

ments. This information will be used to finalize the design in accordance with *23 CFR, Parts 115, 117, and 650*, to ensure that design features will be of sufficient capacity to accommodate the design year storm.

The structures carrying the maglev system over and adjacent to rivers and streams in the project area will be designed to avoid increases in the floodplain elevation. Piers will be placed so as to minimize encroachment on the 100-year floodplain. In some cases, it may be possible to span the entire 100-year floodplain.

During final design and prior to construction, permitting procedures will be instituted in accordance with PADEP Chapter 105, *Dam Safety and Waterway Management, Rules and Regulations* and the *Floodplain Management Act*, P.L. 851, No. 166, administered by the PADEP. All construction within floodplains will be in compliance with Executive Order 11988, *Floodplain Management*, dated May 24, 1977; FEMA regulations; and all federal, state, and local regulations. Additionally, hydraulic calculations will be conducted during final design and if any changes to the 100-year floodplain result, coordination with FEMA will be conducted to revise the floodplain maps in accordance with their requirements.

All regulatory floodplain encroachments will be in accordance with *Sections 60.3(c), 65.3, 65.6, and 65.12* of FEMA's NFIP and related regulations, revised October 1, 1993, which state for streams with 100-year floodplain delineations, but with no regulatory floodways, the cumulative effect of the proposed development, when combined with all other existing and anticipated development in the area, will not increase the water surface elevation of the base flood (100-year) more than one foot at any point within the community.

4.10 Cultural Resources

Cultural resources include aboveground historic resources, prehistoric archaeological sites, and historic archaeological sites. Cultural resources within the project corridor potentially impacted by the proposed project were identified and evaluated in compliance with *Section 106 of the National Historic Preservation Act of 1966* (NHPA), its implementing regulations, Executive Order 11593, *the Archaeological and Historic Preservation Act*, Commonwealth of Pennsylvania state acts, and the *Pennsylvania History Code*.

4.10.1 Historic Structures

4.10.1.1 Methodology

Section 106 of the NHPA, as amended, requires that an analysis of the Maglev Project be performed in order to determine its effect upon resources listed in or eligible for listing in the *National Register of Historic Places* (NRHP). The regulations of the Advisory Council on Historic Preservation (*36 CFR Part 800*) specify a three-step analysis. First, historic properties must be identified and evaluated for NRHP eligibility. Second, the Criteria of Effect and (if necessary) Adverse Effect must be applied to each resource potentially impacted by the undertaking. Third, measures to avoid, minimize, or mitigate the adverse effects must be developed in consultation with the Pennsylvania Historical and Museum Commission (PHMC), designated as the SHPO, and other interested parties, in accordance with the provisions of *36 CFR 800.6(a)*.

Historic structures identification began by compiling previously identified NRHP-listed and NRHP-eligible historic resources within the study area for the preliminary alternative alignments. A wide range of source material was utilized. The most useful was the information contained in PHMC's NRHP/National Historic Landmarks (NHL) GIS database for Allegheny and Westmoreland counties, which showed resource locations and, in many cases, NRHP boundaries. Where boundaries were not present in the GIS database, they were identified using the PHMC's paper files. Other sources employed included: *Maps of City Designated Historic Districts and National Register Districts and National Register Eligible Districts Located within the Pittsburgh City Limits* (Pittsburgh Historic Review Commission, 2001); the SPC historic resources database; county-wide historic resource surveys conducted in Allegheny (PHMC, 1985) and Westmoreland (PHMC, 1980) counties; and previously prepared historic resource survey and determination of eligibility reports, environmental impact statements, and environmental assessments for projects that fell within the maglev project study area. Project reports reviewed included the following: *Historic Resource Survey Addendum, Mon/Fayette Transportation Project State Route 51 to Pittsburgh, Allegheny County, Pennsylvania* (PTC, 1998); *S.R. 0028 Project, Pittsburgh and Millvale Boroughs, Historic Resources Survey and Determination of Eligibility Report* (FHWA and PENNDOT, 1996) and *S.R. 0028 Project, Pittsburgh and Millvale Boroughs, Historic Resources Survey and Determination of Eligibility Report Addendum* (FHWA and PENNDOT, 1998); *Phase I Airport Busway/Wabash HOV Facility Environmental Assessment and Section 106 and 4(f) Evaluation* (FTA, FHWA, and PAAC, 1994); *Martin Luther King, Jr. East Busway Extension Planning Analysis/Environmental Extension* (FTA and PAAC, 1992); *Route 22 Improvements, S.R. 0022, Section B04, Determination of Effect Report* (FHWA and PENNDOT, 1995); *Airport Parkway-Southern Expressway Final Environmental Impact Statement* (FHWA, PENNDOT, Allegheny County, and FAA, 1989); and *Allegheny County, City of Pittsburgh, West End Improvement Project, S.R. 0019 Section A27, Historic Resource Survey and Determination of Eligibility Report* (PAAC and PENNDOT, 2000).

Prior to beginning the historic resource survey, meetings were held with PHMC to explain the nature of the project and define the survey methodology. Meetings were also conducted with representatives of the City of Pittsburgh Historic Review Commission, Pittsburgh History and Landmarks Foundation, the Westmoreland County Historical Society, and the Murrysville Historical Preservation Society, to ensure that all previously surveyed historic resources were identified.

