

Cost Savings of Expedited

NEPA/404 Approvals

an analysis of three projects in Pennsylvania

This report discusses the following projects:

- **Mon/Fayette Transportation Project from I-68 to PA 43**
a project of the Pennsylvania Turnpike Commission
- **Mon/Fayette Transportation Project from I-70 to PA 51**
a project of the Pennsylvania Turnpike Commission
- **Lackawanna Valley Industrial Highway Project**
a project of the Pennsylvania Department of Transportation

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Background

The United States General Accounting Office Report on Highway Planning dated August 1994 (GAO/RCED-94-211) states:

“When the Federal Highway Administration (FHWA) and the states undertake actions that will have a significant impact on resources such as wetlands, air quality, historic sites, or endangered species, the National Environmental Policy Act (NEPA) requires them to prepare an Environmental Impact Statement (EIS). In preparing an EIS, the state identifies (1) the need for a project, (2) alternatives that meet the project’s need, (3) the environmental impacts of the alternatives, and (4) measures to minimize such impacts. Under NEPA, FHWA also prepares environmental documents that address many federal, state and local environmental laws. FHWA uses the NEPA reviews to bring all of the environmental and other considerations into a single analysis, developing a document that not only identifies environmental impacts, but also helps the agency make better transportation decisions.

If a construction project will have an impact on wetlands or other waters of the United States, the Clean Water Act of 1977 requires the states to assess and mitigate these impacts. To meet Section 404 requirements, the state studies the preferred alternative’s impacts on wetlands, develops measures to mitigate such impacts, and applies [to the U.S. Army Corps of Engineers] for a Section 404 permit. If the Corps approves the application, the state can proceed with the design and construction of the project. Throughout the NEPA and Section 404 reviews, FHWA, the states and agencies such as the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the U.S. Army Corps of Engineers (the Corps) coordinate to ensure that the EIS adequately assesses the environmental impacts and that the preferred alternative meets Section 404 permit requirements.”

The integrated NEPA/404 process, which coordinates agency activities and makes it possible to obtain NEPA environmental approval and a U.S. Army Corps of Engineers Section 404 permit, concurrently, was adopted by federal agencies in FHWA Region 3 on July 23, 1992 with the execution of an interagency consensus document. The agencies involved include the Federal Highway Administration, Region 3; the Environmental Protection Agency, Region 3; the U.S. Army Corps of Engineers, North Atlantic Division; the U.S. Fish and Wildlife Service, Region 5; and the National Marine Fisheries Service, Northeast Region.

Introduction

This report summarizes the estimated construction cost savings achievable by using an expedited integrated NEPA/404 approval process for three projects that were developed in Pennsylvania. The average time for receiving NEPA/404 approval for projects of this type is 5.6 years, according to an August, 1994 report prepared by the United States General Accounting Office (GAO/RCED-94-21D). By using an intensive project management effort to expedite environmental studies and reviews, the time required for approval for these projects was reduced by 50 percent or more. All three projects had a goal to improve the transportation system and support economic development for residents of depressed regions. In each case, there was a strong political and public mandate to expedite these priority projects.

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The Mon/Fayette projects, which the Pennsylvania Turnpike Commission (PTC) is developing in southwestern Pennsylvania, are located in the 65-mile north-south corridor between Pittsburgh and Morgantown, West Virginia. Within this corridor are the depressed communities of the Mon Valley, where the decline of steel manufacturing has devastated the local economy. At a time when traditional sources of funding for large projects were not available, the Pennsylvania legislature enacted legislation that made it possible for the Turnpike Commission to develop four separate but contiguous projects in this region. Two of the Mon/Fayette projects were advanced simultaneously and expedited through the NEPA/404 approval process in less than two and a half years; two others are now being developed.

