Preliminary Investigation (PI-0260)

Caltrans Division of Research, Innovation and System Information

Historic Aquatic Conveyance Systems: Survey of Practice

Requested by
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Executive Summary

Background

The California Department of Transportation (Caltrans) is seeking information from other state departments of transportation (DOTs) about practices used to assess the impacts of transportation projects to long linear features that are similar to California's historic water conveyance systems. These California water features have been found eligible, either partially or in their entirety, to be listed on the National Register of Historic Places. Similar long linear features in other states might be water conveyance systems, railroads, trails or corridors of cultural significance such as Route 66.

Information gathered from these agencies will be used to create a standardized methodology to determine the impacts of transportation projects—such as upgrading existing bridges or building new ones—to water conveyance systems and other long linear features. These standard practices are expected to reduce or eliminate risks associated with draft and final environmental document project milestones.

To assist Caltrans in this information-gathering effort, CTC & Associates conducted a national survey of state DOTs to inquire about agency experience with assessing the impacts of transportation projects on long linear features. A literature search supplemented the information gathered through the survey. Findings from these efforts are presented in this Preliminary Investigation in two topic areas:

- Survey of practice.
- Related research and resources.

Summary of Findings

Survey of Practice

An email survey was distributed to state transportation agency members of the following committees:

- American Association of State Highway and Transportation Officials (AASHTO) Committee on Environment and Sustainability.
- Transportation Research Board (TRB) Standing Committee on Historic and Archaeological Preservation in Transportation.

Eight state transportation agencies responded to the survey. New Jersey DOT has established a programmatic approach for assessing the impact of transportation projects on the Delaware and Raritan Canal (D&R Canal). Vermont Agency of Transportation is currently establishing a programmatic approach for assessing the impact of transportation projects on railroads. Texas DOT has not established a programmatic approach for assessing the impact of transportation projects on long linear features such as water conveyance systems but has a long-standing relationship with the Texas State Historic Preservation Office (SHPO) on how to treat projects that might affect irrigation and other water conveyance systems. The remaining five agencies—Delaware, Missouri, Tennessee, Wisconsin and Wyoming DOTs—have not established a programmatic approach primarily because these states have few linear resources.

Information obtained from respondents addressed current practices related to long linear features in general and, more specifically, the impacts of transportation projects and mitigation measures related to water conveyance systems. Survey results from these agencies are presented in the following topic areas:

- Long linear features.
- Water conveyance systems.

Long Linear Features

Current Practice

Findings from the survey are summarized below based on the agency's experience with using a programmatic approach to assess the impact of transportation projects on long linear features:

- Established a programmatic approach.
- Establishing a programmatic approach.
- Alternative to a programmatic approach.
- No programmatic approach.

Established a Programmatic Approach

Of the eight transportation agencies responding to the survey, only New Jersey DOT has established a programmatic approach for assessing the impact of transportation projects on a water conveyance system, the D&R Canal. The agency has jurisdictional and maintenance responsibilities for highway bridges over the 60-mile canal and frequently performs emergency repairs to bridges, culverts, railroads and other infrastructure in environmentally sensitive and historically significant areas. Other regulating agencies with responsibilities to the canal and surrounding state park include the D&R Canal Commission (DRCC), which assists with park development and land use; New Jersey Department of Environmental Protection (NJDEP), Division of Parks and Forestry; and New Jersey Water Supply Authority (NJWSA).

New Jersey DOT and the DRCC established an interagency task force to develop a programmatic approach for transportation projects and to create protocols that meet DRCC and New Jersey DOT needs. The task force developed a standardized approach for materials used for bridge repair projects along the canal. In the future, it will review the characteristics of various structure types and work to develop a series of protocols that meet DRCC regulations while conforming to current design standards and Federal Highway Administration (FHWA) funding regulations.

The agency has not developed formal written procedures for preparing environmental documents. Typically, the environmental unit will coordinate with the New Jersey Historic Preservation Office, DRCC, NJDEP and NJWSA to prepare environmental documents for review and approval before construction.

Establishing a Programmatic Approach

Vermont Agency of Transportation is establishing a programmatic approach to assess the impact of transportation projects to railroads. Currently the agency uses the activities-based approach described in an Advisory Council on Historic Preservation (ACHP) program comment that addresses the exemption for federal undertakings on railroads described in Section 106 of the National Historic Preservation Act. (Section 106 requires federal agencies to consider the effects of projects on historic properties and to allow the ACHP to comment.) Upcoming survey

work should allow the agency to also use the property-based exemption under this program comment.

Alternative to a Programmatic Approach

Although Texas DOT has not committed through a programmatic agreement, the agency has a long-standing relationship with the Texas SHPO on how to treat projects that might affect irrigation and other water conveyance systems. The respondent noted that the agencies have collaborated on approaches to evaluating irrigation systems and avoiding adverse effects to those considered historical. Texas DOT is less consistent with its treatment of other linear corridors, but has a general programmatic agreement for Section 106 that covers many common issues.

No Programmatic Approach

Five state transportation agencies responding to the survey—Delaware, Missouri, Tennessee, Wisconsin and Wyoming DOTs—have not established a programmatic approach to assess the impact of transportation projects on long linear features, primarily because their states lack linear features:

Delaware. In addition to a lack of linear features in the state, Delaware DOT projects typically do not have the potential to impact eligible linear features on a regular basis. Railroads are the common linear feature encountered in the state; impacts to portions of historic or potentially historic railroads have occurred occasionally in the past few years, but not on a scale where the SHPO "would be comfortable with the development of a programmatic approach."

When the agency does assess the impacts of a transportation project to a historic railroad, Delaware DOT establishes the character-defining features and integrity requirements of the linear resource, and the important associated elements for the railroad property type. The primary element to convey significance is the railroad alignment and roadway, for example, the railroad right of way; grade modifications such as cuts and fills; and a railroad bed. Secondary features (such as the ballast, tracks and buildings) add to the integrity of the railroad, but are not all necessarily required for the resource to retain integrity, according to the survey respondent. Assessment of transportation project impacts to railroads may differ from that of nonlinear resources. For example, if a project impacts only a small portion of a railroad (such as replacing or removing materials or associated elements) and the majority of the railroad alignment and roadway remain intact, the project may not be considered to have an adverse effect.

