ATTACHMENT B

SUMMARY OF MITIGATION MEASURES

AND

MITIGATION MONITORING PROGRAM

Attachment B

Summary of Mitigation Measures and Mitigation Monitoring Program

Access to the Region's Core Project

The mitigation measures and other features of the Project that reduce adverse impacts, to which Federal Transit Administration (FTA) and New Jersey Transit (NJ TRANSIT) committed in the Final Environmental Impact Statement (FEIS), are summarized in the following table. This summary table is provided in the Record of Decision (ROD) to facilitate the monitoring of the implementation of the mitigation measures. However, the FEIS provides the full description of all mitigation measures that are included in the Project. NJ TRANSIT will establish a program for monitoring the implementation of the mitigation measures as part of its Project Management Plan (PMP). FTA, with the assistance of the FTA project management oversight contractor, will oversee NJ TRANSIT's execution of the PMP, including its program for monitoring environmental compliance, through quarterly review meetings or other means specified in the FTA-approved PMP.

NJ TRANSIT is prohibited from eliminating or altering any of the mitigation commitments identified in the FEIS for the Project without the express written approval by FTA. In addition, any change to the Project that may involve new or changed environmental or community impacts not considered in the FEIS must be reviewed in accordance with FTA environmental procedures (23 CFR Part 771.130). NJ TRANSIT will immediately notify FTA of any proposed change to the Project that differs in any way from what the FEIS states. FTA will determine the appropriate level of environmental review for the proposed change (i.e., a written re-evaluation of the FEIS, an environmental assessment of the change, or a supplemental environmental impact statement), and the NEPA process for this supplemental environmental review will conclude with a separate NEPA determination, or, if necessary, with an amendment of this ROD.

NJ TRANSIT will prepare a Construction Environmental Protection Plan (CEPP). The Plan will provide a detailed outline of environmental commitments and any other procedures to be implemented during the construction phase to protect sensitive resources that may be affected during construction. The plan will discuss how the initial condition of the resource shall be assessed, where applicable; how construction work will actually be implemented to avoid or minimize impacts; and how environmental performance will be monitored during construction. The plan will provide an effective means for disseminating appropriate current information to the public and other interested parties.

Attachment B – Summary of Mitigation Measures

Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Public Transportation	PT01	Coordination of Track Outages	Track outages will be scheduled with Amtrak approval during off-peak periods, at night and on weekends. During final design of the project, staging plans will be developed in coordination with Amtrak to identify required outages. New project initiative agreements will be prepared as required to address construction affecting Amtrak facilities on the NEC.	Review and verify agreements	NJ TRANSIT	Final Design, Construction
Public Transportation	PT02	MPT Plan for Bus Service: Hoboken	Develop and implement an MPT plan to maintain bus service, including bus service on streets near the Hoboken Fan Plant/Construction Access Shaft, and bus service to Frank R. Lautenberg Station. The MPT plan will illustrate detour routes and signing indicating hours of effect; lane closures for staged construction; placement of temporary traffic control devices; temporary pavement; and temporary pedestrian walkways where necessary to maintain bus service.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Public Transportation	PT03	MPT Plan for Bus Service: NYC	Develop and implement an MPT plan in coordination with NYCT and NYCDOT to mitigate impacts to bus service. The MPT plan will require excavations to be covered during peak periods so that all travel lanes on West 34th Street, including the bus lanes, can be maintained. The MPT plan will maintain off-peak bus service on West 34th Street.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Public Transportation	PT04	NYC Subway Station Access and Operations Plan	Work with NYCT to maintain station operations and adequate station access and egress throughout construction. Approved signs and notices of street access stair closures will be posted in advance of construction to minimize passenger impacts.	Review and verify plans	NYCT	Final Design, Construction
Public Transportation	PT05	Additional M16/M34 Buses	Work with MTA NYCT to develop a strategy to provide the additional buses required on the M16/M34 line as a result of the Build Alternative.	Verify agreement on strategy	NYCT	Operations
Station Access and Parking	SP01	PSNY Pedestrian Access Plan	Work with NYCT, LIRR and Amtrak during final design of the project to develop a PSNY pedestrian access plan to allow pedestrians and riders to avoid station areas impacted by construction activities. Approved signs and notices will be posted in advance of construction to minimize passenger impacts.	Review and verify plans	NYCT	Final Design

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Station Access and Parking	SP02	Environmental Review of Potential Parking Projects	Potential parking projects will be subject to appropriate environmental review under NEPA (if federally funded) or NJDEP (if state funded).	Verify environmental compliance	NJ TRANSIT	Operations
Station Access and Parking	SP03	Parking Improvements Beyond the Project Area	Use NJ TRANSIT's Station Access Program to evaluate and plan for parking, feeder or alternate bus services, and pedestrian and bicycle access working with communities and local municipalities.	Review station access plans	NJ TRANSIT	Operations
Roadways and Traffic	TR01	MPT Plan for Roadway and Traffic: New Jersey	Work with NJDOT, Hudson County, and local municipalities to develop an MPT plan to implement the following mitigation: - Traffic impacts to the intersection of Tonnelle Avenue and the Route 3 ramps in North Bergen will be mitigated by signal timing changes, as indicated in ARC FEIS Table 3.6-7. - Traffic impacts to the intersection of Park Avenue at 19th Street in Weehawken will be mitigated through traffic signal timing changes, as indicated in ARC FEIS Table 3.6-8. - For cut-and-cover construction impacts at Tonnelle Avenue in North Bergen, open cut areas will be plated over to enable uninterrupted traffic circulation. Based on this sequential plating process, a maximum of one lane in each direction will be closed at any one time.	Review and verify plans	NJDOT	Final Design, Construction
Roadways and Traffic	TR02	MPT Plan for Roadway and Traffic: NYC	Work with NYCDOT to monitor future traffic conditions and develop and implement an MPT plan to mitigate traffic impacts and maintain traffic access and circulation during construction. The MPT plan may include: additional signal timing changes; detouring of traffic to streets on which construction would not be occurring; and adjusting existing travel lane configurations and utilization. (See ARC FEIS Tables 3.6-E through 3.6-G in Appendix 3.6)	Review and verify plans	NYCDOT	Final Design, Construction

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Roadways and Traffic	TR03	Traffic Signal Timing: NYC	Adjust NYC traffic signal timing (i.e., reallocating "green time" among approaches to better match intersection approach capacity to traffic demand) and change curb use regulations to increase intersection approach capacity. While these mitigation measures, summarized by intersection in ARC FEIS Table 3.3.9, have been approved by NYCDOT, the final mitigation measures are subject to revisions based on changing traffic patterns and consultation with NYCDOT.	Review and verify plans	NYCDOT	Operations
Roadways and Traffic	TR04	MPT Plan for Street Lane Closures: NYC	Street lane closures will be limited primarily to nighttime periods and weekends, when vehicular volumes would be lower. In cases where construction equipment would be placed in a curb lane continuously, the MPT plan will minimize impacts to traffic flow and levels of traffic service by detouring auto trips onto parallel streets, moving bus stops, and/or retiming traffic signals. Conversion of parking lanes to a travel lane will not occur.	Review and Verify Plans	NJ TRANSIT	Final Design, Construction
Pedestrians	PD01	MPT Plan for Pedestrians: Hudson County	Work with NJDOT, Hudson County, and local municipalities to develop and implement an MPT plan, including protected sidewalk shifts into curbside lanes or sidewalk reconfiguration, to mitigate pedestrian impacts and maintain pedestrian access and circulation in areas adjacent to proposed construction sites.	Review and verify plans	NJDOT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Pedestrians	PD02	MPT Plan for Pedestrians: NYC	Develop and implement an MPT plan, with NYCDOT and NYPD, to maintain adequate pedestrian access and circulation during construction. Construction will be scheduled during off-peak hours to the extent possible, and temporary surfaces placed to allow pedestrians to pass during construction. The MPT plan will be prepared in accordance with New York City regulations during final design of the project, and an ongoing program of review of pedestrian circulation with NYCDOT will occur during construction. Mitigation for the four impacted sidewalk segments are: 1. South side of West 33rd Street between Sixth and Seventh Avenues – a walkway will be maintained on the north (closed) side or the effective width of the south sidewalk will be increased from 8.3 to 10 feet by maintaining a clear width of about 12 feet 2. West side of Seventh Avenue between West 33rd and West 34th Streets – an effective width of 11 feet by will be maintained by retaining a clear width of about 13 feet 3. West side of Seventh Avenue between West 34th and West 35th Streets – an effective width of 12 feet will be maintained by retaining a clear width of about 14 feet 4. West side of Broadway between West 34th and West 35th Streets – an effective width of 10 feet will be maintained by retaining a clear width of about 12 feet	Review and verify plans	NYCDOT	Final Design, Construction
Pedestrians	PD03	Pedestrian Mitigation Measures: NYC	Work with NYCDOT to implement pedestrian mitigation measures identified in the ARC FEIS Table 3.4-18. Crosswalks will be widened to meet CEQR standards by replacement of current pavement markings.	Review and verify plans	NYCDOT	Operations
Pedestrians	PD04	PSNY Long-term Transportation Plan	Work with New York City and New York State agencies to develop a long-term transportation plan to support the proposed commercial and residential developments around PSNY.	Review and verify plans	NJ TRANSIT	Operations

