egress sites, and power substations.

### **Ridership Forecast**

A comprehensive ridership forecast for the SCMAGLEV will be conducted to evaluate future passenger demand for the SCMaglev. This update will involve detailed data collection and analysis, including current transportation patterns, demographic trends and economic forecasts within the service area. Advanced modeling techniques will predict ridership growth, ensuring that the system is designed to meet the evolving needs of the populations within the corridor. Accurate up-to-date ridership data is crucial for planning, design, funding, and

operational strategies. The findings will demonstrate the project's viability, support the case for funding by showcasing anticipated benefits in reducing congestion, promoting sustainable travel and enhancing regional connectivity. Note that this forecast will include an update to the Washington, DC to Baltimore, MD segment so that the data for the entire DC to NYC route will address up-to-date analyses with the intention of advancing the project holistically. This update will be completely outside the bounds of and have no interaction with the ongoing NEPA work for that segment. Among the components and elements under this task will be:

- Data collection – gathering accurate and current information on transportation patterns, demographic trends, and commuter behavior; collection of current ridership figures from existing transportation modes within the proposed service area, such as trains, buses, and highways; collection of, demographic data, including population density, employment centers, and travel behavior surveys; developing stakeholder interviews and focus groups to gain insights into potential factors influencing mode choice and willingness to use the SCMaglev system; a gap analysis detailing the demand data that have been identified to date and identifying any gaps and areas needing updates from the past ridership studies.
- Model updates – updating existing models with the latest data collected during the ridership data collection subtask and incorporating scenario analysis to assess the sensitivity of ridership to different variables, such as population growth, changes in transportation policies, and economic factors, on ridership projections.

Each major task will conclude with a final report and recommendations.

By developing a picture of the economy, environmental makeup, and demand for high speed transit of the region along the proposed right of way, this work can educate an outline for how to focus project planning going forward. While this will set goals and provide a template for future scopes of work, it will also be the seminal documentation to design a safe, transformative system that will contribute to the economy and sustainability of its local environment.

Though the Covid-19 pandemic slowed many projections due to the changes in traveling habits, we have been seeing the same trends returning since 2022. Building marginal capacity increases into systems that are already decades behind on improvements may not meet the true demand. If the United States is going to build, as Executive Order 14052 compels us, “infrastructure that is resilient and that helps combat the crisis of climate change”, then we need to understand the market appetite for new rights of way, with systems built for the future.

Understanding that need means looking forward. Thus far, the overall project has focused on the Washington, DC to Baltimore section of the route. Preliminary documents such as the Scoping Report, Purpose and Need, and PASR have been published for this section of the route, and that phase is actively working towards

finalizing the required NEPA work, permitting, and associated Preliminary Engineering work. To support these needs and move towards the goal of implementing the SCMaglev system, the project team has consulted extensively with state and local agencies during the EIS process, resulting in a DEIS published in January 2021 and a 122-day comment period following (the comments from which are, at this writing, being reviewed by the NEPA consultants). The full project team for the work thus far, led by FRA, which includes BWRR, MDOT, MEDCO, and their subconsultants, has reached multiple milestones in the project while producing deliverables that laid the foundation for the DEIS. These include the following documents accepted by FRA.

- Project Management Plan, October 2016
- Final Scoping Report, published in May 2017
- Statement of Purpose & Need, finalized in October 2017
- Preliminary Alternatives Screening Report (PASR), published in January 2018.
- Topographic Survey and Base mapping, February 2018
- Preliminary Engineering Tasks & Drawings List, February 2018
- Noise, Vibration, EMF Technical Memo, March 2018
- Alternatives Report, November 2018
- Alignments analysis, beginning with 16 alternatives and narrowing down to 2 alignments, both approximately 70% underground
- Geotechnical Boring Report, August 2018
- Conceptual Engineering Technical Memoranda covering:
  - i. Alternatives
  - ii. Alignments
  - iii. Cost
  - iv. Schedule
  - v. Runtime
  - vi. Facilities
  - vii. Civil and guideway structural components
  - viii. Stations and ancillary facilities
  - ix. Fire and life safety consideration
  - x. Propulsion
  - xi. Signaling
  - xii. Communications
  - xiii. Constructability
- Studies on right of way impacts, and electromagnetic field sensitivities
- Operations Revenue and Cost Memo, October 2018
- Updated ridership study, finalized in November of 2018
- Renderings of stations and guideways, March 2019
- DEIS Appendix G Plan & Profile Drawings, July 2019
- Phase 2 TMF alternatives plan, February 2020
- FRA Communications Plan, February 2020
- Updated operations plan, February 2020
- Train speed profiles, February 2020
- Updated KMZ files for BARC options on Alt-J and Alt-J1, March 2020