Missouri. Guidance developed by the Oregon SHPO is used in Missouri in place of a programmatic approach.

Tennessee. The state has few intact linear resources, and only short segments of historic linear resources have been identified as eligible for listing with the National Register.

Wisconsin. The agency has developed a programmatic approach for parkways and bridges in Milwaukee County, but not for true linear features. The Wisconsin SHPO does not typically review or evaluate linear resources for their eligibility in the National Register. It has reviewed dams and bridges, but not water conveyance systems. According to the respondent, there are very few water conveyance systems in the state to review. Outside of its routine process for the National Environmental Policy Act (NEPA), the agency has not

developed procedures for preparing environmental documents that address the possible impacts of transportation projects on long linear features.

Wyoming. Transportation projects on long linear features occur so infrequently in the state that Wyoming DOT analyzes each project individually and incorporates the findings in NEPA documentation.

Interest in Developing a Programmatic Approach

Transportation agencies in two states—Missouri and Texas—are potentially interested in developing a programmatic approach to assess the impact of transportation projects to long linear features. Missouri DOT has some interest in developing a programmatic approach for the Little River Drainage District, a massive drainage system located in the Missouri Bootheel region of the state. The state SHPO considers much of this network eligible for the National Register, however, meeting the needs of various stakeholders has made developing a programmatic approach difficult. The Texas DOT respondent reported that the agency is always looking for new ways to address some of these projects and resources programmatically.

Water Conveyance Systems

Impacts of Transportation Projects

Missouri, New Jersey and Texas DOTs identified short- and long-term impacts of transportation projects to water conveyance systems. Among the short-term impacts are erosion and sediment control (Missouri and New Jersey), traffic disruptions (New Jersey) and restrictions to public access (New Jersey). The respondent from New Jersey DOT recommended mitigation issues for these impacts: appropriate erosion and sediment control standards, traffic control measures, proper construction techniques and the use of properly muffled motorized equipment.

Long-term impacts are erosion and slope failure (New Jersey), interruptions to canal operations (Texas) and permanent changes to associated structures (Texas). Construction projects in New Jersey's D&R Canal and State Park may cause long-term, but mitigable adverse impacts to surface water, floodplains, aquatic ecology, wetlands, endangered and protected species, cultural resources, viewsheds and other resources. In Texas, the SHPO has worked with organizations involved in National Register eligible flood control systems to develop an understanding of what may or may not constitute an adverse effect. Changes that do not affect the system's ability to convey water, or that do not change basic design, materials and workmanship, are largely considered to have no adverse effect, especially when changes are made on a small scale relative to the overall system size.

Mitigation Practices

Respondents from three agencies—Missouri, New Jersey and Texas DOTs—described their agencies' experience with mitigation measures and the triggers for conducting mitigation related to water conveyance systems:

Missouri. Impacts in the state have been small. The agency usually incorporates a general history and high-quality photographs of the area before construction.

New Jersey. DOT projects have a high potential to affect the D&R Canal and State Park, and the agency is often required to conduct resource restoration or data recovery for archeology purposes. Mitigation has been required for the replacement of numerous aging bridges that cross the canal that the SHPO believes compromise the integrity of the historic

nature of the canal as well as the setting of the park. The respondent noted that these types of projects can be highly controversial, and getting approval from all agencies for the aesthetics and materials used can be challenging. A programmatic approach is beneficial in these situations if all agencies can agree on the use of certain practices and materials.

Other mitigation measures under consideration to minimize impacts to the visual effects of the canal include:

- Preserving existing vegetation wherever practical.
- Minimizing cut and fill to balance structural stability, appropriate vertical profile and aesthetic features of the roadway and appurtenant features.
- Mitigating ground-disturbing activities through seeding, landscaping restoration and long-term maintenance.
- Limiting lighting within the DOT right of way to areas that require improved visibility for safety (usually confined to higher volume interchanges) and that display driver information signage where necessary.

Texas. Texas DOT proactively conducted intensive evaluations of several irrigation systems. The survey respondent noted that while the agency has not formally conducted mitigation for projects to date, the amount of research and documentation that exists as a result of the evaluations that were made "could easily feed a mitigation product."

Related Research and Resources

A literature search was conducted of domestic in-progress and completed research, published reports and other resources. The search specifically focused on three areas of interest to Caltrans:

- Interaction of historic resources and infrastructure development.
- Short- and long-term impacts on historic water conveyance systems.
- Appropriate cultural resource management techniques:
    - Mitigation measures and triggers for doing mitigation related to historic water conveyance systems.
    - Processing procedures that could be incorporated into a programmatic agreement between Caltrans and agencies that regulate historic resources.

The search uncovered very limited resources directly related to these topic areas. The ACHP web site provides a range of tools and information related to infrastructure projects and Section 106 compliance. Other resources provided in this section are related to programmatic agreements, including the Programmatic Agreements Library Database, which provides access to executed programmatic agreements and research agreements that meet specific requirements.

Gaps in Findings

Only eight state DOTs responded to the survey, and respondents from only three of these agencies reported having experience with a programmatic approach or strategies similar to a programmatic approach that assess the impact of transportation projects to long linear features. Two of these agencies (New Jersey and Texas DOTs) have experience with water conveyance systems. The Texas DOT survey respondent provided a field guide related to the irrigation systems of the lower Rio Grande Valley; none of the remaining agencies has developed

procedures for agency staff to follow when preparing environmental documents. The literature search also produced a very limited amount of research and other resources that address the interaction of historic resources and infrastructure development, impacts on historic water conveyance systems, or appropriate mitigation measures and processing procedures.

