

MEMORANDUM

Subject: Cost-Effective Environmental Mitigation Measures
From: Director, Office of Environmental Policy
Washington, D. C.
To: Regional Federal Highway Administrators,
Regions 1-10, and Direct Federal Division Engineers
Date: June 30, 1982

Reply to
Attn. of: HEV-11

The Federal Highway Administration (FHWA) continues to be concerned about the cost-effectiveness of the selected alternate of a proposed highway improvement, as well as the various mitigation measures being proposed to mitigate anticipated environmental impacts. The FHWA has a very clear responsibility to identify and consider the most cost-effective alternative project concept, to evaluate all anticipated environmental impacts from a proposed project, and to mitigate those impacts to the fullest extent possible consistent with the proper expenditure of Federal-aid highway funds.

Based on reviews of draft and final environmental impact statements by my staff and recent field trips by the staff to review Interstate gap projects relative to the 1983 Interstate Cost Estimate Manual requirements, I believe it is appropriate to discuss the Office of Environmental Policy's views on the matter of environmental mitigation. The attached paper has been coordinated with the Office of Engineering.

/ Original signed by /

Leon N. Larson

Attachment

Cost-Effective
Environmental Mitigation Measures

The need for an adequate evaluation of both environmental effects and possible mitigation measures is discussed in the National Environmental Policy Act which requires a "detailed statement" on major Federal actions with significant effects. Further, that statement should discuss "any adverse environmental effects which cannot be avoided." Both the Council on Environmental Quality (CEQ) regulation and the Federal Highway Administration (FHWA)/Urban Mass Transportation Administration (UMTA) environmental regulation provides further information on that issue. The CEQ regulation states the Record of Decision shall "state whether all practical measures to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not." The FHWA regulation attempts to clarify the meaning of the term "for all practical measures" by indicating that the proposed mitigation measures must be determined to be a "reasonable public expenditure" when considering the severity of the impact and the benefits of the proposed mitigation measures.

The 1981 Highway Act reemphasizes the need to carefully consider the cost-effectiveness of highway construction in that it amends Section 108 of the Federal-Aid Highway Act to limit normal Interstate construction funds to "essential environmental requirements" and other design features that are "necessary to provide a minimum level of acceptable service." While this statutory language is applicable only to the Interstate program, the concept of cost-effective mitigation measures is applicable to all phases of the FHWA program. Program Emphasis Areas 1 (Cost Reduction Program) and 2 (Cost-Effective Design and Construction) also focus FHWA efforts on efficiency and effectiveness in all aspects of the program including environmental mitigation features.

- The Office of Environmental Policy (OEP) has considerable information available regarding mitigation techniques for various environmental subject areas. Attachment "A" provides a listing of the various publications that are available to assist the field staff in this effort. In addition to the FHWA publications that are available, there is an extensive amount of material available from the Transportation Research Board (TRB). The TRB Publications Catalog dated January 1982 lists a wide variety of publications, Transportation Research Records, Transportation Research Circulars, National Cooperative Highway Research Program Reports, etc., that may be useful in identifying appropriate mitigation measures. In addition to those publications, OEP will provide staff expertise at the request of field offices to work an Individual project issues.

One of the several emphasis areas in OEP's review of environmental documents is in the mitigation area. It is the

position of this office that any proposed mitigation must be in response to a specific project impact and, further, that the measure must be cost-effective. There have been occasions in the past where other agencies have requested mitigation measures that appeared to be excessive but were accepted by FHWA in order to "advance the project" or because FHWA did not have sufficient information available to refute the other agency's position.

Information and suggestions from other agencies must be carefully considered and the decision based on a balanced consideration of all relevant factors. In determining the appropriate course of action, the ultimate responsibility for this evaluation and subsequent decision rests with FHWA and it is accountable to the public for the proper expenditure of public funds.

Reviews of environmental documents within OEP and other Headquarters offices and also project field reviews, have resulted in a number of recent recommendations that may be of use as a guide should similar situations arise in the future.

