

D. ENVIRONMENTAL AND SOCIAL IMPACTS

D.1. SCREENING OF IMPACTS

The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies assess the potential impacts of their actions, or actions that they finance, on both the human environment and the natural environment. This chapter contains a preliminary evaluation of potential environmental impacts related to constructing and operating light rail transit service within the project area. This evaluation notes potential areas of concern and is based on readily available information and limited field views. Additional evaluation of these potential areas of concern will be the focus of a future environmental scoping phase of the PATCO Philadelphia Waterfront Transit Expansion project.

Neighborhoods evaluated to identify potential environment and social impacts are Center City and the neighborhoods of the Waterfront. With limited exceptions, the entirety of the proposed Build Alternatives would be located within the cartways and street rights of way owned and managed by the City of Philadelphia or the Pennsylvania Department of Transportation. These roads currently serve a mix of vehicular traffic, including trucks and buses, in an urban environment. Accommodations for cyclists and pedestrian vary through the project area. The project as envisioned would add a new mode to roadways already serving a variety of users.

Maps showing many of the key environmental features within the project area are located in Appendix F. Table D-1 summarizes the degree to which the Build Alternatives comply with the environmental and social impacts.

TABLE D-1: IMPACT ON ENVIRONMENTAL AND SOCIAL FACTORS

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Neighborhood and Community Impacts	Medium	Medium	Medium	Low
Environmental Justice	Low	Low	Low	Low
Parks and Parklands	Medium	Low	Medium	Medium
Historical and Cultural Resources	Low	Medium	Low	Low
Hazardous and Contaminated Materials	Low	Low	Low	Low
Air Quality	Low	Low	Low	Low
Noise and Vibration	Low	Medium	Low	Low
Energy	Low	Low	Low	Medium
Water Resources	Low	Low	Low	Low
Protected Species and Special Habitats	Low	Low	Low	Low
Construction Impacts	Medium	High	Medium	Medium

D.2. NEIGHBORHOOD AND COMMUNITY IMPACTS

A key criterion for the concept of new rail transit in the project area is the compatibility of any candidate alternative with the land use and economic development goals of the municipality and region. For this project, the community impacts are centralized on the various neighborhoods of the City of Philadelphia within the study area, both in Center City and along Columbus Boulevard.

The physical and operating characteristics of the light rail alignment considered in this Alternatives Analysis will be further analyzed in subsequent project phases. DRPA/PATCO will coordinate with the City of Philadelphia and the DRWC to ensure a consistent approach to land use and community impacts both along Columbus Boulevard and in Center City.

Conclusion: This project will increase public access to community-benefit facilities and will create a stronger physical linkage between communities. Neighborhood impacts could include noise, vibration, and traffic, in addition to visual impacts related to overhead wires. Neighborhood and community impacts will be further evaluated in subsequent project phases. Comparing three built alternatives suggests that all will have similar positive impacts on the neighborhood and communities. TSM alternative will have less positive impact due to anticipated longer travel times.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Neighborhood and Community Impacts	Medium	Medium	Medium	Low

D.3. ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, instructs federal agencies to “promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in matters relating to human health or the environment.” Federally funded transportation projects, while enhancing mobility can also result in negative community impacts during the construction and operational phases. The Executive Order instructs federal-funding recipients to provide an equitable distribution of benefits and avoid inequitable distribution of negative impacts.

The Executive Order identifies minority communities as “Black, Hispanic, Asian, American Indian and Alaskan Native, Native Hawaiian or other Pacific Islander.” The PATCO Philadelphia Waterfront Transit Expansion Alternatives Analysis defines “low income” as any individual with an annual household income at least 50 percent below the average household income of the U.S. Census Bureau-defined block group.