Next Steps

Moving forward, Caltrans could consider:

- Contacting New Jersey DOT to learn more about its experience creating protocols for a programmatic approach, specifically, the standardized approach for materials used in bridge repair projects along the D&R Canal.
- Contacting Vermont Agency of Transportation about its plans to create a programmatic approach for railroads to inquire about procedures that could potentially be incorporated in a protocol for water conveyance systems.
- Engaging with Texas DOT and the SHPO for information about their approaches to evaluating irrigation systems and avoiding adverse effects to historic resources.
- Reaching out to the Texas SHPO about its interagency efforts with irrigation districts and flood-controlling entities.
- Gathering information from state DOTs that did not participate in the survey to learn about their experience with long linear features, specifically water conveyance systems.
- Examining the guidance documents provided by Missouri and Texas DOTs and the Vermont Agency of Transportation, and other resources related to infrastructure projects, for potential procedures and practices.

Detailed Findings

Background

Historic water features such as the California State Water Project and the Central Valley Project have been found eligible, either partially or in their entirety, to be listed on the National Register of Historic Places. These long linear features impact the state's transportation system via numerous bridges located throughout California. The historical designation of these resources requires stakeholders from many agencies to review and approve infrastructure rehabilitation and construction projects. The California Department of Transportation (Caltrans) lacks a standardized approach for assessing the impacts associated with transportation projects. The lack of a standardized approach that has been vetted and approved by each regulating agency has resulted in uncertainties in project delivery and the environmental process.

Caltrans is seeking information about practices used by other transportation agencies and described in published literature to assess the impacts of transportation projects to long linear features such as water conveyance systems, railroads, trails or corridors of significance (for example, Route 66). The agency will use this information to create a standardized methodology to determine the impacts that transportation projects have on these historic water conveyance systems, which could reduce or eliminate risks associated with draft and final environmental document project milestones.

To assist Caltrans in this information-gathering effort, CTC & Associates conducted a national survey of state departments of transportation (DOTs) to inquire about agency experience with assessing the impacts of transportation projects on long linear features. A literature search supplemented the information gathered through the survey. Findings from these efforts are presented in this Preliminary Investigation in two topic areas:

- Survey of practice.
- Related research and resources.

Survey of Practice

To learn about state DOT experience using a programmatic approach to assess the impact of transportation projects on long linear features, an email survey was distributed to state transportation agency members of the following committees:

- American Association of State Highway and Transportation Officials (AASHTO) Committee on Environment and Sustainability.
- Transportation Research Board (TRB) Standing Committee on Historic and Archaeological Preservation in Transportation.

Survey questions are provided in Appendix A. The full text of survey responses is presented in a supplement to this report.

Summary of Survey Results

Eight state transportation agencies responded to the survey:

- Delaware.
- Missouri.
- New Jersey.
- Tennessee.

- Texas.
- Vermont.
- Wisconsin.
- Wyoming.

Experience with a programmatic approach varied among agencies:

- *Established programmatic approach*. New Jersey DOT has established a programmatic approach for assessing the impact of transportation projects on the Delaware and Raritan Canal (D&R Canal).
- *Establishing a programmatic approach*. Vermont Agency of Transportation is currently establishing a programmatic approach for assessing the impact of transportation projects on railroads.
- *Alternative to a programmatic approach*. Texas DOT has not established a programmatic approach but has a long-standing relationship with the Texas State Historic Preservation Office (SHPO) for projects that might affect irrigation and other water conveyance systems.
- *No programmatic approach*. The remaining five agencies—Delaware, Missouri, Tennessee, Wisconsin and Wyoming DOTs—have not established a programmatic approach primarily because of a lack of linear resources in these states.

Survey results are summarized below in the following topic areas:

- Long linear features: current practice.
- Transportation projects and water conveyance systems.

Long Linear Features: Current Practice

Use of a Programmatic Approach

Practices used by agencies participating in the survey are summarized below in the following categories:

- Established a programmatic approach.
- Establishing a programmatic approach.
- Alternative to a programmatic approach.
- No programmatic approach.

When available, supplementary resources are provided at the end of each topic area. These resources include guidance and system information provided by respondents or sourced through a limited literature search.

Established a Programmatic Approach

Of the eight transportation agencies responding to the survey, only New Jersey DOT has established a programmatic approach for assessing the impact of transportation projects on a water conveyance system. The D&R Canal is a man-made water conveyance system that originates at the Delaware River near Stockton, New Jersey, and terminates at the Raritan River in New Brunswick, New Jersey. Information about this programmatic approach is summarized in Table 1.

Table 1. New Jersey Department of Transportation: Programmatic Approach

Topic	Description
Project Description	Delaware and Raritan Canal (D&R Canal)
Background	Constructed in the 1830s, this 60-mile canal and many of its historic structures (including wooden bridges and 19th century bridge tender houses, cobblestone spillways, hand-built stone-arched culverts and locks) were added to the National Register in 1973. One year later, the canal became a state park.
Partners	• Delaware and Raritan Canal Commission (DRCC) assists with park development and regulates land use in the park's 400-square-mile watershed. • New Jersey Department of Environmental Protection (NJDEP), Division of Parks and Forestry, manages the multiuse towpath trails in the park. • New Jersey DOT has jurisdictional and maintenance responsibilities for highway bridges over the D&R Canal. Many of the agency's projects along the Route 29 and Route 1 corridors (from Trenton to New Brunswick) have a high potential to affect the canal and park. • New Jersey Water Supply Authority (NJWSA) operates and maintains the water transmission complex of the canal as a water supply resource, pumping water to customers in central New Jersey.
Agency Practices	New Jersey DOT frequently performs emergency repairs to bridges, culverts, railroads and other infrastructure in environmentally sensitive and historically significant areas. Receiving approvals from multiple agencies is challenging, according to the respondent, as each agency "protects its interests." To develop a programmatic approach for transportation projects, New Jersey DOT and the DRCC established an interagency task force to create protocols that consider both the DRCC visual, natural and historic impact and New Jersey DOT design standards. Meetings with subject matter experts (environmental specialist, historic preservationist and structural engineers) began after the task force was formed. Collaboration was strengthened by ongoing meetings of the task force and contacts made through this process. The task force developed a standardized approach regarding the materials used in bridge repair projects for bridges with similar characteristics along the D&R Canal. Future meetings will review the characteristics of the various structure types. The group will work to develop a series of protocols that meet the DRCC regulations while conforming to current design standards and Federal Highway Administration (FHWA) funding regulations. DRCC will review and recommend minimum design clearances for canoeing and boating, and will recommend alternatives if this minimum cannot be accommodated.
Procedures for Preparing Environmental Documents	New Jersey DOT has not developed formal written procedures for preparing environmental documents. Typically, a unit within the agency will make a formal request to the environmental unit to obtain the needed approvals. Then environmental staff will coordinate with the New Jersey Historic Preservation Office, DRCC, NJDEP and NJWSA to prepare the environmental documents for review and approval before construction.

