14. Impacts on cultural heritage

HOW TO USE THIS CHAPTER IN THE CONTEXT OF EA AND ROAD PLANNING

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Shaded area in (A) Stages of EA covered in this chapter; (B) focus of this chapter; and (C) primary target readers.

KEY QUESTIONS ADDRESSED:

? What is it that a society may lose when a road project threatens to damage a part of its cultural heritage?

? How are cultural heritage sites identified?

? How is the significance of threatened cultural heritage assessed?

? How does one provide for the best possible long-term protection of cultural heritage threatened by a road project?
14.1 IMPACTS AND SETTING
The term cultural heritage, also termed cultural property, refers to sites, structures, and remains of archaeological, historical, religious, cultural, or aesthetic value. Cultural heritage, often only partially known and studied, is a particular form of expression of human values which serves to record past achievements and discoveries. Its identification and examination by specialists are helpful in understanding the significance of a site, according to its aesthetic, historic, scientific, and social value, in addition to its amenity value.

The process of assessing the cultural significance of a site is outlined in Box 14.1. For purposes of this discussion, the concept of cultural significance, as expressed through the above-mentioned values, serves as a useful backdrop against which to identify potential impacts. These values suggest that a road project may have the following impacts on cultural heritage:

- damage caused by road construction, related works such as quarries and borrow sites, and unregulated access to cultural heritage sites. Such damage could affect the historic, scientific, social, and amenity values;
- aesthetic impacts on cultural monuments and archaeological sites; and
- positive impacts on the amenity value arising from the increased visibility and accessibility of cultural sites.

BOX 14.1
SIGNIFICANCE ASSESSMENT OF CULTURAL HERITAGE

Cultural significance is a concept used in estimating the value of a site. It includes aesthetic, historic, scientific (research), social or economic value, and the concept of amenity value. Sites that are likely to be significant are those that help our understanding of the past, or enrich the present, and that will be of value to future generations.

Significance assessment is the basis for determining any action that will protect cultural sites and is an integral part of a site management plan. It requires in-depth knowledge of art and architectural history, social history, and knowledge of materials. There usually are many management alternatives for any site; thus understanding the site's significance is a prerequisite for deciding on a course of action. Adequate detail is also needed to determine the best or most appropriate method of conserving cultural significance, as different elements require different management strategies.

Cultural significance can be assessed in different ways and with varying scope. The process may be informal and rapid or it may be formal and require a complement of specialized expertise (such as archaeologists, legal specialists, anthropologists, and botanists). It may deal with an individual site or be part of a regional or local overview. The appropriate level of detail will vary according to circumstances.

Aesthetic value. Aesthetic judgment is perhaps the most subjective of the criteria used in determining cultural significance. Although such judgment is shaped by cultural background and taste, the design, level of craftsmanship, and choice of materials also play an important role. It can explain why the general public is attracted to some sites more than others.

Historic value. A site can be a typical or well-preserved example of a culture, group, period of time, or type of human activity, or might be associated with a particular individual. Often the place, rather than exemplifying one phase or aspect of history, is the embodiment of a long sequence of history.

Scientific or research value. This value will depend upon the importance of the data which could be obtained from the site; more specifically, its rarity, quality or representativeness. In addition to information on technological change, sites can provide evidence of changes in climate, the environment, and the animal population. The assessment of scientific or research significance is difficult because often potential rather than present scientific significance is being evaluated.

Social value. This concept embraces the qualities by which a place becomes a focus of spiritual, political, national, or other cultural significance to a majority or minority group. To the local, regional, or national community such sites may be a source of pride, education, or celebration, or a symbol of enduring culture. The qualities causing this preference are very important and in many cases are the strongest argument for conserving the place. For example, the site may be accessible and well known rather than particularly well preserved or scientifically important.

ing from improved access to sites recognized for their cultural value; and on the scientific, historic, and social values arising from the addition of interesting sites previously unknown or overlooked; and the updating of the region's heritage.

