

**American Association of State Highway and Transportation Officials  
Special Committee on Research and Innovation**

**FY2024 NCHRP PROBLEM STATEMENT TEMPLATE**

**Problem Number: 2024-B-14**

**Problem Title**

Roadside Vegetation Management Guidelines for Prevention and Management of Wildfire

**Background Information and Need for Research**

This topic was initially discussed in a TRB Webinar in July 2022, which indicated where further research and adaptive management strategies were needed.

States where wildfire frequency and intensity has been increasing have had to find adaptive solutions in emergency response and mobilization, and these lessons learned can be passed along to other states as drought and invasive species challenges create new added wildfire risks in other states across the country.

A baseline study of known risk factors and current best management practices being adapted by state DOTs throughout the country is needed to establish begin facilitation of ongoing national adaptive roadside management strategies. This baseline would be added to with continued documentation of incident response to each successional fire event in future years.

**Literature Search Summary**

A search of TRB's TRID Database and the Web of Science Database found over 30 published research articles on Wildfire in the American Landscape. Most research focused on historic events in the Western US, in relation to loss of homes and cities. Any information pertaining to roads and roadside vegetation, has been studied in relation to forestry and roads used for logging. Little to no information was found on consequences of highway or freeway roadside vegetation management in relation to wildfire risk.

The two recent USFS documents linked below provide a summary of wildfire risk and prevention efforts. An analysis of highway roadside vegetation management practices would supplement existing research.

- Reducing the Risk of Severe Wildfire Across Boundaries
  - [https://www.fs.usda.gov/sites/default/files/fs\\_media/fs\\_document/Reducing-Wildfire-Risk.pdf](https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Reducing-Wildfire-Risk.pdf)

- 
- Confronting the Wildfire Crisis
  - [https://www.fs.usda.gov/sites/default/files/fs\\_media/fs\\_document/Confronting-the-Wildfire-Crisis.pdf](https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Confronting-the-Wildfire-Crisis.pdf)

### **Research Objective**

The objective of this research is continuation of developing best management recommendations for state highway transportation organizations in the life cycle process of roadside vegetation management. Increases in occurrence of wildfire from increased drought and invasive species impacts on forest health, compounded by increased traffic volumes, have resulted in a range of responses in adaptive vegetation management from State Transportation organizations. These recent case studies have not been comparatively analyzed for their relative success and cost/benefit. This proposed research project would:

- Identify the range and magnitude of historic case study responses to wildfire on state highway roadsides throughout the country. Recommend best practices for state transportation organizations for 1.) cases where the fire source is traffic related, and 2.) where the highway roadside is managed to serve as a fire break and aid in emergency response.
- Study the success and cost benefit of 1.) fire prevention vegetation management strategies used for the highway roadside to minimize fire risk, 2.) efforts to control invasive species and revegetate roadsides following fire events, 3.) use of prescribed burns as a vegetation management technique to remove weeds and minimize wildfire risk, and 4.) fire suppressant or fire retardant technique such as establishing wide bare ground areas and pre-treating the roadside with fire retardant chemicals.
- Document the costs and benefits in long-term vegetation management of the most impactful case study solutions being adapted by the states.
- Findings, conclusions, and recommendations for best practice will be written as an added chapter to the existing AASHTO Guidelines Roadside Vegetation Management – Specific recommendations for Integrated Vegetation Management response using chemical control, mechanical control, and site restoration for cultural control.

### **Urgency and Potential Benefits**

One of the most significant factors in increased wildfire risk is the rapidly growing Wildland-Urban Interface (WUI) in areas prone to wildfire. The highway road system and roadside vegetation form a WUI throughout the natural and built landscape of our country and have not been adequately studied to determine best management practices.

As population growth and increased traffic volumes combine with the factors of climate and species migration, transportation officials in many states will be required to find adaptive solutions to roadside vegetation management in response to increased fire risk.

Highway roadsides in states experiencing increased wildfire risk from changing climatic conditions and invasive species are now being managed to limit fire ignition sources, and in some cases to serve as wildfire breaks in the larger landscape. The success and cost of these responses has not been documented.