Supporting Documents

Delaware and Raritan Canal State Park, Delaware and Raritan Canal State Park, undated.
https://www.dandrcanal.com/index.php/about-d-r-canal-state-park/general-information
From the web site: The 70-mile Delaware and Raritan Canal State Park is one of central New Jersey's most popular recreational corridors for canoeing, jogging, hiking, bicycling, fishing and horseback riding. The canal and the park are part of the National Recreation Trail System. This linear park is also a valuable wildlife corridor connecting fields and forests.

Delaware and Raritan Canal Commission, Department of Environmental Protection, State of New Jersey, undated.
https://www.nj.gov/dep/drcc/about-commission/overview/
From the web site: The Delaware and Raritan Canal Commission is a state agency created by law in 1974 whose mission is to prepare, adopt and implement a master plan for the physical development of the Delaware and Raritan Canal State Park; review [s]tate and local actions that impact on the park to [e]nsure that these actions conform as nearly as possible to the commission's master plan; and coordinate and support activities by citizens' groups to promote and preserve the park.

The [c]ommission works closely with the New Jersey Department of Environmental Protection, Division of Parks and Forestry, State Park Service, which owns and manages the Delaware and Raritan Canal as a state park. The [c]ommission coordinates its activities with the New Jersey Water Supply Authority, which operates and maintains the vitally important water transmission complex elements of the canal, which provide 100 million gallons of drinking water daily for 1 million people in central New Jersey. Working together, the three agencies ensure that the environmental, recreational, historic and water supply resources of the Delaware and Raritan Canal are protected and preserved for future generations of New Jerseysans.

Related Resource:

> **Regulations for the Review Zone of the Delaware and Raritan Canal State Park**, Seventh Edition, Department of Environmental Protection, Delaware and Raritan Canal Commission, State of New Jersey, June 2009.
> https://www.nj.gov/dep/drcc/pdf/drcc_regs.pdf
> *From Subchapter 1*:
>
> > The [c]ommission is authorized to prepare and adopt a [m]aster [p]lan for the physical development of the Delaware and Raritan Canal State Park and to establish zones in which it will review all private and public projects that impact on the [p]ark and ensure that the projects conform as nearly as possible to the [m]aster [p]lan adopted by the [c]ommission. This chapter establishes the procedure for the review and sets forth the standards that will be considered by the [c]ommission. The rules are intended to encourage consideration of the natural, historic and recreational resources of the [p]ark and its environs at the earliest stages of land use planning and to promote cooperation between the [c]ommission, municipal, county and [s]tate reviewing agencies, and private land users.
>
> Subchapter 10 presents standards and requirements for the visual, historic and natural quality impacts of all projects. Mitigation measures are discussed throughout the document.

New Jersey Department of Environmental Protection, Division of Parks and Forestry, State of New Jersey, undated.
https://njparksandforests.org/
This web site provides access to New Jersey's state parks, forests and historic sites. Among the department's priorities is a commitment to "manage and promote thriving natural and historic resources."

New Jersey Water Supply Authority, New Jersey Water Supply Authority, undated.
https://www.njwsa.org/
From the web site: The New Jersey Water Supply Authority is a public body, corporate and politic, constituted as an instrumentality of the State of New Jersey, exercising public and essential governmental functions. … The Authority has formed partnerships with nonprofit, municipal, [c]ounty and [s]tate entities to maximize its watershed acquisitions. The Authority, along with its partners, has taken a strategic approach at preservation with the intention of creating contiguous areas of preserved open space. In addition, these partnerships have allowed the Authority to cost-share, and to designate management of properties to other entities [that] wish to utilize the properties for mutually acceptable purposes.

Establishing a Programmatic Approach

Vermont Agency of Transportation is currently establishing a programmatic approach to assess the impact of transportation projects to railroads. Information about current practices is summarized in Table 2.

Table 2. Vermont Agency of Transportation: Establishing a Programmatic Approach

Topic	Description
Project Description	The agency is developing a programmatic approach for railroads.
Agency Practices	Currently the agency uses the activities-based approach described in the Advisory Council on Historic Preservation's (ACHP's) Program Comment to Exempt Consideration of Effects to Rail Properties Within Rail Rights-of-Way (see **Supporting Documents** below). The program comment addresses the exemption for federal undertakings on railroads described in Section 106 of the National Historic Preservation Act, which "requires federal agencies to consider the effects of their undertakings on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment with regard to such undertakings." Upcoming survey work should allow Vermont Agency of Transportation to also use the property-based exemption under this program comment.
Procedures for Preparing Environmental Documents	None.

Supporting Documents

"Notice of Amendment to the Program Comment to Exempt Consideration of Effects to Rail Properties Within Rail Rights-of-Way," Advisory Council on Historic Preservation, *Federal Register*, Vol. 84, No. 125, June 28, 2019.
https://www.achp.gov/sites/default/files/program_comments/2019-06/FR%20Notice%20Rail%20ROW%20Program%20Comment%20amended.pdf
From the summary:

> This [p]rogram [c]omment accelerates the review of undertakings affecting rail properties within rail rights-of-way under Section 106 of the National Historic Preservation Act and meets the requirement of Section 11504 of the Fixing America's Surface Transportation Act. The [p]rogram [c]omment can be used by any federal agency with responsibility to consider the effects of undertakings within rail rights-of-way.
>
> The [p]rogram [c]omment is comprised of two major parts: (1) An activity-based approach, and (2) a property-based approach. The activity-based approach provides a list of activities in Appendix A for which, when the specific conditions are met, no further Section 106 review is required. The property-based approach establishes a process whereby project sponsors can opt to work with the relevant USDOT [o]perating [a]dministration and stakeholders to develop a list of excluded historic rail properties that would continue to be subject to Section 106 review, and exempt from review the effects of undertakings to all other historic rail properties within a designated area.