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Pedestrians	PD05	Subway Passenger Flow Mitigation Measures	Work with NYCT to implement mitigation measures for impacts to passenger flow within subway stations as identified in the ARC FEIS Table 3.4-19, monitor project conditions and identify additional improvements, including appropriate improvements in connection with the Moynihan Station project.	Review and verify plans	NYCT	Operations
Pedestrians	PD06	Additional Connections for NYPSE	Work with MTA, NYCT, New York City, and affected community and business entities to identify additional connections between NYPSE and existing subway stations to enhance pedestrian connectivity between the existing subway system, PSNY, and NYPSE. Mitigation of project impacts will require coordination with one or more agencies and will require balanced and coordinated design.	Verify coordination	NJ TRANSIT	Operations
Freight Movements	FM01	Mitigation of Impacts on Freight Operations	Coordinate with NYS&W and Conrail through project final design and construction to mitigate impacts to freight operations. Required outages of NYS&W and Conrail freight tracks will be limited to one track at a time. The outages will be coordinated with freight operators and will be sensitive to primary freight rail movement on the affected rail line.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU01	Relocate Boonton Line	Relocate the existing Boonton Line grade crossing to assure access to properties within the proposed Secaucus Connection during construction, including PSE&G property and the Jersey City Police Department firing range.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU02	MPT Plans for Local Business Access: New Jersey	Implement MPT plans for travel lane and sidewalk closures on Tonnelle Avenue and JFK Boulevard to assure access to businesses within construction zones and reduce disruption to commercial properties.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU03	Temporary Noise Barriers: NYC	Utilize temporary noise barriers and the deployment of quietest and cleanest operating construction equipment to attenuate sound- and air emissions-related land use impacts in New York.	Verify incorporation into construction packages		Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Land Use, Zoning and Policy	LU04	MPT Plans for Local Business Access: NYC	Develop MPT plans with New York City agencies and stakeholders to assure access to businesses within the construction zones and reduce disruption to commercial properties.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU05	Compliance with NJ Redevelopment and Housing Law	Adhere to the New Jersey Redevelopment and Housing Law N.J.S.A. 40A:12A. Attempt to relocate affected businesses near their original locations.	Verify compliance	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU06	Compliance with NY State Eminent Domain Procedure Law	Comply with New York State Eminent Domain Procedure Law (the "Eminent Domain Procedure Law") for displacements and relocations in New York. Work with property owners to obtain favorable relocation assistance, including relocation of displaced businesses near their original locations.	Verify compliance	PANYNJ	Final Design, Construction
Land Use, Zoning and Policy	LU07	Construction of Bridge over Secaucus Connection Loop Tracks	Provide a bridge over the Secaucus Connection loop tracks with connections to existing access roads to assure permanent access to properties within the proposed Secaucus Connection, including PSE&G property and the Jersey City Police Department firing range.	Verify inclusion of requirements in final design plans	NJ TRANSIT	Final Design, Construction
Land Use, Zoning and Policy	LU08	Compliance with Federal Relocation and Property Acquisition Acts	Comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as codified in Title 42, Section 4601 et seq. of the United States Code, and the applicable implementing regulations set forth in Title 49, Part 24 of the Code of Federal Regulations (collectively, the "Uniform Act") (U.S Code 42 and CFR 49) (see Appendix 4.2 for details) for property interests in New Jersey and New York. The Uniform Act defines the acquisition and relocation process and benefits for commercials and residential property owners.	Verify compliance	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Demographics, Neighborhoods, Communities	DM01	Access to Local Businesses and Community Facilities: North Bergen and Hoboken	Maintain access to businesses and community facilities in North Bergen and Hoboken. Measures to maintain access will include: - implementation of MPT plans prepared in coordination with municipal traffic, planning and engineering agencies, and the affected community and stakeholders; - providing appropriate signage for affected businesses and amenities to maintain their visibility when obscured by construction activities; - communicating with the public in advance to notify them of partial sidewalk or street closures and other related actions; - enacting measures to avoid or minimize noise, vibration and dust associated with construction activities.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Demographics, Neighborhoods, Communities	DM02	Access to Local Businesses and Community Facilities: NYC	Maintain access to businesses such as retail shops, restaurants, offices and department stores along West 34th Street, West 33rd Street and West 35th Street in New York. Measures to maintain access will include: - implementation of MPT plans prepared in coordination with the affected community and stakeholders; - providing appropriate signage for affected businesses and amenities to maintain their visibility when obscured by construction activities; - communicating with the public in advance to notify them of partial sidewalk or street closures and other related actions; - enacting measures to avoid or minimize noise, vibration and dust associated with construction activities.	Review and verify plans	PANYNJ	Final Design, Construction
Environmental Justice	EJ01	Access to Community Facilities: Environmental Justice Communities.	MPT plans will provide access throughout the construction period to community facilities in New Jersey or New York, as identified in Section 4.3, that provide services to environmental justice communities.	Review and verify plans incorporation into construction packages	NJ TRANSIT	Final Design, Construction
Environmental Justice	EJ02	Coordination with Environmental Justice Communities	Work with communities, minority and non-minority, to identify truck routes that minimize impacts to environmental justice communities.	Review and verify MPT plans	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Environmental Justice	EJ03	Mentor-Protégé Program	Encourage disadvantaged business enterprises (DBE) as well as college and high school student participation in the ARC project through the project-wide Mentor-Protégé program.	Verify program implementation	NJ TRANSIT	Final Design, Construction
Environmental Justice	EJ04	Access to Public Transportation: Environmental Justice Communities	Consider access to public transportation as part of the relocation efforts for displacement of businesses or community facilities serving environmental justice communities or businesses outside environmental justice communities, but employing low-income and minority populations.	Verify incorporation into relocation plans	NJ TRANSIT	Operations
Environmental Justice	EJ05	Monitoring at Henry Street Residences	Monitor noise impact to three (3) Henry Street residences on a quarterly basis for the first three years of service and annually for two additional years. NJ TRANSIT will work with the property owners to implement sound-proofing measures based on the findings of this monitoring.	Verify monitoring and coordination with property owners	NJ TRANSIT	Operations
Visual and Aesthetic Conditions	VA01	Temporary Construction Barriers: NYC	Install temporary barriers between 15 and 20 feet in height to reduce visual/aesthetic impacts at nearest residential, parkland, office and pedestrian areas at construction sites in Manhattan. Alternative measures such as site enclosures will be investigated to provide visual mitigation for higher building floors.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction
Visual and Aesthetic Conditions	VA02	Visually Compatible Project Facilities	Design project facilities, including fan plants and station entrances, to be compatible with surrounding land uses. Include local municipalities in New Jersey, NJSHPO, NYSHPO, NYCLPC and NYCDCP in the design review process.	Verify design review process	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Air Quality	AQ01	Diesel Emission Controls	Incorporate Diesel Emission Control measures into construction contracts including: - Use of ultra-low sulfur diesel (ULSD) fuel (maximum 15 parts per million of sulfur) in off-road construction equipment with an engine horsepower (HP) rating of 50 HP or above. - Use of Tier II diesel engines in all off-road construction equipment with an engine HP rating of 50 or above with diesel particulate filters (DPF) retrofit technology, where commercially reasonably available, or diesel oxidation catalysts (DOC) where DPFs are not reasonably available and with Best Available Technology, as defined in the NYCDEP Rule implementing the requirements of NYC Local Law 77. - The use of Tier II or better non-road construction equipment on the project site and DPFs or DOCs, as applicable, will be validated by NJ TRANSIT when equipment is first brought on site. - Document that all manufacturer maintenance recommendations for all equipment and technology is adhered to by the contractor(s)). - Use of electrically-powered TBM equipment, compressors, welders, and pumps.	Verify incorporation into contract bid packages	NJ TRANSIT	Final Design
Air Quality	AQ02	Limitations on Idling	Limit unnecessary idling times on diesel-powered engines to three minutes. Exceptions include, but are not limited to the following: - When forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control. - When it is necessary to operate heating, cooling or auxiliary equipment to accomplish the intended use of the mobile source. - To bring the mobile source to the manufacturer's recommended operating temperature. - When the outdoor temperature is below 20 degrees Fahrenheit. - When the mobile source is being repaired.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Air Quality	AQ03	Relocation of Diesel-Powered Exhausts	Locate diesel-powered exhausts away from fresh air intakes, air conditioners, and windows.	Verify incorporation into fan plant design specifications	NJ TRANSIT	Final Design, Construction
Air Quality	AQ04	Dust Control Plan	Implement a Dust Control Plan and a Soil Erosion and Sediment Control Plan to control dust resulting from construction activities. The plan will detail sources and measures to reduce dust, as well as monitoring and enforcement provisions, and include, among other things, spraying of a suppressing agent (non-hazardous, biodegradable), containing fugitive dust through windscreens and barriers, prevention, cleanup, construction equipment wheel washing, and other measures, and adjusting construction activities to respond to meteorological conditions, as appropriate.	Review and verify plans	NJ TRANSIT	Final Design, Construction
Air Quality	AQ05	Diesel Emission Control	Implement Diesel Emission Control measures in consultation with USEPA and state and local agencies in New Jersey and New York	Verify consultation	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV01	Noise and Vibration Complaints Procedure	Where practicable, schedule individual project construction activities in coordination with NJ Jersey municipalities, New York City, and affected property owners to avoid or minimize adverse impacts. Establish a noise and vibration complaint procedure to address community concerns and implement additional control methods if necessary.	Verify schedule coordination and establishment of complaint procedure	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Noise and Vibration	NV02	Noise Barrier Installation: NJ	Install noise barriers (e.g., ¾-inch thick plywood) to comply with FTA and NJDEP noise criterion as follows: - A 20-foot high noise barrier along the edge of Paterson Plank Road, 70 feet above the Tonnelle Avenue Fan Plant/Construction Access Shaft site, will provide noise and visual/aesthetic mitigation for lower dwelling unit floors. Alternative measures such as site enclosures will be investigated to provide noise mitigation for higher building floors. - A 15-foot high barrier between the G&B Baker's Supply Corporation Building and the cut-and-cover construction just west of and under Tonnelle Avenue to mitigate construction noise. - A 25-foot high, 400-foot long noise barrier adjacent to the Hoboken Fan Plant/Construction Access Shaft will provide noise and visual/aesthetic mitigation for the residences nearest the site in Weehawken.	Verify compliance and incorporation into design plans	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV03	Noise Muffling and Enclosures	To the extent possible, utilize acoustical noise tent/enclosures surrounding jackhammers or pavement breakers and/or jackhammer noise mufflers for noise reduction during demolition of the northernmost portion of the G&B Baker's Supply Corporation Building.	Verify compliance in contract packages	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV04	Regulatory Permission for Blasting: NJ	Require regulatory permission for blasting for the construction of the Palisades tunnels in sensitive areas later than 7:00 PM. Provide residences of Paterson Plank Road dwelling units with a blasting schedule in advance of blasting.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV05	Site Enclosure Installation: NYC	Install site enclosures or temporary noise barriers (e.g., ¾-inch thick plywood) of at least 15 feet high at construction sites in New York.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV06	Compliance with Noise Emission Standards	Construction equipment will comply with FTA, NJDEP and NYC noise emission standards.	Verify incorporation in contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Noise and Vibration	NV07	OSHA-Approved Backup Alarms	Vehicles will be equipped with OSHA-approved quieter backup alarms and will be routed through the construction site to minimize the use of alarms.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Noise and Vibration	NV08	Pre-Construction Inspection and Vibration Monitoring	Conduct a pre-construction inspection and vibration monitoring for historic and non-historic buildings adjacent to construction sites to avoid minor structural damage during construction. The following specifications should be in construction contracts: - Mitigation for blasting and pile driving-related vibration will include controlled blasting techniques, timed multiple charges and blast mats, use of pre-auguring, where possible, and requiring that loose vibrating noise-producing fittings be appropriately secured prior to pile driving. Procedures specific to timed multiple charges will include the design of the number, location, and spacing of shot holes, delay times, pounds-per-delay, and firing sequences. - Pre- and post-construction surveys and field vibration level monitoring during blasting and pile driving activities will be implemented to verify that actual vibration levels would be acceptable, and to require modification of the contractor's means and methods. - Community outreach relative to times of blasting. - Blasting in areas overseen by Amtrak will follow that agency's blasting requirements. - Adjustments in blast design parameters, pre-auguring, and appropriate cuts in the pavement for pavement breaking to protect sensitive receptors. Where practical, saw cuts extending completely through the pavement will be implemented, and concrete cutters will be used on pavement surfaces instead of pavement breakers. - Field vibration monitoring gauges will be installed during blasting, drilling, pile driving, and pavement breaking activities at sensitive or historic receptors and at or below buildings within which vibration-sensitive activities occur, such as the recording studios within the Hammerstein Ballroom/Manhattan Center to verify that actual vibration levels would remain below the U.S. Bureau of Mines building damage criteria damage threshold of 2.0 inches/second for buildings and 0.5 inch/second for historic buildings, and to require modification of the contractor's means and methods.	Verify incorporation into contract packages	NJ TRANSIT	Final Design, Construction