In reviewing a draft environmental impact statement (EIS) for a non-Interstate project from one State it was noted that the State department of transportation (DOT) always provided for a stream channel cross section and structure span length that would accommodate a 100-year flood without overtopping the structure or roadway. In this specific situation the need to modify an existing stream channel to accommodate the 100-year flood without overtopping the road would have caused extensive channel modifications with consequent significant increase in cost together with significant adverse environmental impacts. As a result of FHWA's review the State was asked to reconsider its position. The FHWA policy on bridge lengths with reference to flooding situations is contained in FHWM 6-7-3-2. The FHWA does not believe it is cost-effective to automatically design structures to carry the 100-year flood without overtopping the highway.

During field reviews by various members of OEP staff, the subject of cut-and-cover roadways (decks) was discussed with several State DOT's. While each case needs to be evaluated on its merits, preliminary indications are that several of the proposed decks appear to be excessive in length. While the cost of decking varies with the location and design features (i.e., number of lanes etc.), the "average" figure of the cost of this construction is in the range of \$10,000 a foot. This translates to a cost of approximately \$53 million per mile. Additionally, maintenance costs are very high because of the need for lighting and cleaning and, at times, the need for continual mechanical ventilation. Accordingly, decks should be considered for mitigation only in those extraordinary circumstances where there is clear evidence that specific environmental impacts will require decking as the only prudent mitigation. Because of costs, decking should be considered only after all other mitigation measures have been evaluated.

In reviewing the draft EIS for another proposed project, it was noted there was a proposed freeway-to-freeway type interchange between the proposed project and a local county road. Because of the high cost associated with the construction of the proposed interchange, the low traffic volumes on the county road, and the possible foreclosing of alternatives for any future relocations of the county road, this office requested additional supporting data. The State DOT reexamined this proposed interchange site and concluded an interchange was not justified. In this specific location the estimated savings was in excess of \$1 million.

The OEP has also reviewed a number of draft EIS's which propose the use of closed drainage systems. Based on the information in these draft documents, it was impossible to ascertain what specific problem the enclosed drainage system was designed to address. There may be specific situations where the use of an open drainage system will result in the intake of contaminants which would have an adverse effect on the lake or stream that the drainage facility leads into and those contaminants need to be excluded from that body of water. However, because of the costs involved with this type of construction, the environmental document will need to clearly identify the specific environmental impacts that will result if a closed drainage system is not used.

Recently, a State where a proposed roadway crossed a wetland decided to bridge the entire wetland area in response to concerns expressed by wildlife resource agencies. This would involve approximately 3,300 feet of structure at a cost of approximately \$17.5 million. The FHWA was not satisfied that sufficient information was available to justify bridging the entire wetland area and requested additional wetland studies. This additional analysis has not been completed, however, preliminary analysis indicates the possibility of reducing structure lengths to 1,200 feet with an estimated savings of \$6 million. The OEP recognizes there may be environmental reasons (e.g., a unique biological setting) or engineering reasons (e.g., poor soil conditions that would cause excessively high embankment construction costs) that provide a reasonable basis for the construction of a structure. However, a balanced decision will usually result in the use of mitigation measures other than bridging. The significance and function of the wetland area, other mitigation techniques such as equalizer pipes, the direct impacts from the construction technique, "other" impacts from the operation and maintenance of the facility, and both construction and maintenance costs are all factors that need to be evaluated as a part of this complex decisionmaking process.

With respect to cost-effectiveness in the design of noise barriers, a June 8, 1982, memorandum from this office mentioned that a computerized barrier design program was under development. That project has now been finalized and distribution of the program is expected next month. This will be a major step in facilitating the design of cost-effective noise barriers.

Attachment "B" is from a recent memorandum that was sent to those Regions with incomplete Interstate gap EIS's. This attachment summarizes various techniques that may assist in reducing the EIS development time. These same ideas are equally valuable concepts to be utilized on non-Interstate projects. The "coordination" that is stressed throughout this attachment will assist in resolving issues that may arise relative to various project-specific environmental mitigation proposals.

2 Attachments (NO)