Details about the activities-based approach are given in Section III (page 31076 of the program comment, page 2 of the PDF); Section IV addresses the property-based approach (page 31077 of the program comment, page 3 of the PDF). Appendix A, Exempted Activities List, addresses "maintenance, repair and upgrades to rail properties that are necessary to ensure the safe and efficient operation of freight, intercity passenger, commuter rail and rail transit operations" (beginning on page 31079 of the program comment, page 5 of the PDF). Properties and activities discussed include track and trackbed; bridges and tunnels; railroad and rail transit/roadway at grade crossings and grade separations; erosion control, rock slopes and drainage; environmental abatement; and landscaping, access roads and laydown areas.

Related Resource:

> **Program Comment to Exempt Consideration of Effects to Rail Properties Within Rail Rights-of-Way**, Advisory Council on Historic Preservation, August 17, 2018.
> https://www.achp.gov/digital-library-section-106-landing/program-comment-exempt-consideration-effects-rail-properties
> *From the web page*: This program comment exempts undertakings that may affect historic rail properties within rail rights-of-way from Section 106 of the National Historic Preservation Act. The program comment adopts a two-pronged approach: an activities-based approach and a property-based approach. The activities-based approach details specific activities that are exempt from Section 106 review which should have minimal or no adverse effects on historic properties. The property-based approach provides an optional process for identifying excluded historic rail properties that will continue to be subject to Section 106 review while exempting consideration of effects to other rail properties.

Alternative to a Programmatic Approach

Although Texas DOT has not established a programmatic approach to assess the impact of transportation projects on long linear features, the agency has a long-standing relationship with the Texas SHPO on how to treat projects that might affect irrigation and other water conveyance systems. Information about this collaboration is summarized in Table 3.

Table 3. Texas Department of Transportation: Alternative to a Programmatic Approach

Topic	Description
Project Description	Projects that might affect irrigation and other water conveyance systems.
Partners	Texas Historical Commission (which serves as the SHPO)
Agency Practices	• Although Texas DOT has not committed through a programmatic agreement, the agency has a long-standing relationship with the Texas SHPO on how to treat projects that might affect irrigation and other water conveyance systems. • The agency has less consistency with other linear corridors, but has a general programmatic agreement for Section 106 that covers many common issues. • Texas DOT partners with the Texas SHPO to evaluate historic road corridors for named highways, such as the Bankhead Highway, Meridian Highway and Old Spanish Trail. The Texas SHPO also evaluated even older road segments in conjunction with the National Park Service and identified road segments associated with the Camino Real de Tejas. • Texas DOT and the Texas SHPO share data on these types of evaluations and historic designations.
Procedures for Preparing Environmental Documents	See A Field Guide to Irrigation in the Lower Rio Grande Valley in **Supporting Documents** below for an example guidance document. *Note*: According to the respondent, other guidance documents were not finalized, in part because the SHPO "wanted to go further with the maintenance plan."
Additional Contacts	Texas DOT and the Texas SHPO have collaborated on approaches to evaluating irrigation systems and avoiding adverse effects to historic systems. For more information about these collaborations and how Texas DOT and Texas SHPO work with other agencies, such as irrigation districts and flood-controlling entities, contact: Linda Henderson Historic Preservation Specialist, Environmental Affairs Division Texas Department of Transportation 512-416-2770, linda.henderson@txdot.gov Justin Kockritz Lead Project Reviewer Texas Historical Commission 512-936-7403, justin.kockritz@thc.texas.gov

Supporting Documents

A Field Guide to Irrigation in the Lower Rio Grande Valley, Lila Knight, Historical Studies Branch, Environmental Affairs Division, Texas Department of Transportation, 2009.
http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/420-07-gui.pdf
From the executive summary:

> The Lower Rio Grande Valley is blanketed by a tapestry of the irrigation systems of over 25 separate irrigation districts comprising over 2,000 miles of canals and underground pipelines. With the Valley experiencing a burgeoning population growth at a rate that is double the rest of Texas, the need to widen existing roads and construct new ones cannot be accomplished without intersecting the features of the existing historic-age irrigation systems. The Texas SHPO (Texas Historical Commission), in consultation with the Historical Studies Branch of the Environmental Affairs Division of TxDOT [Texas DOT], determined that each of the historic-age irrigation systems would be considered potentially eligible for NRHP [National Register of Historic Places] listing for the purposes of coordinating transportation projects until the establishment of a methodology for the evaluation of this unique property type.

A discussion of character-defining features of irrigation structures begins on page 92 of the report (page 95 of the PDF), including sections about conveyance features (beginning on page 118 of the report, page 121 of the PDF) and infrastructure (beginning on page 183 of the report, page 186 of the PDF). Guidelines for evaluating irrigation systems begin on page 220 of the report (page 223 of the PDF).

Texas Historical Commission, Texas Historical Commission, undated.
https://www.thc.texas.gov/
From the web site: The Texas Historical Commission (THC) is the state agency for historic preservation. Our staff consults with citizens and organizations to preserve Texas history through its architectural, archeological and cultural landmarks. The agency is recognized nationally for its preservation programs.

Related Resource:

> **Historic Resources Toolkit**, Texas Department of Transportation, undated.
> https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/historic-resources.html
> Links on this web page provide access to tools used by Texas DOT to meet environmental requirements under the Section 106 programmatic agreement or memorandum of understanding. Also available on this web page are guidance documents for evaluating National Historic Preservation Act eligibility of historic properties and resources, including A Field Guide to Irrigation in the Lower Rio Grande Valley, which "[p]rovides guidance for surveying and evaluating NRHP [National Register of Historic Places] eligibility of historic-age irrigation resources in the Lower Rio Grande Valley."

No Programmatic Approach

Five state transportation agencies responding to the survey—Delaware, Missouri, Tennessee, Wisconsin and Wyoming DOTs—have not established a programmatic approach to assess the impact of transportation projects on long linear features. Most of these respondents explained that their agencies had not established a programmatic approach because of a lack of linear features in their states. Information provided by respondents is summarized below:

- *Delaware*. In addition to a lack of linear features in the state, the survey respondent noted that Delaware DOT projects typically do not have the potential to impact eligible linear features on a regular basis. The linear features that Delaware DOT encounters most frequently are railroads. According to the survey respondent, impacts to portions of historic or potentially historic railroads have occurred occasionally in the past few years, but not on a scale where the SHPO "would be comfortable with the development of a programmatic approach."

