California Statewide Local Streets and Roads Needs Assessment

Final Report
April 2023

Prepared by

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Sponsored by

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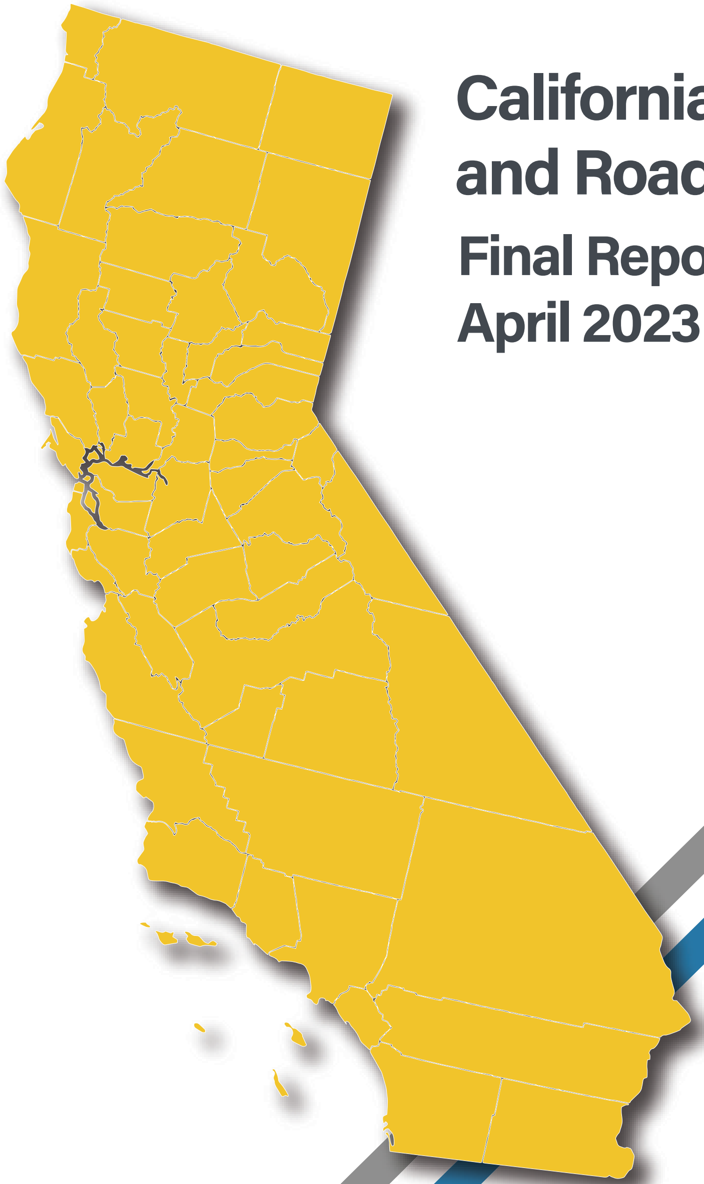

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www.SaveCaliforniaStreets.org

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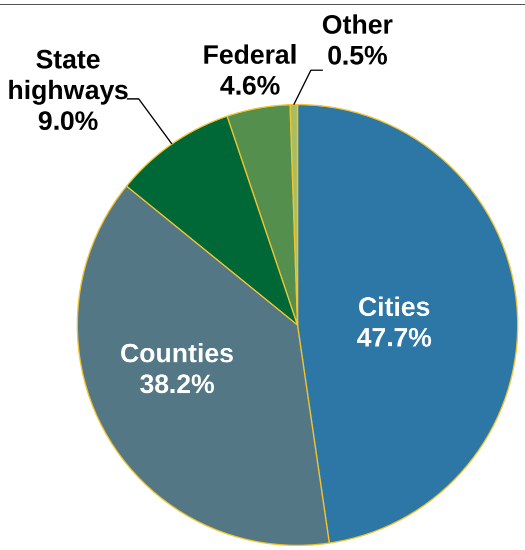
Executive Summary

Nearly every trip begins on a city street or county road. Whether traveling by bicycle, bus, rail, truck or family automobile, Californians need a reliable and well-maintained local street and road system.

Every component of California's transportation system is critical to providing a seamless, interconnected system that supports the traveling public and economic vitality throughout the state. Sustainable communities cannot function without a well-maintained local street and road system that provides access for transit and active modes of transportation like bicycling and walking.

The first comprehensive statewide study of California's local street and road system in 2008 provided critical information and analysis of the local transportation network's condition and funding needs. Each subsequent report has monitored the changes biennially.

This study sought answers to important questions: What are the current pavement conditions of local streets and roads? What will it cost to repair all streets and roads? What measures are necessary for a system to function safely? What is the impact of the additional funding available from the Road Repair and Accountability Act of 2017 (SB 1) on the condition of local streets and roads, bridges, and essential components?



Road Centerline Miles by Agency

Responsible for over 85 percent of California's roads, cities and counties find the continuation of this study to be of critical importance for several reasons. Its results continue to educate policymakers at all levels of government and the public about the infrastructure investments needed to provide California with a seamless, multi-modal transportation system. Its findings provide a credible and defensible analysis to support a dedicated, stable funding source for local system maintenance. It also provides the rationale for the most effective and efficient investment of public funds, potentially saving taxpayers from paying significantly more to fix local streets and roads into the future.

Previous editions of this report cautioned that without an influx of new revenues, the vital local street and road system would continue to deteriorate and cost taxpayers increasingly more to repair.

After years of careful consideration and study, the Legislature passed and Governor Jerry Brown signed SB 1 in 2017. The passage of SB 1 was a significant success for municipal governments statewide and injected a long-awaited substantial infusion of funding to maintain local street and road systems. The bill provides over $5 billion annually for transportation, and of this, approximately $1.5 billion is allocated to the local street and road system owned and maintained by 539 cities and counties.

Despite the passage of SB 1 in 2017, there was considerable uncertainty surrounding local transportation funding through 2022 due first to the effort to repeal SB 1 in November 2018, and then to the COVID-19 pandemic in early 2020. The former created a climate of uncertainty where cities and counties were reluctant to commit to long-term repair efforts, and the latter resulted in significant revenue reductions and uncertainty through the 2022 construction season. Both of these events impacted local government transportation project delivery between 2018 to 2022.

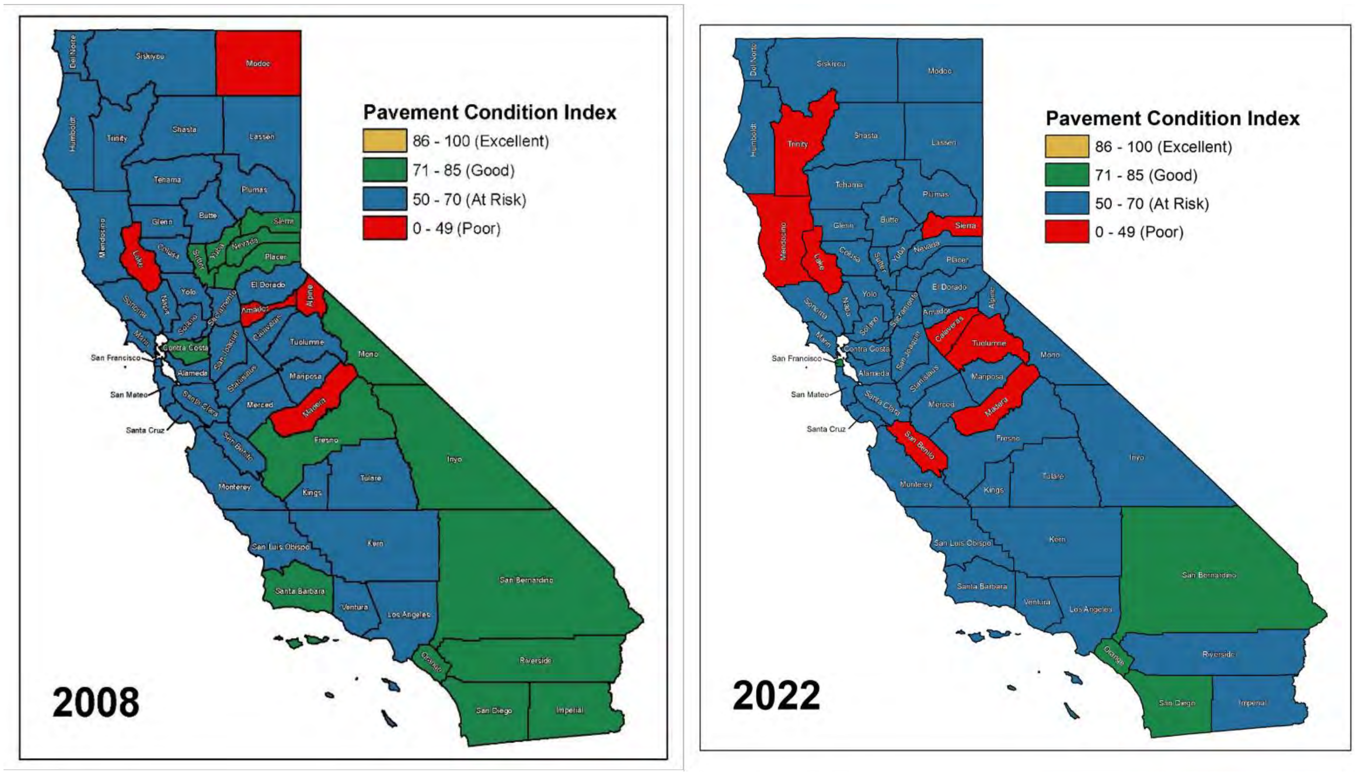
As with previous updates, this 2022 update surveyed all of California's 539 cities and counties. Almost 70 percent of the agencies that were solicited responded – a level of participation that makes clear the sustained interest in addressing the growing problems of crumbling local streets and roads.

Pavements

The Pavement Condition Index (PCI) of California's local streets and roads has decreased by half a point since 2020. On a scale of zero (failed) to 100 (excellent), the average statewide PCI for local streets and roads is 65, or "At Risk". Fifty-four of 58 counties have either at risk or poor pavements. The maps on the following page illustrate the changes in condition since 2008.

To use taxpayer money wisely, it makes more sense to preserve and maintain roads in good condition than to wait and repair or replace them when they deteriorate or fail. The estimated costs reported in this study are based on improving roadway pavement condition to meet best management practices (BMPs). At BMP conditions, preventive maintenance treatments (i.e., slurry seals, chip seals, thin overlays) are most cost-effective. In addition to costing less, preventive maintenance interferes less with commerce and the public's mobility and is more environmentally friendly than rehabilitation or reconstruction.

The importance of this approach is significant. As roadway pavement conditions deteriorate, the cost to repair them increases exponentially. For example, it costs as much as 14 times more to reconstruct a pavement than to preserve it when it is in good condition. Even modest resurfacing is 4 times more expensive than maintaining pavement in the BMP condition. To put it another way, 14 miles of roadway can be maintained in a BMP condition for the same cost as reconstructing 1 mile of failed pavement. By bringing the local roadway system to BMP condition, cities and counties will be able to then maintain streets and roads at the most cost-effective level. This outcome is not only optimal, but also necessary.



Technological Cost Savings

This report also includes the impact of using sustainable technologies (e.g., cold-in-place recycling) that result in significant cost savings. Since 2012, the number of agencies that employ some form of recycling has more than doubled. This trend is expected to continue, and cost savings can be as much as 25 percent over conventional treatments, resulting in a reduction of the 10-year pavement funding needs. These cost savings are therefore included in the funding scenarios presented here.

Funding Scenarios (in constant 2022 dollars)

Three funding scenarios were analyzed:

1. **Existing Funding with SB 1 ($3.36 billion/year**) – This is the current funding amount and includes SB 1 together with cost savings from paving technologies. The PCI is expected to drop slightly to 63 by 2032, however, the percent of good pavements will increase to over 60 percent (see Table).

   Note that this scenario does not consider the impact of zero-emission vehicles (ZEVs), which are estimated to reduce gas revenues by up to $1.5 billion annually by 2035 (see Section 4.3).

2. **Maintain PCI at 65 ($3.76 billion/year)** – To maintain the PCI at 65, additional funding ($3.76 billion/year) is needed. In this scenario, the pavement would be rated 'good' in two-thirds of the network.

3. **Funding required to reach BMP ($8.54 billion/year)** – The optimal scenario is to bring all pavements into a state of good repair so that BMPs can prevail. To reach BMP levels (PCI in 80s), $85.4 billion would be needed over the next 10 years. ***After that, it would only require $3.28***

billion each year to maintain the pavements in that condition. This is essentially the same as the existing level of funding.

The following table summarizes the results of each scenario.

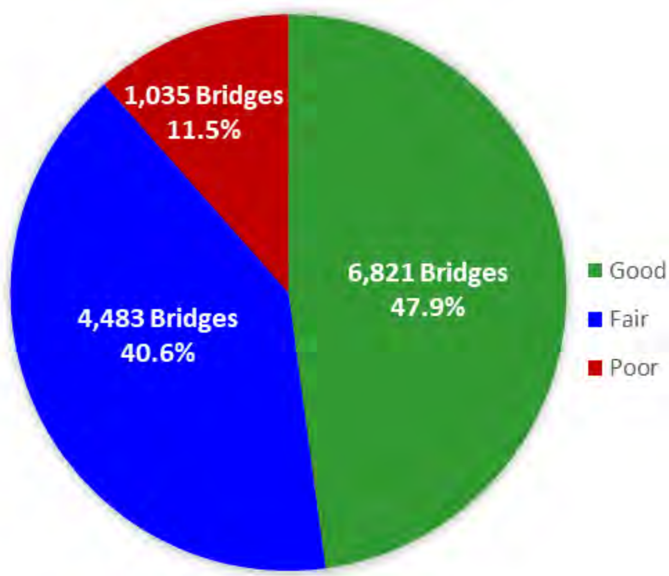
Scenarios	Annual Budget ($B)	PCI in 2032	Condition Category	% Pavements in Poor/Failed Condition	% Pavements in Good Condition
Current Condition (2022)	-	65	At Risk	23.0%	55.1%
1. Existing Funding	$3.36	63	At Risk	21.0%	60.6%
2. Maintain PCI at 65	$3.76	65	At Risk	21.1%	66.0%
3. Best Management Practice	$8.54	87	Excellent	0.0%	100.0%

Essential Components

The transportation network also includes essential safety and traffic components such as curb ramps, sidewalks, storm drains, streetlights, and signals. Maintenance of these components will require $39 billion in total over the next 10 years, and there is an estimated funding shortfall of $22.6 billion.

Bridges

Local bridges are an integral part of local street and road infrastructure. They make up approximately 48 percent of all the bridges in California, and there are 12,339 local bridges. Their average age is over 50 years, 10 years older than the national average, and more than half (52.1 percent by deck area) are in fair or poor condition.



The bridge safety, strengthening, and widening improvements necessary to keep pace with California's modern mobility needs will require $7.2 billion. To simply maintain their current condition will require $800 million annually, but only $290 million is available. There is an estimated shortfall of $4.3 billion to maintain the safety and integrity of bridge infrastructure.