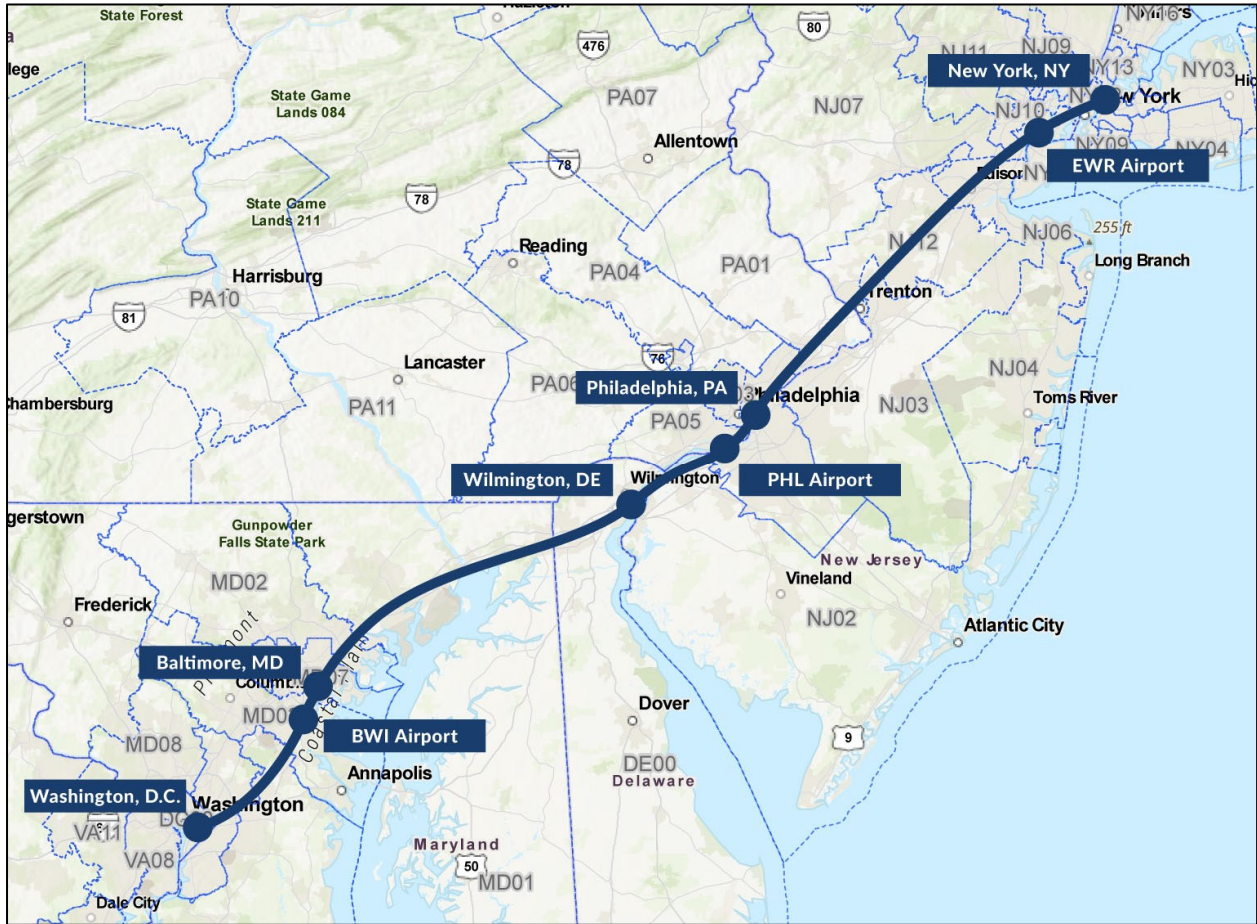
- Updated KMZ files for Camden Yards station alternative, April 2020
- Memos on Railroad Communication, BWI Airport FAA Communications, May 2020
- Updated station cost estimates for Camden Yards, Cherry Hill, and Mount Vernon East, May 2020
- Facility impact design drawings, May 2020
- DEIS Design drawings, June 2020
- Updated end to end polygon KMZ files including TMF and station updates along J and J1 alternatives, June 2020

The DEIS was funded through a Cooperative Agreement between the FRA and MDOT signed in 2016 that provided \$27.8M in Federal funding and added \$6.95M in matching funds provided by BWRR as the project sponsor. MDOT was further awarded two separate awards in 2020 for \$24M and \$2M for additional work on SCMaglev deployment, that will be supplemented with non-Federal match amounts of \$6M and \$500k respectively, also from BWRR as project sponsor.