  When assessing the impacts of a transportation project to a National Register eligible railroad, Delaware DOT focuses on establishing the character-defining features and integrity requirements of the linear resource, and the important associated elements for the railroad property type. The agency has determined that the primary element to convey significance is the railroad alignment and roadway, for example, the railroad right of way; grade modifications such as cuts and fills; and a railroad bed. The respondent noted that the existence of secondary features (such as the ballast, tracks and buildings) "certainly add to the integrity of the railroad, but are not all necessarily required for the resource to retain integrity."

  With this in mind, the agency's assessment of transportation project impacts to railroads may differ from that of other types of resources, such as stand-alone buildings and structures or even building complexes, because of the length and linear nature of railroads. For example, if a project impacts only a small portion of a railroad (such as replacing or removing materials or associated elements) and the majority of the railroad alignment and roadway remain intact, the project may not be considered to have an adverse effect.

- *Missouri*. Instead of developing a programmatic approach, Missouri DOT uses guidance developed by the Oregon SHPO (see **Supporting Documents** below). Missouri DOT has not developed specific procedures for preparing environmental documents to address the potential impacts of transportation projects to long linear features.

- *Tennessee*. The survey respondent noted that Tennessee has few intact linear resources. Only short segments of historic linear resources have been identified as eligible for listing with the National Register.

- *Wisconsin*. The agency has developed a programmatic approach for parkways and bridges in Milwaukee County, but not for true linear features. The respondent reported that the Wisconsin SHPO does not typically review or evaluate linear resources for their eligibility for listing in the National Register. It has reviewed dams and bridges, but not water conveyance systems. According to the respondent, there are very few water conveyance systems in the state to review. Outside of its routine process for the National Environmental Policy Act (NEPA), the agency has not developed procedures for preparing environmental documents that address the possible impacts of transportation projects on long linear features.

- *Wyoming*. The respondent reported that transportation projects on long linear features occur so infrequently that the agency has the capacity to analyze each project individually and incorporate the findings in NEPA documentation.

Supporting Documents

Missouri

Guidance for Recording and Evaluating Linear Cultural Resources, Oregon State Historic Preservation Office, Oregon Parks and Recreation Department, December 2013.
https://www.oregon.gov/oprd/OH/Documents/OR_Linear_Resources_Guidance.pdf
Missouri DOT uses these report guidelines instead of a programmatic approach to assess the impact of transportation projects on long linear features. *From the introduction*:

> This document has been developed by the Oregon State Historic Preservation Office, and is intended to be a true guidance document, not a policy statement. While the document does briefly address the question of findings of effect, the focus is to assist the preparers of determinations of eligibility by illustrating key considerations, approaches and significance elements for each type. It has been prepared with full recognition that all resources are different, and may require consideration of circumstances that occur only at that resource.

Guidance for irrigation features or systems begins on page 13 of the report (page 14 of the PDF) and includes recommendations for field recordation and system evaluation. Guidance for other linear resources is also provided, including transportation-related canals (beginning on page 14 of the report (page 15 of the PDF), roads (beginning on page 16 of the report, page 17 of the PDF) and railroads (beginning on page 18 of the report, page 19 of the PDF). Useful links and documents for specific linear resources begin on page 22 of the report (page 23 of the PDF).

Related Resource:

> **Historic Preservation**, Historic Preservation Section, Missouri Department of Transportation, undated.
> https://www.modot.org/historic-preservation
> *From the web page*:
>
> > The Missouri Department of Transportation [MoDOT] strives to balance historic preservation concerns with the task of planning, designing, constructing and maintaining the [s]tate's complex transportation infrastructure. MoDOT's Historic Preservation (HP) staff works to identify potential conflicts between the two and to help resolve them in the public interest.
>
> The web page includes a brief summary of the agency's efforts to meet Section 106 requirements of the National Historic Preservation Act, which "requires that MoDOT consider the potential impacts that any federally funded or permitted project may pose to significant cultural resources. Cultural resources include archaeological sites, buildings, structures (e.g., bridges), objects and districts. The significance of a cultural resource is evaluated by applying a set of criteria that are set forth by the National Register of Historic Places." Compliance with Section 106 requires the agency to identify historic properties, assess adverse effects and resolve any adverse effects.

Interest in Developing a Programmatic Approach

Of the state agencies that have not developed a programmatic approach, Missouri and Texas DOTs are potentially interested:

- *Missouri*. The respondent noted that the agency has some interest in developing a programmatic approach for the Little River Drainage District, a massive drainage system

located in the Missouri Bootheel region that was constructed in the early 20th century (see *Supporting Documents* below). The Missouri SHPO considers much of this network eligible for the National Register, however, meeting the needs of various stakeholders has made developing a programmatic approach difficult.

- *Texas*. The Texas DOT respondent reported that the agency is "always looking for new ways to address some of these project types and resource types programmatically." For example, the agency has developed two approaches for historic irrigation systems:
    - National Register guidelines for evaluating these irrigation districts as a whole.
    - A maintenance plan approach that does not depend on full-scale evaluation but instead proposes various project activities that would not constitute an adverse effect on resources.

  While not in full agreement on the National Register evaluation method, the Texas SHPO is receptive to the maintenance plan approach. The SHPO also generally agrees that many types of project activities do not require full coordination and can be cleared internally through the agency's primary programmatic approach.

Other respondents explained that their agencies are not interested in establishing a programmatic approach because the need for this type of assessment is uncommon:

- *Delaware*. According to the respondent, Delaware lacks the need for a programmatic approach since the state does not have a large number of linear resources eligible for the National Register. The linear features that Delaware DOT encounters most frequently are railroads. Transportation projects with potential impacts to portions of historic or potentially historic railroads occur only occasionally—not to the extent that the Delaware SHPO "would be comfortable with developing a programmatic approach."
- *Tennessee*. The Tennessee DOT respondent reported that the state has few intact linear resources. Only short segments of historic linear resources have been identified as National Register eligible.
- *Wisconsin*. Wisconsin DOT does not typically review linear features for their significance for listing in the National Register.
- *Wyoming*. Because transportation projects on long linear features occur infrequently, the agency has the capacity to analyze them on a project-by-project basis and incorporate results in NEPA documentation.