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Noise and Vibration	NV09	Temporary Barriers: Emergency Access Elevator Entrance	Install temporary plywood panels on the walls of at least the ground and second floors of the garage (over any existing openings in the walls) during the construction of the ADA Access/Emergency Personnel Access elevator entrance on West 34th Street between Eighth and Ninth Avenues to minimize noise and vibration to the Hammerstein Ballroom/Manhattan Center. As feasible, plywood barriers could be erected from floor to ceiling within the garage immediately around the construction activity.	Verify incorporation in final design plans	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV10	Coordination with Hammerstein Ballroom/Manhattan Center	To the extent practicable, schedule noise- and vibration-generating construction activities, such as blasting, in coordination with at Hammerstein Ballroom/Manhattan Center and other affected buildings.	Verify consultation with building representatives	PANYNJ	Final Design, Construction
Noise and Vibration	NV11	Regulatory Permission for Blasting: NYC	Blasting during construction of the Manhattan tunnels and NYPSE cavern will not occur after 10:00 PM, except with special permission from regulatory agencies. A blasting schedule will be provided to building owners and occupants, such as the Hammerstein Ballroom/Manhattan Center.	Verify incorporation in contract packages	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV12	Construction Protection Plan: NYC	Prepare a Construction Protection Plan (CPP) that will follow the New York City Department of Buildings Technical Policy and Procedures Notice #10/88, and other relevant federal, state and local regulations and includes monitoring related to historic buildings within 90 feet of proposed construction (as further described in the ARC FEIS Section 106 Programmatic Agreement).	Verify plan development	NJ TRANSIT	Final Design
Noise and Vibration	NV13	Isolation of Interior Work Areas	Isolate interior construction work areas for NYPSE entrances, to the extent possible, from other public access space by installing interior noise barriers inside affected buildings.	Verify noise barriers on final design plans	NJ TRANSIT	Final Design, Construction

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Noise and Vibration	NV14	Noise Impact Mitigations: St. Michael's Academy	Mitigate noise and vibration impacts to Saint Michael's Academy, Convent, and Church and adjacent apartment buildings associated with the Dyer Avenue Fan Plant construction with the following: - Construct a 20-foot high barrier or alternative measure (including site enclosure or acoustical windows) - Limit queuing of trucks - Coordinate the timing of the noisiest construction activities - Assign a project staff person throughout the construction period to coordinate with staff and residents and to identify the most effective mitigation measures	Verify inclusion in contract packages	PANYNJ	Final Design, Construction
Noise and Vibration	NV15	Noise Impact Mitigations: Henry Street Residence	Install building sound insulation, double-glazed windows, and/or air conditioning to mitigate noise for Henry Street residences in Secaucus, New Jersey. Vibration mitigation measures for Henry Street residences will include track bed improvements. Final mitigation measures will be selected with property owners during final design.	Verify incorporation into final design plans	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV16	Mitigate Noise Impacts: Bay Head and Suffern Rail Yards	Noise mitigation for sensitive receptors adjacent to Bay Head Rail Yard and Suffern Rail Yard will include building sound insulation, double-glazed windows, and/or air conditioning. Final mitigation measures will be selected in consultation with affected residences and property owners during final design.	Verify incorporation into final design plans	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV17	Installation of Fan Silencers	Install fan silencers to reduce fan noise levels to meet FTA, NJDEP, and New York City noise limits for each proposed fan plant. Fan plants in New York will be field checked by New York City representatives. Monitor noise levels at nearest receptors.	Verify inclusion in final design and contract packages	NJ TRANSIT	Operations
Noise and Vibration	NV18	Installation of Intake and Exhaust Silencers	Include air intakes and exhaust silencers and acoustical enclosures for the chiller units for the rooftop cooling towers and chiller units of the 35th Street Fan Plant.	Verify inclusion in final design plans and contract packges	PANYNJ	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Noise and Vibration	NV19	Coordinated Use of Jackhammers	At construction sites in Manhattan, jackhammers will be located inside an acoustical noise tent/enclosure and/or will be provided with mufflers to mitigate noise. The use of jackhammers will be coordinated, to the extent possible, with operations of businesses within affected buildings.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction
Noise and Vibration	NV 20	Noise Analysis of Fan Plant Silencer Lengths	During the final design of the fan plants, a more detailed noise analysis would be required to determine the noise levels at the nearest receptors (during the different modes of fan operation) to determine the required silencer lengths.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Permitting
Ecology	EC01	MIMAC Wetlands Restoration	Develop a wetlands restoration plan in consultation with MIMAC. Consult with MIMAC and gain approval from NJDEP and USACE for acceptable ratio for mitigation of construction impacts to wetlands of greater than six months in duration within ESAs in Segments 1 and 2.	Verify consultation and agreement	NJ TRANSIT	Final Design, Permitting
Ecology	EC02	Upland Forest Mitigation: Segment 1	Mitigate construction impacts to upland forest in Segment 1 at a 1:1 ratio, as recommended by the USFWS and as required by the NJ No Net Loss Reforestation Act. Mitigation will include the re-establishment of woody species impacted during construction. Coordinate upland reforestation measures with the MIMAC, including USFWS.	Verify incorporation in final design, permit applications and contract packages	NJ TRANSIT	Final Design, Permitting
Ecology	EC03	Compensatory Wetland Mitigation	Coordinate with MIMAC and gain approval from NJDEP and USACE on a compensatory wetland mitigation plan for construction impacts to ESA in Segments 1 and 2.	Verify consultation and approved plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC04	Construction of Osprey Nesting Platforms	Construct new osprey nesting platforms at a 3:1 ratio, using NJDEP Division of Fish and Wildlife designs, as recommended by NJDEP to mitigate for the active osprey nesting platform in Segment 1. Coordinate with NJDEP and NJMC on specific locations. Erect new osprey nesting platforms 1,000 feet or more from the construction site in the Riverbend Wetland Preserve and/or Saw Mill Creek Wildlife Management Area, as recommended by NJMC.	Verify inclusion in final design and contract package	NJ TRANSIT	Final Design, Permitting, Construction

