4.21 Construction Impacts

Construction activities would have temporary impacts to resources, residents, and the traveling public within the immediate vicinity of the proposed project. Potential impacts may include: the economy and employment, access and traffic detours, air emissions and noise, vibration, water quality, utilities, and excavation waste.

Construction practices would comply with all applicable federal, state, and local regulations regarding safety, health, and sanitation. All contractors would be required to adhere to OSHA guidelines to protect their employees and the public.

4.21.1 Economy and Employment

4.21.1.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would have no immediate construction impacts on the economy and employment. Future projects included as part of the No-Build Alternative could have impacts on the economy and employment, however, through the creation of construction jobs.

Build Alternatives

Sections A, B, C

Construction of the proposed project would result in short-term economic benefits in the project area through the creation of a large number of construction jobs. A portion of these wages would be spent on goods and services provided by local businesses. Other local businesses may also provide construction-related services such as surveying and drilling, as well as materials such as gravel, concrete, and steel.

4.21.1.2 Mitigation

No mitigation would be necessary because no adverse impacts to economy and employment would occur.

4.21.2 Access and Traffic Detours

4.21.2.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in immediate access and traffic detours. Future projects included as part of the No-Build Alternative would impact access and require some traffic detours, however.

Build Alternatives

Sections A, B, and C

Detours and road closures during construction would create temporary inconveniences for residents, business owners, and the traveling public. Maintenance and protection of traffic plans would be developed during final design to mitigate access impacts and minimize delays throughout the project. These plans would include appropriate signs, pavement markings, and media announcements. Access to all businesses and residences would be maintained through construction scheduling.

Emergency service providers and school district transportation may be impacted by temporary road closures and reduced speeds in work zones required during construction.

Temporary road closures or detours may impact transit service or access within localized areas as a result of construction activities. Impacts to transit service may include detour routes or temporary relocation of transit stops.

Commercial and recreational river traffic would be impacted by the construction of the new river crossing over the Monongahela River. Impacts may include restrictions during construction of the piers while setting the beams.

Railroad traffic would be impacted by construction of this project along or over existing rail lines.

4.21.2.2 Mitigation

Emergency service providers and school districts that would be impacted by the construction of the maglev project would be informed of the proposed construction sequence and any required detours before construction begins. The emergency providers, school districts, and general public could be informed of the schedule on a construction web site or other media. Detours should be posted at lease two weeks prior to putting them into effect.

PAAC and WCTA would be informed of the proposed construction activities and detours well in advance of the commencement of construction to allow transit service to be maintained during construction.

Coordination with the USCOE and USCG would take place to minimize the disruption of navigation along the Monongahela River during construction of the river crossing. Recreational boaters will be warned of the construction by boating traffic control devices.

Coordination with Norfolk Southern, Union, Allegheny Valley, Wheeling & Lake Erie, CSX, and the Pittsburgh and Ohio Central railroad companies would be conducted to minimize the effect of construction of the Maglev Project adjacent to or over their rail facilities.

4.21.3 Air Emissions and Noise

4.21.3.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in immediate construction impacts on air emissions and noise. Future projects included as part of the No-Build Alternative could have air quality and noise impacts, however.

Build Alternatives

Sections A, B, and C

Air quality within the construction area may be temporarily impacted by construction activities. Fugitive dust from earth-moving equipment is the activity that most likely could impact the surrounding environment.

Temporary noise impacts would occur in construction areas generated by the following equipment:

- Excavators/scrapers and graders;
- Tractors/dozers;
- Cranes;
- Trucks; and
- Compressors.

4.21.3.2 Mitigation

Air quality mitigation measures would include the use of approved dust palliatives, and emissions would be controlled in accordance with state and local ordinances. Any burning would be conducted, when permitted, in accordance with state and local ordinances.

Noise mitigation measures would include the use of proper mufflers and adjustments to construction equipment. Construction operation times would be coordinated with the local communities to minimize noise impacts, especially near noise-sensitive areas.