Supporting Documents

Missouri

Little River Drainage District, Missouri State Archives, Missouri Digital Heritage, undated. https://www.sos.mo.gov/archives/mdh_splash/default.asp?coll=lilrivdd
From the introduction: Southeast Missouri's "Bootheel" is a natural basin for Mississippi River flooding. For much of its history the land was an uninhabitable swamp. In the early twentieth century a system of ditches, levees and canals was constructed to drain the swampy land. It was the world's largest drainage project, and by its completion had moved more earth than the construction of the Panama Canal. The Little River Drainage District was constructed between 1914 and 1928. It consists of 957.8 miles of ditches and 304.43 miles of levees. It covers 540,000 acres and drains a total of 1.2 million acres.

Transportation Projects and Water Conveyance Systems

Focusing specifically on water conveyance systems, the respondents from Missouri, New Jersey and Texas DOTs identified short- and long-term impacts of transportation projects to water conveyance systems. Respondents from New Jersey and Texas DOTs also discussed mitigation related to water conveyance systems.

Impacts of Transportation Projects

Among the short-term impacts of transportation projects to water conveyance systems were erosion and sediment control (Missouri and New Jersey), traffic disruptions (New Jersey) and restrictions to public access (New Jersey).

Erosion was also cited as a long-term impact along with slope failure, interruptions to canal operations and permanent changes to associated structures. The New Jersey DOT respondent added that construction projects may cause long-term, but mitigable adverse impacts to surface water, floodplains, aquatic ecology, wetlands, endangered and protected species, cultural resources, viewsheds and other resources that are part of the D&R Canal and State Park. The Texas DOT respondent reported that some of the flood control systems administered by the International Boundary and Water Commission and by the U.S. Army Corps of Engineers are considered National Register eligible, but Texas SHPO has worked with these organizations to develop an understanding of what may or may not constitute an adverse effect. Changes that do not affect the system's ability to convey water, or that do not change basic design, materials and workmanship, are largely considered to have no adverse effect, especially when changes are made on a small scale relative to the overall system size.

Table 4 summarizes the short-term impacts described by these survey respondents; note that the respondent from New Jersey DOT described corresponding mitigation measures for these impacts. Table 5 summarizes the long-term impacts.

Table 4. Short-Term Impacts of Transportation Projects to Water Conveyance Systems

Topic	State	Description
Construction Staging	Texas	These impacts do not alter contributing components of a historic water conveyance system.
Erosion Control	Missouri, New Jersey	*Missouri*. The U.S. Army Corps has used bridge replacement projects as a means to address erosional issues in some locations, which includes neighboring private property. *New Jersey*. Short and controlled incidents of erosion and sediment transport from sites occur during construction. *Mitigation measure*: Appropriate erosion and sediment control standards.
Public Access Restrictions	New Jersey	• The agency must obtain park approvals to restrict public access to the towpath trail on D&R Canal and State Park property during project construction. *Mitigation measure*: Traffic control measures to ensure access to recreational areas.

Topic	State	Description
Public Access Restrictions	New Jersey	• An increase in noise and dust could temporarily inconvenience park users (activities such as jogging, water-based recreation and bird watching). *Mitigation measures*: ○ Proper construction techniques. ○ Use of properly muffled motorized equipment. • Short-term impacts to the D&R Canal Historic District. This occurred during a project that involved the temporary removal of a loose, unstable railroad crossing. *Mitigation measure*: Since the track removal was temporary, the proposed project did not constitute an encroachment on the D&R Canal Historic District. New Jersey DOT reinstalled the rails as part of a planned upgrade of a future bridge project within the historic district.
Temporary Easements	Texas	These impacts do not alter contributing components of a historic water conveyance system.
Traffic Disruptions	New Jersey	Temporary disruption of traffic. *Mitigation measures*: • Proper construction techniques. • Traffic control to prevent accidents and minimize delays.

Table 5. Long-Term Impacts of Transportation Projects to Water Conveyance Systems

Topic	State	Description
Erosion and Slope Failure	New Jersey	Several roadside locations were affected from the Route 29 highway project (in Lambertville, New Jersey) that parallels the canal. Slope stabilization was needed to minimize long-term erosion and slope failure issues. Gabion baskets were installed as a temporary fix. Eventually the agency installed permanent sheeting to prevent further erosion of the embankment and undermining of the roadway. This work resulted in permanent impacts to the canal.
Interruptions to the Canals	Texas	Underground pipes were placed at major roadways. The agency and state SHPO concur that these limited actions on a small portion of the overall system do not have an adverse effect to the historic system as a whole.
Permanent Changes to Associated Structures	Texas	• Putting open-air canals into underground pipes. Other changes, such as lining earthen structures with concrete, can have long-term impacts but do not necessarily change their ability to convey the historical significance. • Minor changes to nonprimary structures. These changes might have less impact than the same kinds of changes on main canals. Roads crossing these types of structures do not change their ability to convey historical significance, especially if piers are not placed within the conveyance structure.

Mitigation Practices

Three survey respondents reported on their agencies' experience with mitigation measures and triggers for conducting mitigation related to water conveyance systems. The Missouri DOT respondent noted that impacts in the state have been small and usually incorporate a general history and high-quality photographs of the area before construction. The respondents from New Jersey and Texas DOTs provided a more detailed response about their agencies' experience, which is summarized below.

New Jersey

In New Jersey, DOT projects have a high potential to affect the D&R Canal and State Park, and the agency is often required to conduct resource restoration or data recovery for archeology purposes. For example, after completing a Boyd Park project in New Brunswick, the SHPO required New Jersey DOT to restore the locks that enabled vessels to get to and from the canal and the Raritan River. In a Route 29 project, New Jersey DOT removed numerous hazardous trees that were dying or infested with emerald ash borers. The trees were located along the road corridor that encroached onto the highway. However, removing the trees adversely affected the canal and park viewsheds; New Jersey DOT was required to develop a replanting plan to replace the trees.