Total Funding Shortfall

The table on the next page shows the total funding shortfall of $74.3 billion (2022 dollars) over the next 10 years. For comparison, the funding needs from the previous updates are also included. Note that the pavement and essential component needs have markedly increased due to higher construction costs. Finally, for the first time, Active Transportation costs have been separated from Essential Components.

Transportation Asset	Needs ($B)							2022 ($B)		
	2008	2010	2012	2014	2016	2018	2020	Needs	Funding	Shortfall
Pavement	$ 67.6	$ 70.5	$ 72.4	$ 72.7	$ 70.0	$ 61.7	$ 76.0	$ 81.0	$ 33.6	$ (47.4)
Essential Components	$ 32.1	$ 29.0	$ 30.5	$ 31.0	$ 32.1	$ 34.1	$ 35.5	$ 27.8	$ 16.4	$ (22.6)
Active Transportation								$ 11.2		
Bridges*		$ 3.3	$ 4.3	$ 4.3	$ 4.6	$ 5.5	$ 7.2	$ 7.2	$ 2.9	$ (4.3)
Totals	**$ 99.7**	**$ 102.8**	**$ 107.2**	**$ 108.0**	**$ 106.7**	**$ 101.3**	**$ 118.7**	**$ 127.2**	**$ 52.9**	**$ (74.3)**

*Bridge needs are from 2020 report.

Conclusions

SB 1 is a critical funding source that has resulted in cities and counties stabilizing the average statewide local pavement condition at 65. However, it is too soon to conclude that SB 1 will succeed in its goal of stabilizing the deterioration observed since 2008. Efforts to rescind the new revenues from SB 1 in the first 2 years after its passage resulted in industry-wide hesitation to expand construction capacity. This was coupled with agencies' concerns about over-committing on future project delivery. The limited construction capacity had an unintended consequence; bid prices for street and bridge maintenance and repairs were as much as 30 percent higher in 2022 than 2020. In addition, the needs of other infrastructure components continue to grow, reducing the funding available for pavements. The impacts of COVID-19 also led to reductions in pavement revenues and expenditures in 2020–2022.

1 Introduction

California's 58 counties and 481 cities[1] own and maintain over 144,530 centerline miles of local streets and roads[2]. This is an impressive 85.9 percent of the state's total publicly maintained centerline miles (Figure 1.1). Conservatively, this network is valued at over $253 billion.

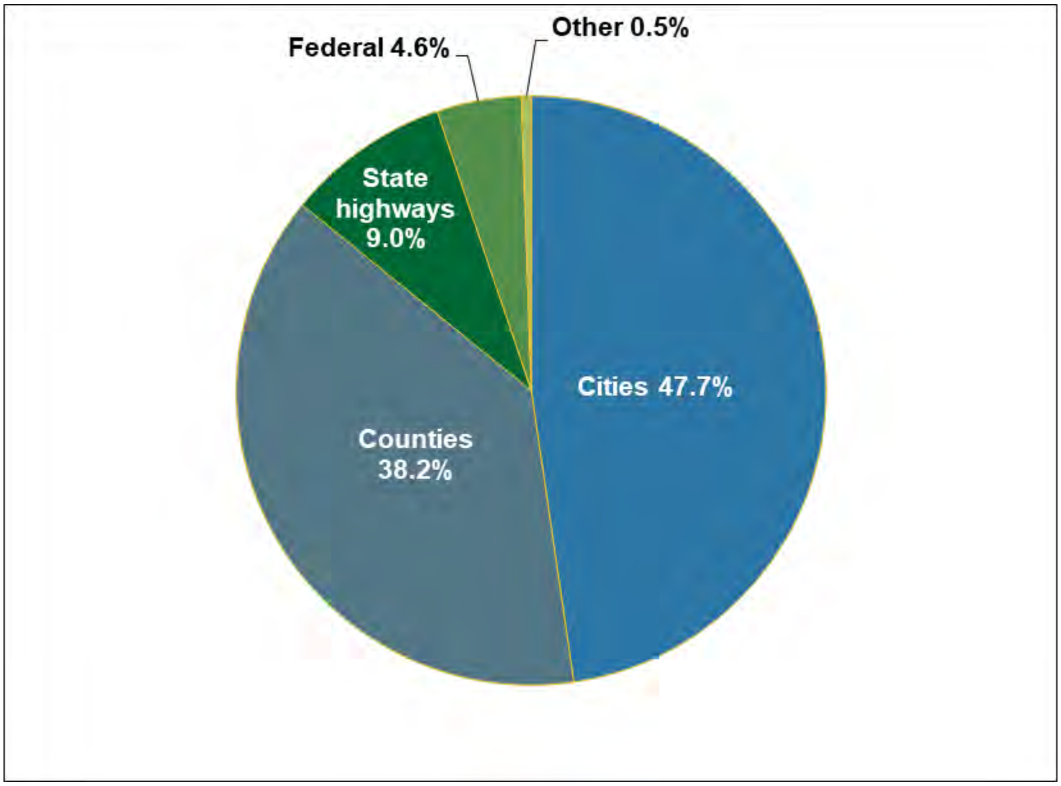


Figure 1.1 Breakdown of Maintained Road Centerline Miles by Agency[2]

Because lane miles are more commonly used in pavement management analyses (the costs derived are based on areas, and lane miles are a more accurate indicator of pavement areas), Table 1.1 shows the breakdown of lane miles for local streets and roads by functional classification, and for unpaved roads. Major streets or roads are those that are classified as arterials or collectors, and local streets or roads are those that are classified as residentials and alleys. Unpaved roads are those that have either dirt or gravel surfaces.

[1] Four new cities (Wildomar, Menifee, Eastvale, and Jurupa Valley) were incorporated after the original 2008 study. Note that San Francisco is traditionally counted as both a city and a county, but for purposes of this analysis, their data have been included as a city only. Therefore, a total of 539 cities and counties were used in this study.

[2] California Department of Transportation (Caltrans), Division of Transportation System Information. *2019 California Public Road Data – Statistical Information Derived from the Highway Performance Monitoring System* (HPMS). December 2020. The total miles are calculated from this reference and survey results. Note that the HPMS reports a total of 151,818 miles belonging to cities and counties; this is a significant difference from the total miles reported on the online survey (144,530). For this study, the online survey results were used.

Streets and roads are also separated into urban and rural classifications. Urban and rural roads are defined based on the U.S. Census Bureau definitions of urban and rural areas: rural areas have population centers less than 5,000 or have a population density below 1,000 persons per square mile, while urban areas have population centers with more than 5,000 people. However, an urbanized or rural area may or may not contain an incorporated city and the urban boundary does not necessarily follow city incorporation lines. In this study, each individual city or county categorized their own miles.

Table 1.1 Breakdowns of Functional Classification and Unpaved Roads

	Lane Miles by Functional Class				Unpaved	Total
	Urban		Rural			
	Major	Local	Major	Local		
Cities	78,545	108,427	1,832	3,311	1,276	193,391
Counties	12,745	22,796	32,184	44,252	15,801	127,779
Totals	91,291	131,223	34,016	47,563	17,077	321,170

Note: San Francisco is included as a city.

Approximately 70 percent of the total paved lane miles are in urban areas (Table 1.1). In addition, almost 94 percent of rural roads belong to the counties, and 82 percent of urban roads belong to the cities. Finally, unpaved roads comprise approximately 5.3 percent of the total network, and counties own almost 93 percent of these unpaved roads.

1.1 Study Objectives

In 2008, the first study was conducted to assess statewide local street and road network needs[3]. The purpose of this study was to determine how much funding would be needed to maintain the local streets and roads system for the subsequent 10 years, so that that information could be reported to the Governor, the State Legislature, the California Transportation Commission, and Caltrans, as well as other stakeholders.

The specific objectives of the 2008 study were summarized as a series of questions:

- What are the conditions of local streets and roads?
- What will it cost to bring them up to an acceptable condition?
- How much will it cost to maintain them in an acceptable condition for the next 10 years?
- Similarly, what are the needs for other essential components, such as safety, traffic, and regulatory items?
- Is there a funding shortfall? If so, how much is it?
- What are the impacts of different funding scenarios?

Since then, the study has been updated every 2 years, and the objectives have been essentially the same. Bridges were added to the scope in 2014, and in 2020, a companion report on bridges was also prepared. Previous reports are available for download at www.SaveCaliforniaStreets.org.

[3] Nichols Consulting Engineers, Chtd. *California Statewide Local Streets & Roads Needs Assessment*. October 2009.

In April 2017, Governor Jerry Brown signed the Road Repair and Accountability Act of 2017 (also known as SB 1) which provided a substantial infusion of funding (approximately $1.5 billion) for maintaining and improving the local transportation system. This report examines the impacts of SB 1 over the first 4 full fiscal years of new funding for both policymakers and the public. The data used for this study were collected using an online survey sent to all California cities and counties.

1.2 Study Assumptions

As in the previous studies, some important assumptions were made during data analysis (Table 1.2). Most are consistent with those used in the Caltrans 2020 State Highway Operation and Protection Program (SHOPP)[4]. The assumptions include:

- Data were analyzed over 10 years.
- All costs reported are in constant 2022 dollars.
- The goal was to reach a pavement condition where best management practices (BMPs) can occur. This translates to a Pavement Condition Index (PCI) in the 80s (on a scale of 0 to 100, where zero is failed and 100 is excellent) and with no failed pavements. Caltrans SHOPP defines performance goals quite differently; e.g., achieve a pavement pothole and cracking Level of Service of 90 percent or greater by 2027, or not less than 98.5 percent of bridge area to be in good or fair condition by 2027.
- It is assumed that no new streets or roads were added within the analysis period. In addition, capital improvement or expansion projects (e.g., realignments, widenings, grade separations) were <u>not</u> included.
- The inclusion of essential components (safety, traffic and regulatory) of the roadway system, such as sidewalks, curb ramps, and storm drains, is consistent with the SHOPP. Bicycle and pedestrian facilities are also included.
- The bridge needs assessment was not updated for this cycle; however, a companion report is available from the 2020 update.

[4] Caltrans. *2022 SHOPP – State Highway Operation and Protection Program (SHOPP Plan)*. March 2022.

Table 1.2 Comparison of 2022 Statewide Study and Caltrans SHOPP

Assumptions	2022 Statewide Study	Caltrans SHOPP
Analysis Period	10 years	10 years
Cost Basis	2022 dollars	2022 dollars
Goals	Best management practices (PCI in 80s & no failed pavements)	Achieve pavement pothole and cracking Level of Service of 90 percent or higher by 2027
Total Scenarios Evaluated	3	1
Capital Improvement Projects	No	Only related to operational improvement
Essential Components	Yes	Yes
Bridges	See 2020 Study	Yes

1.3 Study Sponsors

This study was sponsored by the cities and counties of California and has been managed by a coalition of cities, counties, and Regional Transportation Planning Agencies (RTPAs). The Oversight Committee is composed of representatives from the following:

- League of California Cities (Cal Cities)
- California State Association of Counties (CSAC)
- County Engineers Association of California (CEAC)
- Regional Transportation Planning Agencies (RTPA)
- Rural Counties Task Force (RCTF)

Oversight Committee members include:

- David Leamon, Stanislaus County (Project Manager)
- Steve Burger, Los Angeles County
- Elmer Datuin, Riverside County
- Brad Eggleston, City of Palo Alto
- Damon Letz, City of Santa Clarita
- Heather Miller, Ventura County Transportation Commission
- Matt Randall, Placer County (representing Highway Bridge Program)
- Sui Tan, Metropolitan Transportation Commission
- Ron Vicari, Sacramento County
- Mike Woodman, Nevada County Transportation Commission (representing the Rural Counties Task Force)

Staff members include:

- Damon Conklin, League of California Cities
- Michael Coleman, League of California Cities
- Meghan McKelvey, League of California Cities
- Kristina Gallagher, CSAC/CEAC
- Mark Neuburger, CSAC/CEAC
- Merrin Gerety, CSAC/CEAC

Appendix A includes a list of all agencies that contributed financially to the 2020–2022 updates.

2 Pavement Needs Assessment

This chapter discusses the methodology and assumptions used for the pavement needs assessment and presents the results of the analysis. The data collection efforts are described in more detail in Appendix B, but, briefly, an online survey was made available on the www.SaveCaliforniaStreets.org website between March and early June 2022. All cities and counties were contacted and asked to participate in the survey. A total of 379 agencies responded to the survey and either updated or confirmed the data that were provided in previous surveys. The response rate (70 percent) decreased from 2020 but remained robust enough to accurately represent conditions statewide.

2.1 Methodology and Assumptions

Because not all 539 cities and counties responded to the survey, a methodology was developed to estimate the pavement needs of the missing agencies. The following paragraphs describe this methodology, which is consistent with previous updates.

2.1.1 Filling in the Gaps

Inventory Data

To estimate an agency's pavement needs, it was crucial to quantify the miles (both centerline and lane miles) and pavement area in the jurisdiction. Missing inventory data were populated based on the following rules:

- If no updated inventory data were provided, then previous survey data were used.
- If the inventory data provided were incomplete, the average number of lanes and average lane width were calculated from agencies that submitted complete inventory data in the previous surveys. Those data (Table 2.1) were used to populate the missing information..

Table 2.1 Assumptions Used to Populate Missing Inventory Data

Functional Class	Average Number of Lanes	Average Lane Width (feet)
Urban Major Roads	2.93	15.4
Urban Residential/Local Roads	2.11	15.8
Rural Major Roads	2.01	13.8
Rural Residential/Local Roads	1.93	10.8
Unpaved Roads	1.80	14.8

Pavement Condition Data

To assist those agencies that did not have pavement condition data, the online survey provided a table showing the average PCIs calculated during the 2020 study. The agencies were encouraged to look at the data from neighboring cities or counties to make their best estimate of the pavement condition in their jurisdiction. For those agencies that had never provided any condition data, the average condition of the associated county was used.

The surveys also asked for condition data for different functional classifications, and additional rules were developed to populate the missing data:

- If the PCI was provided for one but not the other functional classes, the same PCI was used for all functional classes.
- If no pavement condition data were provided in 2020, the last PCI provided was used, but the number was extrapolated based on the statewide PCI trend; i.e., if the statewide average deteriorated 1 point, then the jurisdiction's PCI used was also assumed to have deteriorated 1 point.
- The only exception was for San Francisco Bay area agencies, where the data were provided by the Metropolitan Transportation Commission (MTC).

2.1.2 Pavement Needs Assessment Goal

The needs assessment goal in the 2022 update was the same as in previous studies. To reiterate, the goal is for pavements to reach a condition where BMPs can occur, so that only the most cost-effective pavement preservation treatments are needed. Other benefits, such as fewer travel delays and reduced environmental impacts (e.g., dust, noise, energy usage) also result when roads are in good condition.

Our goal is to bring streets and roads to a condition where best management practices (BMPs) can occur.

