CALTRANS
Adaptation Priorities Report




DISTRICT 6

June

2020

This page intentionally left blank.

CONTENTS

TABLES

FIGURES

This page intentionally left blank.

1. INTRODUCTION

California's climate is changing. Temperatures are warming, sea levels are rising, wet years are becoming wetter, dry years are becoming drier, and wildfires are becoming more intense. Most scientists attribute these changes to the unprecedented amounts of greenhouse gases in the atmosphere. Given that global emissions of these gases continue at record rates, further changes in California's climate are, unfortunately, very likely.

The hazards brought on by climate change pose a serious threat to California's transportation infrastructure. Higher than anticipated sea levels can regularly inundate roadways, extreme floods can severely damage bridges and culverts, rapidly moving wildfires present profound challenges to timely evacuations, and higher as well as lower than anticipated temperatures and rainfall can cause expensive pavement damage over a broad area. As Caltrans' assets such as bridges and culverts age, they will be forced to weather increasingly severe conditions that they were not designed to handle, adding to agency expenses and putting the safety and economic vitality of California communities at risk.

Recognizing this, Caltrans has initiated a major agency-wide effort to adapt their infrastructure so that it can withstand future conditions. The effort began by determining which assets are most likely to be adversely impacted by climate change in each Caltrans district. That assessment, described in the Caltrans Climate Change Vulnerability Assessment Report for District 6, identified stretches of the State Highway System within the district that are potentially at risk. This Adaptation Priorities Report continues the analysis of the vulnerability assessment and considers the implications of those impacts on Caltrans and the traveling public, so that facilities with the greatest potential risk receive the highest priority for adaptation. District 6 anticipates that planning for, and adapting to, climate change will continue to evolve subsequent to this report's release as more data and experience is gained.

1.1. Purpose of Report

The purpose of this report is to prioritize the order in which assets found to be exposed to climate hazards will undergo detailed asset-level climate assessments. Since there are many potentially exposed assets in the district, detailed assessments will need to be done sequentially according to their priority level. The prioritization considers, amongst other things, the timing of the climate impacts, their severity and extensiveness, the condition of each asset (a measure of the sensitivity of the asset to damage), the number of system users affected, and the level of network redundancy in the area. Prioritization scores are generated for each potentially exposed asset based on these factors and used to rank them.

1.2. Report Organization

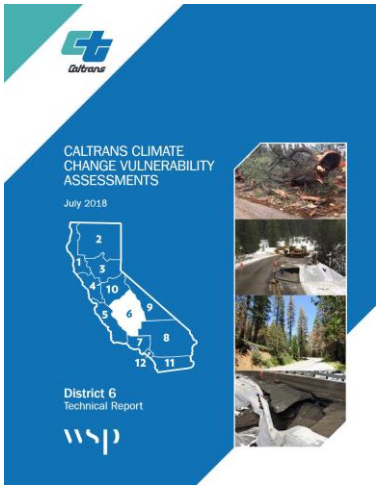
The main feature of this report is the prioritized list of potentially exposed assets within District 6. Per above, this information will inform the timing of the detailed adaptation assessments of each asset, which is the next phase of Caltrans' adaptation work. The final prioritized list of assets for District 6 can be found in Chapter 4 of this document. The interim chapters provide important background information on the prioritization process. For example, those interested in learning more about Caltrans' overall adaptation efforts, and how the prioritization fits into that, should refer to Chapter 2. Likewise, those who are interested in learning more about how the prioritization was determined should refer to Chapter 3.

2. CALTRANS' CLIMATE ADAPTATION FRAMEWORK

Enhancing Caltrans' capability to consider adaptation in all its activities requires an agency-wide perspective and a multi-step process to make Caltrans more resilient to future climate changes. The process for doing so will take place over many years and will, undoubtedly, evolve over time as everyone learns more about climate hazards, better data is collected, and experience shows which techniques are most effective. Researchers have just started examining what steps an overarching adaptation framework for a department of transportation should entail. Figure 1 provides a graphical illustration of one such path called the Framework for Enhancing Agency Resiliency to Natural and Anthropogenic Hazards and Threats (FEAR-NAHT).[1] This framework, developed through the National Cooperative Highway Research program (NCHRP), has been adopted by Caltrans as part of its long-term plan for incorporating adaptation into its activities (hereafter referred to as the Caltrans Climate Adaptation Framework or "Framework").

Steps 1 through 4 of the Framework represent activities that are currently underway at Caltrans Headquarters to effectively manage its new climate adaptation program and develop policies that will help jumpstart adaptation actions throughout the organization. Step 1, *Assess Current Practice*, and Step 4, *Implement Early Wins*, are both addressed within a document called the Caltrans Climate Adaptation Strategy Report. The Adaptation Strategy Report undertook a comprehensive review of all climate adaptation policies and activities currently in place or underway at Caltrans. The report also includes numerous no-regrets adaptation actions ("early wins") that can be taken in the near-term to enhance agency resiliency. Several of these strategies also touch on elements of Step 2, *Organize for Success*, and Step 3, *Develop an External Communications Strategy and Plan*. In addition to this, a comprehensive adaptation communications strategy and plan for climate change is being developed as part of a Caltrans pilot project with the Federal Highway Administration.

Step 5, *Understand the Hazards and Threats*, is the first step where detailed technical analyses are performed, and in this case, identify assets potentially exposed to various climate stressors. This step has been completed for a subset of the assets and hazards in District 6 and the results are presented in the Caltrans Climate Change Vulnerability Assessment Report for District 6. The exposure information generated in the Vulnerability Assessment Report is used as an input to this study.



COVER OF THE CALTRANS VULNERABILITY ASSESSMENT TECHNICAL REPORT FOR DISTRICT 6

[1] This framework and related guidance for state DOTs is being developed as part of NCHRP 20-117, Deploying Transportation Resilience Practices in State DOTs (expected completion in 2020).

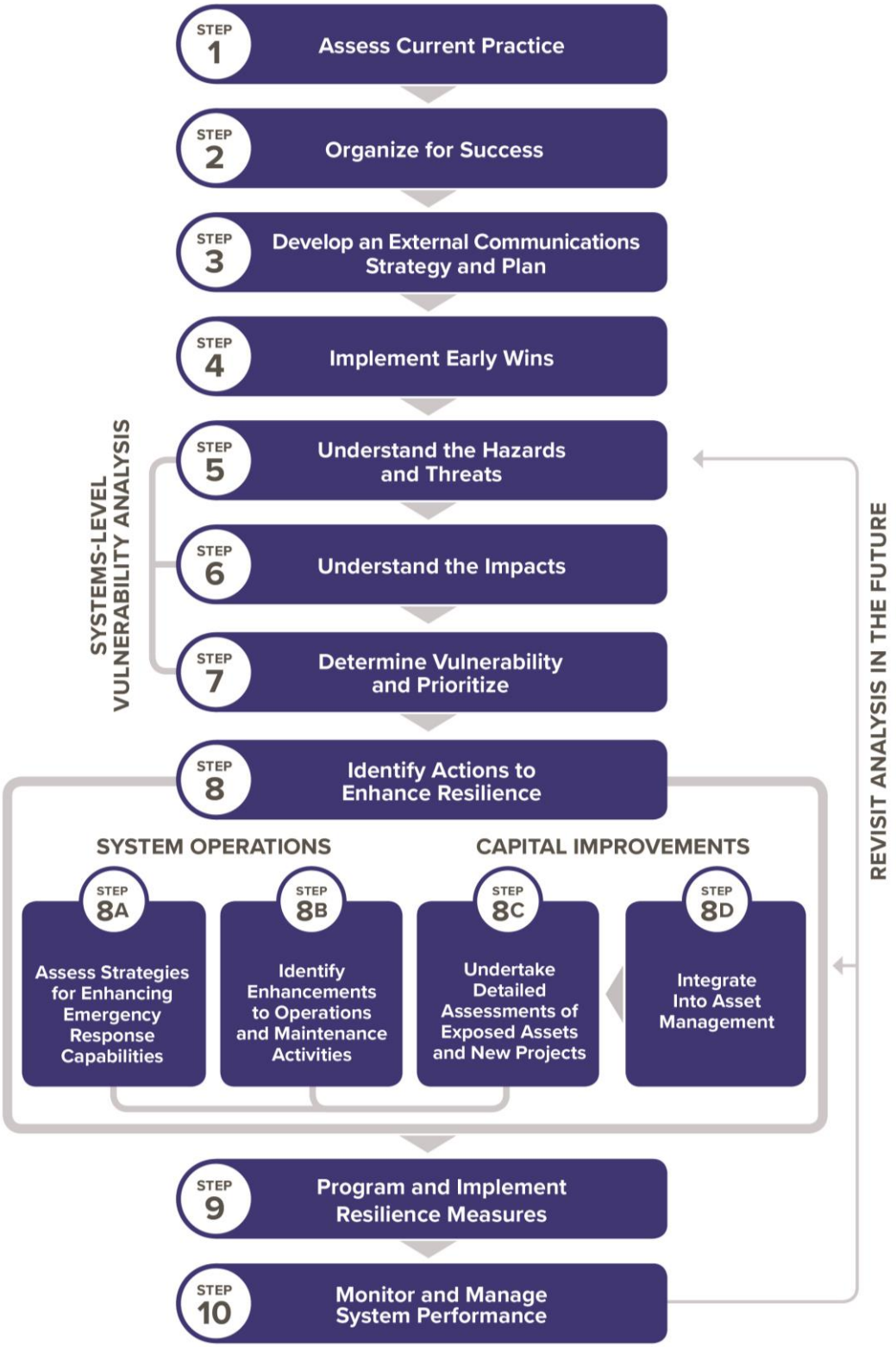


FIGURE 1: CALTRANS' CLIMATE ADAPTATION FRAMEWORK

The work undertaken for this study, the District 6 Adaptation Priorities Report, covers both Steps 6 and 7 in the Framework. Step 6, *Understand the Impacts*, is focused on the implications of the exposure identified in Step 5. This includes understanding the sensitivity of the asset to damage from the climate stressor(s) it is potentially exposed to and understanding the criticality of the asset to the functioning of the transportation network and the communities it serves. Developing an understanding of these considerations is part of the prioritization methodology described in the next chapter.

Step 7, *Determine Vulnerability and Prioritize*, focuses on creating and implementing a prioritization approach that considers both the nature of the exposure identified in Step 5 (its severity, extensiveness, and timing) and the consequence information developed in Step 6. The goal of the prioritization is to identify which assets should undergo detailed adaptation assessments first, because resource constraints will prevent all assets from undergoing detailed study simultaneously.

After Step 7, the Framework divides into two parallel tracks, one focused on operational measures to enhance resiliency and the consideration of adaptation (Steps 8A and 8B) and the other on identifying adaptation-enhancing capital improvement projects (Steps 8C and 8D). Collectively, these represent the next steps that should be undertaken using the information from this report. On the operations track, the results of this assessment should be reviewed for opportunities to enhance emergency response (Step 8A) and operations and maintenance (Step 8C). Caltrans' next step on the capital improvement track should be to undertake detailed assessments of the exposed facilities (Step 8C). The prioritization information generated as part of this assessment should also be integrated into the state's asset management system (Step 8D). All projects recommended through the asset management process should also undergo detailed adaptation assessments (hence the arrow from Step 8D to 8C).

Thus, there will be two parallel pathways for existing assets to get to detailed facility level adaptation assessments. The first is through this prioritization analysis, which is driven primarily by the exposure to climate hazards with asset condition as a secondary consideration. The second is through the existing asset management process, which is driven primarily by asset condition and will have vulnerability to climate hazards as a secondary consideration.

The detailed adaptation assessments in Step 8C will involve engineering-based analyses to verify asset exposure to pertinent climate hazards (some exposed assets featured in this report will not be exposed after closer inspection). Then, if exposure is verified, Step 8C includes the development and evaluation of adaptive measures to mitigate the risk. The highest priority assets from this study will be evaluated first and lower priority assets will be evaluated later. Once specific adaptation measures have been identified, be they operational measures or capital improvements, these projects can then be programmed (Step 9). Step 10 then focuses on continuous monitoring of system performance to track progress towards enhancing resiliency. Note the feedback loops from Step 10 to Steps 5 and 8. The arrow back to Step 5 indicates that the exposure analysis should be revisited in the future as new climate projections are developed. The arrow back to Step 8 indicates how one can learn from the performance indicators and use this data to modify the actions being undertaken to enhance resilience.

3. PRIORITIZATION METHODOLOGY

3.1. General Description of the Methodology

The methodology used to prioritize assets exposed to climate hazards draws upon both technical analyses and the on-the-ground knowledge of District 6 staff. The technical analysis component was undertaken first to provide an initial indication of adaptation priorities. These initial priorities were then reviewed with district staff at a workshop and adjusted to reflect local knowledge and recommendations. These adjustments are embedded in the final priorities shown in Chapter 4.

With respect to the technical analysis, there are a few different approaches for prioritizing assets based on their vulnerability to climate hazards. The approach selected for this study is known as the *indicators approach*. The indicators approach involves collecting data on a variety of variables that are determined to be important factors for prioritization. These are then put on a common scale, weighted, and used to create a score for each asset. The scores collectively account for all the variables of interest and can be ranked to determine priorities.

It is important to note that, since the prioritization process is focused on determining the order in which detailed adaptation assessments are conducted, only assets determined to be potentially exposed to a climate hazard are included in this analysis. Assets that were determined to have no exposure to the hazards studied are not included in this study.

The remainder of this chapter describes the prioritization methodology in detail. Section 3.2 begins by describing the asset types and hazards studied. Next, Section 3.3 discusses the individual prioritization metrics (factors) that were used in the technical analysis. Following this, Section 3.4 describes how those individual factors were brought together into an initial prioritization score for each asset. Lastly, Section 3.5 describes how the initial prioritization was adjusted with input from district staff.

3.2. Asset Types and Hazards Studied

Caltrans is responsible for maintaining dozens of different asset types (bridges, culverts, roadway pavement, buildings, etc.). Each of these asset types is uniquely vulnerable to a different set of climate stressors. Resource constraints only allowed this study to investigate a subset of the asset types owned by Caltrans in District 6 and, for those, only a subset of the climate stressors that could impact them. Additional exposure and prioritization analyses are needed in the future to gain a fuller understanding of Caltrans' adaptation needs.

HIGHWAY 41, DISTRICT 6

The subset of asset types and hazards included in this study generally mirror those that were included in the District 6 Climate Change Vulnerability Assessment Report. That said, exposure to two additional hazards was included as part of this study: (1) riverine flooding impacts to bridges and culverts and (2)

temperature impacts to pavement binder grade. Table 1 shows all the asset types included in this study for District 6 and marks with an "X" the hazards that were evaluated for each in the exposure analysis.

TABLE 1: ASSET-HAZARD COMBINATIONS STUDIED

	Wildfire	Temperature	Riverine Flooding
Pavement Binder Grade		X	
Bridges			X
Large Culverts[2]			X
Small Culverts[3]	X		X

The various asset-hazard combinations include:

- **Pavement binder grade exposure to temperature changes:** Binder can be thought of as the glue that holds the various aggregate materials in asphalt together. Binder is sensitive to temperature. If temperatures become too hot, the binder can become pliable and deform under the weight of traffic. On the other hand, if temperatures are too cold, the binder can shrink causing cracking of the pavement. There are various types (grades) of binder, each suited to a different temperature regime. This study considered how climate change will influence high and low temperatures and how this, in turn, could affect pavement binder grade performance.

  Assumptions were made that (1) all roadways are currently (or could be in the future) asphalt and (2) the binder grade currently in place on each segment of roadway matches the specifications in the Caltrans Highway Design Manual. From here, the allowable temperature ranges of each binder grade were compared to projected temperatures in 2040, 2070, and 2100. If the temperature parameters exceeded the design tolerance of the assumed binder grade, that segment of roadway was deemed to be potentially exposed.

PAVEMENT CRACKING

- **Bridge exposure to riverine flooding:** Bridges are sensitive to higher flood levels and river flows. With climate change, precipitation is generally expected to become more intense in District 6 leading to increased flooding on rivers and streams. These higher flows could exceed the design tolerances of bridges. In addition, wildfires are also expected to become more prevalent in

[2] Culverts 20 feet or greater in width.
[3] Culverts less than 20 feet in width.

District 6 with climate change. After a wildfire burns, the ground can become hard and less capable of absorbing water. As a result, flood flows can increase substantially in the aftermath of a fire, which could further exacerbate the risks to bridges. To better understand the threat posed to bridges in District 6, a flood exposure index was developed and calculated for each bridge that crosses a river or stream. The index considered both the changes in precipitation and wildfire likelihood in the area draining to the bridge in the early, mid, and late century timeframes. The index also considers the capacity of the bridge to handle higher flows using waterway adequacy information from the National Bridge Inventory (NBI). A higher score on the index indicates bridges at relatively greater risk due to a combination of higher projected flows and lower capacity.

- **Bridge deterioration:** Bridges have a history of deck and soffit deterioration, in which water and salt levels are so high that they corrode the steel and reinforced concrete of bridges. Repairs to bridge decks and distressed concrete on soffits are critical to maintaining structural integrity.

- **Large culvert exposure to riverine flooding:** A distinction is made in the analysis between large and small culverts due to different data being available for each. Large culverts are included in the NBI and are generally 20 feet or greater in width. Small culverts are generally shorter than 20 feet in width and covered through a different inventory/inspection program. Large culverts, like bridges, are sensitive to increased flood flows. Thus, a flood exposure index was calculated for each large culvert in the same manner as was done for bridges.

- **Small culvert exposure to riverine flooding:** Small culverts (those less than 20 feet in width) are, like bridges and large culverts, also sensitive to higher flood flows. Hence, a flood exposure index like the one for bridges and large culverts was calculated for this asset type. The one difference is that the capacity component of the index for small culverts used the actual dimensions of the culvert, information that was not available for bridges and large culverts. Although the actual dimensions of small culverts were available, due to resource and data constraints, no hydraulic analyses were performed to determine overtopping potential. Instead, the size was simply used as a factor in the riverine flood exposure index.[4]

GARZA FIRE, JULY 2017

[4] Image by California National Guard. July 2017. *Garza Fire at Tar Canyon Road*. Available at flickr. Accessed May April 2020. Licensed to CC BY 2.0.

- **Small culvert exposure to wildfire:** In addition to the higher post-fire flood flows captured in the flood exposure analysis, culverts can also be sensitive to the direct impacts of fire on the structure. Certain culvert materials (e.g. wood and plastic) can easily burn or be deformed during a fire. Thus, an assessment was made to determine the likelihood of a wildfire directly impacting each small culvert in the early, mid, and late century timeframes. This analysis was only conducted for small culverts because information on culvert construction materials was not available for large culverts.

3.3. Prioritization Metrics

Metrics are the individual variables used to calculate a prioritization score for each asset. These can be thought of as the individual factors that, collectively, help determine the asset's priority for adaptation. Each of the asset-hazard combinations described in the previous section has its own unique set of factors that are used in the prioritization. The metrics were selected based on their relevancy to each asset-hazard combination and data availability. For example, the condition rating of a culvert is a very relevant metric for prioritizing culverts exposed to riverine flooding, however, it is not at all relevant to prioritizing bridges exposed to the same hazard. Table 2 provides an overview of all the metrics included in this study and denotes with an "X" their application to the various asset-hazard combinations studied.

TABLE 2: METRICS INCLUDED FOR EACH ASSET-HAZARD COMBINATION STUDIED

Metrics	Wildfire	Tempera-ture	Riverine Flooding		
	Small Culverts	Pavement Binder Grade	Bridges	Large Culverts	Small Culverts
Exposure					
Past natural hazard impacts	X		X	X	X
Initial timeframe for elevated level of concern for wildfire	X				
Highest projected wildfire level of concern	X				
Initial timeframe when asphalt binder grade needs to change		X			
Maximum riverine flooding exposure score for the 2010-2039 timeframe			X	X	X
Maximum riverine flooding exposure score			X	X	X
Consequences					
Bridge substructure condition rating			X		
Channel and channel protection condition rating			X	X	
Culvert condition rating				X	X
Culvert material	X				
Scour rating			X		
Average annual daily traffic (AADT)	X	X	X	X	X
Average annual daily truck traffic (AADTT)	X	X	X	X	X
Incremental travel distance to detour around the asset	X		X	X	X

The metrics included in this study fall into two categories: exposure metrics and consequence metrics. Exposure metrics capture the extensiveness, severity, and timing of a hazard's projected impact on an asset. Assets that have more extensive, more severe, and sooner exposure are given a higher priority. Consequence metrics provide an indication of how sensitive an exposed asset is to damage using information on the asset's condition. Consequence metrics also indicate how sensitive the overall transportation network may be to the loss of that asset should it be taken out of service by a hazard. The poorer the initial condition of the potentially exposed asset and the more critical it is to the functioning of the transportation network, the higher the priority given. The specific metrics that are included within each of these categories are described in the sections that follow.