BWRR has spent nearly \$7 million through its 20% share of the current SCMaglev cooperative agreement and is committed to providing the 20% non-Federal match requirements of this solicitation as it has in prior grant agreements. Even this is only a portion of the significant private funding that has been expended on the Project since 2010, including engineering, environmental, economic analyses and other costs, now totaling over \$161.7 million. During this time, the government of Japan has provided approximately \$14.1 million in study funding, and \$1.3 million in JBIC study funding, with future amounts subject to appropriations. Further, The Government of Japan has stated that it will provide significant financial support for the Baltimore-Washington segment's construction costs. JR Central has granted BWRR the right to use the SCMaglev technology, developed at an estimated cost of \$6.2 billion, and has waived any licensing fees or technology costs.

The magnitude of a project of this size requires multiple phases of study applied for and performed in parallel. As noted above, the overall project for the SCMaglev deployment has been awarded funding, but that has been concentrated on the Washington, DC to Baltimore phase. This new scope will build the foundation for demand and benefits of the system as a whole, with a necessary post-pandemic update to the perspective. In addition, it will focus the framework of future purpose and need documents, and also allow all transit entities to gain perspective on market demand outside of existing systems.

## VII. Project Location



The above map shows a conceptual SCMaglev route between Washington, DC and New York City. The first segment, studied under the DEIS published in 2021, has two alignment options still under study which both start inside Washington, DC through a stop at BWI Airport and terminate in Baltimore City. The route north of Baltimore will have multiple alignments analyzed as a function of this scope. They will all make stops in Wilmington, DE, Philadelphia Airport, Philadelphia, PA, Newark Airport (EWR), and New York City. It will service an approximately 225-mile proposed right of way that navigates through the following Congressional Districts: DC-At large, MD-7, MD-5, MD-4, MD-3, MD-2, MD-1, DE-At large, PA-5, PA-1, NJ-12, NJ-3, NJ-6, NJ-7, NJ-8, NY-10, NY-12

Approximate Corridor Latitude and Longitude

Terminal	Lat/Long
Washington, DC	38°54'11.39" N 77°01'05.61 W"
New York City	40°45'14.57" N 73°59'05.18" W

## VIII. Evaluation and Selection Criteria

### Evaluation Criteria

The NOFO requests projects under Track 5 that meet basic eligibility requirements. For this study of ridership and environmental benefits, the work will involve a segment of the high-speed ground transportation corridor between Washington, DC and New York City (as designated in 2011 by Secretary LaHood<sup>6</sup>), will develop a revenue-producing Maglev route, and is submitted here by the State of Maryland for approval. The preconstruction planning activities proposed in the work are outlined above, and in the attached Article 4 Statement of Work.

### **Evaluation Criteria – Project Readiness**

FRA, in coordination with the MDOT, has been developing an Environmental Impact Statement for the proposed SCMaglev Project between Baltimore, Maryland, and Washington, DC. BWRR serves as project sponsor and developer of the proposed SCMaglev System. FRA published a Notice of Intent (NOI) in the Federal Register on November 25, 2016, and concluded the formal scoping process, as well as the Project Purpose and Need, in 2017. As part of the EIS development process, a Preliminary Alternatives Screening Report and Alternatives Report were published in 2018.

FRA released the Draft Environmental Impact Statement, Draft Section 4(f) Evaluation, and Draft Section 106 Programmatic Agreement (PA) on January 15, 2021. The DEIS public comment period closed May 24, 2021. FRA then paused the project in August of 2021 to review project elements and determine next steps. As of May 2024, FRA and the NEPA contractor are reviewing the nearly 6,000 comments received during the comment period, and a path forward on NEPA is being developed.

Regarding agreements, the overall project would deploy Magnetic Levitation Technology on a new, dedicated right of way. As such, there is no access agreement needed. That said, the Project Sponsor, BWRR, has a Right of Use agreement with the technology owner, Central Japan Railway (JRC), whereby the technology will be licensed for use free of charge. BWRR also has a Memorandum of Understanding with USJMaglev to further the development of this project in the United States.