The BMP goal is to reach a PCI in the high 80s and to eliminate deferred maintenance. Deferred maintenance, or "unfunded backlog", is defined as work that is needed but is not funded. MTC's StreetSaver® pavement management system program was used to calculate the unfunded backlog. This program was selected because the analytical modules were able to perform the required analyses, and the default pavement performance curves were based on data from California cities and counties. This is described in detail in Appendix B of the 2008 report, which can be downloaded at www.SaveCaliforniaStreets.org.

2.1.3 Maintenance and Rehabilitation Treatment Types and Costs

Assigning the appropriate maintenance and rehabilitation (M&R) treatment is a critical component of the needs assessment. It is important to know both the ***type*** of treatment and ***when*** to apply it. This is typically outlined in a decision tree. The Federal Highway Administration has widely researched pavement preservation concepts and their efficacy[5], and the National Highway Institute has several training courses available. In addition, the National Center for Pavement Preservation at Michigan State University maintains a technical library available to the public[6].

Asphalt Pavements

Figure 2.1 summarizes the types of asphalt treatments assigned in this study. Briefly, if a pavement section has a PCI between 90 and 100, no treatment is required. Good-to-excellent asphalt pavements

[5] Federal Highway Administration. "Pavements". http://www.fhwa.dot.gov/pavement/pres.cfm.
[6] Michigan State University. "National Center for Pavement Preservation". https://www.pavementpreservation.org/.

(PCI>70) are ideal candidates for pavement preservation techniques (e.g., preventive maintenance treatments such as chip or slurry seals). These are typically applied at 5-to-7-year intervals depending on the type of road and the volume of traffic.

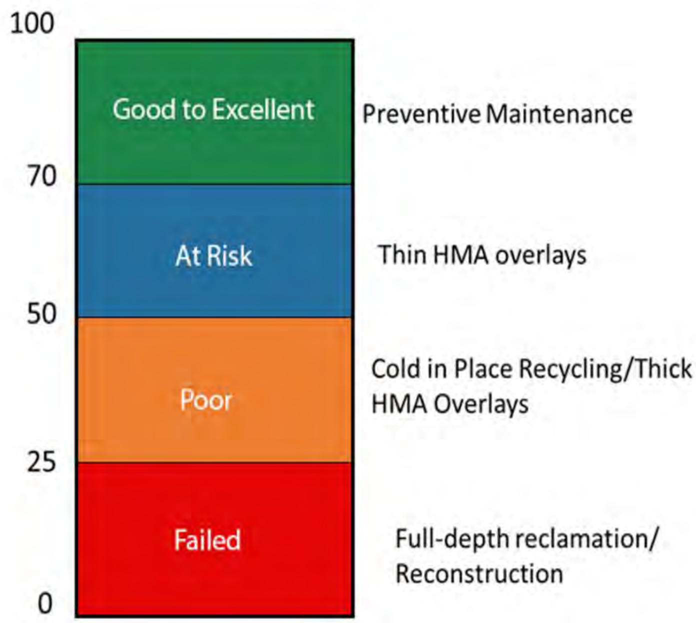


Figure 2.1 PCI Thresholds & Treatments Assigned for Asphalt Pavements

As pavements deteriorate, treatments that address structural adequacy are required. Hot mix asphalt (HMA) overlays are usually applied at varying thicknesses to pavements with PCIs between 25 and 69. This may be combined with milling or recycling techniques.

Finally, when the pavement has failed (PCI<25), reconstruction is typically required.

The PCI thresholds shown in Figure 2.1 are generally accepted industry standards and the descriptions of each category herein are typical of most agencies, however, these may vary. For example, it is not unusual for local streets to have slightly lower thresholds, indicating that they are held to lower standards

Concrete Pavements

Similarly, many strategies are available to manage concrete pavements. Good-to-excellent concrete pavements (PCI>70) are also ideal candidates for preventive maintenance, such as diamond grinding to remove a thin surface layer of concrete. This approach improves friction, smooths the pavement, and reduces noise. Partial and full-depth slab repairs are also used as preventive maintenance to restore isolated panels that have cracked or failed.

Concrete overlays can be used to cover a wide range of pavement repair conditions. Bonded concrete overlays of asphalt are typically applied on roadways in good condition (PCI>70) to add structure and/or provide a more permanent maintenance solution to the road. Unbonded concrete overlays of asphalt are typically applied on roadways in fair to significantly deteriorated condition (PCI of 25 to 70) and will restore structural capacity using the existing roadway as a structural base layer.

When the pavement has failed (PCI<25), reconstruction with concrete pavement is an alternative, and may be accompanied by recycling techniques. Concrete pavements typically last 20 to 25 years prior to needing their first preventive maintenance treatment.

Cost Comparison

Unit cost data for asphalt treatments from over 148 agencies were summarized and averaged for analysis (Table 2.2). There was a large range in costs, but for purposes of this analysis, the average was used. The costs of each treatment were separated by functional class because major roads had consistently higher costs than did local roads. Unit costs ($/square yard [sy]) increased from 2020 for all categories. On average, seals increased in cost by 4 – 6 percent, overlays by 3 – 8 percent, and reconstruction by 7 – 8 percent.

Table 2.2 Unit Costs Used for Different Treatments and Road Classifications

Classification	Unit Costs ($/sy)			
	Preventive Maintenance	Thin HMA Overlays	Thick HMA Overlays	Reconstruction
Major Roads	$6.86	$26.86	$43.61	$99.04
Local Roads	$6.41	$26.02	$41.66	$84.39

It should be noted that the costs of preventive maintenance treatments (e.g., seals) have increased significantly since 2016. Costs of overlays and reconstructions have also increased, and reconstruction costs are now higher than in 2008 for the first time, despite the increase in use of recycling technologies such as full-depth reclamation. Figures 2.2 to 2.5 illustrate trends in the unit costs of different maintenance strategies.

Finally, only asphalt concrete roads were included in this analysis. Portland cement concrete pavements comprised such a small proportion (approximately 3 percent) of the total network that it was deemed not significant for the funding analysis.

Construction costs increased from 4 to 8 percent in 2022.

Technological Cost Savings

This report includes the impact of sustainable paving technologies such as cold-in-place recycling that have construction cost savings of 28 percent compared to conventional treatments (see Section 2.3) and as much as 26 percent savings for full-depth reclamation. Since 2012, the number of agencies that employ some form of recycling has more than doubled. This is one example of how cities and counties have stretched the proverbial dollar. This trend is expected to continue therefore the associated cost savings were included in the pavement needs analysis and funding scenarios.