3.3.1. Exposure Metrics

The following metrics were used to assess asset exposure in District 6:

- **Past natural hazard impacts:** Assets that have experienced weather or fire-related impacts in the past are likely to experience more issues in the future as climate changes and should be prioritized. Care was taken to ensure that these impacts were identified for assets that had not been replaced with a more resilient design after the flood event occurred. In addition, this study identifies small culverts that were damaged directly by fire and replaced with culverts of the same material. Any asset that was identified as previously impacted by either flooding or fire was flagged and that asset was given a higher priority for adaptation.

- **Initial timeframe for elevated level of concern from wildfire:** Assets that are more likely to be impacted by wildfire sooner should be prioritized first. Using the future wildfire projections developed for the District 6 Climate Change Vulnerability Assessment Report, the initial timeframe (2010-2039, 2040-2069, 2070-2099, or Beyond 2099) for heightened wildfire risk was determined for each small culvert. The most recent timeframe across the range of available climate scenarios was chosen. Assets that were impacted sooner were given a higher priority for adaptation.

- **Highest projected wildfire level of concern:** Assets that are exposed to a greater wildfire risk should be prioritized. The wildfire modeling conducted for the District 6 Climate Change Vulnerability Assessment Report classified fire risk into five levels of concern (very low, low, moderate, high, and very high) at various future time periods. Using this data, the highest level of concern was determined for each small culvert between now and 2100 and across all climate scenarios. Assets with higher levels of concern were given a higher priority for adaptation.

- **Initial timeframe when asphalt binder grade needs to change:** Roadway segments that are more likely to need binder grade changes sooner should be prioritized. Using the assumptions and data from the pavement binder grade exposure analysis described above, the initial timeframe (prior to 2010, 2010-2039, 2040-2069, or 2070-2099) for binder grade change was determined. Roadway segments that were found to need binder grade changes sooner were given a higher priority for detailed adaptation assessments.

FLOODED FARMLAND, SAN JOAQUIN RIVER

- **Maximum riverine flooding exposure score for the 2010-2039 timeframe**: Assets that have relatively higher exposure to riverine flooding in the near-term should be prioritized. Using the riverine flood exposure index values calculated using the process described above, the highest score for the near-term (2010-2039) period was determined for each bridge, large culvert, and small culvert considering all climate scenarios and the range of outputs from all climate and wildfire models. Assets with the highest overall riverine flooding scores in this initial period received a higher priority for adaptation.

- **Maximum riverine flooding exposure score:** In addition to understanding the most pressing near-term needs for dealing with riverine flooding, assets that have relatively higher exposure to riverine flooding at any point over their lifespans should also be prioritized. To calculate this metric, the highest riverine flooding exposure score was determined for each asset considering all time periods (from now through 2100), all climate scenarios, and all climate and wildfire models. Assets with the highest overall riverine flooding scores received a higher priority for adaptation.

3.3.2. Consequence Metrics

The following metrics were used to understand the consequences of each asset's exposure, considering both asset sensitivity to damage and network sensitivity to loss of the asset:

- **Bridge substructure condition rating:** Poor bridge substructure condition can contribute to failure during riverine flooding events. The NBI assigns a substructure condition rating to each bridge. Values range from nine to two with lower values indicating poorer condition. Bridges with poor substructure condition ratings were given higher priority for adaptation assessments.

- **Channel and channel protection condition rating:** Poor channel conditions or inadequate channel protection measures can contribute to failure during riverine flooding events. The NBI assigns a channel and channel protection condition rating to each bridge and large culvert. Values range from nine to two with lower values indicating poorer condition. Bridges and large culverts with poor channel or channel protection ratings were given higher priority for adaptation assessments.

- **Culvert condition rating:** Poor culvert condition can contribute to failure during riverine flooding events. The NBI assigns a culvert condition rating to each large culvert. Values range from nine to two with lower values indicating poorer condition. Caltrans has developed their own culvert condition rating system for small culverts. Possible ratings in the Caltrans system include good, fair, critical, and poor. Large and small culverts with poorer condition ratings in either system were prioritized.

- **Culvert material:** Culvert material determines the sensitivity of culverts to direct damage from wildfires. Caltrans includes material data in its databases on small culverts (no equivalent information exists for large culverts). Possible culvert materials include HDPE (high density polyethylene [plastic]), PVC (polyvinyl chloride [plastic]), corrugated steel pipe, composite, wood, masonry, and concrete. HDPE, PVC, corrugated steel pipe, composite, and wood culverts are all more sensitive to wildfire and any small culverts made from these materials that are exposed to an elevated risk from wildfire were prioritized for adaptation.

- **Scour rating:** Scour is a condition where water has eroded the soil around bridge piers and abutments. Excessive scour of bridge foundations makes bridges more prone to failure, especially during riverine flooding events. The NBI assigns a scour condition rating to each bridge. Values range from eight to two with lower values indicating greater scour concern. Bridges with lower scour values (higher scour concern) were given higher priority for adaptation assessments.

- **Average annual daily traffic (AADT):** AADT is a measure of the average traffic volume on a roadway. The consequences of weather-related failures/disruptions/maintenance are greater for assets that convey a higher volume of traffic. Disruptions on higher volume roads affect a greater proportion of the traveling public and there is a greater chance of congestion ripple effects throughout the network because alternate routes are less likely to be able to absorb the diverted traffic. AADT data was obtained from Caltrans databases and assigned to all the asset types included in this study. Exposed assets with higher AADT values were given greater priority for adaptation.

- **Average annual daily truck traffic (AADTT):** AADTT is a measure of the average truck volumes on a roadway. Efficient goods movement is important for maintaining economic resiliency and for providing relief supplies after a disaster. The consequences of weather-related failures/disruptions/maintenance are greater for assets that are a critical link in supply chains.

AADTT data was obtained from Caltrans databases and assigned to all the asset types included in this study. Potentially exposed assets with higher AADTT values were given greater priority for adaptation.

SNOWSTORM AND COLLAPSING SR 41

- **Incremental travel distance to detour around the asset:** This metric measures the degree of network redundancy around each asset. A detour routing tool was developed for this project that can find the shortest path detour around a bridge, large culvert, or small culvert and calculate the additional travel distance that would be required to take that detour. The tool was run for each of the assets studied. Assets that had very long detour routes were given greater priority for adaptation.

3.4. Calculation of Initial Prioritization Scores

Once all of the metrics had been gathered/developed, the next step was to combine them and calculate an initial prioritization score for each asset. Calculating prioritization scores is a multi-step process that was conducted using Microsoft Excel. The primary steps are as follows:

1. **Scale the raw metrics:** Several of the metrics described in the previous section have different units of measurement. For example, the AADT metric is measured in vehicles per day whereas the incremental travel time to detour around the asset is measured in minutes. There is a need to put each metric on a common scale to be able to integrate them into one scoring system.

For this study, it was decided to use a scale ranging from zero to 100 with zero indicating a value for a metric that would result in the lowest possible priority level and 100 indicating a value for a metric that would result in the highest possible priority level. The districtwide minimum and maximum values for each metric were used to set that metric's zero and 100 values. The past weather/fire impacts metric (which had binary values) was assigned a zero if the condition was false (i.e., there were no previous weather/fire impacts reported) and 100 if the condition was true. Categorized values, like the various conditions rating metrics, were generally parsed out evenly between zero and 100 (i.e., if there were seven condition rating values, the minimum and maximum values were coded as zero and 100, respectively, with the five remaining categories assigned values at intervals of 20). The remaining metrics with continuous values were allowed to fall at their proportional location within the re-scaled zero to 100 range.

2. **Apply weights:** Some metrics have been determined by Caltrans to be more important than others for determining priorities. Therefore, the relative importance of each metric was adjusted by multiplying the scaled score by a weighting factor. Metrics deemed more important to prioritization were multiplied by a larger weight. For consistency, Caltrans Headquarters staff harmonized the weights to be used in all districts based on national best practices and input from the districts. Table 3 shows the weighting scheme applied to the asset-hazard combinations in District 6. The weights are percentage based and add to 100% for all the metrics within a given asset-hazard combination (column).

   In general, higher weights were assigned to the future exposure metrics (including those considering both the hazard timing and severity) as they are the primary drivers of adaptation need. This helps ensure adaptations are considered proactively before the hazards affect the assets. It also focuses the first detailed assessments on those assets that are projected to be most severely affected by climate change.

   Amongst the consequence metrics, more weight is given to the AADT and detour route variables relative to the condition rating related variables (bridge substructure condition rating, channel and channel protection condition rating, culvert condition rating, and scour rating). The logic for this is as follows. First, except for the scour rating, the connection between asset condition and asset failure during a hazard event is not always straightforward. Where there is less confidence in a metric, it is weighted less.[5] Second, other prioritization systems used by Caltrans, namely the asset management system, focus on condition to prioritize assets. Thus, poor condition assets will already be prioritized through that program and, per Caltrans' Climate Adaptation Framework shown in Figure 1, will also undergo detailed adaptation assessments before upgrades are made. There is little value in duplicating that prioritization system for this report; instead this effort puts more priority on assets based on their exposure to climate change-related hazards. Lastly, the traffic volume and detour length variables are

[5] Note that the scour rating metric is weighted somewhat higher than the other condition related assets because of its more direct connection to asset failure.

the primary measures by which impacts to users of the system are captured and, given the importance of mobility to the functioning of the state, were weighted higher.[6]

TABLE 3: WEIGHTS BY METRIC FOR EACH ASSET-HAZARD COMBINATION STUDIED

Metrics	Percentage Weights by Asset Type				
	Wildfire	Tempera-ture	Riverine Flooding		
	Small Culverts	Pavement Binder Grade	Bridges	Large Culverts	Small Culverts
Exposure					
Past natural hazard impacts	20%	-	20%	20%	20%
Initial timeframe for elevated level of concern for wildfire	17.5%	-	-	-	-
Highest projected wildfire level of concern	17.5%	-	-	-	-
Initial timeframe when asphalt binder grade needs to change	-	60%	-	-	-
Maximum riverine flooding exposure score for the 2010-2039 timeframe	-	-	22.5%	22.5%	22.5%
Maximum riverine flooding exposure score	-	-	22.5%	22.5%	22.5%
Consequences					
Bridge substructure condition rating	-	-	1%	-	-
Channel and channel protection condition rating	-	-	2.5%	2.5%	-
Culvert condition rating	-	-	-	2.5%	5%
Culvert material	20%	-	-	-	-
Scour rating	-	-	6.5%	-	-
Average annual daily traffic (AADT)	7%	13%	7%	10%	10%
Average annual daily truck traffic (AADTT)	3%	27%	3%	5%	5%
Incremental travel distance to detour around the asset	15%	-	15%	15%	15%
TOTAL	100%	100%	100%	100%	100%

An exception to some of the logic noted above can be found with small culvert exposure to wildfire. For these assets, nearly as much weight is given to the culvert material variable as to the AADT and detour route variables collectively. This is because the very nature of the threat to small culverts from wildfire is highly related to the material of the culvert. If the culvert is plastic or wood, it is much more susceptible to fire damage than, say, a concrete culvert. Since they are less likely to be adversely affected by fire in the first place, one would not want to give high priority to concrete culverts for wildfire just because they convey a high AADT or have long

[6] Within the traffic volume related metrics, note that slightly more weight is given to AADT as opposed to truck AADT given that the majority of traffic on a roadway is non-truck. Thus, it was reasoned that the total volume should factor in somewhat more heavily than the truck volume. One exception to this was for temperature impacts to pavement. This asset-hazard combination is unique in that the traffic volume information is not just an indicator of how many users may be affected by necessary pavement repairs but also an indicator of how much damage may occur to the pavement should temperatures exceed binder grade design thresholds. Given that, for this asset-hazard combination, more weight is given to truck volumes since trucks do disproportionately more damage to temperature-weakened pavement.

detour routes. That is why more weight is placed on the material metric for this particular asset-hazard combination.

3. **Calculate prioritization scores for each hazard**: After the weights were applied, the next step was to calculate prioritization scores for each individual hazard. This was done by first summing the products of the weights and scaled values for all the metrics relevant to the particular asset-hazard combination being studied (i.e., summing up the products for each column in Table 3). Since there are different numbers of metrics used to calculate the score for each asset-hazard combination, these values were then re-scaled to range from zero to 100 with zero representing the lowest priority asset and 100 the highest priority asset. These interim scores provide useful information for understanding asset vulnerability to each specific hazard.

4. **Calculate cross-hazard prioritization scores:** While the prioritization scores for each hazard provide useful information, they do not provide the full picture on the threats posed to each asset. It was decided that the final scores used as the basis for prioritization need to look holistically across all the hazards analyzed. This cross-hazard perspective provides a better view of the collective threats faced by each asset and a better basis for prioritization. To calculate the cross-hazard scores, the scores for each hazard analyzed for the asset were summed. These were then re-scaled yet again to a zero to 100 scale since different asset types have different numbers of hazards. As before, the higher the score, the higher the adaptation priority of that asset. These cross-hazard scores represent the final scores calculated for each asset during the technical assessment portion of the methodology.

5. **Assign priority levels**: The final step in the technical assessment was to group together assets into different priority levels based on their cross-hazard scores. This was done to make the outputs more oriented to future actions, decrease the tendency to read too much into minor differences in the cross-hazard scores, and better facilitate dialogue at the workshop with District 6 staff. Five priority levels were developed (Priority 1, 2, 3, 4, and 5) and assets were assigned to those groups on a district-wide basis. An equal number of assets were assigned to each priority level to help facilitate administration of the facility-level adaptation assessments that will follow this study.

3.5. Adjustments to Prioritization

After the initial prioritization scores were calculated, a workshop was held with the district to explain the scoring methodology and go over the preliminary results. District 6 staff were given the opportunity to make recommendations on adjusting asset priorities. District adjustments to the prioritization are important for a variety of reasons. First, there could be errors in the databases themselves; rarely are large databases entirely free of errors. Second, errors may have been introduced during the GIS processing of some of the datasets. For example, a small culvert may have been inadvertently associated with the wrong stream during the geoprocessing step, leading to it receiving an inaccurate riverine flooding exposure score. Lastly, district staff, possess an intimate knowledge of their assets and may have knowledge about the assets or their environmental context that is not easily captured in an indicator-based scoring methodology.

District 6 reviewed the preliminary prioritization results and made some adjustments to the prioritized roadway segments. See Chapter 4.4 of this document for more information about the changes made. Table 7 presents a summary of all the Priority 1 roadways in District 6 sorted by their cross-hazard

prioritization scores and Table 11 shows all cross-hazard roadway priorities in District 6. Roadway segments that had their priority level manually changed by district staff are indicated in these tables with footnotes.

4. DISTRICT ADAPTATION PRIORITIES

District 6 is the second largest Caltrans District, which includes Madera, Fresno, Tulare, Kings and Kern counties. With Interstate 5 and State Route 99 running the entire length of District 6, it has the largest portion of road miles to maintain in the State Highway System. This chapter presents Caltrans' priorities for undertaking detailed adaptation assessments of assets exposed to climate change in District 6. The material presented in this chapter reflects the results of the technical analysis and the coordination with District 6 staff described in the previous chapter. The information is broken out by asset type with priorities for bridges discussed in the first section, followed by those for large culverts, small culverts, and roadways.

4.1. Bridges

A total of 117 bridges were assessed for vulnerability to enhanced riverine flooding associated with climate change. All these bridges should eventually undergo site-specific adaptation assessments. However, due to resource limitations, this will not be possible to do all at once. Instead, the bridges will be analyzed over time according to the priorities presented here.

Figure 2 provides a map of all the bridges assessed for riverine flooding in the district. The color of the points corresponds to the priority assigned to each bridge; darker red colors indicate higher priority assets. The map shows that high priority bridges are scattered throughout the district. That said, there are a few clusters of areas that have several high priority bridges. Several bridges along Interstate 5 and State Route 99 throughout the district have high priority due to past flooding impacts, high riverine flood exposure scores for future conditions, and high car and truck volumes. There is also a concentration of bridges with high prioritization scores on State Route 198 in the Coalinga Canyon within Fresno County due to high riverine flood exposure scores, poor asset condition, and long detour routes.

Table 4 presents a summary of all the Priority 1 bridges in District 6 sorted by their cross-hazard prioritization scores. A complete listing of all bridges ranked by their prioritization scores appears in Table 8 in the appendix.

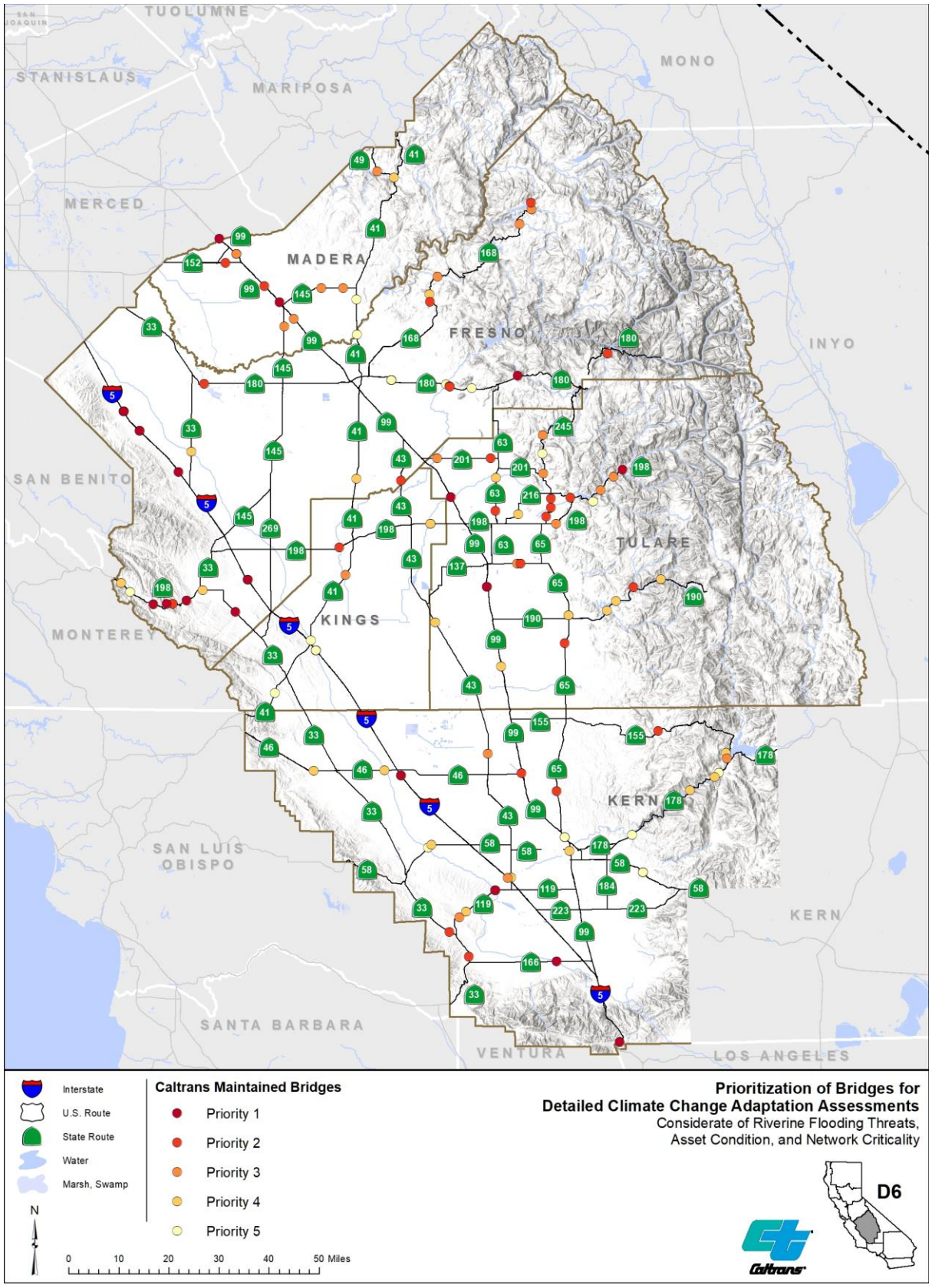


FIGURE 2: PRIORITIZATION OF BRIDGES FOR DETAILED ADAPTATION ASSESSMENTS

TABLE 4: PRIORITY 1 BRIDGES

Priority	Bridge Number	County[7]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
1	42 0241L	FRE	INTERSTATE 5 SB	ARROYO HONDO	33.62	100.00
1	41 0001	MAD	STATE ROUTE 99	CHOWCHILLA RIVER	29.33	93.94
1	50 0048	KER	INTERSTATE 5	CUDDY CREEK	R.55	89.72
1	42 0412L	FRE	INTERSTATE 5 SB	ARROYO PASAJERO	7.96	89.70
1	50 0315L	KER	INTERSTATE 5 SB	KERN RIVER FLOOD CANAL	71.64	87.70
1	42 0080	FRE	STATE ROUTE 180	MILL CREEK	92.18	87.33
1	50 0315R	KER	INTERSTATE 5 NB	KERN RIVER FLOOD CANAL	71.66	86.48
1	41 0052	MAD	STATE ROUTE 99	FRESNO RIVER	11.65	85.94
1	42 0013	FRE	STATE ROUTE 198	COALINGA HOT SPRINGS CANYON	9.77	84.59
1	42 0412R	FRE	INTERSTATE 5 NB	ARROYO PASAJERO	7.96	82.83
1	42 0249L	FRE	INTERSTATE 5 SB	PANOCHE CREEK	49.99	81.25
1	42 0249R	FRE	INTERSTATE 5 NB	PANOCHE CREEK	49.99	80.65
1	50 0084	KER	STATE ROUTE 119	KERN RIVER	15.08	80.53
1	42 0115	FRE	STATE ROUTE 33	ZAPATO CHINO CREEK	5.28	79.57
1	46 0029	TUL	STATE ROUTE 198	KAWEAH RIVER	43.92	75.70
1	42 0012	FRE	STATE ROUTE 198	WARTHAN CREEK	13.6	74.73
1	42 0099	FRE	STATE ROUTE 198	KOLINGO CREEK	19.15	73.14
1	46 0060L	TUL	STATE ROUTE 99 SB	ELK BAYOU	25.01	73.04
1	46 0060R	TUL	STATE ROUTE 99 NB	ELK BAYOU	25.01	73.04
1	42 0246L	FRE	INTERSTATE 5 SB	TUMEY GULCH	44.93	72.46
1	42 0246R	FRE	INTERSTATE 5 NB	TUMEY GULCH	44.93	72.26
1	50 0323	KER	STATE ROUTE 166	CALIFORNIA AQUEDUCT PM 272.5	17.44	71.78
1	46 0033R	TUL	STATE ROUTE 99 NB	CROSS CREEK	44.89	71.35