The process that was used to expedite the Mon/Fayette projects was initially developed by the Pennsylvania Department of Transportation (PennDOT) and applied to the Lackawanna Valley Industrial Highway project, which became a high priority for PennDOT in 1991. Located in the coal region of northeastern Pennsylvania, the highway was proposed to connect I-81, near Scranton, with Carbondale, located 16 miles to the northeast. The new expressway would reduce congestion on U.S. Route 6 and provide good access to previously strip-mined land, opening the Lackawanna Valley to new development. Fourteen months after this project was expedited, the Federal Highway Administration issued a Record of Decision; a month later, the Army Corps of Engineers issued a Section 404 permit.

When a much-needed highway project is expedited through the integrated NEPA/404 approval process, construction costs are reduced and the economic benefits of the completed facility are made available to the community sooner. In addition to these easily-identifiable benefits, there is a sometimes overlooked, yet substantive, environmental benefit.

For the three projects discussed in this report, the integrated process advanced the detailed evaluation of critical environmental features into preliminary design rather than final design, which made it possible to incorporate environmental information into engineering solutions early in the process and to minimize impacts to environmental resources.

Expediting the Integrated NEPA/404 Approval Process

A methodology for expediting large projects through the integrated NEPA/404 approval process was developed by PennDOT for the Lackawanna Valley Industrial Highway Project and adopted by the Pennsylvania Turnpike Commission for the Mon/Fayette projects.

Essentially, the methodology involves project management techniques that include:

- The use of a special assistant for PennDOT projects, appointed by PennDOT, and a special assistant for Turnpike projects, appointed by the Turnpike Commission, to provide leadership and guidance through the State's transportation project development process;
- The creation of an executive committee, comprised of senior transportation agency managers, resource and regulatory agency representatives, and local officials;
- The use of an Environmental Impact Statement (EIS) management team, comprised of key transportation professionals, consultants and subconsultants, who shared the common goal of providing project management;
- The use of a management consultant to provide oversight coordination and accelerated document review;
- The adoption of an intensive meeting schedule, in which EIS Management Team Status Meetings are held weekly, Resource Agency Coordination Meetings (ACMs) are held monthly, and Executive Committee Meetings are held quarterly;
- A commitment from the cooperating agencies to provide additional coordination and to hold frequent and additional ACMs; and
- The funding of additional resource agency positions to expedite the review process.

Mon/Fayette Transportation Project: I-68 to PA 43

This 12-mile project consists of a new 4-lane toll facility between Cheat Lake, West Virginia and Uniontown, Pennsylvania, with interchanges providing access to I-68 and State Route 857 in West Virginia and to Gans Road, Ruble Mill Road and Big Six Road in Pennsylvania. Under

consideration since the 1960s, this Pennsylvania Turnpike expansion project was identified for expedited NEPA/404 approval in 1992.

Developed through the PennDOT 10-step Transportation Project Development Process, a detailed environmental analysis was completed for this project and a public hearing held to present the preferred alternative on September 23, 1993. The Final Environmental Impact Statement (FEIS) was distributed for comment on July 29, 1994. After reviewing the additional comments received on the FEIS, the FHWA issued the Record of Decision on September 23, 1994.

Construction of the 8-mile segment in Pennsylvania is estimated to cost \$141 million; the 4-mile segment in West Virginia is estimated to cost \$80 million.

Mon/Fayette Transportation Project: I-70 to PA 51

Developed through PennDOT's 10-step process, this 17-mile project will be a new 4-lane toll facility between I-70 near Speers in Washington County and PA 51 at Large, in Allegheny County, Pennsylvania. Also included in the project is a park and ride facility in Jefferson Borough and the upgrade of two miles of PA 51.

This project was identified for expedited NEPA/404 approval in 1992. Public hearings for this project were held on May 6 and October 14, 1993 to obtain comments on the Draft EIS and Supplemental Draft EIS respectively. The comments from these hearings were addressed and documented in the FEIS, which was released March 4, 1994. After reviewing comments received on the FEIS, the FHWA issued a Record of Decision on May 19, 1994.

The estimated construction cost of this project is \$477 million.