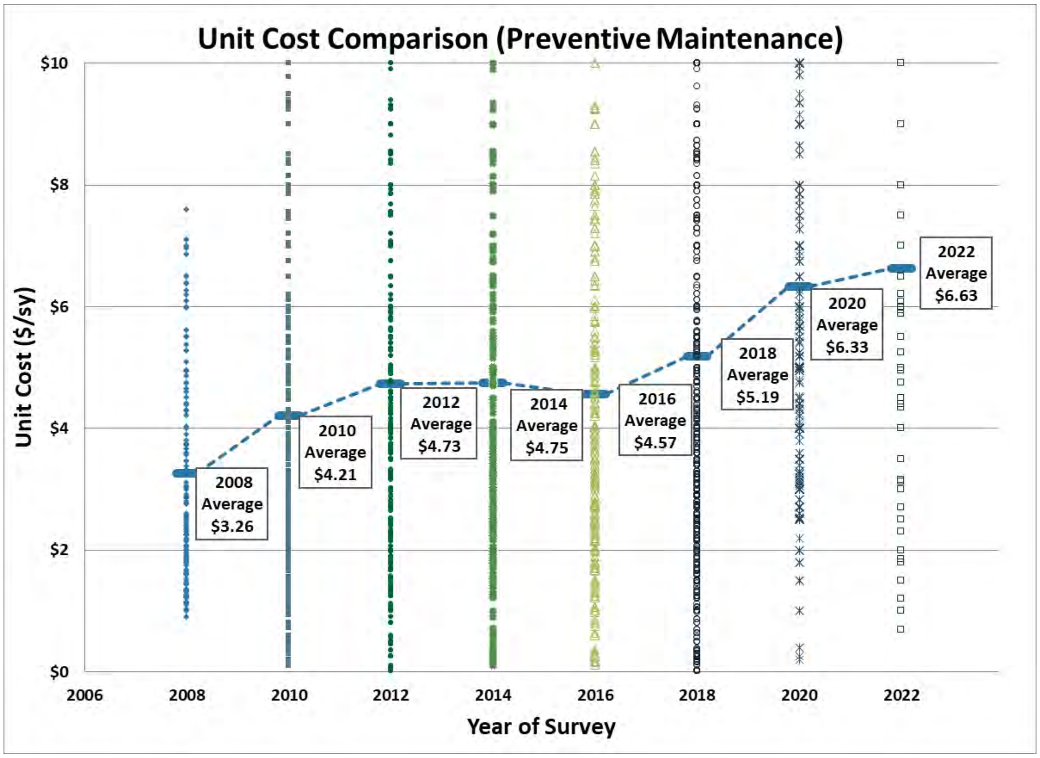


Figure 2.2 Unit Price Trends for Preventive Maintenance Treatments

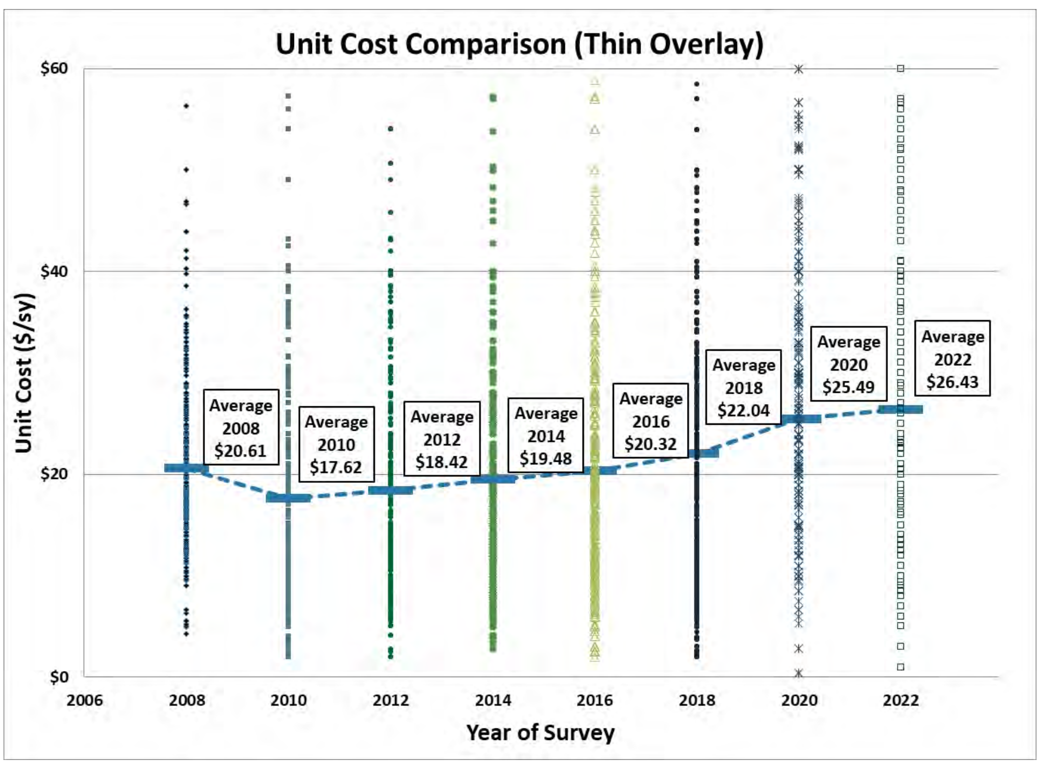


Figure 2.3 Unit Price Trends for Thin HMA Overlays

Pavement Needs Assessment

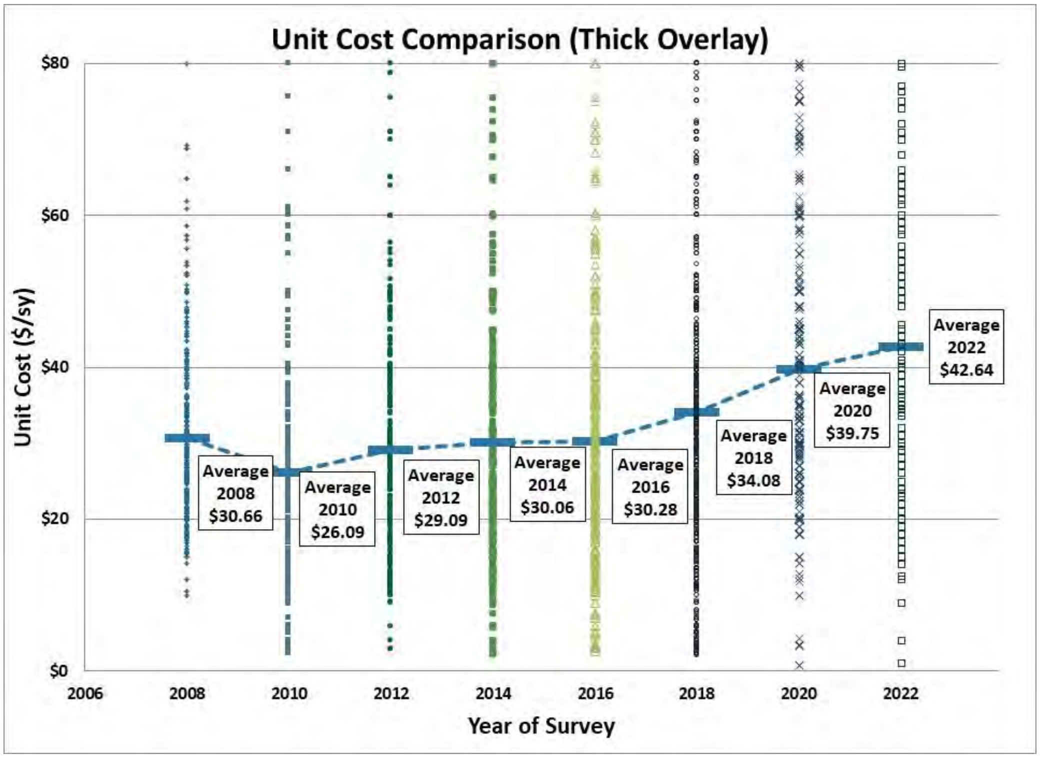


Figure 2.4 Unit Price Trends for Thick HMA Overlays

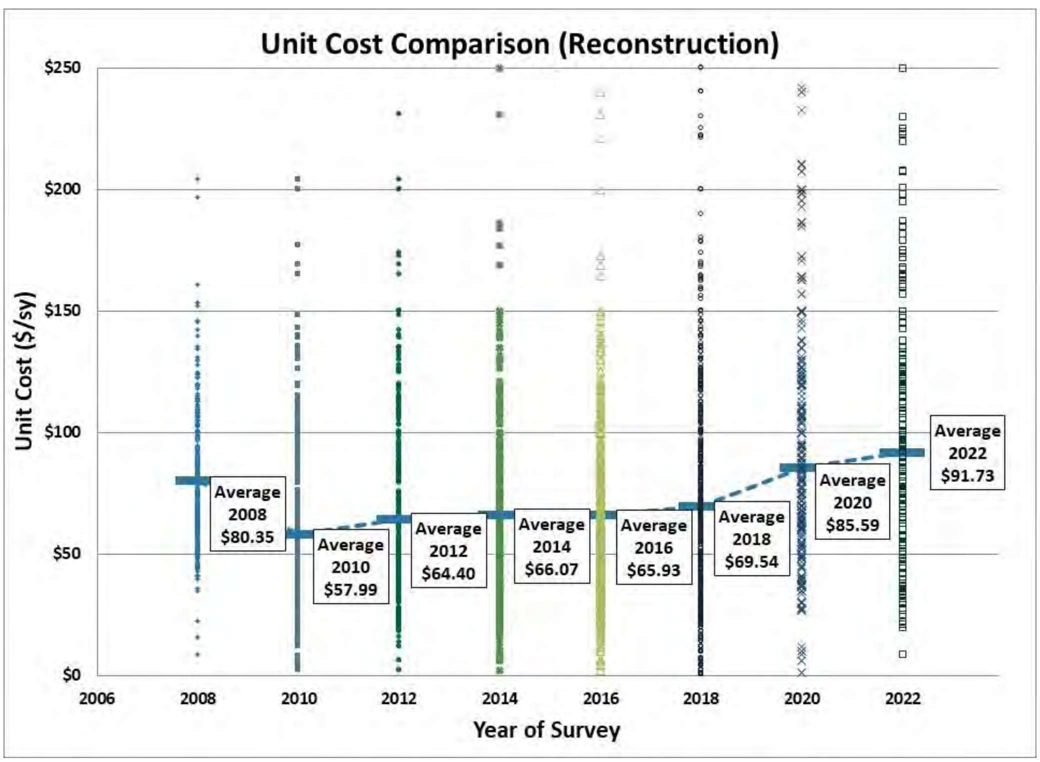


Figure 2.5 Unit Price Trends for Reconstruction

2.1.4 Escalation Factors

As with the previous studies, no escalation factors were used in this analysis. Costs are shown as constant 2022 dollars, and this is consistent with the SHOPP as well as many Regional Transportation Plans (RTPs).

2.2 Average Network Condition

The survey revealed that the pavement condition statewide decreased from 65.58 in 2020 to 65.22 in 2022. This is a reflection of the huge drop in funding in FY 2020/21 and FY 2021/22 due to COVID impacts (see Chapter 4). Despite this, the PCI was essentially stable from 2020, and the historical decline in PCI appears to have been arrested.

The 2022 average PCI was 67.6 for cities and 59.9 for counties. Table 2.3 indicates that major streets or roads continued to be in better condition than local roads. Rural local roads had the lowest PCI of any category.

Table 2.3 Average 2022 PCI by Type of Road

Type	Average 2022 PCI	
	Major	Local
Urban Streets	68	67
Rural Roads	63	53

Table 2.4 includes the 2022 PCI for each county (including cities within the county) based on a scale of 0 (failed) to 100 (excellent). The scale is weighted by the pavement area such that long roads have more weight in the calculation of the average PCI than short roads.

Note that the PCI reported is only the ***weighted average*** for each county and ***includes*** the cities within the county. This means that, for example, Amador County and the cities within the county may have pavement sections with a PCI of 100, despite an average of 50.

The average PCI between 2008 to 2018 trended slightly downward but has since stabilized. Some counties reported improvements attributed to better data collection (i.e., more agencies updating their pavement data), better use of pavement preservation treatments, and/or increase in available funding such as local sales taxes or bonds.

The 2022 statewide ***weighted average*** PCI for all local streets and roads is 65 (Table 2.4). Orange County continues to have pavements in the best condition, at an average PCI of 79. Unfortunately, Tuolumne County has pavements in the worst condition, with an average PCI of 24. Appendix C includes maps that illustrate the average PCI for each city and county.

The average pavement condition index for streets and roads statewide is 65. This is similar to 2020 and is still considered "at risk".

Table 2.4 Summary of PCI Data by County (includes Cities) for 2008–2022

County (Cities Included)	Centerline Miles	Lane Miles	Area (sy)	Average Weighted PCI*							
				2008	2010	2012	2014	2016	2018	2020	2022
Alameda	3,596	8,150	73,382,886	66	67	68	66	68	68	68	67
Alpine	151	302	2,139,517	40	45	45	44	44	41	58	58
Amador	477	945	3,598,703	31	34	33	33	56	51	51	50
Butte	1,816	3,644	28,691,159	70	67	65	66	65	60	60	55
Calaveras	831	1,340	8,201,768	55	53	51	51	51	50	52	44
Colusa	761	1,247	13,240,593	61	60	60	62	63	60	61	61
Contra Costa	3,348	7,012	65,788,024	72	70	71	68	69	71	70	68
Del Norte	323	646	4,418,399	70	68	64	63	63	60	60	67
El Dorado	1,399	2,684	21,458,907	62	58	63	63	62	63	63	63
Fresno	6,335	12,563	112,879,098	74	70	69	69	64	61	60	59
Glenn	848	2,017	11,940,355	68	68	68	68	68	68	62	50
Humboldt	1,163	2,354	16,791,631	61	56	64	64	63	56	57	53
Imperial	3,024	6,103	76,823,230	74	72	57	57	58	55	58	56
Inyo	1,133	1,832	13,681,682	75	57	60	62	62	61	62	62
Kern	5,725	12,615	117,170,333	66	63	64	64	63	63	65	63
Kings	1,324	2,710	21,044,749	63	62	62	62	59	60	61	61
Lake	643	1,275	8,629,265	33	31	40	40	40	38	37	35
Lassen	431	879	6,282,324	55	69	66	66	63	60	61	61
Los Angeles	21,192	57,160	472,476,391	68	67	66	66	67	67	68	67
Madera	1,829	3,663	24,879,499	48	48	47	47	46	44	44	40
Marin	1,068	2,151	20,882,530	61	61	61	63	64	67	65	67
Mariposa	365	724	4,606,318	53	44	44	53	65	65	66	51
Mendocino	1,132	2,249	16,243,134	51	49	37	35	35	32	36	47
Merced	2,349	4,975	39,594,831	57	58	58	58	56	56	57	57
Modoc	1,018	2,036	19,339,238	42	40	56	46	59	59	63	64
Mono	737	1,473	9,613,552	71	68	66	67	64	65	66	64
Monterey	1,907	3,859	30,940,471	63	45	50	50	50	49	52	50
Napa	778	1,568	8,926,445	53	60	59	59	59	59	56	60
Nevada	806	1,625	10,348,493	72	71	72	71	70	68	67	69

Table 2.4 Summary of PCI Data by County (includes Cities) for 2008–2022

County (Cities Included)	Centerline Miles	Lane Miles	Area (sy)	Average Weighted PCI*							
				2008	2010	2012	2014	2016	2018	2020	2022
Orange	6,599	16,412	164,099,105	78	76	77	77	79	79	79	79
Placer	2,190	4,625	35,366,855	79	77	71	69	68	64	67	68
Plumas	706	1,412	9,070,195	71	66	66	64	72	73	71	69
Riverside	7,933	18,117	158,987,995	71	72	70	70	71	68	68	69
Sacramento	5,077	10,983	97,772,868	68	66	64	62	62	60	58	58
San Benito	492	758	5,140,912	68	66	66	48	46	37	37	38
San Bernardino	8,898	22,014	167,917,566	72	70	70	71	71	70	74	71
San Diego	7,761	18,852	175,610,151	74	69	67	66	65	69	70	71
San Francisco	943	2,142	21,249,793	62	63	65	66	68	74	74	74
San Joaquin	3,208	6,697	59,355,738	70	70	67	73	70	70	67	68
San Luis Obispo	2,123	3,549	37,101,898	64	64	63	64	63	65	59	58
San Mateo	1,886	3,957	33,244,304	69	70	71	70	71	72	68	70
Santa Barbara	1,689	3,519	30,687,410	72	70	67	66	63	61	61	60
Santa Clara	4,473	9,969	98,505,116	70	69	73	68	67	70	69	69
Santa Cruz	863	1,768	14,127,507	52	48	48	57	50	55	55	54
Shasta	1,682	3,100	24,430,506	64	67	57	60	57	58	49	52
Sierra	399	800	5,566,517	73	71	71	45	44	44	45	45
Siskiyou	1,488	2,985	20,233,539	57	57	57	57	58	56	62	63
Solano	1,781	3,840	33,604,534	66	66	67	65	68	67	65	67
Sonoma	2,400	5,010	49,579,092	53	50	50	52	55	54	58	58
Stanislaus	2,899	5,953	51,942,357	60	51	52	55	55	63	61	64
Sutter	1,032	2,079	16,016,764	73	56	56	65	70	69	59	57
Tehama	1,202	2,406	8,484,455	69	65	65	62	53	54	50	51
Trinity	592	1,112	7,477,638	52	50	50	60	62	59	54	48
Tulare	4,091	8,253	66,849,672	66	68	68	68	60	62	62	59
Tuolumne	661	1,276	8,504,648	62	62	62	47	41	41	28	24
Ventura	2,545	5,590	56,349,603	64	66	69	70	71	69	68	68
Yolo	1,341	2,687	23,513,907	69	67	63	60	55	58	57	56
Yuba	1,066	1,504	19,557,588	74	56	56	60	60	66	67	67
TOTALS	**144,530**	**321,170**	**2,764,361,757**	**68**	**66**	**66**	**66**	**65**	**65**	**66**	**65**

* PCI is weighted by area.

Although it is just a few points shy of the "good/excellent" category, an average pavement condition of 65 has significant implications for the future and is cause for caution. Figure 2.6 illustrates the rapid pavement deterioration that can occur at this point in the pavement life cycle. If repairs are delayed by just a few years, the costs of the proper treatment may increase as much as tenfold.

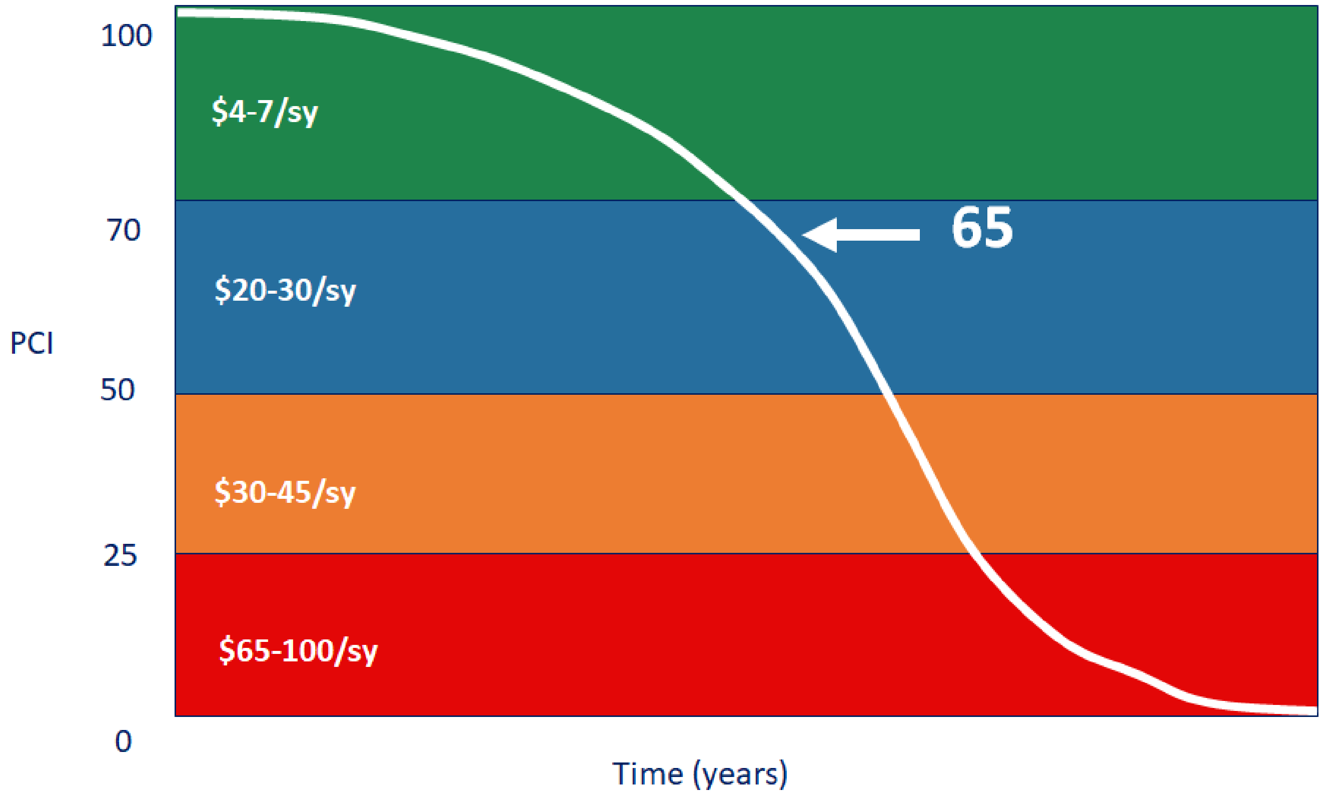


Figure 2.6 Generalized Pavement Life Cycle Curve

There are many financial advantages of maintaining pavements in good condition. These include saving taxpayers' dollars with less disruption to the traveling public, and a variety of environmental benefits.

Many factors contribute to rapid pavement deterioration, including:

- More traffic and heavier vehicles;
- More transit and more frequent bus trips, including heavier buses;
- Heavier and more garbage collection trucks (recycling and green waste trucks are new weekly additions to the traditional weekly garbage truck);
- More street sweeping for National Pollutant Discharge Elimination System (NPDES) requirements; and
- More freight and delivery trucks when the economy is thriving.

Therefore, a PCI of 65 should be interpreted with caution – it indicates that local streets and roads are positioned for rapid decline. Figure 2.7 shows a local street with an average condition of 65.

Figure 2.7 Local Street with PCI of 65

Figure 2.8 shows the distribution of pavement condition by county for 2008 and 2022. Most of the counties in the state have pavement conditions that are either "At Risk" (blue) or in "Poor" (red) condition. The number of counties in these categories has increased since 2008. Of the 58 counties, all but 4 (Orange, San Bernardino, San Diego, and San Francisco) are currently in either "At Risk" or "Poor" condition.

Only 55% of California's local streets and roads are in good condition.