To supplement and update the existing information, a windshield survey was conducted for historic resources along each of the preliminary alternative alignments. Following the November 7, 2001 TAC meeting, Areas of Potential Effect (APEs) were developed, in consultation with PHMC, for the alternative alignments advanced into detailed studies. The maximum extent of the APE was 0.4 kilometers (0.25 miles) from each alternative alignment's centerline in urban and developed areas and 0.8 kilometers (0.5 miles) in more rural areas, subject to visual verification. Field surveys of the APEs were conducted in December 2001 and January 2002 to identify those resources not previously surveyed that appeared to be eligible for listing in the NRHP. A PHMC representative field verified the results of the historic resource survey between January 22 and January 24, 2002. At that time, the Maglev Project's potential effects on historic resources were also discussed. A *Historic Resource Survey and Determination of Eligibility* report was submitted to PHMC in March 2002 (FRA, PAAC, and PENNDOT, 2002). PHMC concurred or disagreed with the report's findings in correspondence dated April 3, 2002. (See Appendix B for the complete list of historic resources cited in this letter.) Following the receipt of the correspondence (and acceptance of PHMC's concurrences on eligible resources), the

project GIS mapping was updated to classify resources as NRHP-listed, NRHP-eligible, and NRHP-not eligible. NHLs were also identified.

Subsequent to the submission of the historic resource survey and determination of eligibility report, two new alternative alignments, designated C5 and C6, were introduced in Section C of the project. Following a review of PHMC's NRHP/NHL GIS database and paper files and development of APEs, historic resource surveys of the new alternative alignments were conducted in April 2002. Pennsylvania Historic Resource Survey forms for three resources, all located within the APE of Alternative Alignment C6, were forwarded to PHMC for concurrence on NRHP eligibility. Following the submission of additional information, concurrence was conveyed by PHMC in September 2002. Infrastructure improvements were then added to the access routes to the Toll Route 66/PA Route 136 station. Forms were submitted on two additional resources. Each was recommended as not eligible for listing in the NRHP by PHMC.

In accordance with *Section 106* and NEPA requirements, a determination of effect report, based upon the Environmentally Preferred Build Alternative, was submitted to PHMC in March 2003. Concurrence on historic resources was reached with PHMC the following month (see Appendix B). Public coordination on the *Section 106* process has been, and will continue to be, presented at all public meetings.

A Programmatic Agreement (PA) among the FRA, the PAAC, the Advisory Council on Historic Preservation (ACHP), and the State Historic Preservation Officer (SHPO) has been developed for the implementation of the Maglev Deployment Program within Allegheny and Westmoreland counties, pursuant to *36 CFR 800.14(b)(1)*. The PA is a streamlining procedure to define the appropriate documentation to conduct archaeological and historic resource studies. If the Pennsylvania project is selected, the PA will also include measures to minimize harm to historic resources that are adversely affected by the project. A copy of the PA is included in Appendix B.

Special protection for historic resources is also provided under *Section 4(f) of the Department of Transportation Act of 1966*. Section 4(f) precludes federal (DOT) funding of projects that use historic properties, unless there is no feasible and prudent alternative to such use, and the project includes all possible planning to minimize harm to the property from such use. The analysis of impacts to Section 4(f) resources for the entire project is found in Chapter 5.0 of this DEIS.

4.10.1.2 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in any immediate impacts to historic resources. Projects in the region's long-range transportation plan would be advanced to address existing and future conditions of congestion and traffic safety. Because of the age and density of development in western Pennsylvania, however, these future transportation improvements may have an impact on potential historic resources.

The increased transportation infrastructure necessary to meet future needs could have impacts to historic resources. Insofar as highway infrastructure requires greater right-of-way

than an elevated rail-based system like maglev would, the Maglev Project could have fewer impacts to historic resources than the highway links it could replace in the future.

Build Alternatives

Tables 4.10.1-1, 4.10.1-2, and 4.10.1-3 list the historic resources for Sections A, B, and C, respectively, and identify the effects on each resource.

Table 4.10.1-1 Historic Resource Effects: Section A

Resource Name	Resource Location	Resource Description	NRHP Status and Criteria	Impact Type	Potential Effect	Alternative Alignment
Oil/Gas Extraction Facility # 2	Elliott Drive, Robinson Township.	Three oil drilling pumping rigs sited on a large wooded lot.	NRHP-Eligible; Criterion C.	Physical	Adverse Effect	A5-North; A5-South
Corliss Street Tunnel	Corliss and West Carson Streets, Pittsburgh.	Brick and limestone elliptical arch vehicular tunnel.	NRHP-Eligible; Criteria A and C.	Visual	No Adverse Effect	A5-North; A5-South
Pan Handle Historic District	Between West Carson Street in Pittsburgh and the Borough of Carnegie; portion in the Maglev APE predominantly follows West Carson Street, Pittsburgh.	Former Pennsylvania Railroad line to St. Louis; seven miles long and approximately 70 resources.	NRHP-Listed; Criterion A.	Visual	No Adverse Effect	A5-North; A5-South
Ft. Pitt Bridge	Over the Monongahela River between the Ft. Pitt Tunnel and Point State Park, Pittsburgh.	First steel, tied arch, double deck tied arch bridge in the nation when built.	NRHP-Listed; Criteria A and C.	Visual	No Adverse Effect	A5-North; A5-South
Pittsburgh & Lake Erie Railroad Complex (Station Square)	South side of the Monongahela River between the Ft. Pitt and Smithfield Street bridges, Pittsburgh.	Former railroad station building, office, shops, warehouse, and railyards.	NRHP-Listed; Criteria A and C.	Physical	No Adverse Effect	A5-North; A5-South
Monongahela Incline	Hillside south of the Pittsburgh & Lake Erie Railroad Complex, Pittsburgh.	One of two remaining funiculars in Pittsburgh. Consists of two tracks and station buildings at either end.	NRHP-Listed; Criterion A.	Visual	Adverse Effect	A5-North; A5-South