Lackawanna Valley Industrial Highway

This 16-mile, four-lane limited access highway with nine interchanges, located between I-81 in Dunmore and Route 6 north of Carbondale, was identified for expedited NEPA/404 approval by PennDOT in 1991. A Draft EIS was completed in June 1992 and was followed by a Public Hearing on July 22, 1992. Comments from the hearing were incorporated into the FEIS, which was released November 23, 1992. On January 26, 1993, fourteen months after the expedited process began, the FHWA issued a Record of Decision.

Currently under construction, the estimated construction cost of the project is \$360 million.

Cost Savings Analysis

Following is an evaluation of the costs of expediting environmental studies on major projects as compared with the benefits of getting projects to construction sooner. This evaluation is based primarily on the I-70 to PA 51 and I-68 to PA 43 Mon/Fayette Projects and the Lackawanna Valley Industrial Highway Project but it also includes the benefit of experience on other PTC projects as well as recent PennDOT projects.

A recent U.S. Government Accounting Office (GAO) report indicates that the average time to complete the NEPA/404 process for major highway projects is 5.6 years. This is the benchmark that has been used to calculate the time savings achieved by expediting these three projects even though potentially the time savings could be greater on projects that are more complex. *Table 1* summarizes the estimated construction cost savings as a result of the expedited NEPA/404 approval process.

TABLE 1
Estimated Construction Cost Savings
As a Result of Expedited NEPA/404 Approval

	I-70 to PA 51	I-68 to PA 43	LVIH
Actual Time for NEPA/404 Approval*	1.9 Years (23 months)	2.2 Years (27 months)	1.2 Years (14 months)
Average Time for NEPA/404 Approval	5.6 Years	5.6 Years	5.6 Years
Time Savings	3.7 Years	3.4 Years	4.4 Years
% cost savings**	11.1%	10.2%	13.2%
Estimated Construction Cost***	\$477.0 Million	\$221.0 Million	\$360.0 Million
Estimated Construction Savings as a Result of Expedited NEPA/404 Approval	\$52.9 Million	\$22.5 Million	\$47.5 Million

* From the date project was expedited. Figures do not reflect work done prior to expediting the process.

** Assumes 3% inflation per year.

*** Construction cost estimates at the time of the FEIS.

Costs of NEPA/404 Approval

The requirements for studies to comply with NEPA and other regulations are the same whether a project is proceeding at a normal pace or being expedited. Therefore, it is difficult to identify specific additional costs that result from expediting the studies. In fact, there are a number of areas where efficiencies are gained or certain costs avoided by moving rapidly (in addition to the construction cost savings calculated above). It should also be noted that the total cost of Preliminary Engineering and Environmental Studies are not incurred merely to satisfy environmental resource agencies and comply with their rules and regulations. A significant percentage of the work done during this time is preliminary engineering design which is necessary regardless of environmental regulations and guidelines. *Table 2* summarizes the costs for the preliminary engineering and environmental studies for the three projects.

TABLE 2
Cost of Preliminary Engineering and Environmental Studies

	I-70 to PA 51	I-68 to PA 43	LVIIH
Preliminary Design	\$ 1,500,000	\$ 2,240,000	\$1,700,000
Borings	300,000	480,000	0 ⁽¹⁾
Mapping	150,000	120,000	0 ⁽⁴⁾
Hazardous Waste Investigations	150,000	160,000	1,150,000 ⁽¹⁾
Public Involvement	500,000	480,000	200,000
Environmental Studies	6,181,000	7,182,000	4,795,000
Permits, etc.	100,000	128,000	100,000
TOTAL COST	\$ 8,881,000 ⁽²⁾⁽⁵⁾	\$10,790,000 ⁽²⁾⁽³⁾⁽⁵⁾	\$7,945,000

⁽¹⁾ Waste investigations were completed to a higher level of detail than normal on all alignments. All final design evaluation, remediation, design, and remediation bid packages were done as part of preliminary engineering. This also includes core borings for design.

⁽²⁾ Costs include a pro-rated share of costs for Traffic Studies, Engineering Review, Public Involvement and Environmental Review by various consultants engaged to provide these services on all four Mon/Fayette Projects.