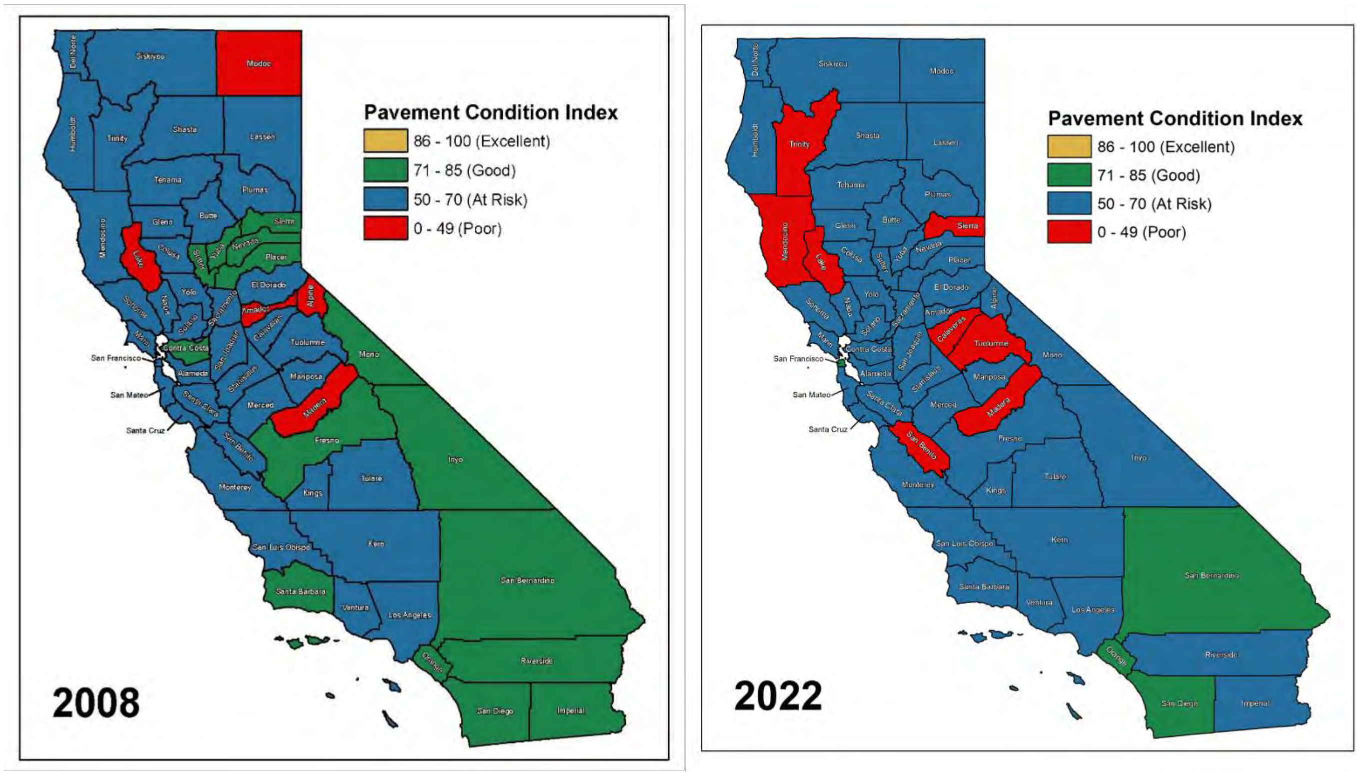


Figure 2.8 Average PCI by County for 2008 and 2022

2.3 Sustainable Pavement Practices

Sustainability is a growing consideration for many local agencies, particularly if it saves costs. Cities and counties were asked for information on any sustainable pavement practices employed and any associated cost savings. The types of sustainable practices that were mentioned included:

- Cold central plant recycling
- Cold-in-place recycling (CIR)
- Full depth reclamation (FDR)
- Hot-in-place recycling (HIR)
- Pavement preservation strategies
- Permeable/pervious pavements
- Reclaimed asphalt pavement (RAP)
- Rubberized hot mix asphalt (RHMA)
- Warm mix asphalt (WMA)

Some sustainable pavement strategies may save up to 40 percent over conventional methods.

Sustainable practices have generally increased in use: 339 agencies provided information about the types of sustainable practices they used. Table 2.5 summarizes sustainable pavement strategies, the number of agencies that listed each strategy, the number of agencies that reported either savings or additional cost for a specific strategy, and the average percent savings or cost over conventional pavement practices.

Table 2.5 Summary of Sustainable Pavement Strategies

Sustainable Pavement Strategy	No. of Agencies			Average % Savings	Average % Additional costs
	No. of Responses	Savings	Add'l Costs		
Reclaimed AC Pavement (RAP)	212	45	11	11%	12%
Cold in Place Recycling (CIR)	118	33	6	28%	57%
Hot in Place Recycling (HIPR)	15	-	-	-	-
Cold Central Plant Recycling	32	5	3	28%	20%
Warm mix AC	91	2	9	10%	21%
Permeable/Pervious	35	-	8	-	40%
Full Depth Reclamation (FDR)	216	38	18	26%	43%
Subgrade Stabilization	107	6	16	33%	16%
Rubberized AC (RAC)	255	7	73	29%	23%
Pavement Preservation	429	78	24	41%	31%

Recycling and pavement preservation strategies were reported to have the highest cost savings compared to conventional treatments. Other sustainable treatments incurred additional costs, particularly rubber hot mix asphalt (RHMA), which cost 23 percent more than did conventional treatments. The responses for warm mix asphalt and permeable/pervious pavements were insufficient to draw any conclusions, however, we note that the additional cost of porous/pervious pavements may be offset by savings in stormwater costs.

The most reasons most commonly given for using sustainable practices were:

- Cost savings or cost-effectiveness;
- Environmental benefits (e.g., produces fewer greenhouse gas emissions, reduces energy consumption, uses fewer natural resources, reduces waste sent to landfills, reuses existing pavement materials, recycles tires, etc.)[7,8];
- Utilizing recycled materials;
- Creating less waste material;
- Better ride quality/finished surface, including quieter pavements;
- Reduced excavation depths;
- Extended pavement life;

Every lane-mile that is recycled in-place is equivalent to taking 11 cars off the road for a year.

[7] Bilal, J., and M. Chappat. *Sustainable Development: The Environmental Road of the Future*. COLAS Group: 2003.

[8] Environment Protection Agency. "Transportation, Air Pollution, and Climate Change. www.epa.gov/otaq/climate/420f05004.htm.

- City Council policies that support or require sustainable pavements;
- Bigger projects and lower unit prices from partnering with other agencies; and
- Lower traffic impact (less construction traffic).

The most common reasons cited for not using sustainable practices were:

- Higher construction costs (mostly related to RHMA) or higher up-front costs;
- Not enough technical information available – design, specifications, etc.;
- Lack of performance data;
- Poor performance from previous projects;
- Lack of experienced contractors to bid on projects; and
- Streets that are not good candidates for these treatments; e.g., limited right of way.

The fact that 60 percent of the cities and counties in California reported using some form of sustainable pavement practices was very encouraging, particularly when one considers the potential cost savings involved. The overwhelming majority also indicated that they would continue to use some form of sustainable strategy in the future.

2.4 Complete Streets

A complete streets policy ensures that transportation planners and engineers consistently design and operate the entire roadway with all users in mind – including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities. California state law (adopted in 2008 and effective 2011)[9] requires that cities and counties *"… plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways, defined to include motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation, in a manner that is suitable to the rural, suburban, or urban context of the general plan."*

This study focused on bicycle and pedestrian facilities. Figure 2.9 shows an example of a complete street that accommodates alternative modes of transportation (i.e., pedestrians, bicyclists, buses), and drivers, as well as curb ramps that comply with the Americans with Disabilities Act (ADA).

The 2022 survey garnered 341 responses. Of these, 104 agencies indicated that they have a complete streets policy in place - double the number reported in 2012. Of the 237 agencies that did not have a complete streets policy, 68 indicated that they had elements in place. Table 2.6 shows the elements utilized by agencies.

[9] http://leginfo.ca.gov/pub/07-08/bill/asm/ab_1351-1400/ab_1358_bill_20080930_chaptered.html

Figure 2.9 Elements of a Complete Street

Table 2.6 Elements of Complete Streets Policy

Element	No. of Agencies
Bicycle facilities	257
Pedestrian facilities	256
Curb ramps	245
Signs	234
Green infrastructures	109
Traffic calming e.g., reducing lane widths	221
Medians	203
Lighting	195
Transit elements	156
Roundabouts	134

Figure 2.10 illustrates the number of agencies (271) that have recently completed a complete streets project. These projects have been constructed across small, medium, and large agencies.

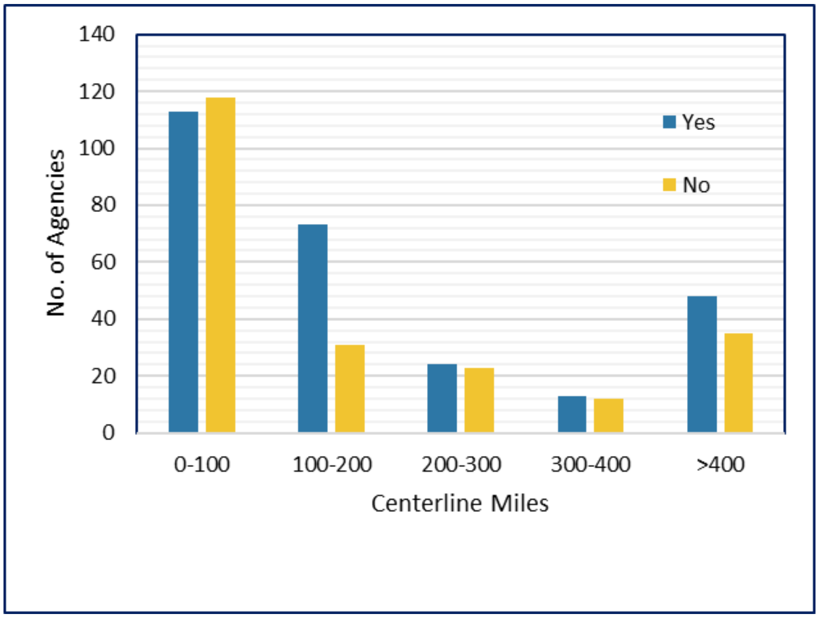


Figure 2.10 Number of Agencies with and without Complete Streets Projects

On average, the respondents also indicated that 33 percent of their street networks were eligible for consideration as a complete street, and that average additional costs were $82.30 per square yard (sy). This is significantly lower than the average additional costs reported in the 2020 study ($117/sy). However, only 145 agencies provided cost data in 2022 and costs varied widely, from less than $1/sy to over $1,000/sy (projects with costs less than $10/sy or greater than $1000/sy were considered outliers and were not included in the analysis). This range was largely due to the wide variety of elements that can be considered part of a complete streets policy. For example, restriping a road to add bicycle lanes is relatively inexpensive, but purchasing right-of-way for widening projects to include pedestrians/bicyclists/transit is significantly more costly. Figure 2.11 illustrates the range and types of complete streets projects possible, and their incremental costs, which range from $12/sy to $86/sy. It continues to be difficult to assume one average unit cost for a complete streets project.

There are many challenges to implementing a complete streets policy. The most commonly cited ones (in order of frequency of responses) were:

1) Insufficient funding
2) Insufficient right-of-way
3) Lack of public support
4) Lack of staffing to implement policy
5) Existing structures and utilities
6) Trees or environmental features

Figure 2.11 Examples of Complete Street Projects

Finally, a complete streets policy may have very different applications for a rural road than for an urban street. Many rural roads are long and/or located in remote areas and may carry as few as 50 vehicles a day with few or no pedestrians or bicyclists. Obviously, these roads will not be candidates for the type of complete streets approach that is appropriate for denser urban areas. Typical examples of complete streets are urban roads that support multiple modes of transportation.

2.5 Additional Regulatory Requirements

All jurisdictions must comply with a variety of pavement and safety regulations or policies. Cities and counties must also comply with many regulatory requirements, including:

1) The Americans with Disabilities Act of 1990 (ADA);
2) The National Pollutant Discharge Elimination System (NPDES);
3) Traffic sign retroreflectivity requirements;
4) Complete streets; and
5) Others (e.g., the Endangered Species Act, air emissions, sanitary/wastewater management plans).

As in previous surveys, participants in the 2022 survey listed the first 3 categories most often, with 51 respondents citing the ADA, 48 citing the NPDES, and 35 citing traffic sign retroreflectivity. This reflects an overall decrease in the number of responses. However, when combined with data from previous years, the survey data were more robust; there were a total of 405 responses for ADA, 361 for NPDES and 328 for retroreflectivity.

Respondents identified $10.6 billion in needs to comply with regulatory requirements, and only $7.4 billion in available funding, resulting in a shortfall of almost $3.2 billion (see Table 2.7).

Table 2.7 Additional Regulatory Requirements (10-Year Needs and Funding)

Regulatory Requirements	Needs ($M)	Funding ($M)	Shortfall ($M)
ADA	$2,704	$1,245	$(1,459)
NPDES	$6,968	$5,915	$(1,053)
Traffic Signs	$295	$156	$(139)
Complete Streets	$501	$16	$(485)
Other	$92	$40	$(52)
Total	**$10,560**	**$7,372**	**$(3,188)**

2.6 Unpaved Roads

Unpaved roads (gravel or dirt surface) are a small component of the local transportation network statewide, and only comprise 5.3 percent of the total road area. Nonetheless, they are important in many rural counties. For example, in Mono County, unpaved roads comprise more than 60 percent of the road system.

Unpaved roads need $1.61 billion over the next 10 years.

The needs assessment for unpaved roads is not complicated – 112 agencies reported a total unpaved road network of 9,491 centerline miles. The maintenance cost is approximately $17,000 per centerline mile per year, almost double the original cost from 2008. Since pavement management software like

StreetSaver® only analyzes paved roads, this average cost was applied to only the unpaved roads. This resulted in a total 10-year need of $1.61 billion.

Figure 2.12 Unpaved Roads

2.7 Pavement Needs

The methods used to identify pavement needs and unfunded backlog are described in detail in Appendix B of the 2008 report and are therefore not duplicated here. To briefly summarize, the analysis included 4 main elements:

- Existing pavement condition (i.e., PCI);
- Appropriate treatment(s) to be applied (based on decision tree and unit costs);
- Performance models; and
- Funding available during analysis period.

Pavement needs are estimated to be $81 billion over the next 10 years.

The calculation of the pavement needs cost is conceptually quite simple. Once the PCI of a pavement section is known, treatment and unit cost can be applied. This is performed for all sections within the ten year analysis period. A section may receive multiple treatments within this timeframe; e.g., Walnut Avenue may be overlaid in Year 1, and then sealed in Year 5 and again in Year 10.

As before, the deferred maintenance or "unfunded backlog" is defined as work that is needed but is not funded. It is theoretically possible to fully fund ***all*** pavement needs in the first year, thereby reducing the backlog to zero, but this is unachievable on a practical basis given resource limitations. Therefore, the funding goal is to achieve the BMP goal within 10 years. Assuming a constant annual funding level, the backlog will decrease to zero by the end of the analysis period.

The results are summarized in Table 2.8 and indicate that $81 billion (constant 2022 dollars) is required to achieve the BMP goal in 10 years. This includes the impact of sustainable technologies, which save 26 to 28 percent over conventional treatments on average. In 2020, the total 10-year need was $76 billion. The $4.7 billion increase in need is the result of increases in paving costs described in Section 2.1.3. Detailed results by county are shown in Appendix C.