Attachment B – Summary of Mitigation Measures

Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Ecology	EC05	Consultation with Agencies re: Hackensack and Hudson Rivers	Continue consultation with state and federal agencies, including NMFS, regarding the Hackensack and Hudson Rivers. -Avoid and minimize impacts on wetlands and open waters within the HMD to the maximum extent practicable. -Provide suitable compensatory mitigation for all unavoidable impacts on wetlands and open water in accordance with the final rule for Compensatory Mitigation for Losses of Aquatic Resources. A conceptual compensatory mitigation plan should be developed as soon as possible. This plan should be reviewed and recommended for approval by MIMAC. -The compensatory mitigation should be constructed prior to or concurrent with the impacts.	Verify consultation	NJ TRANSIT	Final Design, Permitting
Ecology	EC06	Investigation of Section 404b(1) Measures	Investigate avoidance/minimization measures pursuant to Section 404b (1) Guidelines, as the initial step in the mitigation process. Where impacts to wetlands and open waters resulting from the discharge of fill material are determined to be unavoidable, measures will be taken to mitigate these impacts in accordance with the requirements of Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899, and in consultation with MIMAC.	Review and verify avoidance, minimization and mitigation measures	NJ TRANSIT	Final Design, Permitting

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Ecology	EC07	MIMAC Wetlands Mitigation Plan	Concurrent with MIMAC review and comment, NJ TRANSIT will circulate the draft mitigation plan for public review and comment. Any party that commented on the ARC EIS process will be notified of the availability of the draft mitigation plan on the project's web site as well as individual letter. In conjunction with MIMAC and public review and comment, FTA will review and approve the mitigation plan, and the plan will be finalized and submitted by NJ TRANSIT to NJDEP and USACE for approval. Wetland mitigation will be conducted as approved and as conditioned within the issued permits. Continued coordination will take place with NJDEP and USACE to ensure compensatory mitigation compliance. (ARC FEIS Page 4.8-27). Public examination of the proposed final wetlands mitigation plan will occur during the USACE permitting process. As part of that process, the public will be notified when the Section 404 permit application is available for 30-day review during which time the public can submit written comments. The public notification package will include a summary of the project, projected impacts and proposed mitigation (including wetlands mitigation). The public notice will be officially posted on the USACE web site and distributed to the USACE mailing list. In addition, the ARC project website will provide updates on the Section 404 permitting process and a link to the USACE public notice and review process. Once all comments are addressed between the project team and the USACE, the USACE can issue the permit.	Verify plan preparation and submittal prior to permitting	NJ TRANSIT	Final Design, Permitting
Ecology	EC08	Richard P. Kane Wetland Mitigation	Coordinate with the Meadowlands Conservation Trust (MCT) on the potential development of a wetland mitigation bank on the Richard P. Kane Tract as the preferred mitigation option, provided credits are available for purchase.	Verify consultation	NJ TRANSIT	Final Design, Permitting
Ecology	EC09	Explore Use of In-Lieu Fees	Coordinate with the MCT, NJMC, and MIMAC on the potential development of an in-lieu fee program as a mitigation option.	Verify consultation	NJ TRANSIT	Final Design, Permitting

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Ecology	EC10	Oritani Marsh Mitigation	Investigate project-specific mitigation at Oritani Marsh, portions of the Kane Tract, or another suitable mitigation site within the HMD, as a mitigation option. Employ IVA or HGM as necessary to assess the impacts and proposed mitigation on a case-by-case basis. If project-specific mitigation is undertaken, complete title searches on the subject parcels to ensure that these potential mitigation measures are feasible and are not deed restricted and incorporate design elements that provide suitable habitat for migratory birds within the HMD.	Verify consultation and completion of analysis	NJ TRANSIT	Final Design, Permitting
Ecology	EC11	Kearny Yard Mitigation	Provide mitigation for Kearny Yard outfalls impact to intertidal and/or subtidal shallows in accordance with NJDEP regulations and as acceptable to MIMAC.	Verify inclusion in wetlands mitigation plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC12	Riverbend Wetlands Preserve Mitigation	Coordinate through MIMAC and mitigate impacts to the Riverbend Wetlands Preserve (an open space resource), as required, for a parcel that served as mitigation for previously approved impacts within the HMD.	Verify consultation and inclusion in mitigation plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC13	NYS&W Site Mitigation	Coordinate with USACE, MIMAC, and NYS&W regarding impacts to a proposed NYS&W mitigation site, since development of this site would serve as mitigation for previously approved wetland impacts within the HMD.	Verify consultation and inclusion in wetlands mitigation plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC14	Mitigation of Project Related Impacts	Conduct mitigation prior to or concurrent with approved (permitted) project-related impacts.	Verify mitigation has been approved and initiated prior to construction	NJ TRANSIT	Final Design, Permitting
Ecology	EC15	Coordination of Wetlands Mitigation Approach	Coordinate overall compensatory wetlands mitigation approach with MIMAC, which includes USACE, USEPA, USFWS, NMFS, NJDEP, and NJMC.	Verify consultation	NJ TRANSIT	Final Design, Permitting