With the identification by FRA of the cities connecting Washington, DC and New York City as a designated HSIPR corridor<sup>7</sup>, and the recognition from FRA that the same region would benefit from Maglev technology deployment<sup>8</sup>, the proposed scope for this application plans to develop a backbone of actionable analysis and high-level planning behind the full-scale deployment. This would include outlining preliminary options for routes, station areas, demand, and environmental benefits. This level of regional planning would square the work within the Systems Planning Lifecycle, and would look towards the guidance from FRA, planning organizations, contractors, and both existing and generated data to develop the scope towards a Project Planning stage.

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<sup>6</sup> <https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline>

<sup>7</sup> *ibid*

<sup>8</sup> [https://railroads.dot.gov/sites/fra.dot.gov/files/fra\\_net/1176/maglev-sep05.pdf](https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/1176/maglev-sep05.pdf)

As a function of this application process, the Project Sponsor has already committed to supporting the non-Federal match requirement for any award. In addition, the Project Sponsor and MDOT plan to continue their long-standing relationship with MEDCO moving forward to aid in project coordination.

### **Evaluation Criteria - Technical Merit**

MDOT will provide Project oversight and management, and will work with its contractors, MEDCO and BWRR, to carry out the Project work. BWRR has access to the proprietary SCMAGLEV technology due to its relationship with JRC and will provide supplemental administrative and project management services, as well as personnel, materials, and services necessary to perform the Project. The tasks and subtasks as outlined in the SOW have been outlined in consideration of the experience thus far with this project and in consultation with industry experts in environmental and engineering work.

The Project Sponsor, BWRR is a private company. Beyond committing to supply the matching funding for an eventual award, BWRR plans to develop the future funding, ownership, and operations structure of the system which will rely heavily on private industry support. With assistance from MDOT as the grantee and their subcontractor, Northeast Maglev, BWRR will lead and perform the technical efforts. Northeast Maglev is staffed by executives who have decades of experience in capital planning and finance, and long-standing relationships with engineering firms that have been part of major infrastructure projects in highway, rail, and urban development. Beyond this they are led by an Advisory Board that includes former state governors, former USDOT Secretaries, former members of Congress, and industry leaders.<sup>9</sup>

The experienced personnel available to the project provide knowledge, and a deep well of resources and connections to serve as guideposts through implementation. These guideposts will be kept in the forefront of implementation through innovative technologies, project delivery, and financing. The personnel and entities behind this project have led projects around the world in hydroelectric and wind power generation facilities; and have contracted with engineering firms experienced in major infrastructure and transit projects.

Substantial financial commitment from non-federal entities has already been demonstrated through expenditures to date by BWRR, Northeast Maglev and the Japanese government, including future interest to provide significant funding for Baltimore-Washington segment construction. The DEIS was funded through a Cooperative Agreement between FRA and MDOT signed in 2016 that provided \$27.8M in Federal funding and added \$6.95M in matching funds provided by BWRR as the project sponsor. MDOT was further awarded two separate awards in 2020 for \$24M and \$2M for additional work on SCMaglev deployment, that will be supplemented with non-Federal match amounts of \$6M and \$500k respectively, also from BWRR as project sponsor.

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<sup>9</sup> <https://northeastmaglev.com/about/>



BWRR has spent nearly \$7 million through its 20% share of the current SCMaglev cooperative agreement and is committed to providing the 20% non-Federal match requirements of this solicitation as it has in prior grant agreements. Even this is only a portion of the significant private funding that has been expended on the Project since 2010, including engineering, environmental, economic analyses and other costs, now totaling over \$161.7 million. During this time, the government of Japan has provided approximately \$14.1 million in unrelated study funding, and \$1.3 million in JBIC study funding, with future amounts subject to appropriations. Further, The Government of Japan has stated that it will provide significant financial support for the Baltimore-Washington segment's construction costs. JR Central has granted BWRR the right to use the SCMaglev technology, developed at an estimated cost of \$6.2 billion, and has waived any licensing fees or technology costs.

These contributions not only codify the level of commitment from MDOT, BWRR, and JR Central, but also mitigate risk by connecting the project to experts in technology, government, environmental study, and engineering. Each step of this process has gone through deep study and validation to ensure that it is meeting industry standards and creates a foundation for deployment. The technical development of risk mitigation in order to take advantage of these resources is discussed in the Project Management section.