Table 2.8 Cumulative Pavement Needs

Cumulative Needs (2022 dollars)		
Year No.	Year	To Reach BMP Goal in 10 Years ($ Billion)
1	2023	$8.1
2	2024	$16.1
3	2025	$24.2
4	2026	$32.3
5	2027	$40.3
6	2028	$48.4
7	2029	$56.5
8	2030	$64.5
9	2031	$72.6
10	2032	$81.0

Finally, Figure 2.13 illustrates a map of California showing the 10-year pavement needs by county. From this, we can see that the preponderance of needs is in Southern California, the San Francisco Bay Area, and portions of the Central Valley.

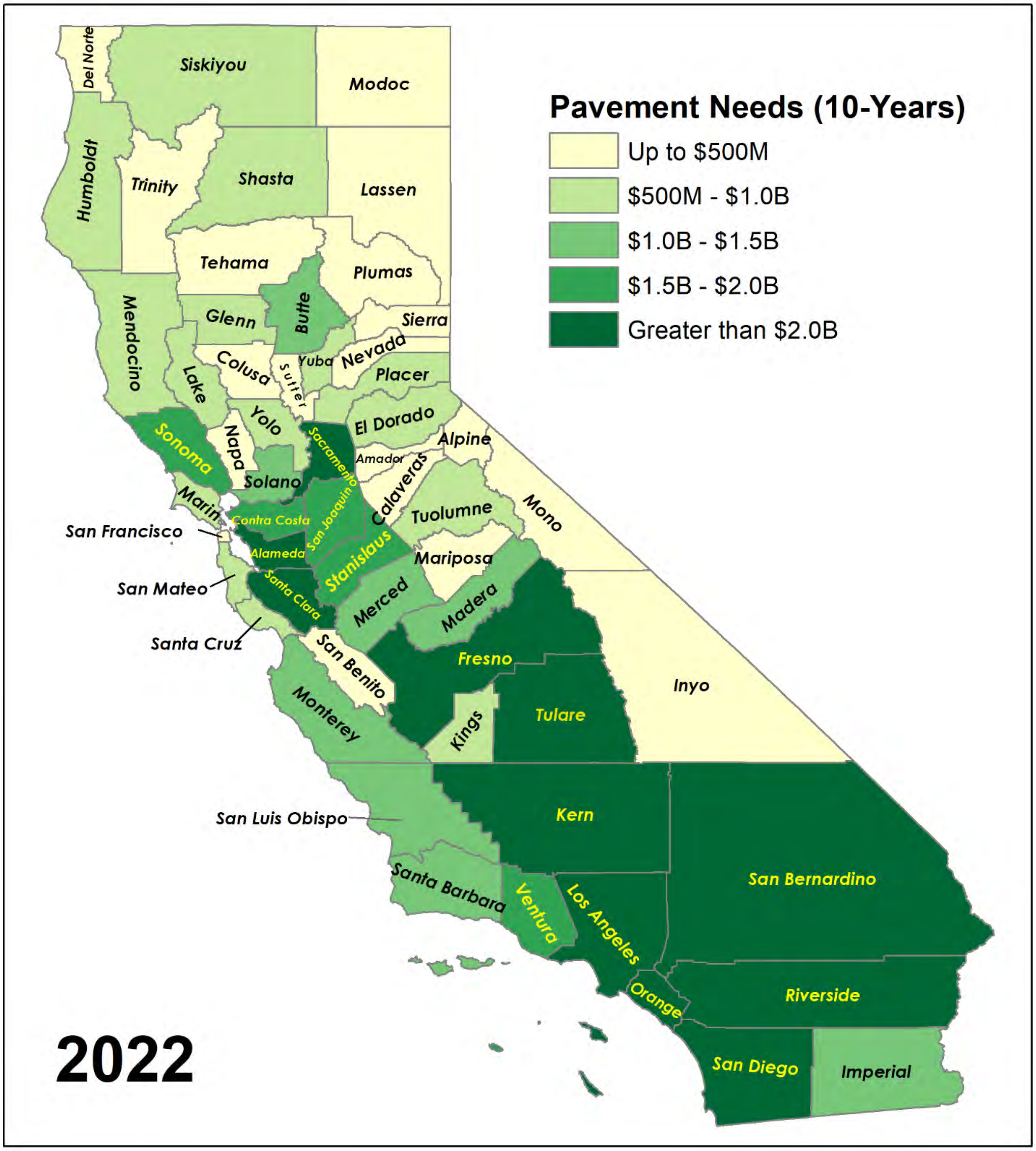
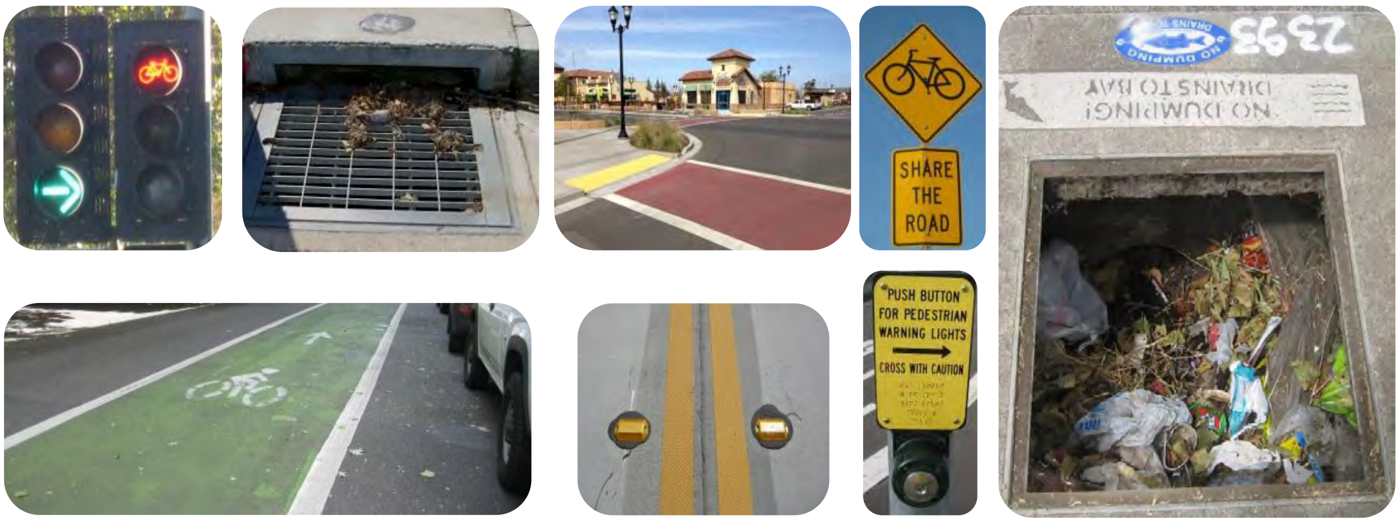


Figure 2.13 10-Year Pavement Needs by County

3 Essential Components Needs Assessment

The transportation system includes essential components such as safety, traffic, and regulatory elements in addition to pavements and bridges. The safety of the traveling public is the highest priority for local agencies, and the transportation system is intended to serve all modes of travel (pedestrians, bicyclists, buses, people with disabilities, etc.) and not just vehicles, so components such as traffic signals, streetlights, and signs are critical and must be assessed.



Storm drains, which are mostly invisible because they tend to be underground, are also needed to remove excess water from the surface to protect pavement structural integrity and safety. In removing water, trash and other pollutants inevitably drain into creeks, rivers, lakes, bays, and the ocean, bringing environmental considerations into play. Cities and counties have the responsibility to remove these pollutants as part of transportation system maintenance.

Underground pipes are often overlooked when establishing priorities, yet their failure can have disastrous consequences. This was made evident by the failure of a 90-year-old water main near the University of California, Los Angeles (UCLA) in July 2014, which caused considerable damage to the roadway system and nearby facilities on the UCLA campus (see Figure 3.1).

Figure 3.1 Water Main Break on Sunset Blvd, Los Angeles – 2014 (Courtesy LA Times)

3.1 Data Collection

As with past surveys, agencies were asked to provide specific information on the inventory and replacement costs for the following 12 asset categories:

Asset Category	Essential Components
1	Storm drains and pipelines
2	Curb and gutter
3	Sidewalk (public)
4	Curb ramps
5	Traffic signals
6	Streetlights
7	Sound/retaining walls
8	Traffic signs
9	Other storm drain elements (e.g., utility access holes, inlets, culverts, pump stations)
10	NPDES
11	Other ADA compliance needs
12	Other physical assets or expenditures

Because only 122 survey responses were received in 2022, data from previous surveys were included in the analysis, resulting in data from 412 agencies. Table 3.1 illustrates the reliability of the data collected from the 2022 survey as determined by the city or county. For example, in the case of **Streetlights**, the survey responses indicate that:

- 33.8 percent of agencies had <u>accurate and informed</u> replacement costs;
- 4.5 percent of agencies provided <u>estimated</u> replacement costs;
- 1.9 percent did not mention the accuracy of the costs provided; and
- 59.7 percent did not respond.

Table 3.1 Percentage of Agencies Responding with Data on Essential Components

Category	Accurate & Informed Estimate	Guess	Did not Mention the Accuracy of the Provided Costs	No Response
Curb and gutter	32.5%	6.5%	2.6%	58.4%
Curb ramps	28.6%	9.1%	1.9%	60.4%
Sound Walls/Retaining walls	6.5%	6.5%	3.9%	83.1%
Storm Drains pipelines	24.0%	5.2%	1.9%	68.8%
Street Lights	33.8%	4.5%	1.9%	59.7%
Traffic signals	37.0%	5.2%	2.6%	55.2%
Traffic signs	28.6%	7.1%	1.3%	63.0%
Pedestrian facilities (sidewalks)	33.1%	11.0%	3.9%	51.9%
Pedestrian paths	2.6%	2.6%	0.0%	94.8%
Other pedestrian facilities, e.g. over crossings	5.2%	0.6%	1.3%	92.9%
Multi use paths	3.9%	3.9%	0.6%	91.6%
Crossing Improvements e.g. high visibility crossings, rapid flashing beacons, roundabouts, scrambles, bulbouts, pedestrian refuge islands, etc.	21.4%	5.2%	1.3%	72.1%
Transit amenities e.g. benches, shelters, real time arrival signage, wayfinding signage	5.8%	5.2%	1.9%	87.0%
Class I bicycle path	37.7%	8.4%	5.8%	48.1%
Class II bicycle lane	35.7%	10.4%	1.9%	51.9%
Class III bicycle routes/sharrow	29.2%	7.1%	2.6%	61.0%
Class IV protected bike lanes	17.5%	1.3%	0.0%	81.2%
Other bicycle facilities, e.g. bike shelters/lockers, etc.	9.1%	2.6%	0.6%	87.7%
Other physical assets or expenditures that constitute >5% of total non pavement asset costs e.g. heavy equipment, corporation yards etc. Note: Do NOT include bridges (handled separately)	4.5%	3.2%	0.6%	91.6%
Other elements e.g. manholes, inlets, culverts, pump stations etc	14.9%	5.8%	1.3%	77.9%
Tunnels	1.3%	0.6%	1.3%	96.8%

Overall, a little over 30 percent of the agencies indicated that they either had accurate data or were able to provide estimates of the replacement costs for these asset categories. Table 3.1 shows that 3 major essential components (storm drains, curb and gutters, and sidewalks) have "good" data (i.e., approximately 76 percent of the agencies have some data on their replacement costs), which is a key factor in estimating needs.

The 2022 survey included survey questions that were requested by the Los Angeles County Metropolitan Transportation Authority in 2020 (highlighted in blue in Table 3.1). However, very few agencies responded to these questions.

Data on essential components are especially challenging to obtain, mostly because very few agencies have the resources to implement and maintain an asset inventory or management system. For example, unincorporated Orange County, with a road network of 320 miles, has over 18,000 signs, 6,200 drainage inlets, 2,500 miles of storm drains, 2,400 traffic signals, and 10,000 miles of paint striping, and almost 10,000 miles of curbs. The cost of inventorying these components can be remarkably high and is not financially possible for many agencies.

3.2 Needs Methodology

In 2016, a new approach was adopted to analyze the essential needs using a new model based on geography (Geographically Weighted Regression; GWR). Appendix E of the 2016 report provides a detailed discussion of this method and key points are provided in this section. While previous models were reasonably accurate in the aggregate, large variations of needs may exist for individual agencies.

Many geographical factors affect the costs of replacing essential components. For instance, it is much more expensive to install a curb ramp in San Francisco than it is in Ceres, and the number of signs that exist in an urban city environment is significantly higher than in a rural environment. The variation in cost can also be attributed to sampling variation, to differences in traffic patterns, road network attributes, or sociodemographic characteristics, or to intrinsic differences in relationships (for instance, different administrative policies produce different responses).

The 2016 model accounts for this variability and is reproduced here:

$$Ln\ Cost = C_{tm3} \times tm^{1/3} + C_{tm} \times tm + C_{isrural} \times isrural + C_{iscounty} \times iscounty + Intercept$$

where:

Cost = total replacement cost, dollars;

Total miles (tm) = total centerline miles of roads or streets;

isrural = indicator variable and is equal to 1 if agency is rural, 0 otherwise; and

iscounty = indicator variable and is equal to 1 if agency is county, 0 otherwise

The model was used primarily for those agencies that did <u>not</u> provide any replacement cost data. However, some agencies reported extremely low costs that were considered anomalies; in these cases, the model was used in place of the data provided.

Table 3.2 indicates the percentage of needs predicted by the model for each county. For example, in El Dorado County, 67 percent of the agencies provided data; therefore, the model only estimated the costs for the remaining 33 percent of agencies. Overall, the model was used to estimate replacement costs for approximately 24 percent of the agencies.