Table 4.10.1-2 Historic Resource Effects: Section B

Resource Name	Resource Location	Resource Description	NRHP Status and Criteria	Impact Type	Potential Effect	Alternative Alignment
Allegheny Valley Railroad	Between 21st Street, Pittsburgh and the Verona-Oakmont Borough boundary line.	Railroad opened in 1856. Primarily served as an outlet from the Pennsylvania Railroad's main line.	NRHP-Eligible; Criterion A.	Visual	No Adverse Effect	B4-East; B4-West
Lawrenceville Historic District	Bounded by the Allegheny River, Allegheny Cemetery, Penn Avenue, and 33rd Street, Pittsburgh.	Neighborhood historic district with approximately 2,500 resources, including residences, industries, churches, school buildings, parks, and cemeteries.	NRHP-Eligible; Criteria A and C.	Visual and Audible	No Adverse Effect	B4-East; B4-West

Table 4.10.1-2 Historic Resource Effects: Section B (Continued...)

Resource Name	Resource Location	Resource Description	NRHP Status and Criteria	Impact Type	Potential Effect	Alternative Alignment
Blaw-Nox Company Union Steel Casting Company	West of the 62nd Street Bridge between the Allegheny River and Butler Street, Pittsburgh.	Ca. 1900 industrial manufacturing complex; approximately 14 structures.	NRHP-Eligible; Criteria A and C.	Visual	No Adverse Effect	B4-East; B4-West
40th Street/Washington Crossing Bridge	Over the Allegheny River, Herra Island, and railroad tracks between the City of Pittsburgh and Reserve Township.	15-span bridge with a 3-span, steel deck arch main span constructed by Allegheny County in 1924.	NRHP-Listed; Criteria A and C.	Visual	No Adverse Effect	B4-East; B4-West
Allegheny River Boulevard Historic District	Washington Boulevard, Pittsburgh, to Hulton Road, Oakmont Borough.	Linear resource that includes the right-of-way, commemorative pylons, bridges and culverts, stone platforms and water fountains, and granite curbing.	NRHP-Eligible; Criteria A and C.	Visual	Adverse Effect	B4-East; B4-West
Universal Portland Cement Company Historic District	Along Hershey Road between Thompson Run Road and Contour Street, Municipality of Penn Hills.	Ca. 1906 industrial manufacturing complex and accompanying working class neighborhood.	NRHP-Eligible; Criteria A and C.	Physical	No Adverse Effect	B4-East; B4-West (Roadway Improvements)

Table 4.10.1-3 Historic Resource Effects: Section C

Resource Name	Resource Location	Resource Description	NRHP Status and Criteria	Impact Type	Potential Effect	Alternative Alignment
Bushy Run Battlefield	S.R. 993, Penn Township.	French and Indian War battle site.	NRHP-Listed; Criterion A; NHL	Visual and Audible	No Adverse Effect	C2-Mod
Lauffer/Radokovich Farm	1067 Blank Road, Penn Township.	Mid-19th century farmstead with a frame farmhouse, barn, and eight outbuildings.	NRHP-Eligible; Criterion A.	Physical	Adverse Effect	C5
Lauffer/Blank Farm	1067 Blank Road, Penn Township.	Two separate farms operated historically and today as one farm; farmstead includes an 1850 brick farmhouse.	NRHP-Eligible; Criterion A.	Physical	Adverse Effect	C5

Section A

Alternative Alignments A5-North and A5-South, which include the PIA and Steel Plaza stations and the maintenance facility, would have the same impact on six resources: Oil/Gas Extraction Facility # 2, the Corliss Street Tunnel, the Pan Handle Historic District, the Ft. Pitt Bridge, the Pittsburgh & Lake Erie Railroad Complex (Station Square), and the Monongahela Incline. Oil/Gas Extraction Facility # 2 would be physically impacted in that some land, one of the remaining derricks, and one oil well would be acquired. The alignments would pass over the Corliss Street Tunnel, and would not adversely effect the characteristics that make the resource eligible for the NRHP. The alignments would cross the Pan Handle Historic District, a historic and current railroad corridor, at a number of locations. Structural piers for the maglev

guideway may be placed within the NRHP boundary of the Pan Handle Historic District, but no contributing resources would be physically impacted. The alignments would cross under the Ft. Pitt Bridge, minimizing visual impact. No buildings associated with the Pittsburgh & Lake Erie Railroad Complex (Station Square), a historic rail facility adaptively re-used as a shopping and entertainment complex, would not be affected, although piers would be placed within the south edge of the NRHP boundary. The alignments would cross over the lower portion of the Monongahela Incline, a funicular up the steep face of Mt. Washington, near the base of the structure. The incline would not be physically impacted, but the view from the incline to Downtown Pittsburgh and the view of the incline would be adversely affected by the crossing.

Additional information on impacts to historic resources in Section A, including detailed maps, can be found in Chapter 5.0, Draft Section 4(f) Evaluation.

Section B

Alternative Alignments B4-East and B4-West, which include the Thompson Run station, would each impact the same five historic resources: the Allegheny Valley Railroad (AVRR), the Lawrenceville Historic District, the Blaw-Nox Company Union Steel Casting Company, the historic 40th Street/Washington Crossing Bridge, and the Allegheny River Boulevard Historic District. Although the Springfield Public School was originally expected to be razed, which would have created an adverse effect, the proposed alignments have been shifted to avoid impacting it. Coordination with PHMC will continue after circulation of this DEIS to verify that there is no effect on this resource.