[7] KER = Kern; KIN = Kings; FRE = Fresno; TUL = Tulare; MAD = Madera

4.2. Large Culverts

A total of 29 large culverts were assessed for vulnerability to more severe riverine flooding associated with climate change. Figure 3 provides a map of all the large culverts potentially exposed to enhanced riverine flooding in the district and colored by their priority level. Given the limited number of large culverts in District 6, it is hard to draw spatial patterns to the vulnerabilities. That said, it is worth nothing that a cluster of three high priority large culverts occur along State Route 33 north of the junction with State Route 58 in McKittrick. Additionally, there are three high priority large culverts along State Route 119 between State Route 33 and Interstate 5. All of the large culverts in these areas have very high riverine flood exposure scores.

Table 5 presents a summary of all the Priority 1 large culverts in District 6 sorted by their cross-hazard prioritization scores. A complete listing of all large culverts ranked by their prioritization scores appears in Table 9 in the appendix.

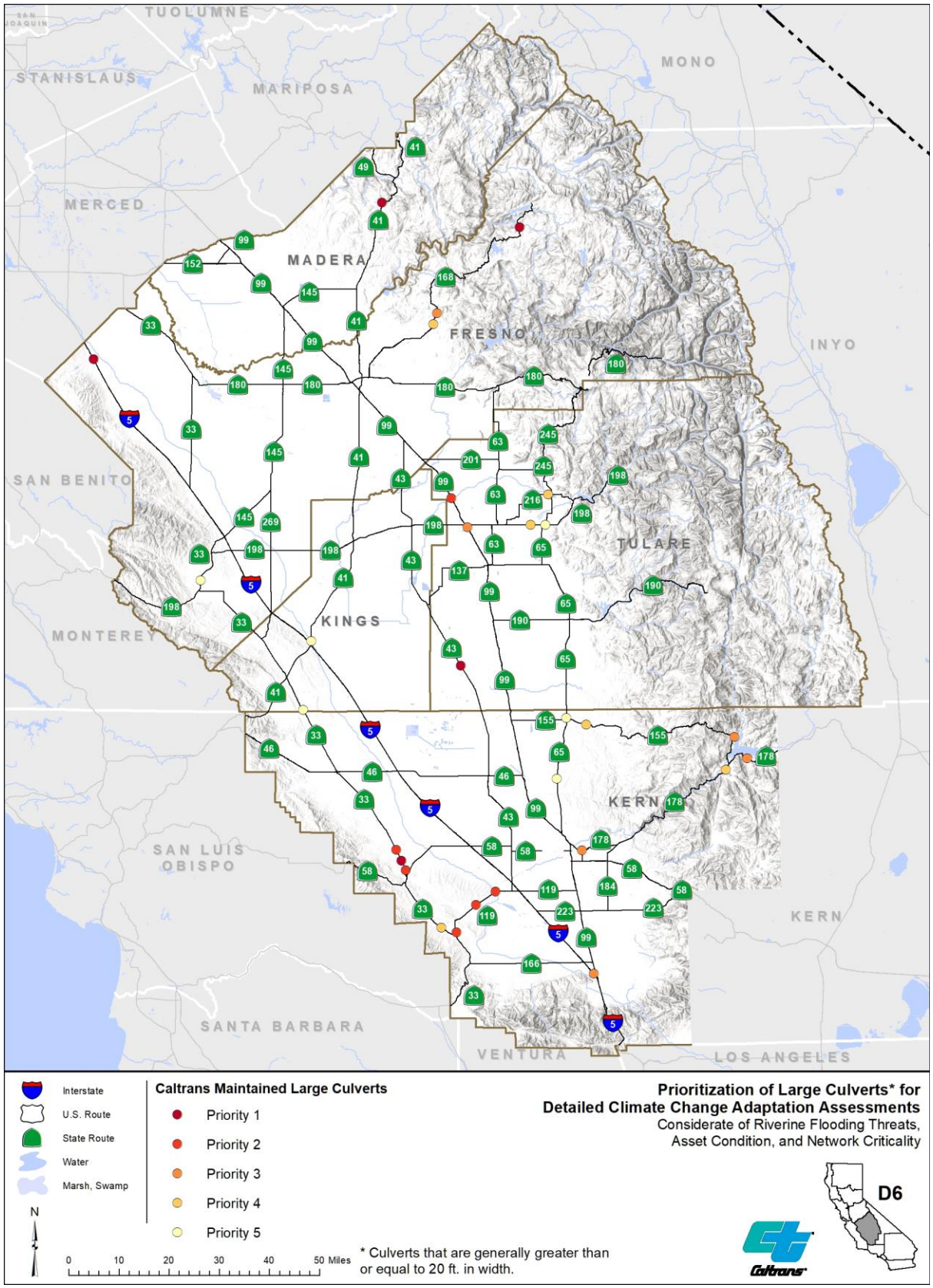


FIGURE 3: PRIORITIZATION OF LARGE CULVERTS FOR DETAILED ADAPTATION ASSESSMENTS

TABLE 5: PRIORITY 1 LARGE CULVERTS

Priority	Bridge Number	County[8]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
1	42 0374	FRE	INTERSTATE 5	LIL PANOCHE CREEK	62.21	100.00
1	41 0021	MAD	STATE ROUTE 41	COARSEGOLD CREEK	27.93	99.01
1	46 0238	TUL	STATE ROUTE 43	DEER CREEK	R10.11	85.97
1	42 0057	FRE	SR 168	S FORK TAMARACK CREEK	58.23	73.07
1	50 0195	KER	STATE ROUTE 33	WASP WASH	37.89	64.27

4.3. Small Culverts

A total of 632 small culverts were assessed for vulnerability to more severe riverine flooding and wildfire associated with climate change. Figure 4 provides a map of all the small culverts potentially exposed to more severe riverine flooding and wildfire in the district. The small culverts are colored based on priority level.

The map indicates several clusters of high priority small culverts. Notable clusters can be found along several different roadways traversing the Sierra Nevada and Diablo Mountain ranges that ring the Central Valley. Specifically, clusters of high priority small culverts can be found along State Route 41 in Madera County, State Routes 198, 168, and 180 in Fresno County, and State Routes 155 and 178 in Kern County. All these assets have high wildfire and riverine flood exposure scores. Notably, a large cluster of high priority small culverts can be found along Interstate 5 North of State Route 33 in Fresno County and in the Tejon Pass in Kern County. Interstate 5 is a major car and truck traffic route in the district. In particular, the Tejon Pass segment has a long detour route. Many of the highest priority assets have no detour route at all, meaning that those reliant on this roadway for access could be cut off from their homes or businesses should the small culvert fail, blocking passage on the roadway.

Table 6 presents a summary of all the Priority 1 small culverts in District 6 sorted by their cross-hazard prioritization scores. A complete listing of all small culverts ranked by their prioritization scores appears in Table 10 in the appendix.

[8] KER = Kern; FRE = Fresno; TUL = Tulare; MAD = Madera

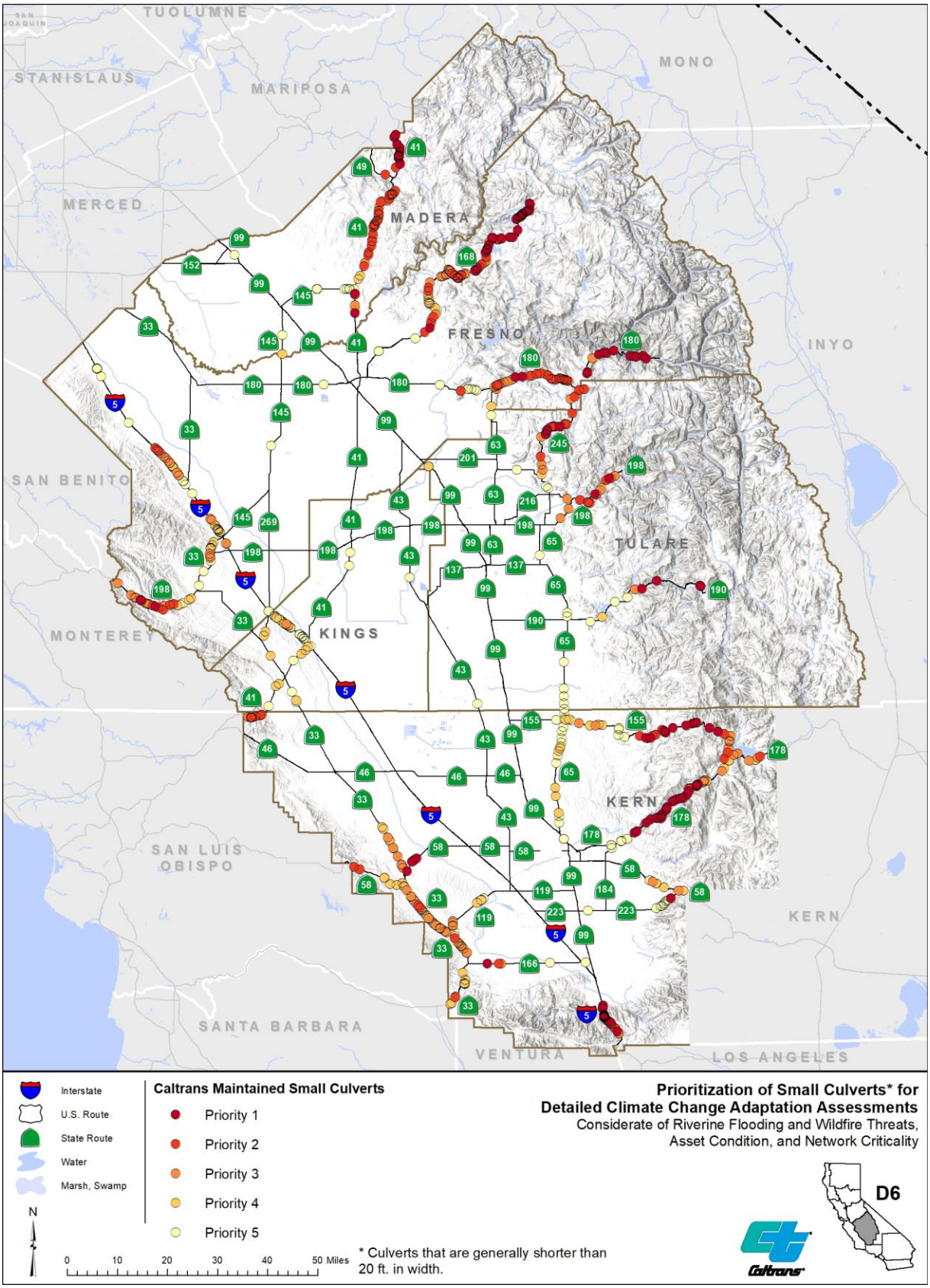


FIGURE 4: PRIORITIZATION OF SMALL CULVERTS FOR DETAILED ADAPTATION ASSESSMENTS

TABLE 6: PRIORITY 1 SMALL CULVERTS

Priority	Culvert System Number	County[9]	Route	Postmile	Cross-Hazard Prioritization Score
1	501780002671	KER	178	26.71	100.00
1	421800012582	FRE	180	125.82	97.08
1	500054000973	KER	5	9.73	92.90
1	421804013304	FRE	180	133.04	91.96
1	421800012380	FRE	180	123.8	91.94
1	421804011859	FRE	180	118.59	91.33
1	421804013527	FRE	180	135.27	90.82
1	421804013245	FRE	180	132.45	89.81
1	421804013434	FRE	180	134.34	89.55
1	421800012220	FRE	180	122.2	87.66
1	500054000736	KER	5	7.36	86.65
1	421804013152	FRE	180	131.52	85.74
1	500054000746	KER	5	7.46	82.15
1	500054000973	KER	5	9.73	82.13
1	501780002548	KER	178	25.48	81.41
1	500054000726	KER	5	7.26	80.39
1	501780002583	KER	178	25.83	79.59
1	501780002331	KER	178	23.31	79.28
1	500054000990	KER	5	9.9	77.85
1	500054000737	KER	5	7.37	77.85
1	500054000973	KER	5	9.73	77.70
1	410410000450	MAD	41	4.5	75.56
1	501780002297	KER	178	22.97	75.05
1	501780002370	KER	178	23.7	74.99
1	500054000667	KER	5	6.67	74.81
1	501554004953	KER	155	49.53	74.57
1	501554004846	KER	155	48.46	74.00
1	410414004417	MAD	41	44.17	73.82
1	500054000973	KER	5	9.73	72.43
1	461904003939	TUL	190	39.39	72.36
1	501780002153	KER	178	21.53	71.84
1	500054000973	KER	5	9.73	71.82
1	410410000823	MAD	41	8.23	71.58
1	501781103003	KER	178	30.03	70.75
1	501554004917	KER	155	49.17	70.59

[9] KER = Kern; KIN = Kings; FRE = Fresno; TUL = Tulare; MAD = Madera

Priority	Culvert System Number	County[9]	Route	Postmile	Cross-Hazard Prioritization Score
1	501780002124	KER	178	21.24	70.08
1	501554004617	KER	155	46.17	69.25
1	501780001957	KER	178	19.57	68.49
1	501780001997	KER	178	19.97	68.49
1	501780001735	KER	178	17.35	68.20
1	501780001617	KER	178	16.17	67.95
1	421680006190	FRE	168	61.9	67.30
1	500054000725	KER	5	7.25	67.28
1	421680006564	FRE	168	65.64	67.27
1	500054000973	KER	5	9.73	66.84
1	501781102938	KER	178	29.38	66.68
1	421680006545	FRE	168	65.45	66.01
1	461904005438	TUL	190	54.38	65.90
1	421680006382	FRE	168	63.82	65.57
1	421680006209	FRE	168	62.09	65.55
1	421680006042	FRE	168	60.42	65.06
1	421680006093	FRE	168	60.93	65.04
1	421680006116	FRE	168	61.16	65.04
1	501780002068	KER	178	20.68	64.86
1	501780001265	KER	178	12.65	63.76
1	421680006443	FRE	168	64.43	63.68
1	421680006321	FRE	168	63.21	63.68
1	421680006185	FRE	168	61.85	63.67
1	421684005521	FRE	168	55.21	63.49
1	421680006022	FRE	168	60.22	63.22
1	421680006318	FRE	168	63.18	63.02
1	421680006132	FRE	168	61.32	62.47
1	421680006138	FRE	168	61.38	62.45
1	501660000396	KER	166	3.96	62.06
1	421684005456	FRE	168	54.56	61.61
1	501554004288	KER	155	42.88	61.54
1	501780001324	KER	178	13.24	61.05
1	421680001800	FRE	168	18	60.65
1	461904005410	TUL	190	54.1	60.59
1	500050000330	KER	5	3.3	60.16
1	502230003007	KER	223	30.07	59.93
1	501554105728	KER	155	57.28	59.89
1	501554105453	KER	155	54.53	59.17

Priority	Culvert System Number	County[9]	Route	Postmile	Cross-Hazard Prioritization Score
1	421684004767	FRE	168	47.67	56.86
1	421684005758	FRE	168	57.58	56.71
1	501550004085	KER	155	40.85	55.37
1	421984001045	FRE	198	10.45	55.06
1	421680004066	FRE	168	40.66	55.01
1	421984000713	FRE	198	7.13	54.91
1	410414400145	MAD	41	1.45	54.10
1	501784103469	KER	178	34.69	54.10
1	410414004141	MAD	41	41.41	53.68
1	501554004030	KER	155	40.3	53.22
1	461904003515	TUL	190	35.15	53.05
1	501784103505	KER	178	35.05	52.82
1	421984000744	FRE	198	7.44	52.73
1	461980004053	TUL	198	40.53	52.67
1	421684004667	FRE	168	46.67	52.61
1	501784103485	KER	178	34.85	52.56
1	421684004652	FRE	168	46.52	52.54
1	501784103452	KER	178	34.52	52.37
1	462450002182	TUL	245	21.82	52.36
1	421684004628	FRE	168	46.28	52.36
1	462450002261	TUL	245	22.61	52.36
1	421684003972	FRE	168	39.72	52.34
1	462450002195	TUL	245	21.95	52.29
1	421800011252	FRE	180	112.52	52.17
1	421800011277	FRE	180	112.77	52.16
1	421684005231	FRE	168	52.31	52.10
1	410414004215	MAD	41	42.15	51.90
1	421800009198	FRE	180	91.98	51.78
1	410414004299	MAD	41	42.99	51.74
1	410414004114	MAD	41	41.14	51.69
1	410414004124	MAD	41	41.24	51.69
1	410414004119	MAD	41	41.19	51.67
1	421804009356	FRE	180	93.56	51.66
1	410414004088	MAD	41	40.88	51.63
1	500580001690	KER	58	16.9	51.57
1	410414400071	MAD	41	0.71	51.53
1	500050000589	KER	5	5.89	51.41
1	500580001911	KER	58	19.11	51.40

Priority	Culvert System Number	County[9]	Route	Postmile	Cross-Hazard Prioritization Score
1	500050000618	KER	5	6.18	51.39
1	462450002669	TUL	245	26.69	51.18
1	501554003566	KER	155	35.66	50.98
1	501784103187	KER	178	31.87	50.80
1	501554004061	KER	155	40.61	50.73
1	501780103127	KER	178	31.27	50.73
1	421684003963	FRE	168	39.63	50.53
1	421684004587	FRE	168	45.87	50.53
1	462450002308	TUL	245	23.08	50.49
1	421684004957	FRE	168	49.57	50.29
1	421684004970	FRE	168	49.7	50.22
1	501554003680	KER	155	36.8	50.17
1	410414003927	MAD	41	39.27	50.11
1	461980003586	TUL	198	35.86	50.06
1	500580002023	KER	58	20.23	49.79

4.4. Roadways

A total of 4,846 roadway segments were assessed for vulnerability to temperature changes that affect pavement performance. All these segments are potentially exposed to temperature changes that could result in the need to change pavement binder grades from current specifications sometime over their asset life. To make the analysis as detailed as possible, the original segments were short with beginning and end points at intersections with other streets (including smaller local streets) in the roadway network. Once the processing of vulnerability scores was complete, smaller segments sharing the same priority score as their neighbors on the same route were consolidated into longer segments to simplify the presentation of the results. This reduced the number of segments to those presented here.