Conclusion: Based on a review of U.S. Census data collected for the project area, there is the possibility of impacts to environmental justice communities. Appendix F identifies the environmental justice communities within the project corridor. More detailed analysis will be undertaken in subsequent project phases, consistent with U.S. Department of Transportation guidance, to determine if and where any disproportionate impacts exist in the project area. All alternatives pass through similar areas of the City with respect to environmental justice communities and are not

expected to result in disproportionate impacts to environmental justice communities. As a result, impacts are expected to be the same across the alternatives.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Environmental Justice	Low	Low	Low	Low

D.4. PARKS AND PARKLANDS

The U.S. Department of Transportation Act of 1966 includes a provision, called Section 4(f), that prohibits the use of public parks and recreational lands, wildlife habitat, and historic sites of national, state, or local significance for transportation projects that result in negative impacts except in circumstances where there is no feasible alternative and that all possible attempts were made to minimize or avoid impacts. In addition, Section 6(f) of the U.S. Land and Water Conservation Fund Act, preserves, develops, and assures the quality and quantity of outdoor recreation resources and prohibits the use of these assets without coordinating with the National Park Service and mitigating the affected areas.

There are numerous parks and recreational facilities located or planned within the project area. In addition to the existing notable parks (such as Independence National Historical Park, Franklin Square and Penn Treaty Park), there are facilities planned for the project area including the Race Street Pier Park, a bicycle and pedestrian trail along Columbus Boulevard, and an additional public space entertainment facility to be located at Pier 53.

Conclusion: Direct negative impacts to parks and parklands are unlikely as the proposed alternatives would operate primarily within the cartway of existing streets. Related effects of constructing and operating the proposed project could include noise, vibration, and visual impacts. The project would likely enhance public access to the anticipated parkland facilities. More detailed analysis will be undertaken in subsequent project phases in coordination with the City of Philadelphia and the DRWC. All alternatives access the same park and recreational areas along the Delaware River waterfront. Within Center City, Alternative 1 and Alternative 3 would operate in close proximity to Franklin Square Park, these alignments could create additional park impacts. Alternative 2 operates along Market Street through the Independence National Historical Park though it is not expected to result in any lasting negative impacts beyond the construction period.

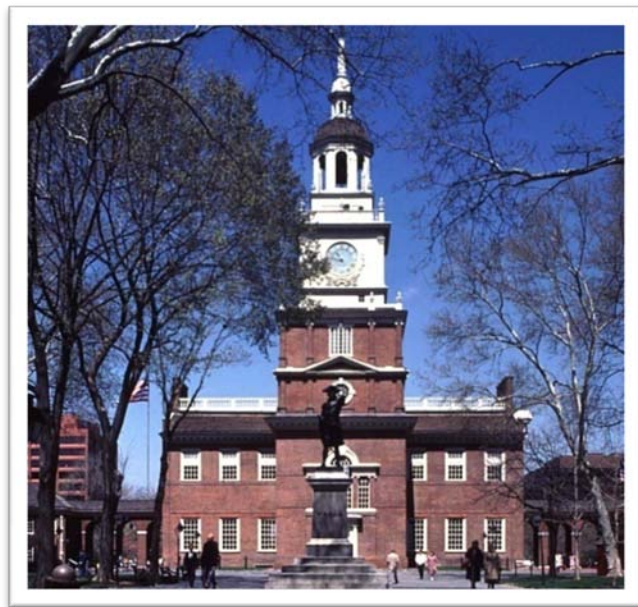
	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Park and Parklands	Medium	Low	Medium	Low

D.5. HISTORIC AND CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act requires federal agencies to define the effects of projects on historic properties and avoid, minimize or mitigate potential adverse effects of federal actions on these properties. Historic properties are defined as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior.”

The National Environmental Policy Act (NEPA) also instructs federal agencies to coordinate actions in order to protect important historic, cultural, and natural resources.

Several major historic and cultural sites and properties of significant historical importance are located within the project area and include Independence Hall, the Liberty Bell, Elfreth’s Alley, Congress Hall, and Franklin Court. Of recent importance, in 2007 archeologists excavated a plot of land at 6th and Market Streets at the President’s House and uncovered the slave quarters of George Washington. The Historic Districts in the project area include the Old City Historic District, the Independence National Historic District, Franklin Square, Head House Square, the Southwark District, and the Society Hill Historic District.