As BWRR looks to build a new right of way for the NEC, staying in front of capital maintenance issues is a main component of the business model. The SCMaglev technology is an improved model not only in terms of speed and safety, but also by including useful life and refurbishment metrics into the model from day one. Financial considerations within the financial model being developed for the EIS will include capitalized maintenance of the guideway, facilities, equipment, and vehicle stock. This will pre-empt major overhauls and service interruptions, and will allow a reliable option for transit. Having multiple reliable transit options in such a dense region will bring relief to the capacity of the system as a whole.

The Project complements existing intercity rail, transit, air and road systems, and will integrate them with the fastest, most reliable technology available. This new corridor between Washington, DC and New York City with major city and airport stops along the way would address key challenges by alleviating traffic in one of the most congested regions in the country. It will include safety and risk mitigation measures for operating in all environmental conditions, and travel a route through both underground tunnel and above ground viaduct. At top speeds of 311 mph, the Project will provide the fastest, safest, and most reliable connectivity for the northeastern seaboard travel market, offering an approximately one-hour service between DC and NYC that is highly integrated into the existing transportation infrastructure between those terminals.

### **Evaluation Criteria - Project benefits**

The current Project is premised on the deployment of the Japanese SCMaglev system. SCMaglev is the most advanced high-speed ground transportation technology in the world. It is currently deployed in Japan between Tokyo and Nagoya by the Central Japan Railway Company (JRC). JRC and its precursor, Japan National Railways, have

been developing the SCMaglev system in Japan since 1962. Since 1997, the SCMaglev train has traveled more than 3 million miles<sup>10</sup>, and over 300,000 passengers have experienced the public ride. The Japanese government acknowledged in 2009 that SCMaglev technology had been comprehensively and systematically established, and in 2011 the Japanese government enacted SCMaglev technological standards, approving its safety for commercial passengers. JRC has been operating their public, commercial-ready trainset since August 2013. This concurrent development of SCMaglev in Japan and in the US affords a unique opportunity to harness best practices and value-engineering efficiencies provided by JRC's experience. It will allow the US to take advantage of the extensive research and lessons learned in Japan over the past generation, providing the opportunity to adapt the findings on system design for a US application. This has enormous positive implications for capital costs, operating costs and system reliability.

The SCMaglev is unique among ultra-high-speed rail potential services, having an existing operating passenger system and overseas safety approval for passenger service. This project is not a concept; it fulfills the goal of the Maglev Deployment Program to deploy a safe revenue service Maglev project.

Part of this deployment has been the thorough review of the transformative effects an SCMaglev system would bring to the NEC. This is exhaustively detailed in the DEIS, most poignantly in the 24 sections of "Chapter 4: Affected Environment, Environmental Consequences and Mitigation". The Benefit Cost Analysis (BCA) attached to this NOFO response concentrates on monetizing the direct effects of the build and implementation of the Washington, DC to Baltimore segment. The purpose of this scope of work is to gain more information on the metrics that could be used in a BCA for the entire DC to NYC line. The preference would be to use those metrics in the future, but the DC to Baltimore segment is used for illustrative purposes.

The monetization of the DC to Baltimore segment is generally discussed in ranges, as there are 12 different alignments that were brought into the DEIS. For the purposes of the BCA, the source data (pulled entirely from the DEIS) was converted to 2022 dollars (per FRA guidance) using the annual average CPI, but the DEIS notes the benefits for the SCMaglev project in 2018 dollars. Depending on differences in the alignment and facility choices, the DEIS notes that time savings benefits alone could total between \$462.3 million and \$519.7 million by 2030 and between \$617.7 million and \$696.6 million by 2045 (essentially years 3 through year 18 of operation). In addition, the safety benefits, which are a cornerstone of the SCMaglev deployment, could total between \$75.2 million and \$83.4 million by 2030 and between \$103.7 million and \$115.2 million by 2045. Benefits like these are compounded by economic impacts that would "result in between 390 and 440 total jobs annually, and between \$24.3 and \$27.4 million in earnings (2018 dollars) for all Build Alternatives."<sup>11</sup> Deploying an SCMaglev system means deploying a safe, timesaving, job-creating option for transportation that

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<sup>10</sup> <https://scmaglev.jp-central-global.com/maglevline/about/>

<sup>11</sup> Section 4.06 Economic Resources Baltimore-Washington, D.C. Superconducting Maglev Project Draft Environmental Impact Statement and Section 4(f) Evaluation

enhances our regional network, and improves the lives of not just the people who ride it but the communities and other transportation modes surrounding it.