14.2 DETERMINING THE NATURE AND SCALE OF IMPACTS

14.2.1 Preliminary assessment
In some cases, the initial assessments of project activities, as well as the land likely to be physically or visually disturbed by the road, may bring to light potential historical or archaeological issues. Public consultation or knowledge of prior archaeological or cultural finds in the region may suffice to identify the existence of such issues. But, in many areas, the information base is too limited, and field surveys will be necessary. In such instances, the assessment team will have to draw upon the information sources identified in the next section and conduct surveys sufficient to determine whether a full assessment is required.

14.2.2 Cultural heritage
If the preliminary assessment establishes the likelihood that historical and archaeological sites, relevant to the road route and its surrounding area, are present, then a complete assessment will be required of potential impacts on cultural heritage. For this, the services of an archaeologist or historian are usually necessary.

Four components of a cultural heritage impacts assessment warrant attention here:

i) secondary sources of information;
ii) the survey process;
iii) the establishment of cultural significance and priorities; and
iv) the assessment of the scale and cost of the impacts.

Secondary sources of information
The lack of adequate information on cultural heritage is probably the single greatest obstacle to its effective protection. Thus the following sources should be examined thoroughly:

- inventories of sites, classified according to applicable legislation and comprised of specialized publications from the departments of the culture ministry (or its equivalent); or from universities and research centers; descriptions of ruins and sites; and excavation reports. With respect to the applicable legislation, Box 14.2 provides some useful pointers as to the kinds of legislation that are particularly relevant to cultural sites;
- legislation of the kinds identified in Box 14.2 should also be surveyed to identify any restrictions on certain categories of cultural heritage;
- bibliographic sources, including travelers' accounts;
- maps which may reveal such information as field boundaries that conserve traces of ancient roadways, and other cartographic evidence of cultural heritage;
- toponyms (place names) taken from texts of old maps and drawings, which provide considerable useful information that may identify settlements which are no longer readily visible, (for example a location rich in traces of ashes from fires or homes destroyed by fire might bear the significant toponym of

BOX 14.2
CULTURAL HERITAGE IN INTERNATIONAL AND NATIONAL LAW
Cultural heritage is legally protected in almost every country. The Convention for the Protection of the World Cultural and Natural Heritage of 1972 has become the foundation for national and other legislation since it requires signatories to adopt general policies, establish appropriate organizations and service, and develop legal, scientific, and financial measures for the protection and conservation of cultural and natural heritage. The World Heritage List, sponsored by UNESCO, also encourages protection and to date includes more than 360 cultural sites of exceptional interest and universal value.

At the national or state level, there are generally four kinds of legislation relevant to cultural sites: (i) heritage place protection acts that specifically protect particular places (or places as a class) and specify procedures for their protection; (ii) land management, zoning, or planning acts that provide general protection for sites; (iii) notification or listing acts that allow for the recording of important data on cultural sites; and (iv) acts to conserve natural areas in which cultural features are located. In many countries, religious laws also address cultural heritage and, in some cases, assign ownership or oversight responsibilities to various religious authorities.

"black lands"); and
- low altitude aerial photography, which has proven one of the best ways to investigate and detect archaeological ruins (Figure 14.1, Box 14.3).

The survey process
Field surveys for cultural sites generally include the following three steps:

i) carry out a rapid field survey, usually on foot, to identify the pattern of site distribution in the area under examination;
ii) determine the area that includes evidence of remains and the points that present the highest concentration of artifacts; record their location, characteristics, and state of conservation—carrying out sample soundings, if necessary; and

FIGURE 14.1
IDENTIFICATION OF ARCHAEOLOGICAL SITES USING AERIAL PHOTOGRAPHY

The drawing illustrates one phenomenon that can be used in aerial reconnaissance of archaeological sites. A buried wall (1) can cause lower humidity prejudicial to the growth of cereals (A). An ancient ditch cutting into the subsoil (2), to the contrary, promotes cereals’ growth and makes them greener (B).