Table 3.2 Percentage of Agencies with Survey Responses for Essential Components

County	% Agencies With Survey Responses	County	% Agencies With Survey Responses
Alameda	93%	Orange	77%
Alpine	100%	Placer	86%
Amador	67%	Plumas	50%
Butte	67%	Riverside	86%
Calaveras	50%	Sacramento	88%
Colusa	0%	San Benito	67%
Contra Costa	100%	San Bernardino	76%
Del Norte	50%	San Diego	84%
El Dorado	67%	San Francisco	100%
Fresno	69%	San Joaquin	75%
Glenn	100%	San Luis Obispo	50%
Humboldt	63%	San Mateo	95%
Imperial	25%	Santa Barbara	78%
Inyo	100%	Santa Clara	94%
Kern	83%	Santa Cruz	60%
Kings	60%	Shasta	75%
Lake	33%	Sierra	0%
Lassen	50%	Siskiyou	50%
Los Angeles	78%	Solano	100%
Madera	67%	Sonoma	80%
Marin	92%	Stanislaus	50%
Mariposa	100%	Sutter	100%
Mendocino	60%	Tehama	100%
Merced	71%	Trinity	100%
Modoc	100%	Tulare	67%
Mono	50%	Tuolumne	50%
Monterey	46%	Ventura	82%
Napa	100%	Yolo	100%
Nevada	50%	Yuba	67%
		Total	**76%**

3.3 Active Transportation

Senate Bill 99 and Assembly Bill 101 established the Active Transportation Program (ATP) to support increased use of active modes of transportation such as biking and walking[10]. For 2022, sufficient data were available to perform a more focused analysis of Active Transportation facilities. The survey collected data on the following elements:

- **Bicycle facilities**: Four classes of bicycle lanes (see Figure 3.2) as well as other bicycle facilities.
    - Class I bike lanes (Bike Paths): These are also known as "separated bikeways" or "off-street bike paths." They are physically separated from motor vehicle traffic and are typically located away from the roadway. They are designed for exclusive use by bicyclists and are separate from pedestrian facilities.
    - Class II bike lanes (Bike Lanes): These are also known as "on-street bike lanes." They are located on the roadway and are typically marked with painted lines and signage. They are designed to provide a dedicated space for bicyclists and are typically located between the curb and parked cars.
    - Class III bike lane (Bike Routes): These are also known as "shared lane markings" or "sharrows." They are typically used on roadways that are not wide enough for a dedicated bike lane. They may be marked with pavement markings and signage to indicate that the roadway is shared by bicyclists and motor vehicles.
    - Class IV bike lane (Separated Bikeways): These are also known as "protected bike lanes" or "cycle tracks." They are physically separated from motor vehicle traffic, typically with a barrier such as a concrete curb, bollard, or Jersey barrier, and/or landscaping. They are designed for exclusive use by bicyclists and are separate from pedestrian facilities.
    - Other bicycle facilities: These include bike shelters, lockers, etc.
- **Pedestrian facilities**: There are three main categories of pedestrian facilities.
    - Pedestrian facilities (sidewalks): These include all paved sidewalks adjacent to streets and roads in cities and counties.
    - Pedestrian paths: These include paved or unpaved paths that are prepared only for pedestrians, e.g., park paths.
    - Other pedestrian facilities: These include over-crossings, etc.
- **Multi-use paths**: Paths that both pedestrians and cyclists can use.

[10] Caltrans. "Active Transportation Program (ATP)." https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program.

Figure 3.2 Bicycle Lane Classes in California. Top-left: Class 1; top-right: Class II; bottom left: Class III; bottom-right: Class IV; (California Air Resources Board 2019)

In 2022, 139 agencies (26% of agencies) responded to the active transportation section of the survey. Data from previous surveys were included to improve the reliability of the analysis, and this increased the response rate to 83% (447 agencies).

Table 3.3 summarizes the data from these 447 agencies. Based on the available data, there are over 149,000 miles of bicycle and pedestrian paths, and cities own more than 70 percent of these facilities. Notably, only 131 agencies provided Class III mileages, but there are believed to be significantly more miles of Class III bike lanes available statewide.

Table 3.3 Summary of Active Transportation Facilities

Agency	Bike Lane Facilities: Class I, II, III, IV (miles)	Other Bicycle Facilities (#)	Sidewalks (miles)	Pedestrian Paths (miles)	Other Pedestrian Facilities (#)	Multi-Use Paths (miles)
Cities	10,934	21,695	92,953	361	576	589
Counties	1,740	22	40,136	2	25	10
Total	**12,674**	**21,717**	**133,089**	**363**	**601**	**599**

3.3.1 Active Transportation Needs

Of the 447 agencies, 54 percent (242) provided the replacement costs for their bicycle and/or pedestrian facilities (excluding the sidewalk). These were then averaged by agency size and type and used to estimate replacement costs for comparable agencies that did not provide any data (see Table 3.4).

Of the 242 agencies that provided replacement costs, 59 percent of costs were related to bicycle facilities and 41% to pedestrian facilities (excluding the sidewalk).

Table 3.4 Summary of Active Transportation Facilities

Agency Type		Street Network Size (miles)	Average Replacement Cost per/centerline mile
City	Urban	0-100	$31,866
		101-400	$44,845
		>400	$53,773
	Rural	0-100	$204,161
		101-400	$5,167
		>400	No Answer
County	Urban	0-100	N/A
		101-400	$64,720
		>400	$20,847
	Rural	0-100	N/A
		101-400	$26,000
		>400	$64,720

Table 3.5 shows the estimated 10-Year Needs for the bicycle ($1.88 billion) and pedestrian ($9.3 billion) facilities for a total of $11.2 billion. It should be noted that multi-use paths were included as pedestrian facilities.

Table 3.5 10-Year Needs for Active Transportation Facilities

Agency	Bicycle Needs ($ Million)	Pedestrian Needs ($ Million)	Totals ($ Million)
Cities	$1,715	$8,339	$10,054
Counties	$166	$993	$1,159
Total	**1,881**	**9,332**	**11,213**

3.3.2 Impact of Bicycle Facilities on Greenhouse Gas Emissions

Motor vehicles are a key contributor to greenhouse gas (GHG) emissions. The United States Environmental Protection Agency (EPA) reported that a passenger vehicle produces approximately 4.64 metric tons of Carbon Dioxide Equivalent (CO_2e) annually[11]. Bicycle lanes can decrease GHG emissions

[11] Environmental Protection Agency. "Greenhouse Gases Equivalencies Calculation – Calculations and References." https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references.

by encouraging the replacement of auto trips with cycling and reducing traffic volumes by changing the geometric design of the streets.

There are multiple research studies that have investigated the impact of bicycle lanes on GHG reduction. A study from the University of California, Davis, for example, quantified GHG reductions associated with new bike lane facilities, and found that adding new bike lanes resulted in reductions of 24.4 annual metric tons CO_2e (California Air Resources Board 2019[12]). Table 3.6 shows that GHG reduction from new Class II and IV bicycle lanes can range from 4 to 59 metric tons CO_2e per year depending on parameters such as length of the facility, average daily traffic (ADT), etc. (Caltrans 2020[13]).

Table 3.6 Potential VMT and GHG Reductions from New Bicycle Lanes (Caltrans 2020)

Facility Category	Auto VMT Reduction (miles per year)	GHG Reduction (metric tons CO_2e per year)
Facility 1: less than 1-mile bike lane parallel to a roadway with less than 12,000 ADT located in a town with less than 250,000 people. The new facility would be within 0.5 mile of 3 activity centers.	8,100	4
Facility 2: 1- to 2-mile bike lane parallel to a roadway with 12,000 to 24,000 ADT located in a university town with less than 250,000 people. The new facility would be within 0.5 mile of 3 to 7 activity centers.	64,200	30
Facility 3: longer than 2-mile bike lane parallel to a roadway with 24,000 to 30,000 ADT located in a town with more than 250,000 people. The new facility would be within 0.25 mile of more than 7 activity centers.	127,980	59

In the 2022 survey, 118 agencies (22%) provided responses about their bicycle facilities. Data from previous surveys were also included, which increased the number of agencies to a more robust 323 (60%). A total of 12,674 miles of bicycle facilities were reported by these agencies (Figure 3.3). Class II bike lanes comprise approximately 59 percent of the total mileage reported. As expected, most bicycle facilities (86%) are owned by cities (but as noted earlier, Class III mileages, by their definition, would be expected to have higher mileages). This report only shows the evaluation of the available data provided.

[12] University of California, Davis, and California Air Resources Board. 2019. *Quantifying Reductions in Vehicle Miles Traveled from New Bike Paths, Lanes, and Cycle Tracks.*

[13] ICF International Inc. and Caltrans. 2020. *Caltrans Greenhouse Gas Emissions and Mitigation Report.*

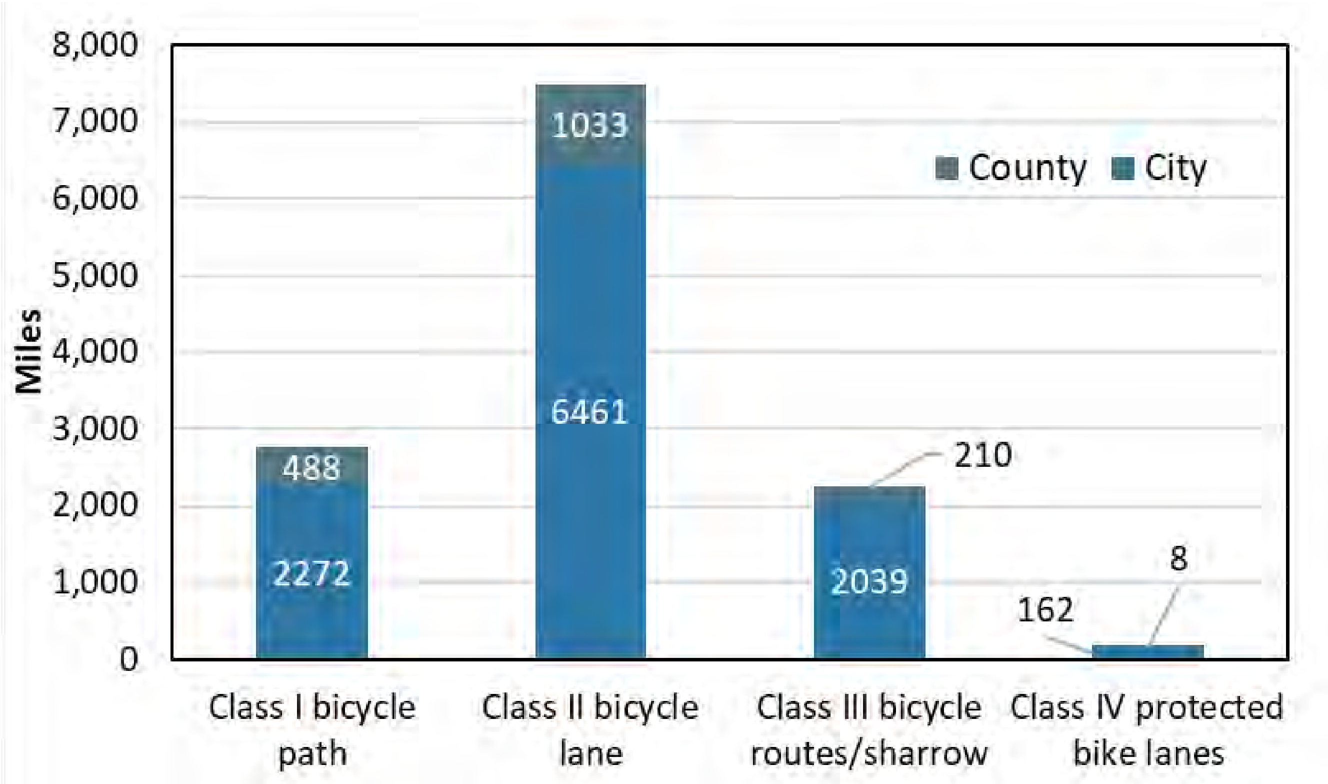


Figure 3.3 Inventory of Different Classes of Bike Lanes (Miles)

Both of the aforementioned studies published by the California Air Resources Board and Caltrans found that Class II and IV bicycle paths had the greatest impact on reducing GHG. Class I bicycle paths do not affect vehicle traffic volumes since they are completely separated. Class III bicycle lanes were excluded from the analysis because they are shared with pedestrians and motorists and have less impact on traffic volume compared to Class II and Class IV lanes.

Three scenarios were used to estimate the ranges of vehicle miles traveled (VMT) and GHG reduction associated with bike lane facilities reported by 323 agencies. Scenarios 1 (minimum reduction), 2, and 3 assume that all bike lanes are defined as in Facilities 1, 2, and 3, respectively, in Table 3.6.

Table 3.7 summarizes the estimated total GHG and VMT reduction from the 323 agencies under each scenario. The average annual reduction in VMT and GHG is approximately 259.8 million miles per year and 121.8 thousand metric tons CO_2e, respectively.

Assuming that the agencies that did not respond to the survey (40%) have similar quantities of bicycle facilities, the average VMT and GHG reduction due to bicycle facilities in California could be as high as 433.8 million miles per year and 203,000 metric tons CO_2e per year, respectively.

Table 3.7 VMT and GHG Reduction Scenarios for Bicycle Facilities

Scenarios for Bike Lane Facility	Assumed Mileage Unit For Each Facility per Year	GHG Reduction Per Facility Per Year (Metric Tons CO_2E)	VMT Reduction per Facility per Year	Total Mileage of Class II and Class IV (from Table 3.6)	Total GHG Reduction (Metric Tons CO_2e per Year)	Total VMT Reduction (Miles per Year)
Scenario 1 (<1 mile bike lane)	0.5	4	8,100	7,664	61,312	124,156,962
Scenario 2 (1-to-2-mile bike lane)	1.5	30	64,260	7,664	153,280	328,326,188
Scenario 3 (>2 miles bike lane)	3.0	59	127,980	7,664	150,726	326,946,667

3.4 Determination of Essential Components' Needs

As with previous models, the 2016 regression model estimates the total replacement cost for only the first 8 asset categories listed in Section 3.1. To estimate the needs, this cost must be converted to an annual amount based on the estimated service lives of the assets. The costs of the remaining 4 categories (other storm drain elements, NPDES, ADA and other physical assets) can then be added. This procedure was described in detail in Appendix E of the 2008 report and has not been duplicated here.

The 10-year need is estimated to be $39 billion in 2022, an increase from the $35.5 billion reported in 2020. Figure 3.4 illustrates the need for each essential component.

The funding need for essential components is $39 billion.