After leaving Downtown Pittsburgh, the alternative alignments would follow the existing right-of-way of the AVRR, a historic and currently active railroad corridor. No contributing element to the AVRR Historic District would be impacted and the AVRR would continue to operate as a railroad. The PHMC has agreed that there would be no adverse effect to the AVRR since the project will not impact railroad operations.

As it continues along the AVRR corridor, the alternative alignments would pass through the Lawrenceville Historic District, a residential, commercial, and industrial neighborhood in the City of Pittsburgh. No contributing resources would be lost. PHMC has concurred with the determination of no adverse effect because no buildings would be acquired and the existing railroad corridor would be utilized as the route. The same situation, and the same assessment of no adverse effect, would also apply to the Blaw-Nox Company Union Steel Casting Company. The alternative alignments would cross over the north approach to the 40th Street/Washington Crossing Bridge, a three-span deck arch bridge. The area is heavily industrialized, which limits views of the bridge. The alternative alignments, consequently, would have limited visual impact. East of Washington Boulevard, the alignments parallel the Allegheny River Boulevard Historic District. The alignments would have a visual impact of the view of the Allegheny River from the road. The impact is evaluated as an adverse effect.

Roadway improvements for the Thompson Run station would affect one resource, the Universal Portland Cement Company Historic District. Improvements would be made to the roads leading into the residential portion of the district. However, no contributing buildings would be affected. The impact is evaluated as no adverse effect.

Additional information on impacts to historic resources in Section B, including detailed maps, can be found in Chapter 5.0, Draft Section 4(f) Evaluation.

Section C

Alternative Alignment C2-Mod (which includes the Greengate Mall station) would result in impacts to one historic resource, Bushy Run Battlefield, a NHL. No property would be acquired from the resource, but the alternative alignment would have a potential visual and audible impact to the French and Indian War site. The impact is evaluated as no adverse effect.

Two historic resources would be impacted by Alternative Alignment C5 (which also includes the Greengate Mall station), the Lauffer/Radakovich and the Lauffer/Blank farms. In each case, the alignments would cross farm fields associated with the resource and property would be acquired. The impact is considered to be an adverse effect.

Based on current information, Alternative Alignment C6, which includes the Toll Route 66/PA Route 136 station, would not impact any NRHP-listed or NRHP-eligible resources.

Additional information on impacts to historic resources in Section C, including detailed maps, can be found in Chapter 5.0, Draft Section 4(f) Evaluation.

4.10.1.3 Summary

There could be impacts to historic resources under the No-Build Alternative. Under the build alternatives, Alternative Alignments A5-North and A5-South would each impact six historic resources. Only the impacts to the Oil/Gas Extraction Facility No. 2, where property and one of the derricks would be acquired, and the visual impact to the Monongahela Incline would be adverse effects. The physical impacts to the Oil/Gas Extraction Facility No. 2 and Pittsburgh & Lake Erie Railroad Complex would be considered Section 4(f) uses. The complete analysis of impacts to Section 4(f) resources for the entire project is found in Chapter 5.0 of this DEIS.

Alternatives Alignments B4-East and B4-West would also impact five historic resources. Only the visual impact to the Allegheny River Boulevard Historic District would be an adverse effect. Roadway improvements for the Thompson Run station would affect one resource, the Universal Portland Cement Company Historic District. It would take a small amount of property from within the NRHP boundary but it would not impact any of the contributing historic structures.

Alternative Alignment C2-Mod would have a potential visual and audible impact to Bushy Run Battlefield, an interpreted historic site. No land would be taken. Two historic farms would be impacted by Alternative Alignment C5. Each impact would involve land taken from within their NRHP boundaries, which is considered to be an adverse effect as well as a Section 4(f) use. Alternative Alignment C6 would have no impacts to historic resources.

4.10.1.4 Mitigation

In accordance with the stipulations in the PA (contained in Appendix B of this DEIS) and the provisions of 36 CFR 800.6(a), where the project would result in an adverse effect to his-

toric structures, measures to avoid, minimize, or mitigate the adverse effects will be developed in consultation with the PHMC and other interested parties.

4.10.2 Archaeological Resources

4.10.2.1 Methodology

Archaeological resources that may be potentially impacted by the proposed project were identified and evaluated in compliance with *Section 106 of the NHPA* and its regulations, Executive Order 11593, the *Archaeological and Historic Preservation Act*, Commonwealth of Pennsylvania state acts, and the Pennsylvania History Code. Coordination is ongoing with the PHMC, Bureau for Historic Preservation (BHP), which serves as the SHPO regarding the potential archaeological resources in the study area.

A PA among the FRA, the PAAC, the ACHP, and the SHPO has been developed for the implementation of the Maglev Deployment Program within Allegheny and Westmoreland counties, pursuant to *36 CFR 800.14(b)(1)*. The PA is a streamlining procedure to define the appropriate documentation to conduct archaeological and historic resource studies. A copy of the PA is included in Appendix B.

In order to evaluate the potential for archaeological resources within the project area, a methodology was developed in consultation with BHP. The methodology included the performance of background documentary research, the development of prehistoric and historic archaeological contexts, and the creation of resource potential models or sensitivity maps within a GIS. The models were utilized to determine areas of prehistoric and historic archaeological resource potential within the selection of the Environmentally Preferred Build Alternative. The APE for the archaeological resources is considered to be the area of potential ground disturbance related to construction activities for each proposed alternative, such as areas of cut. In accordance with the provisions of the PA, the parties agreed that no archaeological field testing would be necessary prior to selection of the Environmentally Preferred Build Alternative. Once a preferred alternative is selected by the FRA, the owner/operator of the maglev system will conduct (for the selected alternative) an appropriate Phase I/II archaeological survey for prehistoric and historic resources in order to identify NRHP-eligible sites.