⁽³⁾ Total cost includes approximately \$300,000 for the Needs Study for all four Mon/Fayette projects.

⁽⁴⁾ Mapping was provided by others.

⁽⁵⁾ Congestion Management System and Major Investment Studies costs are included.

Additional Costs of Expediting NEPA/404 Approval

As indicated previously, it is difficult to specifically delineate additional costs related solely to the expediting of the NEPA/404 Approval. However, it seems that **additional** costs over and above the cost for a project proceeding at an average pace can be grouped into a number of different categories as follows.

Final Design Effort Moved to Preliminary Design

These projects were expedited to construction by making permit applications to the U.S. Army Corps of Engineers and PA Department of Environmental Resources during the development of the EIS rather than final design. This allowed these permits to be issued immediately after the Record of Decision was issued. This is one example of an "additional" cost which is actually not additional to the project, but merely transferred to a point earlier in the process. Similarly, mitigation design plans, soil borings, detailed mapping and ALCAB (Agricultural Lands Condemnation Approval Board) presentations are tasks that involve significant effort and could be completed during final design if a project is not being expedited. Therefore, these costs are not considered as additional costs.

Higher Level Personnel

These projects received a high degree of visibility and the intensity of effort required meant that a higher level of manager or executive from each consulting firm became involved in the projects. This created significant advantages as it reinforced within each firm the high priority of these projects, and it also assured that the projects would benefit from the best experience each firm had to offer. Given PennDOT's salary and overhead limitations, much of this involvement by higher level personnel added no costs. However, assuming the direct involvement of two additional senior executives for each project at 25 hours per month at PennDOT's maximum salary and overhead rates, the total additional costs were approximately \$100,000 for each Mon/Fayette Project and \$60,000 for the LVIH Project.

Additional Coordination Meetings

The most effective management techniques for expediting the work were the weekly EIS Management Team Meetings and the monthly Agency Coordination Meetings. By scheduling regular meetings, assigning follow-up responsibilities, monitoring progress and reinforcing schedules and priorities, efficient progress was achieved. In addition, the project team was able to respond to new regulations such as the Congestion Management System Analysis and Major Investment Studies, as they were issued.

However, bringing all the key people together every week had a cost which can be considered additional. A fair comparison would include a calculation of the number of monthly coordination meetings that would be held if the project took the average length of time (5.6

years) versus the more frequent weekly meetings which resulted in a much shorter time to approval (23, 27, and 14 months, respectively). *Table 3* details the cost comparison for additional meetings including Management Team Meetings, Agency Coordination Meetings and Executive Committee Meetings, while *Table 4* summarizes these costs.

Additional Studies to Expedite Projects

Generally, the requirements for studies, reports and permits are the same whether a project is being expedited or if it is moving at a normal pace. However, in some areas additional effort is expended to assure that all concerns and issues are addressed rather than to take additional time to more clearly understand the exact scope of studies agencies would find acceptable. These additional studies are difficult to identify precisely but several examples follow.

Functional Evaluation of Wetlands. Where a large number of small wetlands are encountered, the cost to complete a functional evaluation of each can become significant. It has recently been recognized that traditional techniques for evaluating the functions and values of wetlands are not completely valid for very small wetlands. Although all agency personnel are aware of this and are willing to discuss an alternative procedure for small wetlands, the process of discussing and debating the issues and reaching agreement among all those involved could have taken several months (agency representatives were unwilling to eliminate the evaluation of functions and values of small wetlands). Potentially, the delay in these studies could have been lengthy. The approach taken on these projects was to complete the traditional evaluation techniques on all wetlands rather than take the time to debate the issue.

Secondary Impacts. There has long been a debate about whether new highway construction causes new development to occur and if so, how an EIS should evaluate and present the potential impacts of the development. Traditionally, highway EIS's have not included detailed evaluation of these potential secondary impacts while some include a brief evaluation. Resource agencies typically make critical comments when secondary impacts are not addressed in detail and potentially their concerns could cause delay in FHWA approval of the Final EIS and Record of Decision. In order to avoid this possible delay on these expedited projects, potential secondary impacts were evaluated in detail and documented in the EIS.