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Ecology	EC16	Coordination with Portal Bridge Capacity Wetland Mitigation	Coordinate wetland mitigation plan with the Portal Bridge Capacity Enhancement Project to mitigate for impacts within the HMD through continued dialogue with MIMAC members and the MCT.	Verify coordination	NJ TRANSIT	Final Design, Permitting
Ecology	EC17	Long-term Mitigation: ESA Segment 1	Mitigate unavoidable long-term impacts to ESA in Segment 1 with the implementation of an approved compensatory wetland mitigation plan to offset impacts, as coordinated with and approved by USACE and NJDEP in consultation with MIMAC. Include measures, such as avoidance/minimization strategies, agency coordination, acquisition of required permits and approvals, use of BMPs, and implementation of compensatory mitigation, to ensure no long-term impacts to ESA.	Review and verify plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC18	Upland Forest Mitigation: Segment 2	Provide mitigation to upland forest in Segment 2 at a 1:1 ratio, as recommended by USFWS, and as required by the NJ No Net Loss Reforestation Act. Coordinate upland forest mitigation with NJDEP and USFWS.	Review and verify plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC19	Compensatory Mitigation: Segment 2	Provide compensatory mitigation for wetland impacts in Segment 2 by: 1) purchasing credits from a federal and state-approved wetland mitigation bank; 2) purchasing credits from an approved in-lieu fee program; 3) the development of an independent wetland mitigation site to satisfy acceptable wetland mitigation ratios, generally about wetland establishment or restoration at 2:1, enhancement at 3:1, or preservation at 27:1 typically in the same watershed as the proposed impacts; or 4) a combination thereof.	Review and verify plan	NJ TRANSIT	Final Design, Permitting
Ecology	EC20	Migratory Bird Habitat	A project-specific mitigation site would allow for the opportunity to incorporate design elements that provide suitable habitat for migratory birds within the HMD.	Verify incorporation into design and contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Ecology	EC21	Consultation with NMFS	Consultation with state and federal agencies including National Marine Fisheries Service (NMFS) as project design advances.	Verify consultation	NJ TRANSIT	Final Design, Construction
Ecology	EC22	Wetland Mitigation Plan for Impacts within HMD Including Penhorn Creek	Construction impacts to ESA in Segment 1, as discussed above, will be mitigated through the implementation of an approved compensatory wetland mitigation plan to offset impacts to wetlands within the HMD, including Penhorn Creek, as coordinated with and approved by regulatory agencies. Construction-related impacts would be temporary in nature and natural communities will be restored to pre-disturbance condition.	Verify approval of mitigation plan and incorporation into construction documents	NJ TRANSIT	Final Design, Construction
Water Resources	WR01	Mitigation of Water Contaminants	Characterize contaminants and coordinate with municipal water treatment authorities prior to new or increased water discharges to either watercourses or municipal sewer systems.	Verify inclusion in operating procedures	NJ TRANSIT	Operations
Water Resources	WR02	Water Quality Impacts Mitigation	Mitigate potential impacts to water quality during construction by: - Minimizing stormwater flow and treating stormwater as close to the point of origin as possible; - Minimizing the amount of disturbed ground surface at any time; - Seeding and stabilizing disturbed areas immediately upon completion of work.	verify incorporation into final design plans	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Water Resources	WR03	Groundwater Impacts Mitigation	Mitigate potential impacts to groundwater during construction by adherence to a SWPPP and to Best Management Practices (BMPs). BMPs consist of measures to trap, treat, and assimilate stormwater runoff, and their use will be stipulated in the SWPPP. The SWPPP will include: - Use of manufactured treatment devices (such as oil/water separators and grit chambers) and sediment traps, and other techniques such as detention basins, that will allow groundwater pumped from the tunnels during construction to meet applicable regulatory criteria. - Implementation of a soil erosion and sediment control plan in compliance with the Soil Erosion and Sediment Control Act of 1975, as amended, and meeting the standards of the NJ State Soil Conservation Committee and New York State guidelines for erosion control and stormwater management. - Avoidance of materials placement over permeable soils that could have adverse effects on groundwater quality, achieved through adherence to proper material handling procedures, including NJDOT standards and any special permit conditions by NJDEP and USACE for erosion control. These material handling procedures include fuel and materials for servicing construction vehicles and equipment.	Verify development of plans	NJ TRANSIT	Final Design, Construction
Water Resources	WR04	Mitigation of Groundwater Impacts	Mitigate potential impacts to groundwater during construction by coordinating with municipalities to characterize contaminants in the groundwater and following agreed-upon treatment and processes.	Verify coordination	NJ TRANSIT	Final Design, Construction
Water Resources	WR05	Tributary Relocation	Relocate a portion of a tributary to Penhorn Creek with in-kind replacement as an open channel with a natural bottom, accomplished through relocation of the stream channel and replanting with indigenous vegetation to maintain stream flow, which would be interrupted by construction of an embankment that would support two new tracks of the NEC.	Verify plans	NJ TRANSIT	Final Design, Permitting
Parklands	PK01	Grade Crossing Relocation	Relocate the existing grade crossing to clear the main construction area to assure access to the PSE&G property and the adjacent Little Snake Hill during construction.	Verify inclusion in final design plans	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Parklands	PK02	Protect Access to East Coast Greenway and the Meadows Path	Coordinate with affected parties through final design and construction to minimize potential access disruptions to the East Coast Greenway and the Meadows Path.	Verify consultation and inclusion in final design	NJ TRANSIT	Final Design, Construction
Parklands	PK03	Minimize Impacts to Hudson River Park	Consult with the HRPT and other New York City and State agencies to avoid or minimize impacts to Hudson River Park from construction vehicle traffic from the Twelfth Avenue construction access shaft site with the construction of as noise barriers.	Verify consultation	NJ TRANSIT	Final Design, Construction
Parklands	PK04	Temporary Relocation of Con Edison activities	Coordinate with affected parties during final design and construction to mitigate identified impacts from temporary relocation of Con Edison activities to the block between West 29th and West 30th Streets and Eleventh and Twelfth Avenues (Block 675), the site of a proposed park.	Verify Coordination	NJ TRANSIT	Final Design, Construction
Parklands	PK05	Construct Bridge over Secaucus Connection loop tracks	Provide a bridge over the loop tracks with connections to existing access roads to assure permanent access to the PSE&G property (with connections to the proposed Little Snake Hill) within the proposed Secaucus Connection.	Verify inclusion in final design plans	NJ TRANSIT	Final Design, Construction
Parklands	PK06	Research Green Acres restrictions	Conduct research with local municipalities to verify if any properties in the New Jersey project area are subject to Green Acres restrictions. The use of Green Acres properties will comply with the diversion process for the New Jersey Green Acres Program (N.J.A.C. 7:36-26.1).	Verify compliance with Green Acres diversion process	NJ TRANSIT	Final Design, Permitting
Soils and Geology	SG01	New Embankments and Viaducts	Construct new embankments and viaducts along the NEC on pile or drilled shaft foundations or place soil surcharges to preload the compressible soils prior to construction to mitigate potential post-construction settlement of above-grade track improvements from just west of Frank R. Lautenberg Station (including the Secaucus Connection loop tracks) to Tonnelle Avenue in North Bergen Mitigation of potential effects on the existing NEC rockfill embankment may require post-construction repairs.	Verify construction techniques in contract packages and on final design plans	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Soils and Geology	SG02	Mitigation of Undermining Settlement or Structural Instability	Underpin or otherwise support foundations in New Jersey to mitigate the potential for undermining settlement or structural instability due to excavation beneath or adjacent to existing railroad, roadway, or utility structures and monitor for movements as excavation progresses. Modify excavation and construction methods if monitoring indicates that movements may exceed established limits. Support may include slurry walls, secant pile walls, or soldier piles and lagging. In addition to providing sidewall support, these lateral retention methods would assist in groundwater control for the excavation.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG03	Soil and Erosion Sediment Control Plan (SESCP)	Prepare and implement a Soil Erosion and Sediment Control Plan (SESCP) in accordance with the Soil Erosion and Sediment Control Act of 1975, as amended (N.J.S.A. 4:24-39 et seq.). The plan will meet the standards of the State Soil Conservation Committee (SSCC), as certified by the Hudson, Essex, and Passaic Soil Conservation District.	Verify development and implementation of SESCP	NJ TRANSIT	Final Design
Soils and Geology	SG04	Seismic Design Considerations	Incorporate seismic design considerations in proposed surface and subsurface structures in New Jersey and incorporate appropriate mitigation measures into the final design if liquefaction impact analyses indicate potential unacceptable performance of structures.	Verify performance of analyses and inclusion of considerations in final design plans	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG05	Ground Stabilization Measures	If faults are encountered during construction of the Palisades tunnels, the Hoboken Fan Plant/Construction Access Shaft, or the western portion of the Hudson River tunnels in New Jersey perform ground stabilization measures such as grouting or ahead of the TBM face to stabilize the ground and/or control groundwater inflow. Additional rock support may also be used.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction

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Access to the Region's Core Project

Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Soils and Geology	SG06	Controlled Blasting Techniques	Limit vibratory ground motion from blasting or mechanical rock excavation to an allowable peak particle velocity of 2.0 inches/second for buildings and 0.5 inch/second for historic buildings or sensitive structures or environments in the vicinity of blasting in New Jersey. Controlled blasting techniques will be used, and if monitoring during test blasts indicated that allowable peak particle velocity limits may be exceeded, blast patterns and methods will be modified to reduce vibrations to an acceptable level. Vibration monitoring will continue during rock excavation operations.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG07	Potential instability of slopes	Investigate and evaluate potential instability of slopes on either side of the Palisades tunnels due to vibrations or portal excavation and implement stabilization or support if required.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG08	Ground Displacement	Control ground displacement due to dewatering in the vicinity of the Hoboken Construction Access Shaft with ground improvement to stabilize soils by underpinning of potentially affected existing structures or by installation of slurry walls or other lateral earth retention in areas of open cut or shaft construction.	Verify inclusion in final plans and contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG09	Seismic Design Considerations	Incorporate seismic design considerations, including effects of soil behavior, in proposed surface and subsurface structures in the Hudson River. Design structures in accordance with project seismic design criteria to resist an appropriate level of shaking, including a maximum design earthquake load.	Verify inclusion in final design plans	NJ TRANSIT	Final Design
Soils and Geology	SG10	Erosion and Sediment Control	Perform construction in accordance with standards and specifications for selection, design, and implementation of erosion and sediment control practices contained in the latest version of New York State Guidelines for Urban Erosion and Sediment Control. Implement erosion control measures in New York where pavement would be removed during construction to prevent adverse impacts to erodible soils.	Verify inclusion in contract packages and final design plans	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Soils and Geology	SG11	Seismic Design Considerations	Incorporate seismic design considerations in proposed surface and subsurface structures in New York. Structures will be designed in accordance with project seismic design criteria to resist an appropriate level of shaking, including a maximum design earthquake load.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design
Soils and Geology	SG12	Ground Stabilization Measures	If fault zones are encountered during construction of the Manhattan tunnels in New York appropriate ground stabilization methods such as grouting will be performed ahead of the TBM face to stabilize the ground and/or limit groundwater inflow. Additional rock support may also be used. If faulting or poor quality rock is present at proposed fan plant/construction access shaft sites, pre-excavation ground improvement will be performed, if necessary, to allow excavation in closely fractured or weathered rock.	Verify inclusion of requirement in contract packages and final design plans	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG13	Controlled Blasting Techniques	Limit vibratory ground motion from blasting or mechanical rock excavation to an allowable peak particle velocity of 2.0 inches/second for buildings and 0.5 inch/second for historic buildings or sensitive structures or environments in the vicinity of blasting in New York. Controlled blasting techniques will be used, and if monitoring during test blasts indicated that allowable peak particle velocity limits would be exceeded, blast patterns and methods will be modified to reduce vibrations to an acceptable level. Vibration monitoring will continue during rock excavation operations.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG14	Mitigation of Hazardous Asbestiform Minerals	In New York, if serpentinite rock excavated for a portion of the proposed tunnels alignment and/or the Twelfth Avenue Fan Plant/Construction Access Shaft contains potentially hazardous asbestiform minerals, implement measures to protect workers, as well as to minimize any environmental hazard associated with excavated material removal and processing. A work safety program consistent with OSHA standards will be implemented during construction to protect workers from inhalation hazards (see Section 5.12).	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Soils and Geology	SG15	Ground displacement	Control ground displacement due to dewatering and potential damage to adjacent and overlying structures in the vicinity of the Twelfth Avenue Construction Access Shaft in New York with ground improvement to stabilize soils, underpinning of potentially affected existing structures, and installation of relatively watertight earth retention systems such as slurry walls.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction
Soils and Geology	SG16	Erosion Control Measures	Consistent with the SESCP, implement erosion control measures in New Jersey where protective vegetation would be removed during construction to prevent adverse impacts to erodible soils due to increased runoff.	Verify inclusion in contract packages and final design plans	NJ TRANSIT	Final Design, Construction
Contaminated Materials	CM01	Mitigation of Contaminated Sites	Mitigate contaminated sites in New Jersey and New York contaminated sites through: - excavation and disposal of contaminated soils offsite, reuse onsite under institutional and engineering controls, or reuse off site - remediation of groundwater through treatment and/or natural attenuation under an institutional control (i.e., CEA).	Verify implementation and compliance with identified controls	NJ TRANSIT	Operations
Contaminated Materials	CM02	Engineering and Institutional Controls	For sites in NJ and NY, maintain engineering and institutional controls, consistent with federal and state requirements to minimize contact and migration of contaminants left in place.	Verify and monitor implementation of necessary controls	NJ TRANSIT	Operations
Contaminated Materials	CM03	Site-specific Mitigation	Implement mitigation activities at the Malanka Landfill site in accordance with an approved Landfill Closure Plan, which will address disruption, closure, and post-closure care of the landfill in accordance with NJDEP solid waste rules. Long-term actions that will be conducted include groundwater monitoring, maintaining site access control and operations and maintenance of the final landfill cover, groundwater treatment systems, landfill gas venting systems, and drainage systems.	Verify completion, approval and implementation of Landfill Closure Plan	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Contaminated Materials	CM04	Inspection and maintenance of sheet pile barrier wall	For the Kearny Rail Yard site, implement continued inspection and maintenance of the sheet pile barrier wall along the Hackensack River; groundwater monitoring; and monitoring and maintenance associated with any institutional or engineering controls established for the site.	Verify on-going inspection, monitoring and maintenance	NJ TRANSIT	Operations
Contaminated Materials	CM05	Mitigation of Contaminated Sites	For sites in New York where contaminated materials will be left onsite, monitor for potential contact and migration of contaminants and mitigate as appropriate.	Verify compliance with requirements for disposal and monitor controls	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Contaminated Materials	CM07	CECP and RAWP	Outline specific mitigation requirements for the below sites in a Construction Environmental Control Plan (CECP) and Remedial Action Work Plans (RAWP) that will be reviewed and approved by NJDEP prior to initiation of construction activities. Engineering and institutional controls as necessary will be maintained by NJ TRANSIT. - Intermodal Properties – 501 New County Road, Secaucus (Site No. 278A) - County Road LLC – 1 County Road, Secaucus (Site No. 278B) - Norfolk Southern – County Road, Secaucus (Site No. 278C) - Malanka Landfill – Secaucus (Site No. 392) - McKay's Landfill – Penhorn Avenue, Secaucus (Site No. 279) - JH Pantheon IV Site – 401 Penhorn Avenue, Secaucus (Site No. 281) - Keystone Freight Corporation/National Retail Freight – 2820 16th Street, North Bergen (Site No. 284) - Public Storage – 2100 Tonnelle Avenue, North Bergen (Site No. 287) - 2001 Tonnelle Avenue Associates – North Bergen (Site No. 288) - McDonald's – 2126-2216 Tonnelle Avenue, North Bergen (Site No. 296) - Carmine Franco Property (Currently Vanessa Bus Company) – 1703-27 Jefferson Street , Hoboken (Site No. 354) - Block 144 Development LLC Property – Adams Street and Grant Street, Hoboken (Site No. 354A) - NW West Corporation – 1281 West Side Avenue, Jersey City (Site No. 240) - Former PSE&G Facilities – Jersey City (Site Nos. 243, 245, 246, 247, 248, 249, 250, 251, 252, 254, and 255) - Hudson County Chromate 86 – 123 Duffield Avenue, Jersey City (Site No. 266) - PSE&G/Hudson Generating Station – Duffield/Van Keuren Avenue, Jersey City (Site No. 391)	Verify CECP and RAWP preparation	NJ TRANSIT	Final Design