Prehistoric Archaeological Resources

Prehistoric archaeological resources consist of areas where culturally modified objects can be found dating from the Paleoindian period (12,000-8,000 B.C.) to the Contact period (ca A.D. 1550-1750). The development of the prehistoric context, the prehistoric archaeological resource sensitivity map, and the predictive model for prehistoric archaeological site potential, incorporated extensive background research. This research indicated that a large body of information already exists for the project region. This research included the study of pertinent regional cultural resource management (CRM) reports and journal articles, interviews with local sources, and the analysis of previous site survey data within the region surrounding the project location. In general, the site information was obtained from the Pennsylvania Archaeological Site Survey (PASS) files maintained by the BHP. These data were analyzed to determine the general types and location patterns of prehistoric sites discovered within the project region and to assess the site database available for development and testing of the model.

The information from prehistoric sites previously recorded in the region was utilized for the development of site distribution patterning. The project region is characterized by broad hilltops or ridge tops, separated by deeply incised valleys cut by the tributaries of the Ohio, Monongahela, and Allegheny rivers. A substantial portion of the project area is disturbed by modern/historic development (i.e., strip mining and residential, commercial, and industrial growth), particularly within the limited alluvial landforms of the terrain. The types of sites expected in the region include burial mounds; villages and hamlets, containing burials, storage pits, ceramics, cultigens, milling stones, post molds, and domestic tools; hunting, gathering, and fishing camps; lithic quarry sites; and isolated hunting strays. Of primary concern are the potential locations of Monongahela village sites, an important resource type within the region. These sites are located on terraces above the rivers and on benches above the larger tributaries, as well as on broad ridges and saddles, often near drainage divides and Indian trails. Undisturbed locations situated within these topographic settings in the project area are considered high probability zones for prehistoric resources.

Environmental variables examined for the modeling process included elevation, aspect, slope, landform, soil types and characteristics, distance to various hydrologic resources and confluences, geologic formations, and terrain/relief. Those variables identified as environmental/site correlates were employed in the GIS to model the spatial distribution of prehistoric archaeological sites and to produce a site potential score for all locations in the study area. The model was then applied to the prediction of a random sample of sites previously omitted from the preliminary model construction process. Based on the refined model, areas of very high, high, moderate, low, and very low potential for prehistoric archaeological sites were identified and used in the GIS to calculate expected impacts for the proposed alternative alignments. Archaeological sites may occur within the areas of low potential, but are expected to be sparse locations of limited extent and archaeological significance. Areas of moderate to very high potential have an increasing probability for intact cultural remains (such as Archaic base camps or Late Woodland villages/farmsteads).

The expected potential for resource impacts was augmented by the results of reconnaissance field investigations. These investigations included preliminary geomorphological and archaeological studies utilizing expedient auger borings and walkover visual inspection by qualified individuals. These investigations focused upon the verification of ground disturbance and the archaeological potential for deeply buried deposits within floodplain environments.

Historic Archaeological Resources

Historic archaeological resources consist of any subsurface historic structure or cultural deposit that dates to the Contact period (ca A.D. 1550-1750) up to A.D. 1955. The development of a historic archaeological context drew upon previous survey reports and recorded site file information, and included the collection of documentary information concerning the general historical development of the region (PTC, PENNDOT, and FHWA, 1993). Historical data were collected for historic archaeological resource types, which had been identified as regionally important by previous surveys. The project area contains residential, commercial, industrial, and agricultural historic resources. Most of the historic industrial activity in the region was located along the Ohio, Monongahela, and Allegheny rivers and the larger tributaries, with some mines and mining communities existing in the uplands of the region. Historic commercial/residential development in the region was most often situated near transportation corridors (i.e., waterways, railroads, and roads) and their crossings. Historic agricultural sites in the

area include a number of farmsteads and early settlements. Of particular importance are locations where historic maps indicate that buildings or features once occurred but are no longer extant.

In order to assess the potential for encountering historic archaeological resources within the proposed alternative alignments, a historic archaeological resource sensitivity map was produced using the GIS. The map incorporates the results of the background research, including available local histories, historic records and mapping, recorded historic sites (PASS files), and the results of various historic resource surveys (including the historic resource studies conducted for this project). Data layers gathered for inclusion and evaluation within the GIS historic sensitivity map included: documented historic Indian pathways; extant historic structures (greater than 50 years old) identified by historic resource surveys and verified by field reconnaissance; historically mapped communities, structures, properties, roadways, railroads, canals, and waterways; and the intersections, crossings, and/or confluences of these linear features.

On the basis of the background research, historic context, and historic resource survey, the relevant historic features within the project area were buffered, assigned a resource sensitivity score (ranging from 1 [low] to 3 [high]), and overlaid within the GIS. The distances assigned to the buffers around various historic features were derived from visual analysis of the historic mapping and the apparent relevant distances. Buffering was applied judgmentally, given a general archaeological knowledge of the typical distribution patterns for archaeological remains found in association with various types of historic features. Based on the background research and the historic context of the area, the resource sensitivity scores assigned to the buffered features reflect the probable occurrence, preservation, and research potential of the anticipated resources.