Project Overview. The issue of the interrelationship of all four Mon/Fayette projects was addressed with the cooperation and approval of a number of important federal agencies including FHWA. While no guidelines exist - and therefore, it could be argued no requirement for this study is imposed - a comprehensive project overview addressing all four Mon/Fayette projects was developed and included in each EIS. This task was performed for the Mon/Fayette projects; it does not apply to the LVIH project.

**TABLE 3
Detailed Meeting Costs**

	I-70 to PA 51	I-68 to PA 43	LVIH
Management Team Meetings			
Management Team Meetings over 5.6 years	67 (Monthly)	67 (Monthly)	22 (Quarterly)
Actual Management Team Meetings (Wkly)	92	108	57
Average Cost per Management Team Meeting per Project *	\$ 4,000	\$ 4,000	\$10,000
Cost of Additional Management Team Meetings	\$ 100,000	\$ 164,000	\$350,000
Agency Meetings			
Semiannual Agency Coordination Meetings over 5.6 Years (Assumes semiannual if project is not expedited)	11	11	11
Actual Monthly Agency Coordination Mtg	23	27	12
Average Cost of Agency Coordination Meetings per Project *	\$ 10,000	\$ 10,000	\$ 20,000
Cost of Additional Agency Coordination Mtgs	\$ 120,000	\$ 160,000	\$ 20,000
Executive Committee Meetings			
Semi-Annual Executive Committee Meeting (if project is not expedited)	11	11	0**
Actual Executive Committee Meetings	9	9	8
Average Cost of Executive Committee Meeting/Project *	\$ 10,000	\$ 10,000	\$ 20,000
Cost (Savings) of Executive Committee Meetings	(\$ 20,000)	(\$ 20,000)	\$160,000

* Mon/Fayette project meetings routinely reviewed four projects at each meeting. Numbers reflect the meeting cost per project. LVIH meetings were smaller and less expensive, but addressed only one project.

** There was no executive committee for this project until it was expedited.

TABLE 4
Summary of Meeting Costs

	I-70 to PA 51	I-68 to PA 43	LVIH
Cost of Additional Management Team Meetings	\$ 100,000	\$ 164,000	\$350,000
Cost of Additional Agency Meetings	\$ 120,000	\$ 160,000	\$ 20,000
Cost (Savings) of Executive Committee Meetings	(\$ 20,000)	(\$ 20,000)	\$160,000
TOTAL ADDITIONAL COSTS OF MEETINGS	\$ 200,000	\$ 304,000	\$530,000

Hazardous Waste Studies. For the LVIH Project, the total cost of hazardous waste studies was approximately \$1,150,000. Of this, 70 percent was needed for final design of remediation; the remaining \$345,000 can be considered an additional cost of expediting the project, since it represents the cost of detailed studies for alternatives considered but not selected. Normally, detailed hazardous waste studies are only performed for one preferred alternative. In expediting this project, detailed hazardous waste studies were performed for all alternatives.

Express Delivery Costs. When a project is expedited, most correspondence is accomplished by fax and overnight delivery services. These overnight and express delivery charges can be considered additional costs. This analysis assumes a cost of \$1,000 per month per project for express delivery (100 deliveries at \$10 each).

Miscellaneous Studies. Throughout the project development process, other miscellaneous studies or activities were completed in order to obtain consensus and continue to move forward. Many of these miscellaneous additional studies were performed at the special request of the resource agencies, and include: field studies in an expanded study area, additional water quality testing, and the evaluation of minor alignment shifts. While in each individual case the additional cost is often small, the number of instances where decisions are made to expedite studies in this way are numerous. Thus, the specific instances are difficult to identify precisely. However, it is reasonable to estimate that these kinds of decisions throughout the course of the projects may have increased the overall costs of the studies by 5%.

Table 5 summarizes the costs of these additional studies and other miscellaneous tasks.