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Contaminated Materials	CM08	Site-specific Mitigation Activities	Site-specific mitigation activities associated with Malanka Landfill will be conducted by NJ TRANSIT in accordance with an approved Landfill Closure Plan. Mitigation activities during construction will include excavation of contaminated soils and dewatering. Other mitigation activities to be conducted under the Landfill Closure Plan will include soil erosion and sediment control, construction of a final cover and drainage system, groundwater leachate collection and landfill gas venting.	Verify preparation and approval of Landfill Closure Plan	NJ TRANSIT	Final Design, Permitting
Contaminated Materials	CM09	Wastewater Treatment	At the site of the proposed Kearny Rail Yard, collect and discharge water generated during the consolidation process and treat wastewater generated from the sedimentation basins.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Permitting, Construction
Contaminated Materials	CM10	Disposal of Contaminated Soils	Excavate and dispose of contaminated soils or reuse off site, or reuse on site under institutional and engineering controls and dewatering and treatment where contaminated groundwater would be encountered. In New York, the following contaminated sites or portions of these sites identified during the PESA that would be directly impacted by the Build Alternative and will be mitigated: - Block 674 (Con Ed) - between Eleventh and Twelfth Avenues and West 28th and West 29th Streets (Site No. 411) - Block 675 – between Eleventh and Twelfth Avenues and West 29th and West 30th Streets (Site Nos. 405, 406, 409, 411, 416418, 425, and 426) - Block 731, Lot 22 – between Ninth and Tenth Avenues and West 33rd and 34th Streets (proposed Dyer Avenue Fan Plant)	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Contaminated Materials	CM11	Excavated Material	Excavated material from the proposed Build Alternative tunnels will be transported to the Kearny Rail Yard site for temporary staging, sample testing and segregation by waste stream. Soils that meet the most stringent SCC could be utilized as fill on the Kearny Rail Yard site, or transported for use as clean fill elsewhere. Contaminated soils (exceeding the most stringent SCC) would be reused off-site (e.g., roadway sub-base material or landfill cover) or at a specific off-site location (i.e., reuse at a location without a recycling permit to reuse soil), with NJDEP approval of a Soil Reuse Proposal. Soils identified as hazardous waste would be transported to an approved licensed disposal facility. This plan would also include NYSDEC approval for excavated tunnel materials originating in New York.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Permitting, Construction
Contaminated Materials	CM12	Radon testing	Include a provision in final engineering contract specifications the requirement for radon testing of excavated tunnels materials to be used as building foundation fill.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction
Contaminated Materials	CM13	Site-specific Mitigation	Outline site-specific mitigation requirements (as summarized in ARC FEIS Table 5.12-1) associated with contaminated materials and potential excavated material removal in the CECP, RAWP, and HASP and comply with NJDEP, NYSDEC, or NYCDEP oversight.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction
Contaminated Materials	CM14	Coordination with NJDEP Office of Brownfields Reuse	Kearny Rail Yard-related activities, will be continue to be coordinated with NJDEP Office of Brownfields Reuse	Verify coordination	NJ TRANSIT	Final Design, Construction
Safety and Security	SS01	Develop and update all Safety and Security plans	Develop and update a Safety and Security Management Plan (SSMP) that includes a Safety and Security Certification Plan (SSCP), the results of the Preliminary Hazard Analysis (PHA) and Threat and Vulnerability Analyses (TVA), and procedures for the System Security and Emergency Management Preparedness Program Plan (SSEMPPP).	Verify preparation and updates to plans	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Safety and Security	SS02	Develop SSEMPPP	Develop a System Security and Emergency Management Preparedness Program Plan (SSEMPPP) prior to the initiation of revenue service that identifies the organizational structure responsible for emergency response and contains information on emergency response protocol, security protocol, and evacuation plans and procedures in the event of a fire or security emergency.	Verify plan development and implementation	NJ TRANSIT	Operations
Safety and Security	SS03	Coordination of Fire and Emergency Services: NJ	Coordinate with New Jersey municipal fire departments, North Hudson Regional Fire and Rescue Company, emergency medical services, and New Jersey municipal police departments regarding operation of diesel fuel-laden equipment in the proposed Palisades and Hudson River tunnels.	Verify coordination	NJ TRANSIT	Operations
Safety and Security	SS04	Coordination of Fire and Emergency Services: NYC	Coordinate with FDNY, emergency medical services, and NYPD regarding operation of diesel fuel-laden equipment in the proposed Hudson River and Manhattan tunnels and NYPSE.	Verify coordination	PANYNJ	Operations
Safety and Security	SS05	Installation of Fencing and Shielding	Install fencing and shielding at all construction sites to reduce the vulnerability to trespassing and vandalism and to protect adjacent walkways and streets.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction
Safety and Security	SS06	Coordination of Timing and Location of Blasting Activities	Coordinate blasting activities with the affected public and businesses with regard to time and locations.	Verify incorporation into construction documents	NJ TRANSIT	Final Design, Construction
Safety and Security	SS07	Installation of Warning and Guide Signage	Install warning and guide signage to alert the public and physically separate work areas from public spaces during construction and times of equipment shutdown and site closure and to enable the affected public to seek alternative routes of travel in the vicinity of the construction sites.	Verify inclusion in contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Safety and Security	SS08	MPT Plans	Manage traffic on affected streets adjacent to construction sites through enactment and enforcement of approved MPT plans that would include lane closures, travel lane shifts, bus stop relocations, and relocated and protected sidewalks and/or bicycle lanes. These plans will be developed during design phases, through coordination with New Jersey transportation and planning agencies in New Jersey and NYCDOT (and NYPD regarding enforcement of the MPT plans) in New York.	Verify plan development and approval	NJ TRANSIT	Final Design, Permitting, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Safety and Security	SS09	Heavy Industrial Crane Operations	Prepare and implement a safety plan that will include the following stipulations for the contractor(s) with regard to heavy industrial crane operations: - Crane operators will be licensed for the type of crane to be operated and required to have completed 10 hours of OSHA training. - Crane operators and riggers will be required to secure all loads and confirm all loose material is removed before a load is lifted. - Cranes over three tons manufacturers rated capacity will be inspected and certified annually in accordance with the current ANSI standard. - Re-certification will be required for any crane involved in an incident and/or subjected to any overloading, side pulling, or shock loading of the boom, as determined by NJ TRANSIT. - Public vehicular and/or pedestrian traffic will not be allowed to pass beneath the boom of any crane. When the boom of a crane must be placed over a street or pedestrian walkway the traffic, vehicular and/or pedestrian will be stopped or rerouted. - A Crane Lift Plan with supporting calculations prepared, signed and sealed by a Registered Professional Engineer will be submitted for any heavy or critical lift. A heavy lift is defined as a lift where the payload is 50 tons or greater. A critical lift is defined as a lift that exceeds 90 percent of the crane's chart capacity, any multiple-crane lift, any lift near power lines, and/or any lift involving complex or specialty rigging - Crane operations will conform with the mitigation measures for traffic (Section 3.6), air quality (Section 5.6), noise and vibration (Section 5.7), and historic and cultural resources (Chapters 6 and 7).	Verify preparation and implementation of Crane Safety Plan	NJ TRANSIT	Final Design, Construction
Utilities	UT01	Con Edison site construction	Work with Con Edison to maintain the full functionality of their site after construction of the fan plant.	Verify coordination and site functionality	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Utilities	UT02	Coordination with Utility Providers	Coordinate with utility providers in the project area relative to future Build Alternative utility requirements.	Verify coordination	NJ TRANSIT	Operations
Utilities	UT03	Relocation of Utilities	Relocate and reconnect utilities prior to shut off of existing lines or protect in place with a slab or steel casing to avoid service disruptions.	Verify inclusion of utility protection language in contract packages	NJ TRANSIT	Final Design, Construction
Utilities	UT04	Coordination with Utility Providers	Coordinate with affected utility providers throughout final engineering design to identify potential issues and prescribe means to resolve them prior to construction.	Verify coordination	NJ TRANSIT	Final Design, Construction
Utilities	UT05	Agreements with Utility Providers	Implement agreements with utility providers and governmental agencies regarding temporary or permanent relocation of utility transmission lines.	Verify agreements	NJ TRANSIT	Final Design, Construction
Utilities	UT06	Public Outreach	Conduct public outreach in New York City and coordinate with agencies and private utilities with regard to minor, short duration service interruptions.	Verify outreach and coordination	NJ TRANSIT	Final Design, Construction
Utilities	UT07	Con Edison Site Coordination	Coordinate with Con Edison regarding proposed infrastructure construction and operation, temporary relocation of affected Con Edison equipment and vehicles and existing and proposed Con Edison site operations to avoid, minimize or mitigate temporary impacts to these operations and Con Edison's ability to provide utility service to its customers.	Verify coordination	NJ TRANSIT	Final Design, Construction
Utilities	UT08	Water Tunnel No.1 Coordination	Coordinate with NYCDEP with regard to construction of the NYPSE cavern 200 feet from Water Tunnel No. 1.	Verify coordination	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Archaeological Resources	AR01	Ground Penetrating Radar (GPR) Survey	Historic Cemeteries of Hudson County - Complete a Ground Penetrating Radar (GPR) survey once the original ground surface has been exposed. Mechanical equipment will be used to remove overburden and to expose subsoils at a point where grave shafts will be discernable. If grave shafts are observed, and confirmed by limited testing, consultation will immediately be initiated under the New Jersey Cemetery Act, and all appropriate local, state, and federal agencies will be notified.	Verify completion of survey and confirm test results	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR02	Industrial Remains Survey	Industrial Remains/Eighteenth-Century Ferry Slip/ Hackensack Plank Road in Hoboken, NJ - Project geomorphologist review of soil borings to determine the presence and depth of intact soil horizons within the APE. This effort will be followed by use of GPR survey, to identify the presence and depth of intact architectural features, such as building floors and wall and/or other subsurface cultural features. This non-intrusive survey will be followed by ground truthing through the subsequent mechanical stripping of overburden, and hand-dug excavations of any cultural features and deposits encountered to determine their National Register eligibility.	Verify completion of archaeological review prior to construction	NJ TRANSIT	Final Design
Archaeological Resources	AR03	Construction Monitoring Protocol: Hudson River to Tenth Avenue	Potential Piers and Wharves at Twelfth Avenue Fan Plant (formerly Hudson River Shore to Tenth Avenue in Manhattan) - Establish a construction monitoring protocol prior to shaft excavation to determine the presence/absence and significance of any archaeological deposits and to identify measures to mitigate adverse effects. This protocol will detail the phasing and methods to be employed in archaeological monitoring conducted during construction.	Verify establishment and implementation of protocol	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Archaeological Resources	AR04	Construction Monitoring Protocol: Tenth Avenue to Sixth Avenue	Residentially-related or Domestic Archaeological Resources: Sites of Proposed Fan Plant/Construction Access Shafts and Station Entrances In New York - Establish a construction monitoring protocol determine the presence/absence and significance of any archaeological deposits present, and to serve as the basis for selecting measures to mitigate any adverse effects. This protocol will detail the phasing and methods to be employed in archaeological monitoring conducted during construction.	Verify establishment and implementation of protocol	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR05	Cultural Resource Manager	Appoint a Cultural Resource Manager to assure that any archaeological resources identified during the course of construction are appropriately evaluated; efforts will be undertaken to the extent possible to avoid or minimize impacts to any eligible archaeological resources, and any adverse effects project-associated construction activities might have on eligible archaeological resources are mitigated. The Cultural Resource Manager will be responsible for determining the nature of any discovery during construction throughout the project area, including warranting construction to cease for a certain period of time while further archaeological investigations would continue, to enable evaluation of the potential extent and significance of the find. The Cultural Resource Manager would be a professional archaeologist who meets applicable New Jersey and New York standards and those of the National Park Service (36 CFR 61).	Verify appoint of Cultural Resource Manager and designation of responsibilities	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Archaeological Resources	AR06	Potential PSNY Remains in Meadowlands	FTA and NJ TRANSIT, along with NJSHPO and NYSHPO, will develop and implement a field testing and/or monitoring plan within 24 months of execution of this PA for that part of the New Jersey Meadowlands in North Bergen, New Jersey, that lies primarily between Tonnelle Avenue and the existing NEC railroad right-of-way embankment and will be affected by construction activities associated with ARC. (i) FTA and NJ TRANSIT will develop the plan to identify any artifacts, architectural elements, and remnants, of the former New York Pennsylvania Railroad Station (constructed in 1910) that may have been disposed in the area following the demolition of that structure in 1964. (ii) The plan to address the disposition of any such remains found will include steps set forth in III.C.3.a, III.C.3.d, and III.C.5.a-d.	Verify plan development, field testing and monitoring	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR07	Unanticipated Discoveries Plan	NJ TRANSIT, in conjunction with FTA, along with NJSHPO and/or NYSHPO, will develop and implement an Unanticipated Discoveries Plan for non-human archaeological resources and human remains, in the event that any unanticipated archaeological resources and/or human remains are encountered during construction of ARC.	Verify plan and incorporation into contract documents	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR08	Cultural Resources Management Plan	The Consultant Contractor for the project shall develop and implement a Cultural Resources Management Plan (CRMP), written by a professional meeting the qualifications cited above, that identifies the necessary engineering and scientific methods, practices, procedures, and resources essential to be employed throughout the design and construction to assure conformance with the applicable requirements of federal and state guidelines that provide protection for built historic properties and archaeological resources. The CRMP shall incorporate any plans and/or agreements already developed by NJ TRANSIT. The CRMP shall be subject to review and comment by FTA, ACHP, NJSHPO and NYSHPO.	Verify plan development and incorporation into contract documents	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Archaeological Resources	AR09	Construction and Archaeological Phasing Plans	NJ TRANSIT will take practical steps to initiate and complete archaeological field analysis and data recovery (depending on site access and testing feasibility) prior to ARC construction activities. NJ TRANSIT, in consultation with NJSHPO and/or NYSHPO, will develop a plan to appropriately phase the archaeological field analysis and data recovery with construction activities.	Verify plan development and incorporation into contract documents	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR10	Construction Protection Plan for Archaeological Resources	NJ TRANSIT will develop a Construction Protection Plan (CPP) for Archaeological Properties (Exhibit H) located within 90 feet of construction in consultation with FTA, NJSHPO and NYSHPO, NYCLPC and other appropriate New Jersey and New York agencies. If any additional Archaeological Resources of special concern are encountered, a Construction Protection Plan for these resources will also be prepared by NJ TRANSIT. The CPPs will be developed prior to construction of ARC and updated as necessary. NJ TRANSIT will ensure that any Archaeological Property that could be adversely affected by ARC construction will be included in a CPP, and NJ TRANSIT will implement such plans, as appropriate	Verify development of and adherence to CPP	NJ TRANSIT	Final Design, Construction
Archaeological Resources	AR11	Documentary Analysis Report	An addendum report to the Phase IA and will be prepared to help refine requirements for monitoring, etc. at sensitive resource locations.	Review and verify report	NJ TRANSIT	Final Design, Construction
Historic Properties	HP01	Amtrak Substation 42 Upgrades	Substation 3 Building (Amtrak Substation 42), North Bergen, New Jersey: Construct electrical upgrades in a manner that is sympathetic to the internal character-defining features (brick walls, arched openings, etc.) of the resource. The appearance of the interior will be recorded through archival black-and-white photography prior to the replacement of the electrical equipment.	NJSHPO concurrence in completeness of documentation and design	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Historic Properties	HP02	NEC Precast Concrete Earth Walls/Retaining Walls	Pennsylvania Railroad New York to Pennsylvania Historic District (NEC): Precast concrete, cast-in-place concrete or mechanically stabilized earth walls (MSE) retaining walls associated with the track improvements will be designed to complement the color, texture, and overall appearance of other retaining walls along the NEC, to support, rather than detract from, the character-defining features of this historic rail line. The new rail infrastructure will be similar to the components already in place on this electrified rail line, particularly within the specific limits of Build Alternative construction. The viaduct will be constructed of concrete or other materials for consistency with other NEC structures. The face of the proposed Palisades Tunnels portal within the district, approaches, and associated structures will be designed to complement the existing tunnels portal. NJ TRANSIT, in consultation with NJSHPO, will develop a plan to provide consulting and interested parties, as appropriate the opportunity to review and comment on the conceptual and preliminary alternative designs developed for the tunnels portal and associated structures, including the technical, structural, aesthetic, historic-cultural and environmental criteria that was considered in the design of the tunnels portals. This process will include continued consulting party review of final design plans and specifications to be implemented during construction.	Verify inclusion in final design plans and SHPO concurrence with design	NJ TRANSIT	Operations
Historic Properties	HP03	Amtrak Substation 41 Upgrade	Substation 4 (Amtrak Substation 41), Kearny, New Jersey: Complete electrical upgrades in a manner that will be sympathetic to the character-defining features of the resource and will result in no adverse effect. The appearance of Substation 4 will be recorded through archival black-and-white photography prior to the replacement of the electrical equipment.	Verify documentation and NJSHPO concurrence with design	NJ TRANSIT	Operations