Error! Reference source not found. provides a map of all the consolidated roadway segments potentially exposed to pavement degrading temperature changes in the district. Each segment is colored according to its priority level. The map shows significant asset vulnerabilities throughout the district. Portions of State Route 58 have the highest cross-hazard prioritization scores. Interstate 5 and State Route 99, two major north-south truck routes in the district, are also considered high priority assets. Several of the highest priority roadways for pavement binder grade changes are in the Kern County portion of the district. All the highest priority roads may experience pavement binder grade issues in the near term. The high volume of car and truck volumes on these roadways also contributes to their high priority scores since maintenance and paving repairs would be disruptive.

After the May 6, 2020 workshop, which was held with District 6 to discuss the hazards and prioritization covered in this report, district staff opted to adjust the prioritization of road segments. The results of these changes can be seen in Table 7, which presents a summary of all the Priority 1 roadways in District 6 sorted by their cross-hazard prioritization scores. A complete listing of all roadways ranked by their prioritization scores appears in Table 11 in the appendix. Roadway segments that were manually adjusted by the district have footnotes next to their cross-hazard score. These roadway segements were changed due to district knowledge of existing pavement conditions which will affect the durability and life of these portions of the State Highway System.

DROUGHT STRICKEN TREES ALONG SR 155, KERN COUNTY

TABLE 7: PRIORITY 1 ROADWAYS

Priority	Route	Carriageway[10]	From County & Postmile / To County & Postmile[11]	Average Cross-Hazard Prioritization Score[12]
1	58	P	KER 58 39.97 / KER 58 45.975	87.54
1	58	P	KER 58 50.611 / KER 58 51.807	87.54
1	58	P	KER 58 T52.137 / KER 58 69.938	87.54
1	58	S	KER 58 45.229 / KER 58 45.622	87.12
1	58	S	KER 58 50.611 / KER 58 51.806	87.12
1	58	S	KER 58 T52.137 / KER 58 74.191	87.12
1	5	P	FRE 5 1.705 / FRE 5 9.233	86.42
1	5	P	FRE 5 40.658 / FRE 5 45.799	86.42
1	5	P	KER 5 13.516 / KER 5 R15.865R	86.42
1	5	P	KER 5 29.542 / KER 5 47.544	86.42
1	5	P	KER 5 82.35 / KIN 5 4.424	86.42
1	99	S	FRE 99 20.189 / FRE 99 21.014	85.75[13]
1	99	S	FRE 99 21.853 / FRE 99 22.742	85.75[13]
1	99	S	KER 99 10.919 / KER 99 R30.548	85.75[13]
1	99	S	KER 99 44.31 / KER 99 50.407	85.75[13]
1	99	S	KER 99 55.522 / TUL 99 3.071	85.75[13]
1	99	S	KER 99 L0.164 / KER 99 0.018	85.75[13]
1	99	S	MAD 99 R14.244 / MAD 99 R18.682	85.75[13]
1	99	P	FRE 99 20.187 / FRE 99 21.236	84.24[13]
1	99	P	FRE 99 21.828 / FRE 99 22.391	84.24[13]
1	99	P	KER 99 10.933 / KER 99 R30.522	84.24[13]
1	99	P	KER 99 44.306 / KER 99 50.405	84.24[13]
1	99	P	KER 99 55.519 / TUL 99 3.067	84.24[13]
1	99	P	KER 99 L0 / KER 99 0.013	84.24[13]
1	99	P	MAD 99 R14.221 / MAD 99 R18.831	84.24[13]
1	178	S	KER 178 0 / KER 178 0.16	83.18
1	178	S	KER 178 0.166 / KER 178 R2.003	83.18
1	178	S	KER 178 9.195 / KER 178 9.292	83.18
1	178	S	KER 178 T9.063 / KER 178 T9.677	83.18
1	65	P	KER 65 R0 / KER 65 5.399	83.03
1	204	S	KER 204 R0 / KER 204 6.739	82.16
1	204	P	KER 204 R0 / KER 204 6.752	82.14

[10] Caltrans' alignment codes designate the carriageway on divided roadways: "P" always represents northbound or eastbound carriageways whereas "S" always represents southbound or westbound carriageways. Undivided roadways are always indicated with a "P".
[11] KER = Kern; KIN = Kings; FRE = Fresno; TUL = Tulare; MAD = Madera
[12] These values represent the average of the cross-hazard prioritization scores amongst all the abutting small segments on the same route sharing a common priority level that were aggregated to form the longer segments listed in this table.
[13] Priority changed in response to input from District 6.

Priority	Route	Carriageway[10]	From County & Postmile / To County & Postmile[11]	Average Cross-Hazard Prioritization Score[12]
1	5	S	FRE 5 1.711 / FRE 5 9.238	82.11[13]
1	5	S	FRE 5 40.663 / FRE 5 45.824	82.11[13]
1	5	S	KER 5 13.502 / KER 5 16.032L	82.11[13]
1	5	S	KER 5 29.527 / KER 5 47.572	82.11[13]
1	5	S	KER 5 5.016 / KER 5 10.305L	82.11[13]
1	5	S	KER 5 82.77 / KIN 5 4.429	82.11[13]
1	65	S	KER 65 R0.017 / KER 65 R0.426	81.67
1	178	P	KER 178 0 / KER 178 0.16	80.49[13]
1	178	P	KER 178 0.16 / KER 178 R2.002	80.49[13]
1	178	P	KER 178 T9.067 / KER 178 13.636	80.49[13]
1	41	S	MAD 41 5.277 / MAD 41 6.214	80.42
1	41	S	MAD 41 9.125 / MAD 41 9.346	80.42
1	184	P	KER 184 L0 / KER 184 12.139	80.38
1	184	S	KER 184 0.854 / KER 184 2.24	80.11
1	184	S	KER 184 2.816 / KER 184 3.172	80.11
1	184	S	KER 184 7.634 / KER 184 8.35	80.11
1	184	S	KER 184 8.481 / KER 184 8.635	80.11
1	119	P	KER 119 8.7 / KER 119 R11.956	79.90
1	119	P	KER 119 R13.168 / KER 119 31.283	79.90
1	166	P	KER 166 22.658 / KER 166 22.924	79.56
1	223	P	KER 223 1.874 / KER 223 3.781	79.49[13]
1	223	P	KER 223 4.864 / KER 223 22.199	79.49[13]
1	180	P	FRE 180 94.781 / FRE 180 104.054	79.41
1	33	P	FRE 33 9.768 / FRE 33 19.966	79.23
1	43	S	KER 43 16.551 / KER 43 16.609	79.14
1	43	S	KER 43 17.043 / KER 43 17.667	79.14
1	43	S	KER 43 R23.625 / KER 43 R24.122	79.14
1	168	P	FRE 168 15.47 / FRE 168 22.12	79.10
1	178	S	KER 178 R1.755L / KER 178 R1.942	79.09
1	119	S	KER 119 28.225 / KER 119 28.495	79.05
1	198	P	FRE 198 21.367 / FRE 198 22.65	79.05
1	178	P	KER 178 R1.731R / KER 178 R2.147	78.96
1	223	S	KER 223 R20.05 / KER 223 21.145	78.90
1	46	P	KER 46 35.128 / KER 46 57.647	78.29[13]
1	41	P	KIN 41 17.462 / KIN 41 33.002	76.71[13]
1	41	P	KIN 41 33.587 / KIN 41 34.689	76.71[13]
1	41	P	MAD 41 2.842 / MAD 41 14.849	76.71[13]
1	43	P	KER 43 0.111 / KER 43 8.249	74.58[13]

Priority	Route	Carriageway[10]	From County & Postmile / To County & Postmile[11]	Average Cross-Hazard Prioritization Score[12]
1	43	P	KER 43 16.541 / KER 43 17.173	74.58[13]
1	43	P	KER 43 25.187 / KER 43 34.549	74.58[13]
1	43	P	KER 43 R23.625 / KER 43 R24.082	74.58[13]
1	155	P	KER 155 0 / KER 155 R0.006	70.38[13]
1	46	S	KER 46 35.673 / KER 46 35.95	70.27[13]
1	46	S	KER 46 49.764 / KER 46 50.904	70.27[13]
1	145	P	FRE 145 0.01 / FRE 145 0.815	55.53[13]
1	145	P	FRE 145 1.733 / FRE 145 3.23	55.53[13]
1	145	P	MAD 145 23.021 / MAD 145 25.393	55.53[13]
1	63	S	TUL 63 0 / TUL 63 5.513	48.93[13]
1	63	P	TUL 63 0 / TUL 63 5.514	48.93[13]
1	216	S	TUL 216 R0 / TUL 216 R0.99	48.44[13]
1	216	P	TUL 216 R0 / TUL 216 R0.99	48.44[13]

5. NEXT STEPS

This report has identified the bridge, large culvert, small culvert, and roadway assets exposed to a variety of climate hazards in District 6 and assigned them priority levels for detailed assessments based on their vulnerability rating. Caltrans' next step will be to begin undertaking these detailed adaptation assessments for the identified assets starting with the highest priority (Priority 1) assets first and then proceeding to lower priority assets thereafter. These detailed adaptation assessments will take a closer look at the exposure to each asset using more localized climate projections and more detailed engineering analyses. If impacts are verified, Caltrans will develop and evaluate adaptation options for the asset to ensure that it is able to withstand future climate changes. Importantly, the detailed adaptation assessments will include coordination with key stakeholder groups whose actions affect or are affected by the asset and its adaptation.[14]

FRESNO AMTRAK STATION

Another next step will be to integrate the prioritization measures into the asset management system used in the district. This will ensure that climate change is a consideration in the identification of future projects alongside traditional asset condition metrics. As noted previously, assets identified for capital investments, especially those flagged as being a high priority for climate change, should then undergo detailed climate change assessments prior to project programming.

In addition, district staff can use the results of this study as a starting point to begin discussions with various important stakeholders in the district about addressing climate change and its impacts. This includes state and federal environmental agencies, the National Forest Service, forest product companies (major landowners in the district whose actions directly affect the road network), and others.

[14] Image by Ron Reiring. January 2008. *"Fresno CA train station."* Retrieved from flickr. Accessed April 2020. Licensed to CC BY 2.0.

Multi-agency stakeholder coordination and involvement of the private sector are essential because the impacts from climate change, and ability to effectively address those impacts, cross both jurisdictional and ownership boundaries. For example, Caltrans could increase the size of a culvert to accommodate higher stormwater and debris flows, but a more cost-effective solution may instead be better land management in the adjacent drainage area. The overall approach to climate change in District 6 cannot just be Caltrans-centric. A common framework across all state agencies must be established for truly effective long-term solutions to be achieved.

Lastly, Caltrans will consider expanding the vulnerability assessments to include hazards and asset-hazard combinations that were not able to be included in this study. As part of the development of this report, several additional hazards were noted by District 6 staff as currently affecting assets and that would be helpful to study in the future (including how climate change will affect these hazards). These include subsidence, collapsible soils, landslides, and riverine flood threats to at-grade roadways (beyond the immediate vicinity of stream crossings that were part of this study). Once these hazards have been mapped and exposure of assets assessed, this information can be incorporated into the prioritization framework used in this study to modify the priorities assigned to assets based on a more comprehensive all hazards vulnerability score.

6. APPENDIX

TABLE 8: PRIORITIZATION OF BRIDGES FOR DETAILED CLIMATE CHANGE ADAPTATION ASSESSMENTS

Priority	Bridge Number	County[15]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
1	42 0241L	FRE	INTERSTATE 5 SB	ARROYO HONDO	33.62	100.00
1	41 0001	MAD	STATE ROUTE 99	CHOWCHILLA RIVER	29.33	93.94
1	50 0048	KER	INTERSTATE 5	CUDDY CREEK	R.55	89.72
1	42 0412L	FRE	INTERSTATE 5 SB	ARROYO PASAJERO	7.96	89.70
1	50 0315L	KER	INTERSTATE 5 SB	KERN RIVER FLOOD CANAL	71.64	87.70
1	42 0080	FRE	STATE ROUTE 180	MILL CREEK	92.18	87.33
1	50 0315R	KER	INTERSTATE 5 NB	KERN RIVER FLOOD CANAL	71.66	86.48
1	41 0052	MAD	STATE ROUTE 99	FRESNO RIVER	11.65	85.94
1	42 0013	FRE	STATE ROUTE 198	COALINGA HOT SPRINGS CANYON	9.77	84.59
1	42 0412R	FRE	INTERSTATE 5 NB	ARROYO PASAJERO	7.96	82.83
1	42 0249L	FRE	INTERSTATE 5 SB	PANOCHE CREEK	49.99	81.25
1	42 0249R	FRE	INTERSTATE 5 NB	PANOCHE CREEK	49.99	80.65
1	50 0084	KER	STATE ROUTE 119	KERN RIVER	15.08	80.53
1	42 0115	FRE	STATE ROUTE 33	ZAPATO CHINO CREEK	5.28	79.57
1	46 0029	TUL	STATE ROUTE 198	KAWEAH RIVER	43.92	75.70
1	42 0012	FRE	STATE ROUTE 198	WARTHAN CREEK	13.6	74.73
1	42 0099	FRE	STATE ROUTE 198	KOLINGO CREEK	19.15	73.14
1	46 0060L	TUL	STATE ROUTE 99 SB	ELK BAYOU	25.01	73.04
1	46 0060R	TUL	STATE ROUTE 99 NB	ELK BAYOU	25.01	73.04
1	42 0246L	FRE	INTERSTATE 5 SB	TUMEY GULCH	44.93	72.46
1	42 0246R	FRE	INTERSTATE 5 NB	TUMEY GULCH	44.93	72.26
1	50 0323	KER	STATE ROUTE 166	CALIFORNIA AQUEDUCT PM 272.5	17.44	71.78
1	46 0033R	TUL	STATE ROUTE 99 NB	CROSS CREEK	44.89	71.35
2	50 0104	KER	STATE ROUTE 155	POSO CREEK	38.79	70.63
2	46 0008	TUL	STATE ROUTE 190	NORTH FORK TULE RIVER	R32.81	69.77
2	46 0100	TUL	STATE ROUTE 63	ST JOHNS RIVER	10.65	69.75
2	42 0122	FRE	STATE ROUTE 168	RANCHERIA CREEK	65.74	69.13
2	42 0020	FRE	STATE ROUTE 180	TEN MILE CREEK	123.56	66.36
2	50 0500	KER	STATE ROUTE 65	POSO CREEK	8.29	65.46
2	42 0081	FRE	STATE ROUTE 43	COLE SLOUGH	0.78	65.45

[15] FRE = Fresno; KER = Kern; KIN = Kings; MAD = Madera; TUL = Tulare

Priority	Bridge Number	County[15]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
2	42 0041	FRE	STATE ROUTE 180	FRESNO SLOUGH (KINGS RIVER - WHITES BRIDGE)	26.95	64.86
2	41 0005L	MAD	STATE ROUTE 99 SB	DRY CREEK	R16.1	64.18
2	50 0007	KER	STATE ROUTE 99	POSO CREEK	44.54	63.29
2	50 0071	KER	STATE ROUTE 33	SANDY CREEK	19.51	61.48
2	41 0009L	MAD	STATE ROUTE 152 WB	BERENDA SLOUGH	12.37	60.96
2	50 0138	KER	STATE ROUTE 33	BITTERWATER CREEK	12.74	60.93
2	46 0120	TUL	STATE ROUTE 137	OUTSIDE CREEK	23.38	60.22
2	46 0213	TUL	STATE ROUTE 65	DEER CREEK	R13.06	60.11
2	46 0137	TUL	STATE ROUTE 201	SAND CREEK	12.48	58.60
2	46 0011	TUL	STATE ROUTE 245	YOKOHL CREEK	1.39	58.03
2	42 0368	FRE	STATE ROUTE 168	LITTLE DRY CREEK	T24.78	56.54
2	42 0009	FRE	STATE ROUTE 198	WARTHAN CREEK	R15.04	56.28
2	46 0073	TUL	STATE ROUTE 245	KAWEAH RIVER	4.19	56.04
2	46 0075	TUL	STATE ROUTE 245	ST JOHNS RIVER	5.97	56.01
2	42 0074	FRE	STATE ROUTE 180	KINGS RIVER OVERFLOW	77.19	54.55
2	45 0057L	KIN	STATE ROUTE 198	KINGS RIVER	5.71	54.29
2	46 0091	TUL	STATE ROUTE 216	KAWEAH RIVER	18.68	54.08
3	50 0302L	KER	INTERSTATE 5 SB	KERN RIVER	42	53.08
3	46 0028	TUL	STATE ROUTE 198	SALT CREEK	41.23	52.98
3	46 0081	TUL	STATE ROUTE 245	COTTONWOOD CREEK	20.8	52.92
3	42 0121	FRE	STATE ROUTE 168	BIG CREEK	64.12	52.29
3	41 0019	MAD	SR 145	FRIANT-MADERA CANAL	22.82	50.80
3	41 0029	MAD	STATE ROUTE 145	COTTONWOOD CREEK	18.41	50.59
3	42 0073	FRE	STATE ROUTE 180	BYRD SLOUGH	R76.99	50.47
3	50 0148	KER	STATE ROUTE 155	KERN RIVER	70.08	50.04
3	41 0087	MAD	STATE ROUTE 145	COTTONWOOD CREEK	5.39	48.98
3	46 0084	TUL	STATE ROUTE 201	KINGS RIVER	R1.75	48.24
3	42 0373	FRE	SR 168	BIG SANDY CREEK	T31.14	47.35
3	41 0073	MAD	STATE ROUTE 49	MIAMI CREEK	3.85	47.06
3	42 0111	FRE	STATE ROUTE 168	TAMARACK CREEK	58.67	45.63
3	46 0027	TUL	STATE ROUTE 198	SOUTH FORK KAWEAH RIVER	37.08	45.53
3	45 0007	KIN	STATE ROUTE 41	KINGS RIVER	32.26	45.53
3	41 0065R	MAD	STATE ROUTE 99 NB	COTTONWOOD CREEK	R7.28	45.44
3	50 0124	KER	STATE ROUTE 119	WEED CREEK	4.41	45.22
3	50 0216	KER	STATE ROUTE 43	POSO CREEK	29.52	43.61

Priority	Bridge Number	County[15]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
3	41 0044L	MAD	STATE ROUTE 99 SB	BERENDA SLOUGH	24.78	43.33
3	41 0044R	MAD	STATE ROUTE 99 NB	BERENDA SLOUGH	24.78	43.33
3	46 0119	TUL	STATE ROUTE 137	INSIDE CREEK	22.7	42.85
3	46 0090	TUL	SR 201	COTTONWOOD CREEK	23.82	42.71
3	46 0025	TUL	STATE ROUTE 198	YOKOHL CREEK	21.82	40.93
4	41 0022	MAD	STATE ROUTE 41	FRESNO RIVER	35.3	39.37
4	42 0424	FRE	STATE ROUTE 33	WARTHAN CREEK	14.88	38.78
4	50 0206	KER	STATE ROUTE 155	FRENCH GULCH	R68.69	38.73
4	46 0010	TUL	STATE ROUTE 190	NORTH FORK MIDDLE FORK TULE RIVER	R40	38.57
4	46 0102	TUL	STATE ROUTE 63	COTTONWOOD CREEK	17.29	37.36
4	42 0369	FRE	STATE ROUTE 168	DRY CREEK	R26.3	37.21
4	50 0126	KER	STATE ROUTE 119	BUENA VISTA CREEK	6.32	37.02
4	50 0003	KER	STATE ROUTE 58	BUENA VISTA SLOUGH	24.01	36.71
4	50 0074	KER	ST RT 43 (ENOS LN)	KERN RIVER	2.58	35.32
4	50 0236	KER	STATE ROUTE 99	KERN RIVER	25.35	34.31
4	50 0278	KER	SR 178	KERN RIVER	R31.72	31.53
4	50 0279	KER	STATE ROUTE 178	KERN RIVER	R38.84	31.26
4	46 0259L	TUL	STATE ROUTE 65	TULE RIVER	18.72	31.02
4	46 0122	TUL	STATE ROUTE 43	TULE RIVER	R19.91	28.57
4	42 0019	FRE	STATE ROUTE 198	WARTHAN CREEK	1.82	26.78
4	42 0272	FRE	SR 33 (DERRICK AV)	CALIFORNIA AQUEDUCT PM 125.31	46.78	26.00
4	46 0261	TUL	STATE ROUTE 216	ST JOHN'S RIVER	4.82	25.44
4	46 0187	TUL	STATE ROUTE 190	TULE RIVER	26.65	25.34
4	50 0506R	KER	SR 46	BITTERWATER CREEK	15.75	24.88
4	45 0006R	KIN	STATE ROUTE 198	CROSS CREEK	25.17	24.41
4	42 0036	FRE	STATE ROUTE 41	MURPHY SLOUGH	R3.94	23.94
4	46 0257	TUL	STATE ROUTE 99	DEER CREEK	8.72	23.69
4	50 0197	KER	STATE ROUTE 46	CALIFORNIA AQUEDUCT - PM 205.19	29.98	23.49
4	46 0186	TUL	STATE ROUTE 190	SOUTH FORK TULE RIVER	23.86	21.28
5	42 0179	FRE	STATE ROUTE 198	HANS GRIEVE CANYON	4.34	20.82
5	50 0358	KER	STATE ROUTE 58	CALIFORNIA AQUEDUCT - PM 224.06	23.03	19.55
5	50 0366	KER	STATE ROUTE 119	CALIFORNIA AQUEDUCT	14.92	17.37
5	46 0264	TUL	STATE ROUTE 245	COTTONWOOD CREEK	16.32	17.18
5	46 0262	TUL	STATE ROUTE 198	HORSE CREEK	33.53	17.09