TABLE 5
Costs of Additional Studies

	I-70 to PA 51	I-68 to PA 43	LVIIH
Wetland Evaluations	\$ 50,000	\$ 50,000	\$ 40,000
Secondary Impacts	150,000	150,000	58,000
Project Overview	150,000	150,000	N.A.
Hazardous Waste Studies	N.A.*	N.A.*	345,000
Express Delivery Costs	23,000	27,000	14,000
Miscellaneous Studies	440,000	539,000	397,000
TOTAL ADDITIONAL STUDIES COSTS	\$ 813,000	\$ 916,000	\$ 854,000

* Detailed hazardous waste studies are being completed during final design for only the selected alternative. Only preliminary hazardous waste studies were completed during the EIS.

Environmental Benefits

As these projects were expedited through the integrated NEPA/404 process, additional coordination with the resource agencies provided early, continuing and active involvement. From preliminary engineering through the Record of Decision, the agencies participated in developing the alternatives and made recommendations to minimize impacts. This level of resource agency involvement resulted in environmentally sensitive projects with fewer environmental impacts than might otherwise have occurred. In addition, expediting the decision on projects provides a significant benefit to property owners by reducing the time in which they live in uncertainty about whether their property will be acquired.

With all three projects, impacts and mitigation commitments have been tracked through the EIS and into final design with resource agency involvement to ensure that all commitments are met. This continuing coordination has resulted in further reduction of environmental impacts as the projects proceed through the design phase.

Summary

In summary, it is clear from this evaluation that the estimated construction cost savings of expediting these projects outweigh the additional costs that were incurred. Following is a summary of the additional costs and net savings. *Table 6* summarizes the additional costs of expediting NEPA/404 approval as detailed in *Tables 2* through *5* while *Table 7* summarizes the net savings of expediting NEPA/404 approval (comparing *Table 1* to *Table 6*).

TABLE 6
Additional Costs of Expediting NEPA/404 Approval

	I-70 to PA 51	I-68 to PA 43	LVIH
Higher Level Personnel	\$ 100,000	\$ 100,000	\$ 60,000
Meeting Costs	200,000	304,000	530,000
Additional Studies	813,000	916,000	854,000
TOTAL ADDITIONAL COSTS	\$1,113,000	\$1,320,000	\$1,444,000

TABLE 7
Net Savings of Expediting NEPA/404 Approval

	I-70 to PA 51	I-68 to PA 43	LVIH
Estimated Construction Savings (From Table 1)	\$ 52,900,000	\$ 22,500,000	\$ 47,500,000
Total Additional Costs (From Table 6)	1,113,000	1,320,000	1,444,000
NET SAVINGS	\$ 51,787,000	\$ 21,180,000	\$ 46,056,000

Recommendations

In the course of expediting large and complex projects such as the Mon/Fayette and LVIH projects, EIS management team members have recognized ways to further improve the transportation project development process. Recommendations to improve the process include:

Provide more detailed engineering. During the development of the EIS, project teams should look at areas where more detail is needed rather than deferring such examination to final design, where "surprises" can create delays, additional costs and/or additional environmental impacts. Some examples of design elements where more detailed engineering would produce benefits include: stream crossings, crossroad improvements at interchanges, location and type of interchanges, and mitigation of Section 4(f) sites. With the use of available technology, such as CADD, GIS and GPS, detailed engineering can be accomplished more quickly and cost-effectively during the EIS than was previously possible.

Identify utilities. Similar to the engineering issues listed above, but worthy of special emphasis, is the need to identify utilities early on. The early identification of major utility relocations would help to evaluate alternatives and to incorporate the impacts of utility relocations into the environmental document.

Identify operational features for toll facilities. The detailed identification of maintenance facilities and toll plazas for toll roads should also be included in preliminary design so that the impacts of these features can be properly identified.

Provide greater flexibility in agreements. Consider using open-ended engineering agreements rather than detailed, task-by-task scopes of work. Open-end agreements facilitate project management by allowing agency administrators greater flexibility in directing consultants to change directions or complete special studies on an as-needed basis.