The project does not envision being a system completely apart from other modes of transit. Progress thus far has included discussions with other intra- and inter-city and interstate transit operators; from bus lines, to light rail to airports. As the nation grows and population centers in the northeast not only become more dense, but also churn more economic activity,<sup>12</sup> it is important to understand that moving people between these dense population centers efficiently requires multiple options.

The COVID-19 Pandemic changed the outlook for many indicators, from housing, to employment, to travel. While many habits saw lasting change, it is clear that transit ridership overall is returning from a recent nadir. For the 2023 fiscal year, Amtrak ridership on the NEC has returned to more than 12M riders.<sup>13</sup> After having suffered its lowest ridership in decades two years prior.<sup>14</sup> By August of 2021, MARC returned to full scheduled service<sup>15</sup> in anticipation of continual increases that they saw through 2022 and 2023.<sup>16</sup> Understanding that pre-pandemic projections for future ridership may come later than planned, this only means that there is slightly more time to prepare for impending capacity constraints.

As Northeast Corridor rail traffic becomes more crowded, reaching a passenger limit is only one problem. As of January 2024, a joint letter written by US Senators from across the Northeast Corridor and beyond, put the State of Good Repair backlog on the NEC at “well over \$40 billion”.<sup>17</sup> BWRR strongly supports rebuilding America’s aging infrastructure, but we also understand that work of this magnitude will take decades, and will likely cause slow orders, schedule changes, and various kinds of disruption—both intended and unintended—as this important work is being completed; not only for Amtrak, but for every commuter rail that it hosts. This shines a light on an overarching issue with transit in the United States: we need more options.

## **Selection Criteria**

The SCMaglev project is meant to be complementary to regional transportation. Whether we look at roads or rails, congestion on the Eastern Seaboard of the US is a critical issue. Part of improving transit in the region is giving all passengers in the region more options for transit when other modes are under repair, experiencing slow orders, or are challenged by capacity issues. The SCMaglev project aims to be a part of the transit future of the region.

## **Selection Criteria - Safety**

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<sup>12</sup> <https://www.ajot.com/premium/ajot-the-northeast-corridor-money-is-the-m-in-megalopolis>

<sup>13</sup> <https://media.amtrak.com/wp-content/uploads/2023/11/Copy-of-FY23-Year-End-Ridership.pdf>

<sup>14</sup> <https://media.amtrak.com/wp-content/uploads/2022/11/FY22-Year-End-Revenue-and-Ridership.pdf>

<sup>15</sup> <https://www.mta.maryland.gov/articles/313>

<sup>16</sup> <https://www.mta.maryland.gov/performance-improvement>

<sup>17</sup> [https://www.welch.senate.gov/wp-content/uploads/2024/01/rail\\_approps\\_letter.pdf](https://www.welch.senate.gov/wp-content/uploads/2024/01/rail_approps_letter.pdf)

Nearly 75% of the SCMaglev line is planned for underground, and the remainder of the line will be either in viaducts above grade, or in protected transitions between the two. As this project surveys options for traveling north of Baltimore, the project team plans to be cognizant of the same safety and environmental disruption concerns that forged the planning for the DC to Baltimore segment. This means the Maglev future on the Northeast Corridor will see a train with no at-grade crossings, which will eliminate the danger of vehicle and trespasser accidents. JR Central, the company behind the SCMaglev technology, puts safety at the forefront, as proven by its track record of zero injuries or fatalities of passengers in the over 50-year history of the Tokaido Shinkansen<sup>18</sup> bullet train. That dedication to safety is fundamental to the development of the SCMaglev, with three different methods of braking, proven countermeasures for power outages, earthquakes, fire suppression and deterrence, and dedicated evacuation routes.

Beyond the safety of the technology, plans are already being developed for an appropriately trained workforce. In 2017 a Memorandum of Understanding was signed with the North American Building Trades Unions (NABTU) to utilize and develop skilled labor for future SCMaglev construction. Northeast Maglev, in concert with BWRR, is working with the building trades unions to establish apprenticeship programs, and working with local educational institutions to develop programs to foster the job skills needed by all aspects of the project. In addition to hiring skilled labor, the vision is to provide a path for local youth to establish careers in highly skilled trades.

### **Selection Criteria - Climate Change and sustainability**

Nearly 75% of the planned route for the Baltimore-Washington SCMaglev is in a tunnel. This is in line with BWRR's plan to minimize surface impacts of the system, including detrimental impacts to environmental justice communities. That plan is not just for the initial segment, but will guide the progress north of Baltimore as well.