Mitigation has also been required for the replacement of numerous aging bridges that cross the canal that the SHPO believes compromise the integrity of the historic nature of the canal as well as the setting of the park. The respondent noted that these types of projects can be highly controversial, especially replacing the once movable bridges with fixed structures. Getting approval from all agencies for the aesthetics and materials used can be challenging. A programmatic approach is beneficial in these situations if all the agencies, including New Jersey DOT, can agree on the use of certain practices and materials for these bridges. For example, the New Jersey DOT performed emergency work to replace the Southbound Brook Bridge (a once movable bridge) over the D&R Canal in Somerset County, one of the last of its kind with a unique historic significance to the canal. The work called for various steel repairs and removal of the concrete counterweight. As a result, the SHPO required New Jersey DOT to develop a web site and Historic American Engineering Record that documented the historical structure; preserve the bridge's operating mechanism, including the reduction gears, drive pinion and electric motor; and develop a bridge management plan for the Landing Lane Bridge, the last remaining, once movable bridge in the canal.

Mitigation for future New Jersey DOT projects has been discussed during task force coordination meetings with the DRCC and other agencies. A draft memorandum of agreement (MOA) was initiated that identified the roles and responsibilities that New Jersey DOT and the DRCC would assume in the development of future projects along the canal. When more agencies became involved, the MOA was no longer needed. New Jersey DOT has continued to work closely with the DRCC on developing mitigation strategies to help minimize potential future impacts to the canal and park.

Below are other mitigation measures under consideration to minimize impacts to the visual effects of the canal:

- Existing vegetation will be preserved wherever practical to avoid disturbing existing views in areas.

- Cut and fill will be minimized to the extent necessary to balance structural stability, appropriate vertical profile and aesthetic features of the roadway and appurtenant features.
- Ground-disturbing activities will be mitigated through seeding, landscaping restoration and long-term maintenance.
- Lighting within the DOT right of way will be minimized to those areas that require improved visibility for safety (usually confined to higher volume interchanges) and that display driver information signage where necessary.

Texas

Texas DOT proactively conducted intensive evaluations of several irrigation systems. The survey respondent noted that while the agency has not formally conducted mitigation for projects to date, the amount of research and documentation that exists as a result of the evaluations that were made "could easily feed a mitigation product."

Related Research and Resources

To supplement the findings from the online survey, a literature search was conducted of domestic in-progress and completed research, published reports and other resources. The search specifically focused on three areas of interest to Caltrans:

- Interaction of historic resources and infrastructure development.
- Short- and long-term impacts on historic water conveyance systems.
- Appropriate cultural resource management techniques:
    - Mitigation measures and triggers for doing mitigation related to historic water conveyance systems.
    - Processing procedures that could be incorporated into a programmatic agreement between Caltrans and agencies that regulate historic resources.

The search uncovered very limited resources directly related to these topic areas. Below are search results in the following categories:

- National guidance and research.
- Related resources.

National Guidance and Research

Section 106 and Infrastructure Projects, Advisory Council on Historic Preservation, undated. https://www.achp.gov/section-106-and-Infrastructure-Projects
ACHP promotes the preservation, enhancement and productive use of national historic resources. This web site provides resources and guidance that help agencies comply with Section 106 of the National Historic Preservation Act while ensuring infrastructure development and preservation of historic places. Among the resources on this web page are:

- 106 Toolkit for Infrastructure Project Reviews: https://www.achp.gov/106_toolkit_for_infrastructure
  This web page is a "quick reference guide for documents, best practices and training opportunities relevant to infrastructure development."

- Interagency coordination:
  https://www.achp.gov/interagency_coordination
  Best practices and resources are provided related to the federal permitting process.

Related Resources

Programmatic Agreements, Environmental Review Toolkit, Federal Highway Administration, undated.
https://www.environment.fhwa.dot.gov/env_initiatives/programmatic_agreements.aspx
In addition to information about national and regional programmatic approaches, resources available for this Every Day Counts initiative include the benefits and costs of programmatic approaches.

Programmatic Agreements Library (PAL) Database, Center for Environmental Excellence by AASHTO, American Association of State Highway and Transportation Officials, undated.
https://environment.transportation.org/pal_database/
This database comprises "examples of executed programmatic agreements; summarizes agreement information; contains a link to the full agreement; and provides ongoing access for practitioners to research agreements that meet specific requirements."

Related Resource:

Programmatic Agreement Toolkit, Center for Environmental Excellence by AASHTO, American Association of State Highway and Transportation Officials, undated.
https://environment.transportation.org/center/products_programs/programmatic_agreement.aspx
Access to various support tools is available on this web page for developing and implementing programmatic agreements.

Contacts

CTC contacted the individuals below to gather information for this investigation.

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Appendix A: Survey Questions

The following survey was distributed to members of the American Association of State Highway and Transportation Officials (AASHTO) Committee on Environment and Sustainability and the Transportation Research Board (TRB) Standing Committee on Historic and Archeological Preservation in Transportation.

General Questions

1. Has your agency established a programmatic approach to assess the impact of transportation projects on long linear features such as water conveyance systems, railroads, trails or corridors of cultural significance?
    A. If your agency has developed a programmatic approach, please provide a brief description of agency practices.
    B. If your agency has not developed a programmatic approach, is there any interest in doing so?
2. Has your agency developed procedures for agency staff to follow when preparing draft and final environmental documents that address the possible impacts of transportation projects to the types of long linear features described above? If yes, please provide an electronic copy of those procedures or send any files not available online to carol.rolland@ctcandassociates.com.

Questions Specific to Water Conveyance Systems

1. Please describe the short-term impacts of transportation projects to water conveyance systems your agency has identified.
2. Please describe the long-term impacts of transportation projects to water conveyance systems your agency has identified.
3. Please share information about your agency's experience with mitigation measures and triggers for doing mitigation related to water conveyance systems.

Wrap-Up

Please provide any comments or additional information about your previous responses.