The three classes of historic archaeological resource potential are extremely relative in nature. Because of the possibility of undocumented historic features within the very low probability areas, there remains a potential for historic archaeological resources that would most likely be verified only by field investigations. Of greater potential are those areas classed as exhibiting low to high potential for historic archaeological resources, as they are directly related to various documented historic features. These higher potential, feature-related zones were ranked by relative potential from low to high, depending upon the nature of the anticipated resources and associated documented features, the potential for preservation of the deposits, and the relative research significance of the potential remains. The overlay of the ranked layers within the GIS resulted in a cumulative potential for encountering historic archaeological resources within each proposed alternative alignment.

4.10.2.2 Impact Analysis

No-Build Alternative

The No-Build Alternative would not result in any immediate impacts to archaeological resources. Projects in the region's long-range transportation plan, however, would be advanced under the No-Build Alternative to address existing and future conditions of congestion and traffic safety. Because of the early settlement patterns that existed in this part of North America, these future transportation improvements could have an impact on archaeological resources. Transportation facilities have been traditionally built along areas that our society

and previous societies have used routinely through the course of their lives. Additional expansion of the existing transportation network through the No-Build Alternative would likely be built in these same areas – areas which exhibit high archaeological probability because they are located where a progression of cultures has chosen to live and develop commerce (Native American paths, early roads, and modern highways all generally share the same alignments).

The increased transportation infrastructure necessary to meet future needs could also have impacts on archaeological resources. Insofar as highway infrastructure requires greater right-of-way than an elevated rail-based system like maglev would, the maglev project could have fewer impacts to archaeological resources than the highway links it could replace in the future.

Build Alternatives

Alternative alignments in Sections A, B, and C were assessed utilizing the recorded archaeological site information and the archaeological resource potentials (low, moderate, and high). Table 4.10.2-1 provides a summary of the potential impacts to archaeological resources within the APE of each proposed alternative alignment. The actual extent of resource impacts would be primarily limited to pier locations, which would be determined in the final design of the project. However, areas of cut are required within some portions of the project.

Table 4.10.2-1 Archaeological Impacts: Sections A, B, and C

Archaeological Potential	A5-North	A5-South	B4-East	B4-West	C2-Mod	C5	C6
Recorded Archaeological Sites*	3	4	0	0	0	3	1
<i>Prehistoric Archaeological Resource Potential in ha (ac)</i>							
High Potential	4.9 (12.0)	5.0 (12.3)	4.2 (10.5)	4.9 (12.0)	11.8 (29.1)	13.8 (34.0)	12.6 (31.2)
Moderate Potential	13.6 (33.5)	15.3 (37.8)	9.0 (22.3)	10.3 (25.4)	30.7 (75.9)	29.3 (72.4)	22.3 (55.2)
Low Potential	106.2 (262.3)	111.2 (274.8)	53.9 (133.3)	45.0 (111.3)	91.2 (225.3)	88.9 (220.3)	105.7 (261.2)
Total	124.6 (307.8)	131.5 (324.9)	67.2 (166.1)	60.2 (148.7)	133.7 (330.3)	132.2 (326.7)	140.7 (347.6)
<i>Historic Archaeological Resource Potential in ha (ac)</i>							
High Potential	7.1 (17.6)	8.2 (20.3)	13.4 (33.0)	13.7 (33.8)	6.8 (16.8)	10.0 (24.8)	8.9 (22.1)
Moderate Potential	45.1 (111.5)	51.4 (127.1)	30.5 (75.4)	32.0 (79.1)	40.1 (99.0)	44.4 (109.8)	36.3 (89.8)
Low Potential	72.4 (178.8)	71.8 (177.5)	23.4 (57.7)	14.5 (35.8)	86.8 (214.6)	77.8 (192.2)	95.4 (235.7)
Total	124.6 (307.9)	131.5 (324.9)	67.2 (166.1)	60.2 (148.7)	133.7 (330.4)	132.3 (326.8)	140.7 (347.6)

* Some of the recorded sites contain both historic and prehistoric components, others are single component sites. See the text for discussion of site specifics.

Section A

Alternative Alignment A5-North would potentially impact the locations of three recorded archaeological sites, 36AL0137 (the Esplen Site - a multi-component prehistoric resource),

36AL0354 (the Glenmawr Historic Site - a late 19th to early 20th century residential site), and 36AL0311 (the City Center Site - a middle 19th to early 20th century urban domestic site with remnants of the canal tunnel). The prehistoric archaeological resource model indicated that Alternative Alignment A5-North would contain 4.9 hectares (12.0 acres) of high, 13.6 hectares (33.5 acres) of moderate, and 106.2 hectares (262.3 acres) of low prehistoric archaeological potential. Alternative Alignment A5-North also would exhibit 7.1 hectares (17.6 acres) of high, 45.1 hectares (111.5 acres) of moderate, and 72.4 hectares (178.8 acres) of low historic archaeological potential.

Alternative Alignment A5-South would impact four archaeological sites, the three sites encountered by Alternative Alignment A5-North (36AL0137, 36AL0354, and 36AL0311) and site 36AL0394 (the Dickinson Homestead Site - an early 20th century domestic site). The prehistoric archaeological resource model indicated that Alternative Alignment A5-South would contain 5.0 hectares (12.3 acres) of high, 15.3 hectares (37.8 acres) of moderate, and 111.2 hectares (274.8 acres) of low prehistoric archaeological potential. Potential impacts for Alternative Alignment A5-South also would include 8.2 hectares (20.3 acres) of high, 51.4 hectares (127.1 acres) of moderate, and 71.8 hectares (177.5 acres) of low historic archaeological potential. Both alignments, Alternative Alignment A5-North and Alternative Alignment A5-South, would have a relatively high potential for localized preservation of historic archaeological deposits within the City of Pittsburgh.