To create those tunnels, a total of 14 to 15 million cubic yards of soil will be excavated across the project during construction. In meetings with local environmental groups, BWRR has received interest in the possible ecological use of this soil, and we are exploring ways to use this material in ways that would be beneficial for the Chesapeake Bay and our local environment, including covering landfills and restoring farmland. These considerations will guide the planning progress through to New York City.

Each year, more than 85 million pounds of nitrogen pollution—about one-third of the Bay's total yearly load—comes from air pollution<sup>19</sup>. With more than 18 million people, the Chesapeake Bay watershed is more populous today than ever before. The Chesapeake Bay Foundation estimates an additional 157,000 people move into the region every year, bringing with them more vehicles and higher demand for energy from power plants. With this understanding of the environmental impact south of Baltimore, the project will quantify the benefits north of Baltimore as well.

SCMaglev would have a significant impact on automobile trip diversions and greenhouse gas (GHG) emissions in its first year of operation. Based on the SCMaglev

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<sup>18</sup> JR Central Annual Report 2021

<sup>19</sup> Chesapeake Bay Program Watershed Model 5.3.2, 2014

ridership forecast, during the first year of operation, 2030, between 11.38 and 12.61 million annual passengers are expected to divert from cars to SCMaglev.<sup>20</sup> As outlined in Appendix D2 of the Baltimore-Washington SCMaglev DEIS, this could allow for a reduction of nearly 285 million Vehicle Miles Traveled (VMT) in the region by 2030.

By taking DC-Baltimore traffic off the major roadways, communities in between will benefit as there will be fewer passing cars leaving behind emissions, noise, and congestion. This reduction in VMT then reduces emission pollutants as a result. By 2030, the region could see a decrease of nearly 2.2 million metric tons of carbon dioxide equivalent (CO<sub>2e</sub>).

The benefits from these studies for the current DC to Baltimore leg of the project are clear, which is why the project desires to include a preliminary study on the environmental benefits of the legs north of Baltimore to flesh out the direction for future purposeful options and need-based solutions.

We can expect some environmental benefits as the adoption of electric cars and trucks become more mainstream. However, there are still risks in not improving on other options. Lithium, the main element used in many electric vehicle batteries, is complicated to mine, has an incredibly long lead time to being production-ready, and has seen staggering increases in price<sup>21</sup>. While it reduces the overall dependence on fossil fuels, we need to have more transit options to adequately reduce the need for personal vehicles.

Environmental goals laid out in by the Northeast Corridor commission depend heavily on transitioning more travelers from cars to trains.<sup>22</sup> SCMaglev would contribute to the adoption of mass transit, and reduce the current system's vulnerability to risk, such as material shortages or supply chain issues, associated with the aging infrastructure.

### **Selection Criteria - Equity**

To ensure that local citizens benefit from the many opportunities that a project of this scale will bring, BWRR announced on March 1, 2021, an industry-leading Diversity, Equity and Inclusion Plan for Economic Opportunity in Maryland. The plan sets goals for 25% of construction and 25% of operational spending in Maryland to be with Minority Business and Women Business Enterprises. Further, the plan sets goals for 25% of permanent jobs and 40% of construction jobs to be filled by people of color and women. Along with these goals, special emphasis for the first leg between DC and Baltimore will be placed on recruiting and hiring individuals from the jurisdictions along the SCMaglev train project's route – namely Anne Arundel, Baltimore, and Prince George's counties, Washington, DC and Baltimore City. To meet these goals, BWRR has already begun to work with the faith-based community, high schools and colleges, nonprofit organizations working with traditionally unemployed and underemployed individuals, and state and local workforce development boards. This emphasis on diversity and equity is a plan for the entire project, including hiring, workforce development, and considering impacts of

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<sup>20</sup> Section 4.2 Transportation Baltimore Washington DC, Superconducting Maglev Project Draft Environmental Impact Statement and Section 4(f) Evaluation

<sup>21</sup> <https://fortune.com/2022/04/22/lithium-expert-says-supply-is-not-enough-to-keep-up-with-demand/>

<sup>22</sup> <https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/article/2024/04/northeastern-us-rail-infrastructure-to-be-transformed>

the infrastructure. The project team is cognizant of these goals and their foundational value through all phases of design and construction through to New York City.