BOX 14.3
AERIAL PHOTOGRAPHY FOR ARCHAEOLOGICAL SURVEYS

The discovery of an archaeological site by aerial photography is rarely an accident, but rather the result of a systematic investigation of clues derived from examination of aerial evidence. The following details should be given particular attention:

- Topographic and vegetation clues: Their study can reveal anomalies in the structure of the landscape (fossilized ruins; terrain anomalies, such as mounds or tells).
- Phytophagic clues: Anomalies in the growth of crops (Figure 14.1), reflected in differences in height and color, vary according to the nature of the underlying structures (e.g. details of vegetation often corresponding to archaeological structures).
- Pedological clues: Anomalies in the surface characteristics of soil are reflected in variations in shading on the photograph. Where building materials are lying just under the surface, this may be revealed by color contrasts with that of the surrounding earth.
- Hygrometric clues: Anomalies in soil humidity can be revealed by a color that differs from that of the surrounding superficial layers (e.g. damper soil may lead to a darker color of the soil and that of vegetation).
authenticate and localize the information gathered. For example, identify where the people obtained the stones they used to build their structures.

If the road project is a complex one, involving more than a single road, it may have an effect on the cultural heritage that warrants a more comprehensive regional approach to the impact assessment and to the organization of the management of the heritage features.

**The establishment of cultural significance and priorities**

There may be several sites of interest that are susceptible to disturbance in any one area. Once the survey information has been gathered, the team can conduct a significance assessment of each site based on an analysis of the remains for their archaeological, historical, scientific, religious, or aesthetic significance (see Box 14.1). At this stage the state of conservation of the remains should also be assessed and recommendations should be made regarding needed protective measures.

Relative to each site, priorities can then be determined, taking into consideration site classification according to legislation, the depth to which archaeological artifacts may be found below the ground surface, and the condition and significance of the site. These priorities might be organized as follows:

- highly important sites and protected sites, to be preserved intact;
- sites of special cultural interest, to be avoided whenever possible; and
- potential sites, requiring surface exploration as well as limited archaeological sounding and recording.

Box 14.4 gives an example of the approach taken for the planning of a road-widening project in the city of Ningbo in China.

**The assessment of the scale and cost of the impacts**

The assessment of the scale of the impacts will reflect the significance of the heritage, the degree of irreversibility of the anticipated impacts, and the extent of potential damage. Both direct impacts (e.g., destruction) and indirect impacts (e.g., changes to water tables and induced development) should be assessed. Minor as well as major heritage values should be included, since any one value may be subject to several different sources of pressure and thus cumulative impact acquires significance.

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**BOX 14.4**

**ROAD WORKS IN HISTORIC URBAN AREAS: CHINA**

Under the Zhejiang Multi Cities Development Project, the World Bank is helping to finance the improvement of urban infrastructure in the city of Ningbo. Due to the rapid growth of the city, the existing road networks are inadequate to carry the present level of traffic. Current growth trends suggest that economic activity and traffic volume will increase in Ningbo. Significantly, the existing roads correspond in large measure to the roads known as early as the 11th century. The original consulting road engineers, when thinking of ways to improve traffic flows, chose to focus efforts on the already established traffic routes. This option, however, involved the widening of roads in the historic core of the city and the destruction of numerous historic structures including temples that are the center of activity for religious communities.

In view of the possible negative impacts of the proposed works on the cultural heritage of Ningbo, specialist architectural conservators were called in to carry out an analysis of the cultural heritage assets. They ranked the buildings and sites adjacent to the proposed road alignment according to architectural and cultural significance, and recommended alterations to the road in order to spare as many of the important structures as possible. The value of a small lake in the center of the city for recreational and visual amenity was also emphasized by the consultants, who urged that the city take steps to conserve the unique character of the lake. They also suggested the creation of conservation areas. In their report they raised the question of creating a ring road rather than routing all traffic through the city.