4.21.4 Vibration

4.21.4.1 Impact Analysis

No-Build Alternatives

The No-Build Alternative would not result in immediate vibration impacts. Future projects included as part of the No-Build Alternative could have vibration impacts to homes and businesses within the vicinity of those projects, however.

Build Alternative

Sections A, B, and C

Vibration due to construction activities, such as blasting, pile driving, and movement of equipment, may impact homes within the vicinity of the project.

4.21.4.2 Mitigation

Contractors would be required to adhere to the manufacturer's standards for equipment operation and maintenance. If blasting is required during construction, pre-blast and post-blast surveys would be conducted on structures in the vicinity. Coordination meetings would be held with municipal officials and property owners near construction sites to explain the blasting process, the proposed blasting schedule, their opportunities to have a pre-blast survey performed, and their options if damage has occurred as a result of blasting.

4.21.5 Water Quality

4.21.5.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in construction impacts to water quality. Future projects included as part of the No-Build Alternative could have impacts on water quality, however.

Build Alternatives

Sections A, B, and C

Temporary impacts to water resources may occur due to construction activities. Earthwork and removal of vegetation for construction would increase the potential for soil erosion and sedimentation to streams within the construction area.

4.21.5.2 Mitigation

Prior to construction activities, all appropriate permits pertaining to waterway crossings and encroachments would be obtained. Mitigation for potential impacts to water quality would be addressed through the implementation of proper soil erosion and sedimentation control measures. Prior to the initiation of construction activities, an E & S Plan and an NPDES earth disturbance permit would be prepared in accordance with PADEP guidelines. Erosion and sedimentation control methods may include:

- Diverting stormwater originating off-site away from construction areas;
- Using proper material for temporary stream crossings;
- Minimizing the extent and duration of exposed soils by using temporary and permanent seeding and mulching;
- Using temporary stormwater sedimentation ponds; and
- Using hay bales and silt barrier fences.

4.21.6 Utilities

4.21.6.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would have no immediate construction impacts on utilities. Future projects included as part of the No-Build Alternative could have impacts on utilities, however.

Build Alternatives

Sections A, B, and C

Many different utility providers were identified during the development and study of the proposed alternative alignments. Major utility facilities affected by the construction of this project have been evaluated to determine the impact and potential relocation that would be required due to the construction of the Maglev Project.

4.21.6.2 Mitigation

Coordination with the utility owners would continue through final design and any impacts associated with utility relocation would be accounted for through mitigation commitments.

4.21.7 Excavation Waste

4.21.7.1 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in excavation waste. Although it is possible that projects included in the No-Build Alternative could include excavation waste, designers for those projects would attempt to balance the projects.

Build Alternatives

The proposed project would consist of an elevated facility with a minimum underclearance of 5 meters (16.5 feet). Even in cut areas, the proposed facility would be elevated and would be higher in elevation over valleys. The guideway requires strict tolerance clearances that must be maintained for operation throughout the life of the facility. Displacement that may occur along the superstructure and substructure elements must be strictly limited. As such, the guideway would not be constructed on or within fill areas, which could produce differential settlement and unacceptable displacement of the structural elements.

There would be numerous cuts along the proposed project, which would generate excavation waste. Excavation waste is material that cannot be utilized within the proposed project right-of-way and must be transported away form the construction site to an area identified for disposal.

The estimated volumes of excavation waste material for the build alternatives considered is as follows:

Alternative Alignment A5-North would generate approximately 11,343,000 cubic meters (14,837,000 cubic yards) of excavation material. This portion of the project is approximately 28 kilometers (17 miles).

Alternative Alignment A5-South would generate approximately 9,984,000 cubic meters (13,059,000 cubic yards) of excavation waste material. This portion of the project is approximately 28 kilometers (17 miles).

The maintenance facility alignment would generate approximately 224,000 cubic meters (293,000 cubic yards) of excavation material. This portion of the project is approximately 5 kilometers (3 miles).