Priority	Bridge Number	County[15]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
5	41 0039	MAD	SR 41	FRIANT-MADERA CANAL	6.94	16.45
5	45 0069L	KIN	INTERSTATE 5	CALIFORNIA AQUEDUCT	14.92	14.39
5	45 0069R	KIN	INTERSTATE 5	CALIFORNIA AQUEDUCT	14.92	14.30
5	42 0400R	FRE	STATE ROUTE 41 NB	SAN JOAQUIN RIVER	33.37	14.14
5	50 0280	KER	STATE ROUTE 178	KERN RIVER	R40	13.80
5	46 0259R	TUL	STATE ROUTE 65	TULE RIVER	18.72	13.64
5	42 0428L	FRE	STATE ROUTE 180 WB	FANCHER CREEK CANAL	R64.89	13.49
5	42 0428R	FRE	STATE ROUTE 180 EB	FANCHER CREEK CANAL	R64.89	13.43
5	45 0088	KIN	STATE ROUTE 41	CALIFORNIA AQUEDUCT	16.99	11.48
5	50 0050L	KER	STATE ROUTE 99 SB	BEARDSLEY CANAL	R28.39	8.35
5	50 0050R	KER	STATE ROUTE 99 NB	BEARDSLEY CANAL	R28.39	7.95
5	50 0047	KER	STATE ROUTE 178	COTTONWOOD CREEK	R11.66	6.22
5	45 0105	KIN	STATE ROUTE 41	AVENAL CREEK	3.75	5.84
5	45 0006L	KIN	STATE ROUTE 198	CROSS CREEK	25.17	4.17
5	42 0070	FRE	STATE ROUTE 180	KINGS RIVER	76.32	4.09
5	50 0489L	KER	STATE ROUTE 58	CALIENTE CREEK	67.3	0.77
5	50 0489R	KER	ROUTE 58	CALIENTE CREEK	67.3	0.39
5	42 0438	FRE	STATE ROUTE 180	WAHTOKE CREEK	81.9	0.00

TABLE 9: PRIORITIZATION OF LARGE CULVERTS FOR DETAILED CLIMATE CHANGE ADAPTATION ASSESSMENTS

Priority	Bridge Number	County[16]	Route	Feature Crossed	Postmile	Cross-Hazard Prioritization Score
1	42 0374	FRE	INTERSTATE 5	LIL PANOCHE CREEK	62.21	100.00
1	41 0021	MAD	STATE ROUTE 41	COARSEGOLD CREEK	27.93	99.01
1	46 0238	TUL	STATE ROUTE 43	DEER CREEK	R10.11	85.97
1	42 0057	FRE	SR 168	S FORK TAMARACK CREEK	58.23	73.07
1	50 0195	KER	STATE ROUTE 33	WASP WASH	37.89	64.27
2	46 0033L	TUL	STATE ROUTE 99 SB	CROSS CREEK	44.89	59.02
2	50 0186	KER	STATE ROUTE 33	MCKITTRICK WASH	35.89	57.27
2	50 0082	KER	STATE ROUTE 119	LAKEVIEW WASH	8.78	53.66
2	50 0121	KER	STATE ROUTE 33	CYMRIC WASH	40.38	53.45
2	50 0227	KER	STATE ROUTE 119	SANDY CREEK	0.97	53.36
2	50 0198	KER	STATE ROUTE 119	BUENA VISTA SLOUGH	14.98	48.69
3	50 0376	KER	STATE ROUTE 178	EAST SIDE CANAL	R2.42	47.57
3	50 0481	KER	STATE ROUTE 178	KISSACK CREEK	49.9	46.72
3	50 0433	KER	STATE ROUTE 155	TILLIE CREEK	R60.69	42.80
3	50 0381	KER	INTERSTATE 5	TECUYA CREEK	16.57	41.89
3	42 0089	FRE	STATE ROUTE 168	BIG DRY CREEK	R21.61	36.79
3	46 0239	TUL	SR 99 & N99-E198	MILL CREEK	R38.2	36.13
4	50 0372	KER	STATE ROUTE 155	RAG GULCH	R15.28	34.43
4	46 0024	TUL	STATE ROUTE 198	OUTSIDE CREEK	R16.58	33.80
4	42 0088	FRE	STATE ROUTE 168	SALES CREEK	18.91	32.63
4	50 0463	KER	STATE ROUTE 178	ERSKINE CREEK	R41.61	30.08
4	50 0072	KER	STATE ROUTE 33	SEVENTEEN CANYON	21.49	28.42
4	46 0244	TUL	STATE ROUTE 216	ANTELOPE CREEK	13.43	26.58
5	45 0089	KIN	STATE ROUTE 41	ARROYO ROBADOR	17.06	25.48
5	42 0430	FRE	STATE ROUTE 33	LOS GATOS CREEK	17.76	23.06
5	45 0097	KIN	STATE ROUTE 33	AVENAL CREEK	0.42	21.80
5	50 0107	KER	STATE ROUTE 65	LITTLE CREEK	11	10.75
5	46 0047	TUL	SR 198 (AVE 296)	FRIANT-KERN CANAL	R19.64	0.19
5	50 0131	KER	STATE ROUTE 65	RAG GULCH	23.59	0.00

[16] FRE = Fresno; KER = Kern; KIN = Kings; MAD = Madera; TUL = Tulare

TABLE 10: PRIORITIZATION OF SMALL CULVERTS FOR DETAILED CLIMATE CHANGE ADAPTATION ASSESSMENTS

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
1	501780002671	KER	178	26.71	100.00
1	421800012582	FRE	180	125.82	97.08
1	500054000973	KER	5	9.73	92.90
1	421804013304	FRE	180	133.04	91.96
1	421800012380	FRE	180	123.8	91.94
1	421804011859	FRE	180	118.59	91.33
1	421804013527	FRE	180	135.27	90.82
1	421804013245	FRE	180	132.45	89.81
1	421804013434	FRE	180	134.34	89.55
1	421800012220	FRE	180	122.2	87.66
1	500054000736	KER	5	7.36	86.65
1	421804013152	FRE	180	131.52	85.74
1	500054000746	KER	5	7.46	82.15
1	500054000973	KER	5	9.73	82.13
1	501780002548	KER	178	25.48	81.41
1	500054000726	KER	5	7.26	80.39
1	501780002583	KER	178	25.83	79.59
1	501780002331	KER	178	23.31	79.28
1	500054000990	KER	5	9.9	77.85
1	500054000737	KER	5	7.37	77.85
1	500054000973	KER	5	9.73	77.70
1	410410000450	MAD	41	4.5	75.56
1	501780002297	KER	178	22.97	75.05
1	501780002370	KER	178	23.7	74.99
1	500054000667	KER	5	6.67	74.81
1	501554004953	KER	155	49.53	74.57
1	501554004846	KER	155	48.46	74.00
1	410414004417	MAD	41	44.17	73.82
1	500054000973	KER	5	9.73	72.43
1	461904003939	TUL	190	39.39	72.36
1	501780002153	KER	178	21.53	71.84
1	500054000973	KER	5	9.73	71.82
1	410410000823	MAD	41	8.23	71.58
1	501781103003	KER	178	30.03	70.75

[17] FRE = Fresno; KER = Kern; KIN = Kings; MAD = Madera; TUL = Tulare

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
1	501554004917	KER	155	49.17	70.59
1	501780002124	KER	178	21.24	70.08
1	501554004617	KER	155	46.17	69.25
1	501780001957	KER	178	19.57	68.49
1	501780001997	KER	178	19.97	68.49
1	501780001735	KER	178	17.35	68.20
1	501780001617	KER	178	16.17	67.95
1	421680006190	FRE	168	61.9	67.30
1	500054000725	KER	5	7.25	67.28
1	421680006564	FRE	168	65.64	67.27
1	500054000973	KER	5	9.73	66.84
1	501781102938	KER	178	29.38	66.68
1	421680006545	FRE	168	65.45	66.01
1	461904005438	TUL	190	54.38	65.90
1	421680006382	FRE	168	63.82	65.57
1	421680006209	FRE	168	62.09	65.55
1	421680006042	FRE	168	60.42	65.06
1	421680006093	FRE	168	60.93	65.04
1	421680006116	FRE	168	61.16	65.04
1	501780002068	KER	178	20.68	64.86
1	501780001265	KER	178	12.65	63.76
1	421680006443	FRE	168	64.43	63.68
1	421680006321	FRE	168	63.21	63.68
1	421680006185	FRE	168	61.85	63.67
1	421684005521	FRE	168	55.21	63.49
1	421680006022	FRE	168	60.22	63.22
1	421680006318	FRE	168	63.18	63.02
1	421680006132	FRE	168	61.32	62.47
1	421680006138	FRE	168	61.38	62.45
1	501660000396	KER	166	3.96	62.06
1	421684005456	FRE	168	54.56	61.61
1	501554004288	KER	155	42.88	61.54
1	501780001324	KER	178	13.24	61.05
1	421680001800	FRE	168	18	60.65
1	461904005410	TUL	190	54.1	60.59
1	500050000330	KER	5	3.3	60.16
1	502230003007	KER	223	30.07	59.93
1	501554105728	KER	155	57.28	59.89

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
1	501554105453	KER	155	54.53	59.17
1	421684004767	FRE	168	47.67	56.86
1	421684005758	FRE	168	57.58	56.71
1	501550004085	KER	155	40.85	55.37
1	421984001045	FRE	198	10.45	55.06
1	421680004066	FRE	168	40.66	55.01
1	421984000713	FRE	198	7.13	54.91
1	410414400145	MAD	41	1.45	54.10
1	501784103469	KER	178	34.69	54.10
1	410414004141	MAD	41	41.41	53.68
1	501554004030	KER	155	40.3	53.22
1	461904003515	TUL	190	35.15	53.05
1	501784103505	KER	178	35.05	52.82
1	421984000744	FRE	198	7.44	52.73
1	461980004053	TUL	198	40.53	52.67
1	421684004667	FRE	168	46.67	52.61
1	501784103485	KER	178	34.85	52.56
1	421684004652	FRE	168	46.52	52.54
1	501784103452	KER	178	34.52	52.37
1	462450002182	TUL	245	21.82	52.36
1	421684004628	FRE	168	46.28	52.36
1	462450002261	TUL	245	22.61	52.36
1	421684003972	FRE	168	39.72	52.34
1	462450002195	TUL	245	21.95	52.29
1	421800011252	FRE	180	112.52	52.17
1	421800011277	FRE	180	112.77	52.16
1	421684005231	FRE	168	52.31	52.10
1	410414004215	MAD	41	42.15	51.90
1	421800009198	FRE	180	91.98	51.78
1	410414004299	MAD	41	42.99	51.74
1	410414004114	MAD	41	41.14	51.69
1	410414004124	MAD	41	41.24	51.69
1	410414004119	MAD	41	41.19	51.67
1	421804009356	FRE	180	93.56	51.66
1	410414004088	MAD	41	40.88	51.63
1	500580001690	KER	58	16.9	51.57
1	410414400071	MAD	41	0.71	51.53
1	500050000589	KER	5	5.89	51.41

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
1	500580001911	KER	58	19.11	51.40
1	500050000618	KER	5	6.18	51.39
1	462450002669	TUL	245	26.69	51.18
1	501554003566	KER	155	35.66	50.98
1	501784103187	KER	178	31.87	50.80
1	501554004061	KER	155	40.61	50.73
1	501780103127	KER	178	31.27	50.73
1	421684003963	FRE	168	39.63	50.53
1	421684004587	FRE	168	45.87	50.53
1	462450002308	TUL	245	23.08	50.49
1	421684004957	FRE	168	49.57	50.29
1	421684004970	FRE	168	49.7	50.22
1	501554003680	KER	155	36.8	50.17
1	410414003927	MAD	41	39.27	50.11
1	461980003586	TUL	198	35.86	50.06
1	500580002023	KER	58	20.23	49.79
2	500580001975	KER	58	19.75	49.79
2	501784103274	KER	178	32.74	49.74
2	501554003739	KER	155	37.39	49.65
2	500050000589	KER	5	5.89	49.52
2	421984000991	FRE	198	9.91	49.51
2	410414003780	MAD	41	37.8	49.48
2	410414003949	MAD	41	39.49	49.40
2	461980003269	TUL	198	32.69	49.34
2	462450002887	TUL	245	28.87	49.28
2	462450002688	TUL	245	26.88	49.28
2	421804010530	FRE	180	105.3	49.27
2	410410002320	MAD	41	23.2	49.17
2	501554003816	KER	155	38.16	49.05
2	421680004493	FRE	168	44.93	48.99
2	462454003231	TUL	245	32.31	48.88
2	462450002497	TUL	245	24.97	48.60
2	462450002491	TUL	245	24.91	48.57
2	501550006808	KER	155	68.08	48.57
2	410410001871	MAD	41	18.71	48.53
2	421684005139	FRE	168	51.39	48.48
2	421684004984	FRE	168	49.84	48.47
2	421684005248	FRE	168	52.48	48.47

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
2	421684005119	FRE	168	51.19	48.46
2	410414002530	MAD	41	25.3	48.22
2	501780005340	KER	178	53.4	48.18
2	500054000418	KER	5	4.18	48.10
2	410410002626	MAD	41	26.26	48.07
2	421805210094	FRE	180	100.94	47.99
2	410410003125	MAD	41	31.25	47.98
2	410490000168	MAD	49	1.68	47.93
2	410410003149	MAD	41	31.49	47.91
2	410410002999	MAD	41	29.99	47.90
2	410414400079	MAD	41	0.79	47.87
2	410414001422	MAD	41	14.22	47.87
2	410414104074	MAD	41	40.74	47.85
2	410414001659	MAD	41	16.59	47.79
2	410414003077	MAD	41	30.77	47.77
2	461804011054	TUL	180	110.54	47.76
2	421680004242	FRE	168	42.42	47.74
2	500414000254	KER	41	2.54	47.71
2	500410000171	KER	41	1.71	47.70
2	461980003309	TUL	198	33.09	47.68
2	461980003260	TUL	198	32.6	47.60
2	500050000589	KER	5	5.89	47.51
2	462450002831	TUL	245	28.31	47.51
2	410410002247	MAD	41	22.47	47.48
2	410410002103	MAD	41	21.03	47.44
2	421804010496	FRE	180	104.96	47.39
2	500330000236	KER	33	2.36	47.38
2	421684703104	FRE	168	31.04	47.34
2	501550003616	KER	155	36.16	47.32
2	501550003422	KER	155	34.22	47.22
2	410414002803	MAD	41	28.03	47.19
2	421680001659	FRE	168	16.59	47.12
2	500414000354	KER	41	3.54	47.08
2	421804008785	FRE	180	87.85	47.02
2	500414100182	KER	41	1.82	47.00
2	421804008829	FRE	180	88.29	46.97
2	421804008799	FRE	180	87.99	46.95
2	410410002418	MAD	41	24.18	46.94

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
2	500410000152	KER	41	1.52	46.86
2	501784103234	KER	178	32.34	46.80
2	462450002412	TUL	245	24.12	46.80
2	500054000418	KER	5	4.18	46.79
2	421804010052	FRE	180	100.52	46.79
2	410414004343	MAD	41	43.43	46.76
2	462450002445	TUL	245	24.45	46.73
2	421804009963	FRE	180	99.63	46.72
2	410410001959	MAD	41	19.59	46.69
2	421684703018	FRE	168	30.18	46.60
2	422450000775	FRE	245	7.75	46.58
2	500414000387	KER	41	3.87	46.57
2	421984001107	FRE	198	11.07	46.52
2	421980001484	FRE	198	14.84	46.46
2	421984001233	FRE	198	12.33	46.42
2	410410002557	MAD	41	25.57	46.37
2	421804008000	FRE	180	80	46.19
2	421804010167	FRE	180	101.67	46.04
2	420054004024	FRE	5	40.24	45.99
2	500334002781	KER	33	27.81	45.94
2	420054003975	FRE	5	39.75	45.90
2	500580001933	KER	58	19.33	45.88
2	422450000515	FRE	245	5.15	45.87
2	410414001715	MAD	41	17.15	45.81
2	501660000620	KER	166	6.2	45.76
2	421685102795	FRE	168	27.95	45.66
2	421804010589	FRE	180	105.89	45.63
2	421804010406	FRE	180	104.06	45.61
2	500580000339	KER	58	3.39	45.58
2	421804010551	FRE	180	105.51	45.57
2	421680004131	FRE	168	41.31	45.56
2	421804010445	FRE	180	104.45	45.56
2	421685102727	FRE	168	27.27	45.51
2	421684103179	FRE	168	31.79	45.51
2	421684703160	FRE	168	31.6	45.51
2	421684703164	FRE	168	31.64	45.51
2	421680002054	FRE	168	20.54	45.51
2	421684703082	FRE	168	30.82	45.51

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
2	421684103202	FRE	168	32.02	45.47
2	421804010363	FRE	180	103.63	45.42
2	410410002281	MAD	41	22.81	45.41
2	410410002287	MAD	41	22.87	45.35
2	421804009770	FRE	180	97.7	45.32
2	421684103365	FRE	168	33.65	45.32
2	421804009686	FRE	180	96.86	45.25
2	500050000589	KER	5	5.89	45.24
2	500050000589	KER	5	5.89	45.23
2	410410002401	MAD	41	24.01	45.09
2	421680001917	FRE	168	19.17	45.08
2	500580000468	KER	58	4.68	45.05
2	421680003983	FRE	168	39.83	44.94
2	421680003988	FRE	168	39.88	44.92
2	501554105876	KER	155	58.76	44.92
2	461980003968	TUL	198	39.68	44.80
2	421984101560	FRE	198	15.6	44.67
2	410410003233	MAD	41	32.33	44.67
2	421804009524	FRE	180	95.24	44.63
2	421684103350	FRE	168	33.5	44.52
2	501550006970	KER	155	69.7	44.48
2	420055203932	FRE	5	39.32	44.41
2	500334002713	KER	33	27.13	44.38
2	421804007984	FRE	180	79.84	44.34
2	410410003130	MAD	41	31.3	44.21
2	461980003072	TUL	198	30.72	44.06
2	501554003988	KER	155	39.88	43.98
2	500334001766	KER	33	17.66	43.98
2	462450001587	TUL	245	15.87	43.96
3	462450001414	TUL	245	14.14	43.87
3	501550006565	KER	155	65.65	43.86
3	421804009010	FRE	180	90.1	43.75
3	410410002702	MAD	41	27.02	43.74
3	462454002067	TUL	245	20.67	43.71
3	421684702810	FRE	168	28.1	43.65
3	421684702921	FRE	168	29.21	43.65
3	500334010624	KER	33	106.24	43.57
3	461980002364	TUL	198	23.64	43.57