Impacts for Alternative Alignments A5-North and A5-South would also include the proposed stations at PIA and Steel Plaza, as well as the roadway improvements associated with them. For PIA, this would add approximately 2.0 hectares (4.9 acres) of high prehistoric archaeological potential and 1.4 hectares (3.4 acres) of high historic archaeological potential. For Steel Plaza, this would add 0.6 hectares (1.5 acres) of historic archaeological potential. Also in Section A, the maintenance facility would contain 2.5 hectares (6.1 acres) of high prehistoric archaeological potential (see Tables 4.10.2-2 and 4.10.2-3).

Table 4.10.2-2 Archaeological Impacts: Passenger Stations

Archaeological Potential	PIA Station	Maintenance Facility	Steel Plaza Station	Thompson Run Station	Greengate Mall Station	Toll Route 66/ PA Route 136 Station
Recorded Archaeological Sites*	0	0	0	0	0	0
<i>Prehistoric Archaeological Resource Potential in ha (ac)</i>						
High Potential	0.4 (0.9)	2.5 (6.1)	0 (0)	0.2 (0.5)	0.4 (0.9)	0 (0)
Moderate Potential	0.4 (1.0)	3.2 (7.9)	0.4 (1.0)	0.4 (0.9)	3.3 (8.1)	0.9 (2.2)
Low Potential	4.7 (11.5)	13.5 (33.3)	1.5 (3.6)	27.3 (67.5)	1.5 (3.8)	5.1 (12.6)
Total	5.4 (13.4)	19.1 (47.3)	1.9 (4.6)	27.9 (68.9)	5.2 (12.8)	6.0 (14.8)
<i>Historic Archaeological Resource Potential in ha (ac)</i>						
High Potential	0 (0)	0 (0)	0.6 (1.5)	0.5 (1.3)	0 (0)	0 (0)
Moderate Potential	0.1 (0.3)	3.9 (9.7)	1.2 (3.0)	3.2 (8.0)	0.4 (1.0)	0.2 (0.6)
Low Potential	5.3 (13.2)	15.2 (37.6)	0 (0)	24.1 (59.6)	4.8 (11.8)	5.7 (14.2)
Total	5.5 (13.5)	19.1 (47.3)	1.8 (4.5)	27.9 (68.9)	5.2 (12.8)	5.9 (14.8)

*Some of the recorded sites contain both historic and prehistoric components, others are single component for discussion of sites. See the text for discussion of site specifics.

Table 4.10.2-3 Archaeological Impacts: Roadway Improvements

Archaeological Potential	PIA	Thompson Run	Greengate Mall	Toll Route 66/PA Route 136
Recorded Archaeological Sites*	0	0	0	1
<i>Prehistoric Archaeological Resource Potential in ha (ac)</i>				
High Potential	1.6 (4.0)	1.9 (4.7)	1.0 (2.4)	0.2 (0.5)
Moderate Potential	5.3 (13.1)	6.0 (14.9)	6.8 (16.9)	0.7 (1.8)
Low Potential	20.0 (49.4)	54.7 (135.1)	7.0 (17.2)	1.9 (4.8)
Total	26.9 (66.5)	62.6 (154.7)	14.8 (36.5)	2.9 (7.1)
<i>Historic Archaeological Resource Potential in ha (ac)</i>				
High Potential	1.4 (3.4)	6.6 (16.3)	1.3 (3.2)	1.1 (2.8)
Moderate Potential	8.0 (19.7)	44.6 (110.1)	10.9 (27.0)	1.6 (4)
Low Potential	17.6 (43.5)	11.5 (28.3)	2.5 (6.2)	0 (0)
Total	27.0 (66.6)	62.6 (154.7)	14.8 (36.4)	2.8 (6.8)

**Some of the recorded sites contain both historic and prehistoric components, others are single component sites. See the text for discussion of site specifics.*

Section B

Impacts to archaeological resources along Alternative Alignment B4-East would include no recorded archaeological sites, 4.2 hectares (10.5 acres) of high, 9.0 hectares (22.3 acres) of moderate, and 53.9 hectares (133.3 acres) of low prehistoric archaeological potential. Alternative Alignment B4-East would also have 13.4 hectares (33.0 acres) of high, 30.5 hectares (75.4 acres) of moderate, and 23.4 hectares (57.7 acres) of low historic archaeological potential.

Alternative Alignment B4-West would have very similar impacts, with no recorded archaeological sites, 4.9 hectares (12.0 acres) of high, 10.3 hectares (25.4 acres) of moderate, and 45.0 hectares (111.3 acres) of low prehistoric archaeological potential, and 13.7 hectares (33.8 acres) of high, 32.0 hectares (79.1 acres) of moderate, and 14.5 hectares (35.8 acres) of low historic archaeological potential.

Regardless of which alternative alignment is selected, there would be a potential for localized preservation of archaeological deposits to occur below the modern/historic disturbance within the terrace landform along the Allegheny River and along the Plum Creek drainage.

The Thompson Run station and associated road improvements (see Tables 4.10.2-2 and 4.10.2-3) would add approximately 2.1 hectares (5.2 acres) of high prehistoric archaeological potential and 7.1 hectares (17.6 acres) of high historic archaeological potential.