The suggested road alignments have been adopted by the city. An inventory of cultural property in the project area has been undertaken. In view of the tremendous pace of new building in Ningbo—as in other cities in China—it is urgent to establish zoning and development controls to guide the development of roads and infrastructure while protecting clusters of historic buildings and other areas of interest. Planning for the protection of the cultural resources at an early stage in project identification is the best way to ensure cost-effective and adequate conservation.
The effectiveness of the government in enforcing relevant legislation should also be taken into account, along with the cost of enhancing this effectiveness, if necessary.

Where tourism could be increased to the benefit of the local or national economy, the costs of realizing such benefits should be calculated. Similarly, any anticipated losses in tourism revenues (arising from damage generated by the road project) should be calculated.

14.3 REMEDIAL MEASURES

14.3.1 Prevention

Where possible, road construction should avoid any alignment that cuts through known cultural sites (see Figure 14.2). If an important site is uncovered during road works, possible realignment of the road should be considered.

In some unusual cases it is preferable to leave a cultural site buried beneath the road. This may involve raising the level of the road, as shown in Figure 14.2.

14.3.2 Mitigation

Commonly-utilized mitigative measures include excavation, erosion control, restoration of structural elements, rerouting of traffic, and site mapping. Other measures that may be required on occasion are structural stabilization, soil and rock stabilization, control of groundwater levels, vegetative stabilization, control of flora and fauna, and site surveillance.

In exceptional cases, if it proves impossible for an alignment to avoid a cultural site of value, salvage excavation should be undertaken. Relocating artifacts or ruins from a site is a last alternative and can be expensive.

A site management plan will be required. It should identify conservation actions required and, where necessary, provide guidance on other measures such as salvage or relocation. It should establish monitoring and evaluation procedures and a schedule of operations and budget. Particularly important is the inclusion in the plan of specific contract clauses to define responsibilities of companies and workers who discover new sites or artifacts, or who damage known sites. These chance find procedures, all too often, are given inadequate attention. At the very least, they should identify the authorities to whom the company or individual should report, the format for such reporting, the waiting period required before work can be resumed, and measures for interim care of the found items.

Dialogue between the road department and the ministry in charge of cultural heritage needs to be frequent and continuous to avoid situations which either damage the cultural site
or delay the road project. In some countries, road projects have been delayed for years because of a lack of procedures governing cultural sites, or lack of funding for the protection, study, or restoration of these sites. In practice, a cooperative relationship between road builders and archaeological specialists is essential. If cultural heritage requirements are too rigid, some site discoveries may be hidden or destroyed to avoid compliance. If, however, road workers fail to allow for heritage sites, substantial delays and cost increases can occur.

All this suggests that if the mitigation plan is to be effective, in most countries it will have to include proposals for strengthening the legal framework and the institutional capacities for the on-going management of the cultural heritage in question. Thus, when the legislation is being examined in order to identify relevant information pertaining to the sites in question, an assessment of the effectiveness of that legislation and of supportive institutional capacity should also be conducted.

14.3.3 Compensation

Examples of compensatory actions may be

- tourist development of the site where heritage elements are conserved and showcased, and
- classification of the site as protected under appropriate legislation. For sites of international quality, UNESCO listing as a World Heritage Site may be proposed.

14.4 MINIMIZING IMPACTS ON CULTURAL HERITAGE FEATURES: AN ACTION CHECKLIST

Baseline data and potential environmental impacts

The identification and prioritization of historical and archaeological sites should occur prior to route surveying. It should pinpoint highly sensitive areas, and archaeological soundings (see Section 14.2).

Analysis of alternatives

Options for the avoidance of sensitive areas should be considered seriously (see Section 14.3.1).

Mitigation plan

Any such plan should include rules for the construction phase and archaeological supervision (see Section 14.3.2).

Environmental specifications for contractors

These should specify the actions required and the person responsible, and should define the nature and scope of any additional development work that may be called for (see Section 14.3.2).

Legislation

The analysis should focus on legislation that is in effect in the country or region, and the regulations regarding various classes of protected sites (see Box 14.2 and Section 14.3.2).

14.5 REFERENCES AND BIBLIOGRAPHY