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
3	421684702912	FRE	168	29.12	43.54
3	421684702950	FRE	168	29.5	43.45
3	421684702956	FRE	168	29.56	43.45
3	420054003794	FRE	5	37.94	43.43
3	500334003008	KER	33	30.08	43.41
3	420630000754	FRE	63	7.54	43.41
3	421684702903	FRE	168	29.03	43.35
3	420054003750	FRE	5	37.5	43.31
3	500410000109	KER	41	1.09	43.30
3	421804008722	FRE	180	87.22	43.20
3	421804011642	FRE	180	116.42	43.17
3	421804008942	FRE	180	89.42	43.16
3	421804009908	FRE	180	99.08	43.13
3	420630000816	FRE	63	8.16	43.13
3	421684703014	FRE	168	30.14	43.09
3	500580007578	KER	58	75.78	43.04
3	421984000134	FRE	198	1.34	42.91
3	421804008865	FRE	180	88.65	42.82
3	421685103250	FRE	168	32.5	42.81
3	421984000918	FRE	198	9.18	42.77
3	501554106030	KER	155	60.3	42.76
3	421984000882	FRE	198	8.82	42.73
3	421684103460	FRE	168	34.6	42.72
3	421684103423	FRE	168	34.23	42.71
3	461984002611	TUL	198	26.11	42.66
3	421984000621	FRE	198	6.21	42.63
3	500050000589	KER	5	5.89	42.59
3	501780005064	KER	178	50.64	42.56
3	421984000862	FRE	198	8.62	42.48
3	421984000505	FRE	198	5.05	42.46
3	421984000825	FRE	198	8.25	42.36
3	410410000598	MAD	41	5.98	42.34
3	461980003734	TUL	198	37.34	42.29
3	410410000809	MAD	41	8.09	42.26
3	421680104326	FRE	168	43.26	42.23
3	421685103221	FRE	168	32.21	42.12
3	421684004826	FRE	168	48.26	42.11
3	461904103357	TUL	190	33.57	42.01

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
3	421680004406	FRE	168	44.06	41.92
3	501780103069	KER	178	30.69	41.92
3	410410002452	MAD	41	24.52	41.88
3	421684703077	FRE	168	30.77	41.83
3	421684703109	FRE	168	31.09	41.81
3	421684703079	FRE	168	30.79	41.81
3	420054002234	FRE	5	22.34	41.72
3	420054003604	FRE	5	36.04	41.64
3	501660000670	KER	166	6.7	41.62
3	410414002943	MAD	41	29.43	41.61
3	501784103639	KER	178	36.39	41.59
3	420054003604	FRE	5	36.04	41.54
3	500334001500	KER	33	15	41.40
3	421984000590	FRE	198	5.9	41.35
3	501780004659	KER	178	46.59	41.22
3	421680102151	FRE	168	21.51	41.14
3	420054003369	FRE	5	33.69	41.13
3	500334002776	KER	33	27.76	41.08
3	501780004749	KER	178	47.49	40.95
3	410410003213	MAD	41	32.13	40.90
3	500334001667	KER	33	16.67	40.87
3	500334003160	KER	33	31.6	40.85
3	421984001324	FRE	198	13.24	40.83
3	421804009563	FRE	180	95.63	40.43
3	410410002508	MAD	41	25.08	40.42
3	500334003715	KER	33	37.15	40.19
3	500334003637	KER	33	36.37	40.19
3	422450000313	FRE	245	3.13	40.18
3	501550006549	KER	155	65.49	40.17
3	421685102934	FRE	168	29.34	40.10
3	462450001293	TUL	245	12.93	40.06
3	420334002340	FRE	33	23.4	40.05
3	421680001974	FRE	168	19.74	40.03
3	462164001834	TUL	216	18.34	39.98
3	421684702811	FRE	168	28.11	39.95
3	500050000290	KER	5	2.9	39.81
3	420334002424	FRE	33	24.24	39.77
3	421684702784	FRE	168	27.84	39.76

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
3	410414001486	MAD	41	14.86	39.72
3	500334001574	KER	33	15.74	39.69
3	500054000667	KER	5	6.67	39.65
3	461980004090	TUL	198	40.9	39.65
3	420054003932	FRE	5	39.32	39.53
3	410414002841	MAD	41	28.41	39.47
3	501784103690	KER	178	36.9	39.41
3	500334001987	KER	33	19.87	39.38
3	500334001549	KER	33	15.49	39.36
3	501784103664	KER	178	36.64	39.31
3	420334002386	FRE	33	23.86	39.26
3	420054003298	FRE	5	32.98	39.19
3	501194000224	KER	119	2.24	39.15
3	500334002813	KER	33	28.13	39.15
3	501780104124	KER	178	41.24	39.11
3	500050000290	KER	5	2.9	39.08
3	500334002442	KER	33	24.42	38.81
3	501550101791	KER	155	17.91	38.71
3	500334002130	KER	33	21.3	38.59
3	500334002234	KER	33	22.34	38.58
3	501550101415	KER	155	14.15	38.58
3	420054002196	FRE	5	21.96	38.56
3	500334002146	KER	33	21.46	38.55
3	461980003613	TUL	198	36.13	38.47
3	501194000297	KER	119	2.97	38.37
3	420054003671	FRE	5	36.71	38.36
3	461980004212	TUL	198	42.12	38.34
3	500334003714	KER	33	37.14	38.34
3	500334003865	KER	33	38.65	38.34
3	500584007011	KER	58	70.11	38.34
3	501194000245	KER	119	2.45	38.29
3	410410003019	MAD	41	30.19	38.25
3	500334004316	KER	33	43.16	38.16
3	450054002281	KIN	5	22.81	38.04
3	500334001393	KER	33	13.93	38.00
3	420054003882	FRE	5	38.82	37.93
3	500334004084	KER	33	40.84	37.90
3	420054001652	FRE	5	16.52	37.87

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
3	500334002023	KER	33	20.23	37.73
3	501780005285	KER	178	52.85	37.50
3	501550006709	KER	155	67.09	37.47
4	500334002683	KER	33	26.83	37.17
4	410410001978	MAD	41	19.78	37.14
4	500334002300	KER	33	23	37.07
4	420054003486	FRE	5	34.86	37.01
4	501554101845	KER	155	18.45	36.99
4	420054003486	FRE	5	34.86	36.92
4	500334004073	KER	33	40.73	36.90
4	501780005219	KER	178	52.19	36.88
4	500334002312	KER	33	23.12	36.85
4	500334002097	KER	33	20.97	36.84
4	501554101925	KER	155	19.25	36.80
4	500334002284	KER	33	22.84	36.77
4	500334002188	KER	33	21.88	36.71
4	500334004550	KER	33	45.5	36.58
4	500330000258	KER	33	2.58	36.50
4	410410001214	MAD	41	12.14	36.43
4	410410002062	MAD	41	20.62	36.27
4	450054002184	KIN	5	21.84	36.21
4	500334001396	KER	33	13.96	36.15
4	410410003182	MAD	41	31.82	36.09
4	500580007670	KER	58	76.7	36.04
4	500650001672	KER	65	16.72	36.03
4	500334002876	KER	33	28.76	35.99
4	500334002905	KER	33	29.05	35.90
4	500334004262	KER	33	42.62	35.76
4	501784103729	KER	178	37.29	35.74
4	500334002994	KER	33	29.94	35.71
4	500334002385	KER	33	23.85	35.69
4	420054003369	FRE	5	33.69	35.68
4	420054001910	FRE	5	19.1	35.52
4	500334003243	KER	33	32.43	35.34
4	500334002665	KER	33	26.65	35.33
4	420054003298	FRE	5	32.98	35.33
4	420054001910	FRE	5	19.1	35.27
4	500334002641	KER	33	26.41	35.22

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
4	500334002227	KER	33	22.27	35.19
4	420054002077	FRE	5	20.77	35.14
4	500330000060	KER	33	0.6	35.06
4	500334004506	KER	33	45.06	35.06
4	420334002630	FRE	33	26.3	35.05
4	500584007095	KER	58	70.95	35.05
4	450054002276	KIN	5	22.76	35.02
4	421984002003	FRE	198	20.03	34.97
4	501554101642	KER	155	16.42	34.95
4	500334002733	KER	33	27.33	34.95
4	420054002077	FRE	5	20.77	34.88
4	450414000623	KIN	41	6.23	34.87
4	421681202581	FRE	168	25.81	34.87
4	500334004215	KER	33	42.15	34.84
4	500334000922	KER	33	9.22	34.81
4	500584007267	KER	58	72.67	34.79
4	420054001640	FRE	5	16.4	34.78
4	421804009148	FRE	180	91.48	34.75
4	500334002724	KER	33	27.24	34.73
4	500650001729	KER	65	17.29	34.59
4	500330000091	KER	33	0.91	34.58
4	462014002372	TUL	201	23.72	34.49
4	500334003261	KER	33	32.61	34.47
4	421804009094	FRE	180	90.94	34.28
4	500334002597	KER	33	25.97	34.24
4	420334002570	FRE	33	25.7	34.13
4	500650001770	KER	65	17.7	34.01
4	421984001158	FRE	198	11.58	33.98
4	500334002913	KER	33	29.13	33.98
4	500334002427	KER	33	24.27	33.79
4	410410001140	MAD	41	11.4	33.54
4	421685102433	FRE	168	24.33	33.48
4	500330000666	KER	33	6.66	33.44
4	500330000656	KER	33	6.56	33.40
4	500330000680	KER	33	6.8	33.38
4	501190000332	KER	119	3.32	33.37
4	421685102454	FRE	168	24.54	33.37
4	421681102540	FRE	168	25.4	33.32

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
4	461980003778	TUL	198	37.78	33.32
4	410410000538	MAD	41	5.38	33.30
4	450054002315	KIN	5	23.15	33.25
4	450334000262	KIN	33	2.62	33.22
4	500580001356	KER	58	13.56	33.17
4	420054001959	FRE	5	19.59	33.06
4	500580001500	KER	58	15	33.02
4	500334000758	KER	33	7.58	32.98
4	500334002514	KER	33	25.14	32.97
4	501784104370	KER	178	43.7	32.92
4	501784104370	KER	178	43.7	32.92
4	501780104193	KER	178	41.93	32.84
4	500650000924	KER	65	9.24	32.75
4	500580001044	KER	58	10.44	32.56
4	500650000423	KER	65	4.23	32.53
4	500580001040	KER	58	10.4	32.52
4	420630000304	FRE	63	3.04	32.51
4	500580001219	KER	58	12.19	32.42
4	461900002265	TUL	190	22.65	32.39
4	420334002564	FRE	33	25.64	32.30
4	420334002729	FRE	33	27.29	32.23
4	420334002559	FRE	33	25.59	32.18
4	501194100951	KER	119	9.51	32.17
4	421685102278	FRE	168	22.78	32.14
4	501194101046	KER	119	10.46	32.13
4	452694000097	KIN	269	0.97	32.02
4	411450100002	MAD	145	0.02	31.76
4	420054001959	FRE	5	19.59	31.69
4	420054003526	FRE	5	35.26	31.66
4	420054003526	FRE	5	35.26	31.57
4	421984002054	FRE	198	20.54	31.53
4	421681102487	FRE	168	24.87	31.52
4	450054002509	KIN	5	25.09	31.50
4	421685102648	FRE	168	26.48	31.47
4	500584007095	KER	58	70.95	31.40
4	460990005274	TUL	99	52.74	31.37
4	450054002509	KIN	5	25.09	31.37
4	450054002235	KIN	5	22.35	31.29

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
4	420054001986	FRE	5	19.86	31.17
4	450054002235	KIN	5	22.35	31.16
4	460990005274	TUL	99	52.74	31.10
4	500654000754	KER	65	7.54	31.09
4	421984001670	FRE	198	16.7	31.08
4	450414001382	KIN	41	13.82	31.01
4	500334002489	KER	33	24.89	31.01
4	420054001986	FRE	5	19.86	30.86
4	450334001287	KIN	33	12.87	30.83
4	501554101130	KER	155	11.3	30.76
4	452690000200	KIN	269	2	30.69
4	450414000548	KIN	41	5.48	30.50
4	501554101192	KER	155	11.92	30.45
4	450414001487	KIN	41	14.87	30.26
4	450054002446	KIN	5	24.46	30.01
4	450414001576	KIN	41	15.76	30.01
5	500334001584	KER	33	15.84	30.01
5	420334002278	FRE	33	22.78	29.98
5	421984001861	FRE	198	18.61	29.86
5	450054002388	KIN	5	23.88	29.66
5	450054002281	KIN	5	22.81	29.58
5	450054002388	KIN	5	23.88	29.54
5	450055201619	KIN	5	16.19	29.48
5	501780000936	KER	178	9.36	29.37
5	500334002058	KER	33	20.58	28.87
5	411454002523	MAD	145	25.23	28.37
5	500334002937	KER	33	29.37	28.32
5	450334000232	KIN	33	2.32	28.28
5	501194100998	KER	119	9.98	28.20
5	411454002445	MAD	145	24.45	28.04
5	421685102379	FRE	168	23.79	27.93
5	420054005836	FRE	5	58.36	27.82
5	501194101067	KER	119	10.67	27.57
5	501554102291	KER	155	22.91	27.54
5	501194101007	KER	119	10.07	27.51
5	501194101111	KER	119	11.11	27.47
5	450334000448	KIN	33	4.48	27.42
5	501785100896	KER	178	8.96	27.28

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
5	500650000219	KER	65	2.19	27.11
5	411454002433	MAD	145	24.33	27.11
5	411454002380	MAD	145	23.8	27.09
5	500650000357	KER	65	3.57	27.07
5	450414000125	KIN	41	1.25	26.96
5	502230002831	KER	223	28.31	26.73
5	500650001932	KER	65	19.32	26.58
5	501554102457	KER	155	24.57	26.57
5	450410001183	KIN	41	11.83	26.46
5	501780001066	KER	178	10.66	26.40
5	450054002565	KIN	5	25.65	26.34
5	450054002446	KIN	5	24.46	26.19
5	500334003663	KER	33	36.63	26.17
5	450054002565	KIN	5	25.65	26.16
5	420054004758	FRE	5	47.58	26.05
5	421984001775	FRE	198	17.75	25.94
5	501785100901	KER	178	9.01	25.84
5	450054002178	KIN	5	21.78	25.83
5	501550101235	KER	155	12.35	25.50
5	460990005253	TUL	99	52.53	25.30
5	502230002722	KER	223	27.22	24.80
5	502230002806	KER	223	28.06	24.35
5	501844001136	KER	184	11.36	24.33
5	450054001748	KIN	5	17.48	23.90
5	502230002937	KER	223	29.37	23.77
5	461900103040	TUL	190	30.4	23.35
5	501554102323	KER	155	23.23	22.88
5	500990102825	KER	99	28.25	22.23
5	500990102825	KER	99	28.25	22.23
5	500650002334	KER	65	23.34	22.14
5	501554102600	KER	155	26	21.98
5	502230002758	KER	223	27.58	21.80
5	411454001798	MAD	145	17.98	21.58
5	411454002339	MAD	145	23.39	21.56
5	501780000960	KER	178	9.6	20.56
5	502230002631	KER	223	26.31	20.54
5	502230002871	KER	223	28.71	20.37
5	420054002853	FRE	5	28.53	20.30

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
5	420054006019	FRE	5	60.19	20.08
5	421681000598	FRE	168	5.98	19.90
5	421681000598	FRE	168	5.98	19.90
5	420054006002	FRE	5	60.02	19.61
5	410990002496	MAD	99	24.96	18.88
5	420054003079	FRE	5	30.79	18.52
5	501194000089	KER	119	0.89	18.43
5	450430000796	KIN	43	7.96	18.08
5	420054003162	FRE	5	31.62	16.51
5	420054003162	FRE	5	31.62	16.44
5	420054003153	FRE	5	31.53	16.34
5	501660001645	KER	166	16.45	15.64
5	460650001882	TUL	65	18.82	15.52
5	461904002677	TUL	190	26.77	15.35
5	420330001678	FRE	33	16.78	15.19
5	421804007536	FRE	180	75.36	15.18
5	501660002348	KER	166	23.48	15.05
5	501194000015	KER	119	0.15	14.64
5	420054006002	FRE	5	60.02	14.33
5	462450000891	TUL	245	8.91	13.73
5	460650003340	TUL	65	33.4	13.65
5	450054002535	KIN	5	25.35	13.64
5	420334001985	FRE	33	19.85	12.25
5	500650001594	KER	65	15.94	11.77
5	450054002345	KIN	5	23.45	11.73
5	462450000833	TUL	245	8.33	11.44
5	421804008144	FRE	180	81.44	11.26
5	421804008200	FRE	180	82	11.14
5	421804108309	FRE	180	83.09	10.79
5	411454001776	MAD	145	17.76	10.71
5	420054000047	FRE	5	0.47	10.30
5	450054002535	KIN	5	25.35	10.07
5	460430000150	TUL	43	1.5	9.85
5	502234101246	KER	223	12.46	9.70
5	500650001429	KER	65	14.29	8.02
5	450054001943	KIN	5	19.43	7.79
5	450054001824	KIN	5	18.24	7.75
5	462014001800	TUL	201	18	7.56

Priority	Culvert System Number	County[17]	Route	Postmile	Cross-Hazard Prioritization Score
5	501554100938	KER	155	9.38	7.44
5	500650001851	KER	65	18.51	7.19
5	450054001888	KIN	5	18.88	7.07
5	450054001888	KIN	5	18.88	7.04
5	500650002086	KER	65	20.86	6.29
5	421684001415	FRE	168	14.15	6.16
5	421804108267	FRE	180	82.67	6.13
5	460650000419	TUL	65	4.19	6.08
5	420630000135	FRE	63	1.35	5.79
5	421450002208	FRE	145	22.08	5.68
5	450414103740	KIN	41	37.4	5.46
5	420054000047	FRE	5	0.47	4.93
5	460650000017	TUL	65	0.17	4.60
5	500650002444	KER	65	24.44	4.59
5	500650002171	KER	65	21.71	4.58
5	460650100961	TUL	65	9.61	4.41
5	450054001943	KIN	5	19.43	4.26
5	421804005110	FRE	180	51.1	2.97
5	460650101952	TUL	65	19.52	2.51
5	450054001824	KIN	5	18.24	2.36
5	450054001888	KIN	5	18.88	2.32
5	411450000387	MAD	145	3.87	2.03
5	500584006947	KER	58	69.47	2.01
5	500584006947	KER	58	69.47	1.94
5	460650000284	TUL	65	2.84	1.70
5	461904001991	TUL	190	19.91	1.52
5	460650000134	TUL	65	1.34	1.43
5	450410003468	KIN	41	34.68	0.00

TABLE 11: PRIORITIZATION OF ROADWAYS FOR DETAILED CLIMATE CHANGE ADAPTATION ASSESSMENTS

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
1	58	P	KER 58 39.97 / KER 58 45.975	87.54
1	58	P	KER 58 50.611 / KER 58 51.807	87.54
1	58	P	KER 58 T52.137 / KER 58 69.938	87.54
1	58	S	KER 58 45.229 / KER 58 45.622	87.12
1	58	S	KER 58 50.611 / KER 58 51.806	87.12
1	58	S	KER 58 T52.137 / KER 58 74.191	87.12
1	5	P	FRE 5 1.705 / FRE 5 9.233	86.42
1	5	P	FRE 5 40.658 / FRE 5 45.799	86.42
1	5	P	KER 5 13.516 / KER 5 R15.865R	86.42
1	5	P	KER 5 29.542 / KER 5 47.544	86.42
1	5	P	KER 5 82.35 / KIN 5 4.424	86.42
1	99	S	FRE 99 20.189 / FRE 99 21.014	85.75[20]
1	99	S	FRE 99 21.853 / FRE 99 22.742	85.75[20]
1	99	S	KER 99 10.919 / KER 99 R30.548	85.75[20]
1	99	S	KER 99 44.31 / KER 99 50.407	85.75[20]
1	99	S	KER 99 55.522 / TUL 99 3.071	85.75[20]
1	99	S	KER 99 L0.164 / KER 99 0.018	85.75[20]
1	99	S	MAD 99 R14.244 / MAD 99 R18.682	85.75[20]
1	99	P	FRE 99 20.187 / FRE 99 21.236	84.24[20]
1	99	P	FRE 99 21.828 / FRE 99 22.391	84.24[20]
1	99	P	KER 99 10.933 / KER 99 R30.522	84.24[20]
1	99	P	KER 99 44.306 / KER 99 50.405	84.24[20]
1	99	P	KER 99 55.519 / TUL 99 3.067	84.24[20]
1	99	P	KER 99 L0 / KER 99 0.013	84.24[20]
1	99	P	MAD 99 R14.221 / MAD 99 R18.831	84.24[20]
1	178	S	KER 178 0 / KER 178 0.16	83.18
1	178	S	KER 178 0.166 / KER 178 R2.003	83.18
1	178	S	KER 178 9.195 / KER 178 9.292	83.18
1	178	S	KER 178 T9.063 / KER 178 T9.677	83.18
1	65	P	KER 65 R0 / KER 65 5.399	83.03
1	204	S	KER 204 R0 / KER 204 6.739	82.16
1	204	P	KER 204 R0 / KER 204 6.752	82.14
1	5	S	FRE 5 1.711 / FRE 5 9.238	82.11[20]

[18] FRE = Fresno; KER = Kern; KIN = Kings; MAD = Madera; TUL = Tulare

[19] The average of the cross-hazard prioritization scores amongst all the abutting small segments on the same route sharing a common priority level that were aggregated to form the longer segments listed in this table.