Section C

Alternative Alignment C2-Mod would not impact any recorded archaeological sites, 11.8 hectares (29.1 acres) of high, 30.7 hectares (75.9 acres) of moderate, and 91.2 hectares (225.3 acres) of low prehistoric archaeological potential. Projected impacts by Alternative Alignment C2-Mod to historic archaeological resources would include 6.8 hectares (16.8 acres) of high, 40.1 hectares (99.0 acres) of moderate, and 86.8 hectares (214.6 acres) of low historic archaeological potential.

Alternative Alignment C5 would display potential impacts to three recorded archaeological sites, 36WM0625 (the Manor Valley Site - a small prehistoric site), 36WM0726 (the Blank Site - a Late Woodland village site), and 36WM0730 (the Blank II Site - a small prehistoric site). Alternative Alignment C5 would also contain 13.8 hectares (34.0 acres) of high, 29.3 hectares (72.4 acres) of moderate, and 88.9 hectares (220.3 acres) of low prehistoric archaeological potential, and 10.0 hectares (24.8 acres) of high, 44.4 hectares (109.8 acres) of moderate, and 77.8 hectares (192.2 acres) of low historic archaeological potential.

Potential impacts from Alternative Alignment C6 would include one recorded archaeological site, 36WM0607 (the Logan Site - a prehistoric site), 12.6 hectares (31.2 acres) of high, 22.3 hectares (55.2 acres) of moderate, and 105.7 hectares (261.2 acres) of low prehistoric archaeological potential. Alternative Alignment C6 would also exhibit 8.9 hectares (22.1 acres) of high, 36.3 hectares (89.8 acres) of moderate, and 95.4 hectares (235.7 acres) of low historic archaeological potential.

Impacts for Alternative Alignment C2-Mod and Alternative Alignment C5 would also include the proposed Greengate Mall station and associated roadway improvements (see Tables 4.10.2-2 and 4.10.2-3), adding 1.4 hectares (3.3 acres) of high prehistoric archaeological potential and 1.3 hectares (3.2 acres) of high historic archaeological potential. The estimated impacts for Alternative Alignment C6 would include the APE for the Toll Route 66/PA Route 136 station and associated roadway improvements, with an additional 0.2 hectares (0.5 acres) of high prehistoric archaeological potential and 1.1 hectares (2.8 acres) of high historic archaeological potential. The roadway improvements for the Toll Route 66/PA Route 136 Station also potentially impact a recorded archaeological site, 36WM0703 (the Findle Site – a small historic/prehistoric site located in the floodplain of Little Sewickley Creek).

4.10.2.3 Summary

On the basis of documentary analysis and field reconnaissance, recorded and potential archaeological sites were identified. Areas of high, moderate, and low archaeological potential were identified through the development of a resource potential model and archaeological sensitivity maps. There could be impacts under the No-Build and build alternatives. Further analysis of the build alternatives would be required as the project progresses to determine the extent, quality, and significance of these potential archaeological resources.

Alternative Alignment A5-North and Alternative Alignment A5-South would have relatively similar potential impacts to recorded and predicted archaeological resources. However, Alternative Alignment A5-South would impact one additional recorded historic archaeological site, 36AL0394, which would not be impacted by Alternative Alignment A5-North. In addition, Alterna-

tive Alignment A5-South would have slightly greater potential for impacts to high and moderate potential archaeological resources (see Table 4.10.2-1).

In Section B, potential impacts for Alternative Alignment B4-East and Alternative Alignment B4-West would be relatively similar. There would be no impacts to recorded archaeological sites. Alternative Alignment B4-East would have slightly greater impacts to archaeological resources, but both alternatives would have comparable impacts to areas of high potential for prehistoric and historic archaeological resources.

Within Section C, Alternative Alignment C5 would have the greatest impacts to recorded sites (including a recorded prehistoric village site [36WM0726]) and predicted archaeological resources with 23.8 hectares (58.8 acres) of high potential surface area, particularly within the crossing of the Bushy Run drainage basin. Alternative Alignment C6 would impact one recorded site and would have somewhat less potential for impacts to high potential areas. The highest potential areas for Alternative Alignment C6 would be where it traverses the Little Sewickley Creek drainage basin. Alternative Alignment C2-Mod would have the least impacts to archaeological resources, with no impacts to recorded sites and the smallest amount of acreage containing high potential for prehistoric and historic archaeological resources.

4.10.2.4 Mitigation

Mitigation for impacts to cultural resources will be in accordance with the Programmatic Agreement. FRA, in cooperation with PAAC, shall ensure that the mitigation measures of the Programmatic Agreement concerning archaeological resources are initiated and concluded prior to completion of the project. Mitigation could include: avoidance of high probability archaeological sites, Phase I and II testing, and/or Phase III data recovery. Other details of mitigation will be developed via coordination with the signatories and consulting parties as per the PA.

Dissemination of public information on the potential impact to archaeological resources, while always difficult because of the need to protect specific resources from “amateur archaeologists” looking to add valuable artifacts to their personal collections, will continue as necessary to allow members of the public to make reasonable decisions on the extent of the impacts. Publicly disseminated information, however, will be presented only in a fashion that guarantees protection of irretrievable cultural resources.

4.11 Aesthetic Environment and Scenic Resources

4.11.1 Methodology

The aesthetic environment and scenic resources were evaluated where the project alternative alignments could result in a change in local or regional aesthetics and other values. When the project alternative alignments were determined to affect the viewshed for important community features (e.g., an outdoor recreation area or historic property), aesthetic or visual quality impacts were assessed. Additionally, GIS-based techniques and mapping techniques were used to create a visual analysis of the impact zone.

Other methods of interpreting visual impacts were also used, such as perspective sketches; GIS and computer aided drafting and design (CADD) generated renderings, modi-