Conclusion: Direct negative impacts to historic and cultural facilities are unlikely as the proposed alternatives would operate primarily within the cartway of existing streets. Related effects of constructing and operating the proposed project could include noise, vibration, and visual impacts. The project would likely enhance public access to the historic and cultural resources. More detailed analysis will be undertaken in subsequent project phases in coordination with the City of Philadelphia, the DRWC, the Pennsylvania Bureau for Historic Preservation consistent with the Pennsylvania History Code and the National Historic Preservation Act of 1966. Because Alternative 2 would operate closer to the City of Philadelphia’s noteworthy cultural and historic resources, it is possible that this alternative could have greater impacts compared to the other candidate alternatives, particularly during the construction period.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Historical and Cultural Resources	Low	Medium	Low	Low

D.6. HAZARDOUS AND CONTAMINATED MATERIALS

There are potential hazardous and contaminated materials throughout the project area and primarily along the Columbus Boulevard portion due to its industrial past. Commercial activity on the Delaware River within the project area can be traced to before 1850. According to PlanPhilly:

Until the advent of the horse-drawn trolley in the 1830s, residential and commercial districts hugged the shoreline of the Delaware River. This created a city in which different classes and land uses were shoved cheek-by-jowl with each other. The construction of the railroads and their massive freight and passenger complexes near Broad Street and on the banks of the Schuylkill in the mid-nineteenth century caused some industry to shift westward. However, the

Delaware River port continued to prosper well into the 20th century, sustaining a variety of factories, warehouses, and other enterprises that required close access to the sea. During its industrial glory years, this waterfront was a muscular, rough, yet lively place. Its streets, alleys and waterfront were defined by hissing steam, clanking machinery, drifting coal smoke, blasting whistles, and sweating workers.²³

Conclusion: Constructing the Build Alternative could disturb hazardous and contaminated materials that may exist below the roadbed. Appendix F contains maps showing known Superfund and other contaminated sites within the project area. More detailed analysis will be undertaken in subsequent project phases in coordination with the City of Philadelphia and other Pennsylvania resource agencies. Based on this level of analysis, all alternatives are likely to have minimal impacts to hazardous and contaminated materials.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Hazardous and Contaminated Materials	Low	Low	Low	Low

D.7. AIR QUALITY

The project would increase the reach and availability of non-diesel transit within Philadelphia and provide fixed-rail transit access between Center City and the auto-dominated Waterfront. Air quality impacts could be associated with this additional rail transit capacity.

The Clean Air Act is the basis for most federal air pollution control programs. The U.S. Environmental Protection Agency (EPA) oversees regulation of air quality on concern nationwide and has determined that the Philadelphia region is an air quality non-attainment area as it fails to meet the standards for two out of six pollutants: ground level ozone (VOCs and NOx), which creates smog, and fine particulate matter (PM2.5), which comes from motor vehicle and power plant emissions.

In accordance with the Clean Air Act Amendments (CAAA) of 1990, DVRPC—the MPO for the Philadelphia area—is required to show that projects listed in its long-range plan and Transportation Improvement Plan (TIP) do not collectively diminish air quality.

Conclusion: The overall effect of the project on regional air quality will depend on the ability of the proposed service to attract users to transit and reduce automobile-related emissions. More detailed analysis of air quality impacts will be undertaken in subsequent project phases in coordination with the EPA, DVRPC, and the Pennsylvania Department of Environmental Protection. The anticipated ridership is not projected to result in significant air quality improvements. Air quality impacts could be increased as a result of light rail transit vehicles operating in shared lanes with traffic possibly creating additional vehicle delay.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Air Quality	Low	Low	Low	Low

²³ Ujifusa, Steven, PlanPhilly, July 2009, <http://planphilly.com/node/1672>

D.8. NOISE AND VIBRATION

The proposed project will be located within the cartway of Philadelphia’s existing streets. In addition, the Columbus Boulevard cartway accommodates both vehicular traffic and rail freight in the southern portion of the project area. Traffic within the project area currently contributes to background noise and vibrations along the anticipated project corridors.