[20] Priority changed in response to input from District 6.

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
1	5	S	FRE 5 40.663 / FRE 5 45.824	82.11[20]
1	5	S	KER 5 13.502 / KER 5 16.032L	82.11[20]
1	5	S	KER 5 29.527 / KER 5 47.572	82.11[20]
1	5	S	KER 5 5.016 / KER 5 10.305L	82.11[20]
1	5	S	KER 5 82.77 / KIN 5 4.429	82.11[20]
1	65	S	KER 65 R0.017 / KER 65 R0.426	81.67
1	178	P	KER 178 0 / KER 178 0.16	80.49[20]
1	178	P	KER 178 0.16 / KER 178 R2.002	80.49[20]
1	178	P	KER 178 T9.067 / KER 178 13.636	80.49[20]
1	41	S	MAD 41 5.277 / MAD 41 6.214	80.42
1	41	S	MAD 41 9.125 / MAD 41 9.346	80.42
1	184	P	KER 184 L0 / KER 184 12.139	80.38
1	184	S	KER 184 0.854 / KER 184 2.24	80.11
1	184	S	KER 184 2.816 / KER 184 3.172	80.11
1	184	S	KER 184 7.634 / KER 184 8.35	80.11
1	184	S	KER 184 8.481 / KER 184 8.635	80.11
1	119	P	KER 119 8.7 / KER 119 R11.956	79.90
1	119	P	KER 119 R13.168 / KER 119 31.283	79.90
1	166	P	KER 166 22.658 / KER 166 22.924	79.56
1	223	P	KER 223 1.874 / KER 223 3.781	79.49[20]
1	223	P	KER 223 4.864 / KER 223 22.199	79.49[20]
1	180	P	FRE 180 94.781 / FRE 180 104.054	79.41
1	33	P	FRE 33 9.768 / FRE 33 19.966	79.23
1	43	S	KER 43 16.551 / KER 43 16.609	79.14
1	43	S	KER 43 17.043 / KER 43 17.667	79.14
1	43	S	KER 43 R23.625 / KER 43 R24.122	79.14
1	168	P	FRE 168 15.47 / FRE 168 22.12	79.10
1	178	S	KER 178 R1.755L / KER 178 R1.942	79.09
1	119	S	KER 119 28.225 / KER 119 28.495	79.05
1	198	P	FRE 198 21.367 / FRE 198 22.65	79.05
1	178	P	KER 178 R1.731R / KER 178 R2.147	78.96
1	223	S	KER 223 R20.05 / KER 223 21.145	78.90
1	46	P	KER 46 35.128 / KER 46 57.647	78.29[20]
1	41	P	KIN 41 17.462 / KIN 41 33.002	76.71[20]
1	41	P	KIN 41 33.587 / KIN 41 34.689	76.71[20]
1	41	P	MAD 41 2.842 / MAD 41 14.849	76.71[20]
1	43	P	KER 43 0.111 / KER 43 8.249	74.58[20]
1	43	P	KER 43 16.541 / KER 43 17.173	74.58[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
1	43	P	KER 43 25.187 / KER 43 34.549	74.58[20]
1	43	P	KER 43 R23.625 / KER 43 R24.082	74.58[20]
1	155	P	KER 155 0 / KER 155 R0.006	70.38[20]
1	46	S	KER 46 35.673 / KER 46 35.95	70.27[20]
1	46	S	KER 46 49.764 / KER 46 50.904	70.27[20]
1	145	P	FRE 145 0.01 / FRE 145 0.815	55.53[20]
1	145	P	FRE 145 1.733 / FRE 145 3.23	55.53[20]
1	145	P	MAD 145 23.021 / MAD 145 25.393	55.53[20]
1	63	S	TUL 63 0 / TUL 63 5.513	48.93[20]
1	63	P	TUL 63 0 / TUL 63 5.514	48.93[20]
1	216	S	TUL 216 R0 / TUL 216 R0.99	48.44[20]
1	216	P	TUL 216 R0 / TUL 216 R0.99	48.44[20]
2	43	S	KER 43 17.667 / KER 43 R23.625	78.94[20]
2	43	S	KER 43 R24.122 / KER 43 R25.125	78.94[20]
2	223	P	KER 223 22.199 / KER 223 27.577	78.60
2	223	P	KER 223 3.781 / KER 223 4.864	78.60
2	33	P	FRE 33 43.443 / FRE 33 53.402	78.60
2	166	S	KER 166 24.064 / KER 166 24.56	78.54
2	155	P	KER 155 31.531 / KER 155 38.989	78.47
2	43	P	KER 43 17.173 / KER 43 R23.625	78.01[20]
2	43	P	KER 43 34.549 / TUL 43 2.098	78.01[20]
2	43	P	KER 43 8.249 / KER 43 9.661	78.01[20]
2	43	P	KER 43 R24.082 / KER 43 R25.125	78.01[20]
2	145	S	MAD 145 25.393 / MAD 145 25.457	72.12
2	145	S	MAD 145 9.132 / MAD 145 9.146	72.12
2	166	P	KER 166 2.277 / KER 166 3.725	65.00[20]
2	166	P	KER 166 22.924 / KER 166 24.62	65.00[20]
2	166	P	KER 166 5.719 / KER 166 7.001	65.00[20]
2	168	S	FRE 168 R0.157L / FRE 168 R11.834	61.25[20]
2	99	S	FRE 99 21.014 / FRE 99 21.853	59.49
2	99	S	FRE 99 22.742 / FRE 99 24.422	59.49
2	99	S	FRE 99 26.216 / FRE 99 28.117	59.49
2	99	S	FRE 99 31.011 / MAD 99 9.732	59.49
2	99	S	KER 99 50.407 / KER 99 55.522	59.49
2	99	S	KER 99 R39.132 / KER 99 44.31	59.49
2	99	S	MAD 99 11.013 / MAD 99 R14.244	59.49
2	99	S	MAD 99 R18.682 / MER 99 0.004	59.49
2	99	S	TUL 99 12.598 / TUL 99 15.369	59.49

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
2	99	S	TUL 99 18.95 / FRE 99 20.189	59.49
2	99	S	TUL 99 3.071 / TUL 99 12.3	59.49
2	168	P	FRE 168 R0.003R / FRE 168 R11.84	59.41[20]
2	99	P	FRE 99 21.236 / FRE 99 21.828	58.81
2	99	P	FRE 99 22.391 / FRE 99 24.416	58.81
2	99	P	FRE 99 26.507 / FRE 99 28.39	58.81
2	99	P	FRE 99 31.295 / MAD 99 9.475	58.81
2	99	P	KER 99 50.405 / KER 99 55.519	58.81
2	99	P	KER 99 R39.119 / KER 99 44.306	58.81
2	99	P	MAD 99 11.285 / MAD 99 R14.221	58.81
2	99	P	MAD 99 R18.831 / MER 99 0	58.81
2	99	P	TUL 99 12.597 / TUL 99 15.366	58.81
2	99	P	TUL 99 18.949 / FRE 99 20.187	58.81
2	99	P	TUL 99 3.067 / TUL 99 12.297	58.81
2	41	S	FRE 41 R0.268 / FRE 41 R0.499	58.34[20]
2	41	S	FRE 41 R21.106 / FRE 41 R31.701	58.34[20]
2	41	P	FRE 41 R21.111 / FRE 41 R31.696	57.40[20]
2	41	P	KIN 41 R48.278 / FRE 41 R6.468	57.40[20]
2	41	P	MAD 41 14.849 / MAD 41 19.528	57.40[20]
2	5	S	FRE 5 21.016 / FRE 5 29.755	57.06
2	5	S	FRE 5 29.94 / FRE 5 40.663	57.06
2	5	S	FRE 5 45.824 / MER 5 0.008	57.06
2	5	S	FRE 5 9.238 / FRE 5 17.962	57.06
2	5	S	KER 5 10.305L / KER 5 13.502	57.06
2	5	S	KER 5 47.572 / KER 5 56.663	57.06
2	5	S	KER 5 57.985 / KER 5 71.668	57.06
2	5	S	KER 5 73.03 / KER 5 82.366	57.06
2	5	S	KIN 5 26.589 / FRE 5 1.711	57.06
2	180	S	FRE 180 53.601 / FRE 180 R54.667	56.88[20]
2	180	S	FRE 180 R56.396 / FRE 180 R65.301	56.88[20]
2	5	P	FRE 5 15.111 / FRE 5 17.965	56.78[20]
2	5	P	FRE 5 21.024 / FRE 5 29.755	56.78[20]
2	5	P	FRE 5 29.953 / FRE 5 40.658	56.78[20]
2	5	P	FRE 5 45.799 / MER 5 0.009	56.78[20]
2	5	P	FRE 5 9.233 / FRE 5 14.875	56.78[20]
2	5	P	KER 5 47.544 / KER 5 56.637	56.78[20]
2	5	P	KER 5 5.014 / KER 5 13.516	56.78[20]
2	5	P	KER 5 57.999 / KER 5 71.688	56.78[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
2	5	P	KER 5 73.015 / KER 5 82.35	56.78[20]
2	5	P	KIN 5 26.566 / FRE 5 1.705	56.78[20]
2	145	P	FRE 145 0 / FRE 145 0.01	56.58[20]
2	145	P	FRE 145 0.815 / FRE 145 1.733	56.58[20]
2	145	P	FRE 145 20.282 / FRE 145 25.336	56.58[20]
2	145	P	MAD 145 25.393 / MAD 145 25.457	56.58[20]
2	145	P	MAD 145 9.046 / MAD 145 9.148	56.58[20]
2	63	S	TUL 63 8.015L / TUL 63 8.076L	55.66
2	180	P	FRE 180 23.504 / FRE 180 25.835	55.48[20]
2	180	P	FRE 180 53.601 / FRE 180 R54.663	55.48[20]
2	180	P	FRE 180 R56.409 / FRE 180 R65.304	55.48[20]
2	198	P	KIN 198 28.323 / TUL 198 R3.704R	55.30[20]
2	198	P	KIN 198 R14.782 / KIN 198 R18.238	55.30[20]
2	198	P	KIN 198 T21.867 / KIN 198 22.316	55.30[20]
2	198	P	MON 198 25.786 / FRE 198 7.04	55.30[20]
2	198	P	TUL 198 R3.951R / TUL 198 R9.906	55.30[20]
2	198	P	TUL 198 R9.967 / TUL 198 R11.733	55.30[20]
2	198	P	TUL 198 T19.877 / TUL 198 20.507	55.30[20]
2	198	S	KIN 198 28.322 / TUL 198 R3.581L	54.61[20]
2	198	S	KIN 198 R14.785 / KIN 198 R18.238	54.61[20]
2	198	S	TUL 198 R3.811L / TUL 198 R9.906	54.61[20]
2	198	S	TUL 198 R9.967 / TUL 198 R11.736	54.61[20]
2	65	P	TUL 65 29.734 / TUL 65 30.54	52.11
2	65	P	TUL 65 R11.862 / TUL 65 15.649	52.11
2	46	P	KER 46 30.637 / KER 46 32.074	52.05
2	46	P	KER 46 32.401 / KER 46 32.548	52.05
2	63	P	FRE 63 2.501 / FRE 63 8.362	49.87[20]
2	63	P	TUL 63 L9.127R / TUL 63 8.072R	49.87[20]
2	137	P	TUL 137 14.26 / TUL 137 14.471	48.86[20]
2	137	P	TUL 137 15.284 / TUL 137 16.351	48.86[20]
2	137	S	TUL 137 15.331 / TUL 137 R15.45	48.19[20]
2	269	P	KIN 269 0.969 / FRE 269 1.622	47.64[20]
2	216	P	TUL 216 12.01 / TUL 216 15.512	47.53[20]
2	178	P	KER 178 13.636 / KER 178 26.63	47.45[20]
2	216	S	TUL 216 13.996 / TUL 216 14.013	47.31[20]
2	58	P	KER 58 69.938 / KER 58 75.517	34.71[20]
2	58	P	KER 58 7.424 / KER 58 15.41	34.71[20]
3	178	S	KER 178 R2.003 / KER 178 T9.063	85.91[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
3	178	P	KER 178 R2.002 / KER 178 T9.067	85.85[20]
3	99	S	FRE 99 28.117 / FRE 99 31.011	77.88[20]
3	99	S	KER 99 0.018 / KER 99 10.919	77.88[20]
3	99	S	KER 99 R30.548 / KER 99 R39.132	77.88[20]
3	99	S	TUL 99 12.3 / TUL 99 12.598	77.88[20]
3	99	S	TUL 99 15.369 / TUL 99 18.95	77.88[20]
3	99	P	FRE 99 28.39 / FRE 99 31.295	76.79[20]
3	99	P	KER 99 0.013 / KER 99 10.933	76.79[20]
3	99	P	KER 99 R30.522 / KER 99 R39.119	76.79[20]
3	99	P	TUL 99 12.297 / TUL 99 12.597	76.79[20]
3	99	P	TUL 99 15.366 / TUL 99 18.949	76.79[20]
3	5	S	FRE 5 17.962 / FRE 5 21.016	65.05[20]
3	5	S	FRE 5 29.755 / FRE 5 29.94	65.05[20]
3	5	S	KER 5 16.032L / KER 5 29.527	65.05[20]
3	5	S	KER 5 56.663 / KER 5 57.985	65.05[20]
3	5	S	KER 5 71.668 / KER 5 73.03	65.05[20]
3	5	S	KER 5 82.366 / KER 5 82.77	65.05[20]
3	5	S	KER 5 R0.11 / KER 5 5.016	65.05[20]
3	5	S	KIN 5 4.429 / KIN 5 26.589	65.05[20]
3	5	P	FRE 5 14.875 / FRE 5 15.111	60.32[20]
3	5	P	FRE 5 17.965 / FRE 5 21.024	60.32[20]
3	5	P	FRE 5 29.755 / FRE 5 29.953	60.32[20]
3	5	P	KER 5 56.637 / KER 5 57.999	60.32[20]
3	5	P	KER 5 71.688 / KER 5 73.015	60.32[20]
3	5	P	KER 5 R0.004 / KER 5 5.014	60.32[20]
3	5	P	KER 5 R15.865R / KER 5 29.542	60.32[20]
3	5	P	KIN 5 4.424 / KIN 5 26.566	60.32[20]
3	41	S	FRE 41 R31.701 / MAD 41 2.842	53.30[20]
3	41	S	FRE 41 R6.468 / FRE 41 R21.106	53.30[20]
3	41	S	KIN 41 16.267 / KIN 41 16.777	53.30[20]
3	41	S	KIN 41 R37.507 / KIN 41 R38.038	53.30[20]
3	41	S	KIN 41 R39.842 / KIN 41 R39.958	53.30[20]
3	41	S	KIN 41 R40.121 / KIN 41 R40.965	53.30[20]
3	41	S	KIN 41 R41.199 / FRE 41 R0.268	53.30[20]
3	41	S	MAD 41 19.801 / MAD 41 20.167	53.30[20]
3	41	S	MAD 41 23.111 / MAD 41 23.589	53.30[20]
3	59	P	MAD 59 L0.2 / MER 59 R0	51.01
3	198	S	KIN 198 2.857 / KIN 198 R14.785	50.53