### **Selection Criteria - Workforce Development**

In developing this system in the United States, BWRR has already met with and listened to the concerns of local and regional union, trade, and community organizations to ensure that we are developing not only jobs, but also skills. The route's tunnel and viaduct sections, and additional properties such as train stations, electric substations, fresh air and support facilities, will create a significant number of construction-related jobs. A memorandum of understanding between North America's Building Trades Unions and the project developer was signed in November 2017 with a common goal of providing local residents access to apprenticeship opportunities, job training, and good paying union careers. As a Maryland-based company, Northeast Maglev strongly identifies with local business aspirations. This local connection drives the company's interests in collaborating with a variety of business associations to identify and recruit a diverse group of qualified firms capable of providing support for the construction, management and operations of the SCMaglev train service. As we move forward, we see the project investing in both disadvantaged business enterprises and mainstream companies to make this high-tech transportation initiative a reality.

## **IX. Project Implementation and Management**

In accordance with this NOFO's guidance this section outlines expected arrangements for project contracting, contract oversight, change-order management, conformance to Federal requirements for project progress reporting, and risk management.

### Project Contracting and Oversight

The project manager will work in concert with the designated state agency and the project partner to establish efficient communication and public oversight.

The specific scope pertaining to this work will be performed with the guidance of MDOT as the grantee, and BWRR, the Project Sponsor. These entities will both be engaged with the Maryland Economic Development Corporation, which will assist with project management duties, and will have separate engagements with FRA, Northeast Maglev, and other entities engaged in engineering tasks. In regard to the larger project of future construction and operation, the packaging strategy has yet to be finalized, and will depend on various factors, including the capacity and capability of the contracting community. Pre-construction activities will be conducted through one or more consultant contracts. Consulting contracts will engage experts in their respective fields. As the Project advances, BWRR's internal management team will be augmented and supplemented by consultants with expertise in Program Management Oversight, Program Management/Construction Management, and/or Owner's Engineer contracts.

MDOT will follow federal requirements for procuring and overseeing consultants and contractors financed with Maglev Deployment Program funding. At the outset of the Project, MDOT will establish a Project Management Plan (PMP) that will identify the performance-based metrics for the program. The PMP will delineate appropriate lines of

communication (including with FRA and other government/regulatory agencies); note respective roles and responsibilities of all parties; define commonly used terminology; and establish procedures for document control (revision numbering), progress reporting, financial reporting, and scheduling. The PMP will be a desktop reference for all staff working on the program. It will be modified and adopted by all consultants and contractors involved in the Project, with all parties subject to audit on conformity.

### Change Order Management

As the Project statement of work is implemented, change-orders can be expected. Lessons learned from other major infrastructure projects, and from the current EIS project with BWRR, will be applied in the development of tender documents to minimize change orders. Reviews will be undertaken throughout the project development stages to identify potential areas of uncertainty and resulting modifications.

When necessary changes are identified, the project manager will assess change-orders, negotiate with contractors, communicate with the grantee and the project partner, and develop clear, efficient modifications without delay.

Identifying those stages and conditions in the Project where change-orders are likely will help to mitigate the issues involved in this process. These stages will be identified in the project management plan and managers will proactively approach contractors to preclude delays in processing change orders, altering contracts as issues arise and cultivating negotiations that incorporate changes at low cost. To ensure efficient resolution of issues at the lowest possible level, an escalation ladder will be developed.

### Federal Progress Reporting

The project manager will prepare necessary reports as identified in the grant administration requirements for the Federal Railroad Administration, including:

- Quarterly Progress Reports, to include project description, significant objectives and accomplishments, milestones and deliverables, technical/cost/schedule problems, work planned for the next quarter
- Quarterly Financial Reports, to include cash reporting, expenditures, recipient share, income
- Final Performance Report, at the conclusion of the grant, to include an abstract and narrative, and budget summary

In addition, as applicable, the following reports will be provided:

- Quarterly Disadvantaged Business Enterprise (DBE) Progress Reports
- Reports of Significant Events
- Final Financial Status Report
- Other Closeout Reports

Project data and reporting will be maintained in a secure document control system.

## Risk Management

The project management team will develop a fully integrated schedule including specific tasks, responsible parties, durations, and dependencies. During regular project working group meetings, impacts to the schedule, both short and long term, will be prioritized and the development of a mitigation plan will be assigned. The key to effective risk management is the proactive involvement of senior managers looking ahead in the program execution. Each element of the program will be regularly assessed for potential risk impacts. Project working groups meetings will be conducted throughout the project to facilitate the identification and assessment of potential risks.