### **Link to 2-21-2026 AASHTO Strategic Plan**

The primary links to the strategic plan are in Policy, Implementation and Research in the advocacy for minimizing the impacts of climate change and applying scenario planning to better weigh options in decision-making. This research also would be a vital part of the ongoing adaptive management discussion on roadside management strategy and sustainability by contributing to Organizational Optimization as it embraces a sense of urgency and the need to be agile and nimble in organization response, and findings would be cataloged along with other roadside management references in a nationally accessible system.

### **Implementation Considerations**

Proposal developed with input from AKR20 – Roadside Maintenance Operations

Support from:

- AKD40 – Landscape and Environmental Design
- AKD20 – Roadside Safety Design
- AEP70 – Environmental Analysis and Ecology

Communication and Implementation Funding: No additional funding would be required, communication and implementation would be handled through the ongoing work of the supporting standing committees, and their established national communications network of landscape architects, restoration ecologists, biologists, and others involved with maintenance of the roadside. The results would be shared via AASHTO committees, the No Boundaries pooled fund study, and the National Roadside Vegetation Management Association (NRVMA). Data resulting from this research would serve as a baseline for a national dialogue of ongoing adaptive management planning, each additional major cases of wildfire occurring in the future would be added to this study.

Communication and Implementation Period: Upon completion of the project and update of the AASHTO Guidelines for Vegetation Management, a series of webinars, annual

meeting presentations, and follow-up discussions will be planned, extending 12 to 18 months beyond publication of final documents.

**Recommended Research Funding and Research Period**

\$375,000

24 months

**Problem Statement Author(s):** For each author, provide their name, affiliation, email address and phone.

Raymond Willard

PLA, Washington State Department of Transportation

[ray.willard@wsdot.wa.gov](mailto:ray.willard@wsdot.wa.gov)

(360)688-0291

Ken Murray

PLA, California Department of Transportation

[kenneth.murray@dot.ca.gov](mailto:kenneth.murray@dot.ca.gov)

(916)247-9456

**Potential Panel Members:** For each panel member, provide their name, affiliation, email address and phone.

Raymond Willard

PLA, Washington State Department of Transportation

[ray.willard@wsdot.wa.gov](mailto:ray.willard@wsdot.wa.gov)

(360)688-0291

Ken Murray

PLA, California Department of Transportation

[kenneth.murray@dot.ca.gov](mailto:kenneth.murray@dot.ca.gov)

(916)247-9456

Any members of AKR20, AKR20(1), AKD20, AEP70, and AKD40

**Person Submitting the Problem Statement:** Name, affiliation, email address and phone.

Raymond Willard

PLA, Washington State Department of Transportation

[ray.willard@wsdot.wa.gov](mailto:ray.willard@wsdot.wa.gov)

(360)688-0291

---

## **NCHRP Review of B-14**

Revised by:

Ann Hartell

[ahartell@nas.edu](mailto:ahartell@nas.edu)

Comments:

The proposed research addresses an issue of interest to an increasing number of states. A scan of current practice and assessment of effectiveness is feasible; however obtaining sufficient information to conduct an analysis of costs and benefits will be very challenging and the results may be highly dependent on context and the specifics of a particular fire event. If the benefit-cost analysis is removed from the scope the budget could be reduced to \$300,000. The AASHTO Guidelines for Roadside Vegetation Management is not currently proposed for an overall update, so the results from the proposed research would need to be developed as stand-alone research to ensure on-time publication by NCHRP.

Review Date:

December 1, 2022

---

## **FHWA Evaluation of B-14**

Revised by:

Daniel Buford, Gillian O'Doherty

Comments:

Include the potential impacts of the proposed treatments and use of roadside areas as firebreaks on adjacent waterways, as well as on roadside vegetation.

Review Date:

December 23, 2022

---

## **AASHTO Committee Evaluation for B-14**

Submitted By:

Kelly Hardy

Design

Comments:

This appears to be a timely and very relevant topic to study. Prospective solutions should address roadside safety. Of interest to a growing number of western states.

---

**Submitter Response for B-14**

Comments:

We have discussed the comments within our AKR20 committee and agree with all comments. We appreciate Ann Hartell's observations and recommendations for scaling back the project research scope and reducing the estimated cost to \$300,000.

Contact Info:

Raymond Willard  
willarr@wsdot.wa.gov

---