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
3	198	S	KIN 198 R18.238 / KIN 198 T21.867	50.53
3	198	S	TUL 198 R11.736 / TUL 198 T19.877	50.53
3	198	S	TUL 198 R3.581L / TUL 198 R3.811L	50.53
3	198	S	TUL 198 R9.906 / TUL 198 R9.967	50.53
3	46	P	KER 46 20.543 / KER 46 30.637	50.42
3	46	P	KER 46 32.074 / KER 46 32.401	50.42
3	46	P	KER 46 32.548 / KER 46 35.128	50.42
3	46	P	KER 46 57.647 / KER 46 57.785	50.42
3	63	S	TUL 63 5.513 / TUL 63 L7.97	50.20
3	63	P	TUL 63 5.514 / TUL 63 L7.97	50.19
3	63	P	TUL 63 9.818 / TUL 63 15.109	50.19
3	180	S	FRE 180 41.96 / FRE 180 42.182	50.14
3	180	S	FRE 180 42.265 / FRE 180 42.806	50.14
3	180	S	FRE 180 67.59 / FRE 180 74.166	50.14
3	180	S	FRE 180 R54.667 / FRE 180 R56.396	50.14
3	180	S	FRE 180 R65.301 / FRE 180 66.571	50.14
3	152	P	MAD 152 13.043 / MAD 152 15.634	50.06
3	152	P	MAD 152 R0 / MAD 152 1.667	50.06
3	152	S	MAD 152 13.043 / MAD 152 15.634	49.92
3	152	S	MAD 152 R0.026 / MAD 152 2.069	49.92
3	65	P	KER 65 5.399 / TUL 65 R11.862	49.87
3	65	P	TUL 65 15.649 / TUL 65 15.834	49.87
3	65	P	TUL 65 16.401 / TUL 65 16.879	49.87
3	65	P	TUL 65 17.408 / TUL 65 17.487	49.87
3	65	P	TUL 65 18.159 / TUL 65 29.734	49.87
3	65	P	TUL 65 30.54 / TUL 65 39.576	49.87
3	65	S	TUL 65 18.158 / TUL 65 29.734	49.84
3	198	P	FRE 198 26.801 / KIN 198 R14.782	49.62
3	198	P	KIN 198 R18.238 / KIN 198 T21.867	49.62
3	198	P	TUL 198 20.507 / TUL 198 27.857	49.62
3	198	P	TUL 198 38.512 / TUL 198 41.845	49.62
3	198	P	TUL 198 R11.733 / TUL 198 T19.877	49.62
3	198	P	TUL 198 R3.704R / TUL 198 R3.951R	49.62
3	198	P	TUL 198 R9.906 / TUL 198 R9.967	49.62
3	145	P	MAD 145 6.56 / MAD 145 8.062	49.52[20]
3	145	P	MAD 145 8.062 / MAD 145 9.046	49.52[20]
3	145	P	MAD 145 9.148 / MAD 145 R12.603	49.52[20]
3	41	P	FRE 41 R31.696 / MAD 41 2.842	49.32[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
3	41	P	FRE 41 R6.468 / FRE 41 R21.111	49.32[20]
3	41	P	KIN 41 16.259 / KIN 41 17.462	49.32[20]
3	41	P	KIN 41 33.002 / KIN 41 33.587	49.32[20]
3	41	P	KIN 41 34.689 / KIN 41 36.312	49.32[20]
3	41	P	KIN 41 8.305 / KIN 41 15.966	49.32[20]
3	41	P	KIN 41 R36.822 / KIN 41 R39.252	49.32[20]
3	41	P	KIN 41 R39.777 / KIN 41 R39.968	49.32[20]
3	41	P	KIN 41 R40.127 / KIN 41 R40.964	49.32[20]
3	41	P	KIN 41 R41.161 / KIN 41 R48.278	49.32[20]
3	41	P	MAD 41 19.528 / MAD 41 27.39	49.32[20]
3	41	P	MAD 41 28.928 / MAD 41 32.68	49.32[20]
3	41	P	MAD 41 35.25 / MAD 41 35.566	49.32[20]
3	233	P	MAD 233 0.582 / MAD 233 2.071	49.30
3	233	P	MAD 233 2.49 / MAD 233 3.887	49.30
3	233	P	MAD 233 L0.097 / MAD 233 0.014	49.30
3	46	S	KER 46 20.543 / KER 46 26.749	49.28
3	46	S	KER 46 29.584 / KER 46 29.982	49.28
3	46	S	KER 46 30.39 / KER 46 30.637	49.28
3	46	S	KER 46 32.074 / KER 46 32.401	49.28
3	46	S	KER 46 32.586 / KER 46 32.765	49.28
3	137	S	TUL 137 14.624 / TUL 137 14.709	49.18
3	137	S	TUL 137 16.485 / TUL 137 17.525	49.18
3	190	S	TUL 190 R15.233 / TUL 190 18.598	49.16[20]
3	137	P	TUL 137 12.283 / TUL 137 14.26	49.13[20]
3	137	P	TUL 137 14.471 / TUL 137 14.508	49.13[20]
3	137	P	TUL 137 14.59 / TUL 137 14.712	49.13[20]
3	137	P	TUL 137 14.752 / TUL 137 15.284	49.13[20]
3	137	P	TUL 137 16.351 / TUL 137 16.477	49.13[20]
3	137	P	TUL 137 16.486 / TUL 137 17.524	49.13[20]
3	137	P	TUL 137 17.697 / TUL 137 18.163	49.13[20]
3	190	P	TUL 190 R15.233 / TUL 190 21.1	49.09[20]
3	33	P	FRE 33 22.346 / FRE 33 24.347	49.05[20]
3	33	P	KER 33 54.851 / KER 33 R60.182	49.05[20]
3	233	S	MAD 233 2.489 / MAD 233 3.5	49.03
3	58	S	KER 58 74.191 / KER 58 77.394	48.85
3	58	P	KER 58 15.42 / KER 58 26.782	48.68[20]
3	58	P	KER 58 31.458 / KER 58 39.96	48.68[20]
3	58	P	KER 58 75.517 / KER 58 77.074	48.68[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
3	145	S	MAD 145 7.754 / MAD 145 8.062	48.64[20]
3	145	S	MAD 145 9.146 / MAD 145 10.147	48.64[20]
3	43	P	FRE 43 8.34 / FRE 43 9.308	48.63[20]
3	43	P	KER 43 9.661 / KER 43 10.8	48.63[20]
3	43	P	KIN 43 17.431 / KIN 43 23.46	48.63[20]
3	43	P	TUL 43 2.098 / KIN 43 5.089	48.63[20]
3	216	P	TUL 216 R0.99 / TUL 216 2.462	48.25[20]
3	201	P	FRE 201 0 / FRE 201 1.25	48.02[20]
3	43	S	FRE 43 9.163 / FRE 43 9.308	48.02[20]
3	43	S	KIN 43 1.222 / KIN 43 1.687	48.02[20]
3	43	S	KIN 43 19.326 / KIN 43 19.494	48.02[20]
3	43	S	TUL 43 R21.942 / TUL 43 22.323	48.02[20]
3	216	S	TUL 216 R0.99 / TUL 216 2.462	48.01[20]
3	155	P	KER 155 R0.006 / KER 155 R1.46	47.83[20]
3	155	P	KER 155 R1.971 / KER 155 R3.469	47.83[20]
3	155	P	KER 155 R4.041 / KER 155 R21.377	47.83[20]
3	166	P	KER 166 0.01 / KER 166 0.511	47.35[20]
3	269	S	KIN 269 0.001 / KIN 269 0.969	47.29[20]
3	269	P	KIN 269 0.002 / KIN 269 0.969	47.29[20]
3	180	P	FRE 180 104.054 / TUL 180 110.442	43.92[20]
3	180	P	FRE 180 116.85 / FRE 180 137.933	43.92[20]
3	180	P	FRE 180 41.63 / FRE 180 43.63	43.92[20]
3	180	P	FRE 180 51.769 / FRE 180 52.329	43.92[20]
3	180	P	FRE 180 89.371 / FRE 180 94.781	43.92[20]
3	180	P	FRE 180 R54.663 / FRE 180 R56.409	43.92[20]
3	180	P	FRE 180 R65.304 / FRE 180 76.689	43.92[20]
3	180	P	FRE 180 R76.769 / FRE 180 R82.604	43.92[20]
3	168	P	FRE 168 11.83 / FRE 168 14.538	43.72[20]
3	168	P	FRE 168 46.736 / FRE 168 47.798	43.72[20]
3	168	P	FRE 168 T23.529 / FRE 168 R28.621	43.72[20]
3	49	P	MAD 49 0 / MAD 49 0.952	26.68[20]
3	245	P	TUL 245 25.941 / FRE 245 8.422	18.82[20]
4	99	S	FRE 99 24.422 / FRE 99 26.216	62.41[20]
4	99	S	MAD 99 9.732 / MAD 99 11.013	62.41[20]
4	99	P	FRE 99 24.416 / FRE 99 26.507	62.32[20]
4	99	P	MAD 99 9.475 / MAD 99 11.285	62.32[20]
4	58	P	KER 58 0.001 / SLO 58 D1.351	51.81[20]
4	58	P	KER 58 2.7 / KER 58 7.424	51.81[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
4	58	P	KER 58 26.782 / KER 58 31.458	51.81[20]
4	198	S	KIN 198 22.353 / KIN 198 28.322	50.12[20]
4	198	S	TUL 198 29.368 / TUL 198 29.687	50.12[20]
4	198	P	KIN 198 22.316 / KIN 198 28.323	48.89[20]
4	198	P	TUL 198 27.857 / TUL 198 38.512	48.89[20]
4	198	P	TUL 198 41.845 / TUL 198 42.434	48.89[20]
4	198	P	TUL 198 42.639 / TUL 198 44.163	48.89[20]
4	152	P	MAD 152 1.667 / MAD 152 13.043	48.56
4	152	S	MAD 152 2.069 / MAD 152 13.043	48.55
4	168	S	FRE 168 R11.834 / FRE 168 11.83	48.43
4	46	P	KER 46 3.345 / KER 46 20.543	48.43
4	46	S	KER 46 3.347 / KER 46 20.543	48.42
4	63	S	TUL 63 8.076L / TUL 63 9.818	48.41
4	63	S	TUL 63 R8.881L / TUL 63 L9.127L	48.41
4	65	P	TUL 65 15.834 / TUL 65 16.401	48.29
4	65	S	TUL 65 15.834 / TUL 65 16.401	48.29
4	65	P	TUL 65 16.879 / TUL 65 17.408	48.29
4	65	S	TUL 65 16.879 / TUL 65 17.408	48.29
4	65	S	TUL 65 17.487 / TUL 65 18.158	48.29
4	65	P	TUL 65 17.487 / TUL 65 18.159	48.29
4	41	S	KIN 41 15.966 / KIN 41 16.267	48.23
4	41	S	KIN 41 36.312 / KIN 41 R36.822	48.23
4	41	S	KIN 41 7.849 / KIN 41 8.305	48.23
4	41	S	KIN 41 R39.252 / KIN 41 R39.842	48.23
4	41	S	KIN 41 R39.958 / KIN 41 R40.121	48.23
4	41	S	KIN 41 R40.965 / KIN 41 R41.199	48.23
4	269	P	FRE 269 11.735 / FRE 269 13.741	48.22
4	180	P	FRE 180 26.161 / FRE 180 27.767	48.19[20]
4	180	P	FRE 180 28.171 / FRE 180 28.299	48.19[20]
4	180	P	FRE 180 28.55 / FRE 180 33.446	48.19[20]
4	180	P	FRE 180 33.603 / FRE 180 34.563	48.19[20]
4	180	P	FRE 180 34.627 / FRE 180 41.63	48.19[20]
4	180	P	FRE 180 43.63 / FRE 180 51.769	48.19[20]
4	180	P	FRE 180 52.329 / FRE 180 53.601	48.19[20]
4	180	P	FRE 180 76.689 / FRE 180 R76.769	48.19[20]
4	180	P	FRE 180 R82.604 / FRE 180 89.371	48.19[20]
4	63	P	FRE 63 0.498 / FRE 63 2.501	48.14[20]
4	63	P	TUL 63 15.109 / TUL 63 R23.652	48.14[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
4	63	P	TUL 63 8.072R / TUL 63 9.818	48.14[20]
4	63	P	TUL 63 L8.881R / TUL 63 L9.127R	48.14[20]
4	180	S	FRE 180 44.339 / FRE 180 44.752	48.05[20]
4	180	S	FRE 180 47.443 / FRE 180 47.761	48.05[20]
4	180	S	FRE 180 50.28 / FRE 180 51.769	48.05[20]
4	180	S	FRE 180 52.329 / FRE 180 52.704	48.05[20]
4	180	S	FRE 180 53.312 / FRE 180 53.601	48.05[20]
4	216	S	TUL 216 2.462 / TUL 216 2.656	48.01
4	43	P	KER 43 10.8 / KER 43 12.743	47.95
4	43	P	KER 43 15.831 / KER 43 16.541	47.95
4	43	P	KIN 43 16.378 / KIN 43 16.391	47.95
4	43	P	KIN 43 16.504 / KIN 43 17.431	47.95
4	43	P	KIN 43 23.46 / FRE 43 8.34	47.95
4	43	P	KIN 43 5.089 / KIN 43 16.252	47.95
4	233	P	MAD 233 0.014 / MAD 233 0.582	47.95
4	233	P	MAD 233 2.071 / MAD 233 2.49	47.95
4	233	P	MAD 233 L0 / MAD 233 L0.097	47.95
4	233	S	MAD 233 2.071 / MAD 233 2.489	47.94
4	190	P	TUL 190 0 / TUL 190 R15.233	47.93[20]
4	190	P	TUL 190 21.1 / TUL 190 27.295	47.93[20]
4	119	P	KER 119 0.274 / KER 119 8.7	47.92
4	119	P	KER 119 R11.956 / KER 119 R13.168	47.92
4	145	S	FRE 145 34.218L / FRE 145 35.27	47.92
4	145	S	MAD 145 8.062 / MAD 145 8.062	47.92
4	216	P	TUL 216 11.751 / TUL 216 12.01	47.88
4	216	P	TUL 216 2.462 / TUL 216 7.948	47.88
4	168	P	FRE 168 14.538 / FRE 168 15.47	47.86
4	168	P	FRE 168 22.12 / FRE 168 T23.529	47.86
4	168	P	FRE 168 R11.84 / FRE 168 11.83	47.86
4	168	P	FRE 168 R28.621 / FRE 168 L27.405	47.86
4	137	P	KIN 137 0 / KIN 137 2.049	47.81[20]
4	137	P	TUL 137 14.508 / TUL 137 14.59	47.81[20]
4	137	P	TUL 137 14.712 / TUL 137 14.752	47.81[20]
4	137	P	TUL 137 16.477 / TUL 137 16.486	47.81[20]
4	137	P	TUL 137 17.524 / TUL 137 17.697	47.81[20]
4	137	P	TUL 137 18.163 / TUL 137 27.396	47.81[20]
4	137	S	TUL 137 14.508 / TUL 137 14.624	47.78
4	137	S	TUL 137 14.709 / TUL 137 14.752	47.78

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
4	137	S	TUL 137 16.477 / TUL 137 16.485	47.78
4	137	S	TUL 137 17.525 / TUL 137 17.697	47.78
4	137	S	TUL 137 20.298 / TUL 137 20.57	47.78
4	137	S	TUL 137 21.8 / TUL 137 22.093	47.78
4	137	S	TUL 137 23.791 / TUL 137 23.966	47.78
4	137	S	TUL 137 26.4 / TUL 137 27.396	47.78
4	145	P	FRE 145 11.753 / FRE 145 20.282	47.76[20]
4	145	P	FRE 145 29.598 / FRE 145 33.116	47.76[20]
4	145	P	FRE 145 3.23 / FRE 145 8.903	47.76[20]
4	145	P	FRE 145 33.141 / FRE 145 34.054	47.76[20]
4	145	P	FRE 145 34.218R / MAD 145 6.56	47.76[20]
4	145	P	MAD 145 8.062 / MAD 145 8.062	47.76[20]
4	145	P	MAD 145 R12.603 / MAD 145 23.021	47.76[20]
4	190	S	TUL 190 R14.834 / TUL 190 R15.233	47.75
4	59	P	MAD 59 L0.159 / MAD 59 L0.2	47.66
4	43	S	FRE 43 5.045 / FRE 43 5.521	47.66
4	43	S	FRE 43 7.236 / FRE 43 7.44	47.66
4	43	S	KER 43 16.156 / KER 43 16.551	47.66
4	43	S	KIN 43 24.319 / KIN 43 24.615	47.66
4	155	P	KER 155 L0.402 / KER 155 L0	47.66
4	155	P	KER 155 R1.46 / KER 155 R1.971	47.66
4	155	P	KER 155 R61.044 / KER 155 R70.895	47.66
4	245	P	TUL 245 0 / TUL 245 7.052	47.60
4	245	P	TUL 245 7.07 / TUL 245 9.72	47.60
4	33	P	FRE 33 60.443 / FRE 33 70.7	47.60[20]
4	33	P	FRE 33 70.8 / FRE 33 72.834	47.60[20]
4	33	P	FRE 33 8.017 / FRE 33 9.768	47.60[20]
4	33	P	FRE 33 R28.914 / FRE 33 R29.021	47.60[20]
4	33	P	FRE 33 R39.824 / FRE 33 R39.948	47.60[20]
4	33	P	FRE 33 R79.906 / MER 33 L0	47.60[20]
4	33	P	KER 33 12.913 / KER 33 18.188	47.60[20]
4	33	P	KER 33 18.449 / KER 33 23.408	47.60[20]
4	33	P	KER 33 24.238 / KER 33 33.117	47.60[20]
4	33	P	KER 33 46.266 / KER 33 54.851	47.60[20]
4	33	P	KER 33 73.725 / KIN 33 12.956	47.60[20]
4	33	P	KIN 33 16.401 / KIN 33 16.687	47.60[20]
4	178	P	KER 178 55.405 / KER 178 57.07	47.54
4	33	S	FRE 33 69.437 / FRE 33 70.8	47.51[20]

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
4	33	S	KIN 33 8.778 / KIN 33 8.944	47.51[20]
4	201	P	FRE 201 1.25 / TUL 201 13.97	47.45[20]
4	201	P	TUL 201 L13.98 / TUL 201 16.009	47.45[20]
4	41	P	KIN 41 15.966 / KIN 41 16.259	47.41[20]
4	41	P	KIN 41 36.312 / KIN 41 R36.822	47.41[20]
4	41	P	KIN 41 R39.252 / KIN 41 R39.777	47.41[20]
4	41	P	KIN 41 R39.968 / KIN 41 R40.127	47.41[20]
4	41	P	KIN 41 R40.964 / KIN 41 R41.161	47.41[20]
4	41	P	SLO 41 50.429 / KIN 41 8.305	47.41[20]
5	180	S	FRE 180 25.835 / FRE 180 26.161	47.70[20]
5	180	S	FRE 180 27.767 / FRE 180 28.171	47.70[20]
5	180	S	FRE 180 28.299 / FRE 180 28.55	47.70[20]
5	180	S	FRE 180 33.446 / FRE 180 33.603	47.70[20]
5	180	S	FRE 180 34.563 / FRE 180 34.627	47.70[20]
5	180	S	FRE 180 66.571 / FRE 180 67.59	47.70[20]
5	43	P	KER 43 12.743 / KER 43 15.831	47.46
5	43	P	KIN 43 16.252 / KIN 43 16.378	47.46
5	43	P	KIN 43 16.391 / KIN 43 16.504	47.46
5	216	P	TUL 216 15.512 / TUL 216 19.245	47.45
5	216	P	TUL 216 7.948 / TUL 216 11.751	47.45
5	166	P	KER 166 0.511 / KER 166 2.277	47.43
5	166	P	KER 166 3.725 / KER 166 5.719	47.43
5	166	P	KER 166 7.001 / KER 166 22.658	47.43
5	145	P	FRE 145 25.336 / FRE 145 29.598	47.43
5	145	P	FRE 145 33.116 / FRE 145 33.141	47.43
5	145	P	FRE 145 34.054 / FRE 145 34.218R	47.43
5	145	P	FRE 145 8.903 / FRE 145 11.753	47.43
5	180	P	FRE 180 25.835 / FRE 180 26.161	47.43
5	180	P	FRE 180 27.767 / FRE 180 28.171	47.43
5	180	P	FRE 180 28.299 / FRE 180 28.55	47.43
5	180	P	FRE 180 33.446 / FRE 180 33.603	47.43
5	180	P	FRE 180 34.563 / FRE 180 34.627	47.43
5	43	S	KIN 43 16.252 / KIN 43 16.378	47.41
5	43	S	KIN 43 16.391 / KIN 43 16.504	47.41
5	145	S	FRE 145 33.116 / FRE 145 33.141	47.40
5	145	S	FRE 145 34.054 / FRE 145 34.218L	47.40
5	223	P	KER 223 27.577 / KER 223 31.92	47.39
5	119	P	KER 119 0 / KER 119 0.274	47.37

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
5	119	S	KER 119 0 / KER 119 0.274	47.37
5	155	S	KER 155 R61.044 / KER 155 R60.637	47.34
5	155	S	KER 155 R70.991 / KER 155 R70.895	47.34
5	269	P	FRE 269 1.622 / FRE 269 11.735	47.33
5	269	P	FRE 269 13.741 / FRE 269 24.764	47.33
5	63	P	TUL 63 R23.652 / FRE 63 0.498	47.31
5	137	P	KIN 137 2.049 / TUL 137 12.283	47.30
5	166	S	KER 166 14.573 / KER 166 15.063	47.26
5	201	P	TUL 201 16.009 / TUL 201 23.957	47.26
5	168	S	FRE 168 L28.053 / FRE 168 R36.224	47.21
5	269	S	FRE 269 8.644 / FRE 269 9.356	47.21
5	198	P	FRE 198 22.66 / FRE 198 26.801	47.19
5	198	P	FRE 198 7.04 / FRE 198 21.367	47.19
5	198	P	TUL 198 42.434 / TUL 198 42.639	47.19
5	33	P	FRE 33 19.966 / FRE 33 22.346	46.11
5	33	P	FRE 33 24.347 / FRE 33 R28.914	46.11
5	33	P	FRE 33 53.402 / FRE 33 60.443	46.11
5	33	P	FRE 33 70.7 / FRE 33 70.8	46.11
5	33	P	FRE 33 72.834 / FRE 33 R79.906	46.11
5	33	P	FRE 33 R39.948 / FRE 33 43.443	46.11
5	33	P	KER 33 18.188 / KER 33 18.449	46.11
5	33	P	KER 33 23.408 / KER 33 24.238	46.11
5	33	P	KER 33 33.117 / KER 33 46.266	46.11
5	33	P	KER 33 R60.182 / KER 33 73.725	46.11
5	33	P	KIN 33 12.956 / KIN 33 16.401	46.11
5	33	P	KIN 33 16.687 / FRE 33 8.017	46.11
5	33	P	SLO 33 4.945 / KER 33 12.913	46.11
5	178	P	KER 178 26.63 / KER 178 55.405	46.03
5	245	P	FRE 245 8.422 / FRE 245 8.972	44.93
5	245	P	TUL 245 9.72 / TUL 245 25.941	44.93
5	178	S	KER 178 49.923 / KER 178 50.317	42.52
5	178	S	KER 178 R31.472 / KER 178 R44.046	42.52
5	33	S	KER 33 4.444 / KER 33 4.905	39.41
5	33	S	KER 33 5.773 / KER 33 6.353	39.41
5	190	P	TUL 190 27.295 / TUL 190 47.237	32.76
5	155	P	KER 155 38.989 / KER 155 R61.044	32.49
5	155	P	KER 155 R21.377 / KER 155 31.531	32.49
5	155	P	KER 155 R3.469 / KER 155 R4.041	32.49

Priority	Route	Alignment	From County & Postmile / To County & Postmile[18]	Average Cross-Hazard Prioritization Score[19]
5	155	P	KER 155 R70.895 / KER 155 R70.991	32.49
5	46	P	SLO 46 60.849 / KER 46 3.345	25.35
5	46	S	KER 46 0.039 / KER 46 3.347	24.94
5	41	S	MAD 41 27.979 / MAD 41 28.457	24.86
5	49	P	MAD 49 0.952 / MAD 49 9.275	24.22
5	41	P	MAD 41 27.39 / MAD 41 28.928	22.91
5	41	P	MAD 41 32.68 / MAD 41 35.25	22.91
5	41	P	MAD 41 35.566 / MPA 41 0	22.91
5	168	P	FRE 168 L27.405 / FRE 168 40.072	21.08
5	5	P	LA 5 R87.613 / LA 5 R87.676	18.30
5	5	P	LA 5 R87.733 / LA 5 R87.899	18.30
5	5	P	LA 5 R87.999 / LA 5 R88.285	18.30
5	5	S	LA 5 R88.175 / LA 5 R88.204	18.30
5	5	S	LA 5 R88.593 / KER 5 R0.11	18.30

This page intentionally left blank.


Caltrans
WSP