Guidelines for measuring and evaluating the long-term noise and vibration impacts of transit projects is provided by FTA’s *Transit Noise and Vibration Impact Analysis Guidance Manual* (May 2006).

Conclusion: It is anticipated that the proposed project would contribute some noise and vibration during both the construction and operational phases. Alternative 2, as the longest route traversing the City’s key east-west arterial in Center City (Market Street) could result in more people affected by noise and vibration impacts during construction and operation. As the project progresses, more detailed analysis of the anticipated noise and vibration impacts will be undertaken in subsequent project phases consistent with FTA guidance.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Noise and Vibration	Low	Medium	Low	Low

D.9. ENERGY

Analysis of the anticipated impacts of the proposed projects on energy consumption normally focuses on the power necessary to operate the envisioned transit service. In addition, it could also evaluate any regional impacts to overall energy consumption as users transition from gasoline- or diesel-powered vehicles to the proposed project. Light-rail vehicles are assumed to be powered by electricity via overhead trolley wire.

Conclusion: Adding electric-powered light rail service will require evaluating available traction power. As the project progresses, a detailed evaluation of the energy needs of the Build Alternative will be conducted along with an analysis of power available from existing substations and whether the needs would exist for more power-generating facilities. All three built alternatives are similar length and are expected to draw similar amounts of energy. Because the TSM alternative is bus-based, it is likely to consume more power.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Energy	Low	Low	Low	Medium

D.10. WATER RESOURCES

Evaluating the impacts of proposed transportation projects on wetlands, groundwater, floodplains, coastal zones, and drinking water are required by several federal and state regulations. These include the Clean Water Act, the Coastal Zone Management Act of 1972, US DOT Orders 5660.1A (wetlands protection) and 5650.2 (floodplain protection) and the Safe Drinking Water Act.

Conclusion: While portions of the project are located near the Delaware River, virtually the entirety of each proposed alternative is located within the cartway of existing streets within Philadelphia. Impacts to water resources are not anticipated. This information will be confirmed in subsequent project phases. There is no expected difference in the impacts that the different alternatives will make on the water resources.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Water Resources	Low	Low	Low	Low

D.11. PROTECTED SPECIES AND CRITICAL HABITATS

The Endangered Species Act of 1973 regulates the protection of threatened and endangered species and designated critical habitat. In addition, the U.S. Fish and Wildlife Service and National Marine Fisheries Service require protecting species under the threat of extinction or significant negative impact from land development.

Conclusion: While portions of the project are located near the Delaware River, virtually the entirety of each proposed alternative is located within the cartway of existing streets within Philadelphia. Impacts to natural habitats are not anticipated. This information will be confirmed in subsequent project phases. It is unlikely that there is any difference in the impacts on protected species between the alignments.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Protected Species and Special Habitats	Low	Low	Low	Low

D.12. CONSTRUCTION IMPACTS

Constructing the proposed project may result in temporary lane closures, traffic diversions, modifications of sidewalks, and other construction-related impacts that will affect the environment for motor vehicle drivers, pedestrians and cyclists.

Conclusion: Roadway impacts related to construction would be specified and mitigated in subsequent project phases. A Maintenance and Protection of Traffic Plan will be developed as the project moves forward to ensure proper roadway functioning including pedestrian and cyclist safety, and traffic throughput. Because Alternative 2 would operate along Market Street, impact related to construction are likely to create significant impacts to traffic, pedestrians and existing local, regional and intercity bus service.

	Alternative 1	Alternative 2	Alternative 3	TSM Alternative
Construction impacts	Medium	High	Medium	Medium