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Historic Properties	HP04	DL&W Boonton Line Precast Concrete Earth Walls/Retaining Walls	Delaware, Lackawanna & Western's Boonton Line (Main Line): Precast concrete, cast-in-place concrete, or mechanically stabilized earth walls (MSE) retaining walls associated with the track improvements will be designed to match the color, texture, and overall appearance of other retaining walls along the Main Line, to support, rather than detract from, the character-defining features of this historic rail line. The new rail infrastructure will be similar to the components already in place on the rail line, particularly within the specific limits of Build Alternative construction. The viaduct will be constructed of concrete or other materials for consistency with other Main Line structures.	Verify NJSHPO concurrence with final design	NJ TRANSIT	Operations
Historic Properties	HP05	Nelson Tower Storefront Façade	Nelson Tower: Return storefront facades to their original appearance following project construction using materials that will be sympathetic to the historic architectural characteristics of the Nelson Tower.	Verify restoration of storefronts and NYSHPO and NYCLPC acceptance	NJ TRANSIT	Operations
Historic Properties	HP06	Design Specifications for Affected Properties	Develop design specifications and review process to ensure that any permanent and visible project elements that may be built near a historic property are compatible with the historic and architectural characteristics of the affected property (ies). This process, as described in the ARC FEIS Programmatic Agreement, will include on-going consultation with ACHP, NJSHPO and NYSHPO to avoid or minimize indirect or contextual effects to nearby properties.	Verify on-going review process	NJ TRANSIT	Operations
Historic Properties	HP07	Standard Protection Measures	Set forth standard protection measures to avoid adverse effects on historic properties during construction. Maintain ongoing consultation among NJ TRANSIT, FTA, NJSHPO and NYSHPO and other consulting parties as designs progress.	Verify inclusion in final design plans and contract packages	NJ TRANSIT	Final Design, Construction

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Historic Properties	HP08	Construction Protection Plans (CPPs) for Historic Properties	Develop and implement Construction Protection Plans (CPPs), in consultation with FTA, NJSHPO and NYSHPO, before commencement of any demolition, excavation, or construction. The CPPs will consist of overall plans for protection and avoidance of damage to historic properties, as well as specific protection measures to be developed for each historic property based on property type and potential construction type and effects. CPPs will include the following: - Inspection and documentation of existing conditions at the historic properties adjacent to construction activities - Establishment of protection procedures - Development of a monitoring program to measures vibration impacts during construction	Verify development and implementation	NJ TRANSIT	Final Design, Construction
Historic Properties	HP09	Contract Packages Commitments	Incorporate commitments outlined in the PA in contract packages	Verify incorporation of commitments in final design plans and contract packages	NJ TRANSIT	Final Design, Construction
Historic Properties	HP10	Project Bridge Pier Design	New York Susquehanna & Western (NYS&W) Railroad Historic District: Design project bridge piers in consultation with NJSHPO to complement the color, texture and overall appearance of other piers along the line. The improvements in the vicinity of the railroad bridge will be designed to complement the materials, texture, and color of the adjacent Northeast Corridor (NEC) bridge over the NYS&W and Conrail tracks.	Verify incorporation of design elements in final design plans and contract packages	NJ TRANSIT	Final Design

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Impact Area	*Code*	*Mitigation*		*Monitoring Action*	*Party Responsible for Implementation*	*Monitoring Phase*
Historic Properties	HP11	Old Main DL&W Railroad - Retaining Walls & Koppers Road Bridge	Old Main DL&W Railroad (Morris and Essex Line) Historic District: Project retaining walls constructed of precast concrete, cast-in-place concrete or mechanically stabilized earth walls (MSE) will be designed to complement the color, texture and overall appearance of other retaining walls along the Old Main DL&W Railroad Historic District, to support, rather than detract from, the character-defining features of this historic rail line. The new rail infrastructure will be similar to the components already in place on this electrified rail line, particularly within the specific limits of Build Alternative construction. A wider viaduct will be constructed of concrete or other materials for consistency with the existing structure. A state-level recordation of the Koppers Road Bridge within the district, including archival black-and-white photography of the structure, copies of as-built drawings (if available), and a written narrative on the development and use of the bridge within the local community, will be prepared.	NJSHPO concurrence with design and documentation	NJ TRANSIT	Final Design
Historic Properties	HP12	Partial Demolition of Historic Property	Federal Carton Corporation/G&B Baker's Supply/Grand-City Container Corporation Building, North Bergen, New Jersey: In conjunction with the demolition of an appendage at the northwest corner, stabilize the remaining building and replace the end walls with materials compatible to the appearance and design of the rest of the building. Prior to construction, document original conditions of he building to state-level recordation standards, including archival black-and-white photographs, copies of as-built drawings (if available), copies of historic mapping, and a written narrative on the design, development, and use of the building.	Verify documentation of portion removed and protection of remaining structure	NJ TRANSIT	Final Design, Construction