Alternative Alignment B4-East would generate approximately 924,000 cubic meters (1,200,000 cubic yards) of excavation material. This portion of the project is approximately 30 kilometers (19 miles).

Alternative Alignment B4-West would generate approximately 875,000 cubic meters (1,150,000 cubic yards) of excavation waste material. This portion of the project is approximately 28 kilometers (17 miles).

Alternative Alignment C2-Mod would generate approximately 8,500,000 cubic meters (11,100,000 cubic yards) of excavation material. This portion of the project is approximately 23 kilometers (14 miles).

Alternative Alignment C5 would generate approximately 8,040,000 cubic meters (10,500,000 cubic yards) of excavation material. This portion of the project is approximately 23 kilometers (14 miles).

Alternative Alignment C6 would generate approximately 10,550,000 cubic meters (13,800,000 cubic yards) of excavation waste material. This portion of the project is approximately 31 kilometers (19 miles).

Total estimated volume of excavation waste material for the project would be 21,633,000 cubic meters (28,300,000 cubic yards), based on the Environmentally Preferred Build Alternative (Alternative Alignments A5-South, B4-West, and C6).

4.21.7.2 Mitigation

Disposal of the excavation waste material would be the responsibility of the contractors. The project sponsor will perform environmental due diligence for any excess soil/waste material leaving the project site. It will be important to reduce the amount of excavation waste material that must be removed off-site to limit the potential for impacts to other sites and reduce the costs for appropriate disposal of the material.

Methods to reduce the amount of excavation waste material would include:

- The use of "steepened" cut slopes. The estimated volumes of excavation waste materials are based on cut slopes of a 2:1 ratio. A 2:1 cut slope is conservative for slope stability and it is likely that upon obtaining site-specific geotechnical information (through sub-surface test borings) that the cut slope may be steepened to a 1.5:1 or 1:1 ratio. Steepening the cut slopes will reduce the overall width of the proposed cuts and reduce the volume of excavation waste material. Slope stability will be evaluated with regard to the proposed cut slope ratio and the appropriate use of walls, slope benches, and other geotechnical treatments;
- The overall depth of cut may be limited through refinements to the grade of the proposed alternative and the cost-effective use of walls or structures; and
- The excavation waste material may be used within the proposed alternative to build modest fill areas without encroaching on sensitive features or affecting the operating characteristics of the system.

Implementation of these methods would initially result in a reduction of the estimated excavation waste material as follows:

- Alternative Alignment A5-South – 5,446,000 cubic meters (7,125,000 cubic yards), a reduction of 4,538,000 cubic meters (5,935,000 cubic yards).
- Maintenance facility alignment – No reduction.
- Alternative Alignment B4-West - 785,000 cubic meters (1,025,000 cubic yards), a reduction of 90,000 cubic meters (125,000 cubic yards).
- Alternative Alignment C6 – 9,894,000 cubic meters (12,940,000 cubic yards), a reduction of 656,000 cubic meters (860,000 cubic yards).

These reductions result in a total excavation waste material volume of 16,349,000 cubic meters (21,400,000 cubic yards), which is a 25 percent reduction of material to be disposed of off-site. This percentage of reduction is representative of all build alternatives under consideration.

Additional refinements may result in further reduction of the excavation waste material to be disposed of off-site.

Off-Site Disposal

As previously described, concerns for strict construction/operational tolerances and differential settlement preclude the customary practice of balancing earthwork cuts with the construction of embankment fills. Therefore, disposal of excavation waste material off–site would be required. While the overall estimated amount of excavation waste material, 21,633,000 cubic meters (28,300,000 cubic yards) is large, it must be viewed in the overall context of the project. The total length of alternative from the maintenance facility to the project's eastern terminus, which corresponds to the estimated volume of excavation waste material, is approximately 92 kilometers (57 miles). This results in an average volume of material of 235,000 cubic meters/kilometer (496,000 cubic yards/mile) for disposal. The evaluation of these alignments and the estimated volume of excavation waste is representative of all build alternatives under consideration.