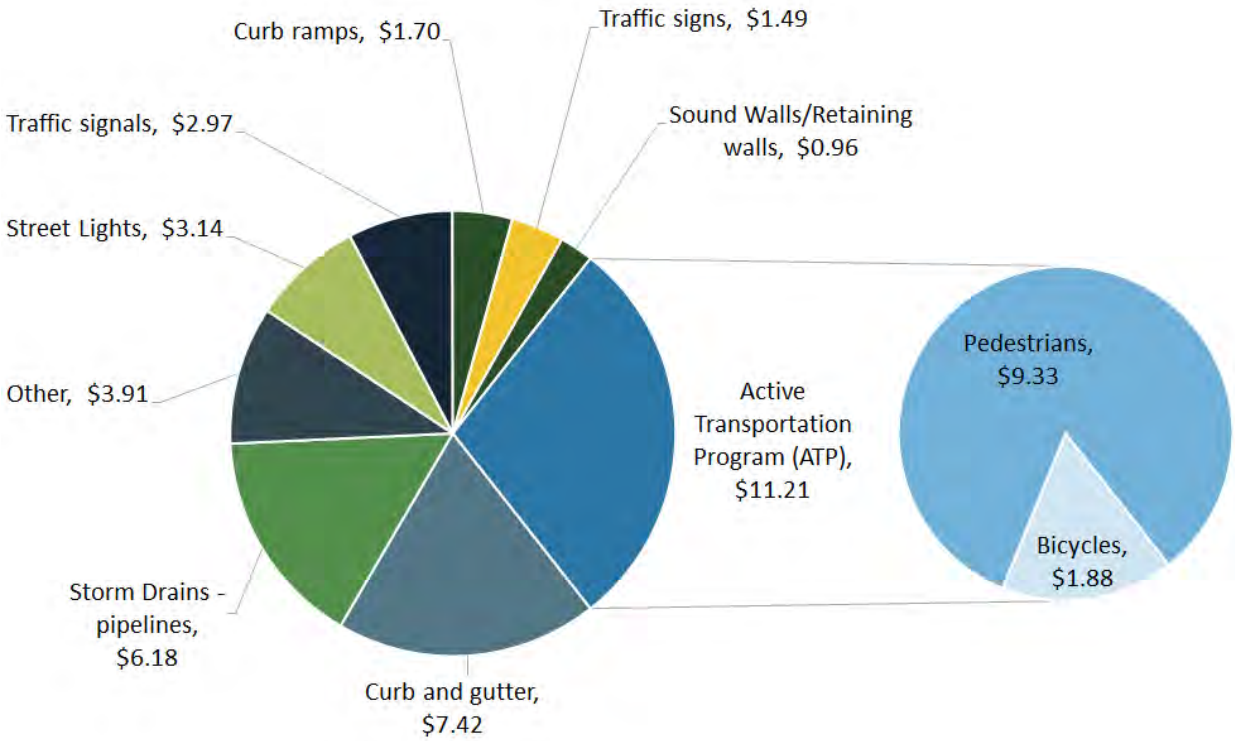


Figure 3.4 10-Year Needs for Essential Components ($ Billion)

Figure 3.5 is a map illustrating the distribution of needs by county. The bulk of the needs are in the urban regions of the state. Appendix D summarizes the essential components' needs for each county.

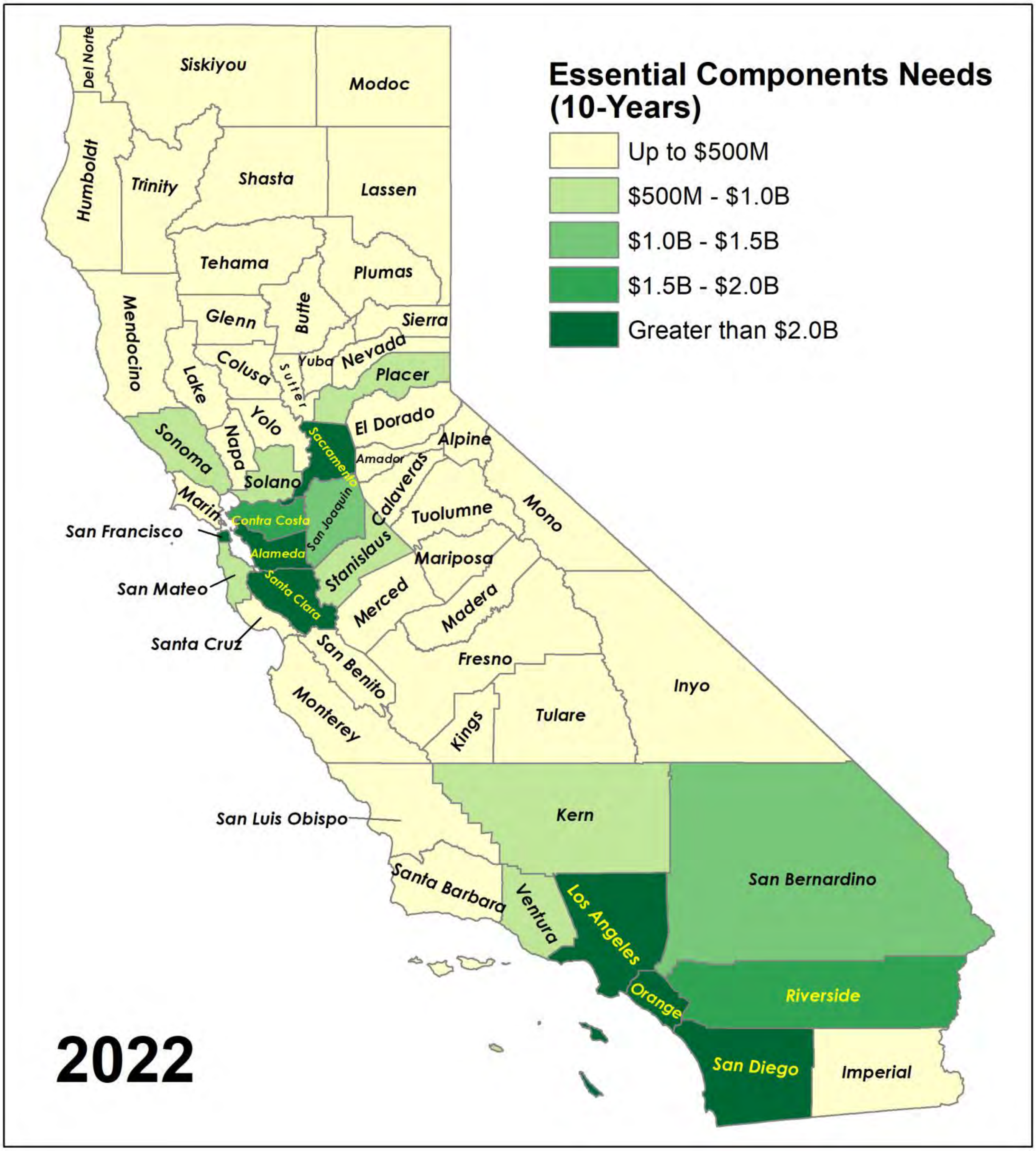


Figure 3.5 Essential Components' Needs by County

4 Funding Analyses

4.1 Pavement Revenue Sources

The online survey asked agencies to provide both their revenue sources and pavement expenditures for 2020/21 and 2021/22, and to estimate an annual average for future years. A total of 338 agencies responded with financial data.

As before, cities and counties identified a myriad of federal, state, and local sources of funds for their pavement expenditures. More than a hundred different local funding sources were identified alone. Funding sources included:

Federal Funding Sources

- Active Transportation Program (ATP), Federal Funds
- American Recovery and Reinvestment Act (ARRA)
- Community Development Block Grant (CDBG)
- Congestion Mitigation And Air Quality Improvement Program (CMAQ)
- Federal Emergency Management Agency Funds (FEMA)
- Forest Reserves
- Highway Safety Improvement Program (HSIP)
- Highway Bridge Program (HBP)
- Highway Bridge Replacement And Rehabilitation (HBRR)
- High Risk Rural Roads Program (HR3)
- Nationally Significant Freight & Highway Projects (INFRA)
- One Bay Area Grant (OBAG)
- Regional Surface Transportation Program (RSTP)
- Safe Routes To School (Federal) (SRTS)
- Surface Transportation Program (STP)
- Transportation Enhancement Activities (TEA)

State Funding Sources

- Active Transportation Program (ATP), State Funds
- CalRecycle
- Gas taxes (Highway User Tax Account; HUTA)
- Prop 1B
- Safe Routes To School, State Funds (SR2S)

- State Transportation Improvement Program (STIP)
- Traffic Congestion Relief Fund (TCRP)
- Transportation Development Act (TDA)
- Transportation Enhancement Activities (TEA)
- Vehicle Registration Fees

Local Funding Sources

- Development impact fees
- Enterprise Funds (solid waste and water)
- Flood Control Districts
- General funds
- Local sales taxes
- Parking and various permit fees
- Traffic impact fees
- Traffic safety/circulation fees
- Transportation mitigation fees
- Utilities; e.g., stormwater, water, wastewater enterprise funds
- Various assessment districts – lighting, maintenance, flood control, special assessments, community facility districts
- Capital Improvement Program (CIP) Reserves/Capital Funds
- Indian gaming funds
- Indian reservation roads
- Investment earnings
- Parcel/property taxes
- Redevelopment
- Refuse/recycling
- Transient Occupancy Taxes (TOT)
- Trench cut fees
- Underground impact fees
- Vehicle registration fees
- Vehicle code fines

This is not an exhaustive list and some funding sources have changed with the advent of the Infrastructure Investment and Jobs Act (IIJA), aka Bipartisan Infrastructure Law (BIL), which was signed into law by President Biden on November 15, 2021.[14]

The funding data were first reviewed to ensure that the description matched the funding source (i.e., federal, state, or local). In cases where the source did not match the description, the source was re-categorized as appropriate. Funds were also further categorized as gas tax, sales tax, general fund, or other, based on the description. Funds and expenditures were then summed by agency and year. Agencies that reported funding or expenditures for some years but not others were further reviewed, and the data for reported years was used to estimate the data for unreported years.

Funds and expenditures for each agency were then divided by the number of lane miles of roadway in that agency, and any outliers were removed. Funding and expenditure data per lane mile were then averaged for urban counties, rural counties, urban cities, and rural cities. These averages were used to

[14] https://www.gfoa.org/the-infrastructure-investment-and-jobs-act-iija-was.

estimate the total funds and expenditures for all cities and counties. The total expenditures and funds were then summed within these categories to determine the statewide total values.

Table 4.1 and Figure 4.1 summarize the total pavement funding available as well as the percentages of funding that come from various sources. Overall, funding stabilized at $2 billion a year between 2014/15 and 2016/17. SB 1 had an immediate positive impact in 2017/18 and was expected to contribute approximately $536 million from that year forward.

However, COVID's impact in FY 2020/21 and 2021/22 was disastrous and resulted in funding dropping to only $870 million across both years. This was partly a result of significant drops in vehicle traffic (and thereby gas taxes) due to shelter-in-place policies and reductions in paving programs due to concerns from cities and counties about the amount of funding expected. The bright light is that future funding levels are expected to rebound to almost $2 billion annually and SB 1 is expected to play a more significant role in pavement funding ($500 million a year, or 26 percent of total funding).

Table 4.1 Funding Sources for Pavements

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
Pavement Funding ($M)	$1,453	$1,571	$1,557	$1,530	$1,691	$1,836	$1,938	$1,967	$1,999	$2,378	$2,156	$2,420	$874	$871	$1,963
Federal	10%	23%	18%	17%	10%	12%	9%	9%	8%	11%	7%	10%	5%	5%	7%
State	62%	50%	53%	53%	52%	50%	44%	41%	43%	37%	35%	35%	44%	46%	32%
SB1/RMRA										10%	18%	17%	48%	45%	35%
Local	28%	27%	29%	30%	38%	38%	47%	50%	49%	43%	40%	38%	4%	4%	26%

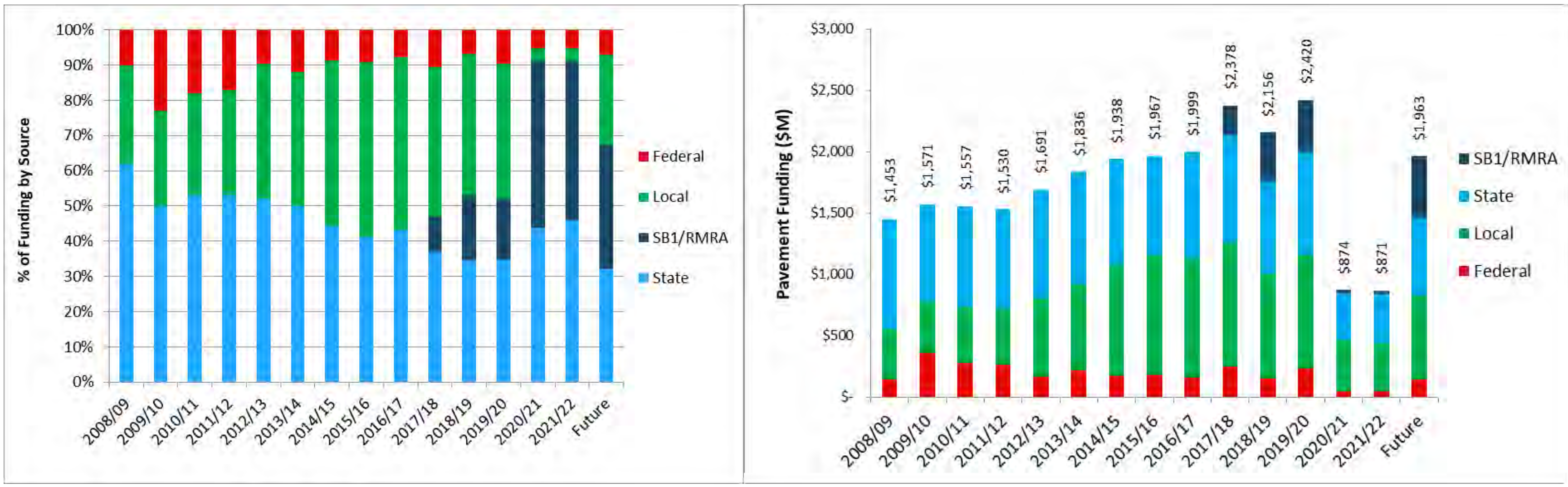


Figure 4.1 Pavement Funding by Source (% by Source On Left)

Prior to SB 1, local agencies relied more on local sources and less on state sources, but with the advent of SB 1, the percentage of state funding sources has returned to 2008/09 levels.

Note that federal funding was a significant component of funding 2009/10 and 2010/11. This reflects the impact of the American Recovery and Reinvestment Act, which was implemented during the recession. Since then, the percentage of federal funds used for pavement has fluctuated around 10 percent and is projected to decrease to 7 percent. Cities and counties, in general, do not rely heavily on federal funds.

The Highway User Tax Account (HUTA), more commonly known as the state gas tax, is still the single largest funding source for cities and counties. This revenue source had been declining prior to 2017/18, partly due to declining gas consumption, and partly due to the additional responsibilities for cities and counties tied to that funding source (e.g., compliance with ADA, which reduces the amount of funding available for pavements) (Table 4.2).

The gas tax is the single largest funding source for cities and counties.

This revenue decline changed with the passage of SB 1. By 2019/20, the gas tax was estimated at over $1.7 billion annually. Unfortunately, COVID's impact led to a huge drop in gas tax revenue, to a little less than $400 million. With COVID's impacts largely mitigated by 2022, funding from the gas tax is projected to increase to $1 billion a year. Table 4.2 shows the amount of funding provided to cities and counties from the gas tax, as well as the percent of state-provided pavement funding and the total pavement funding from gas tax proceeds.

Traditionally, cities and some counties have been able to rely on the General Fund for pavement funding. However, as Table 4.3 illustrates, the number of agencies that receive General Funds has decreased in the last 2 years and is expected to continue to decrease in the future.

Finally, prior to SB 1, pavement funding increasingly relied on local sales tax measures (Table 4.4). However, following the passage of SB 1, local sales taxes are expected to provide 18 to 20 percent of the total pavement funding, except in COVID years.

Table 4.2 Gas Tax Trends for Pavements

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
Gas Tax ($M)	$ 1,115	$ 911	$ 861	$ 907	$1,096	$1,137	$891	$904	$843	$1,200	$1,652	$1,742	$376	$394	$1,080
% of State funding	66%	69%	75%	78%	93%	91%	86%	88%	91%	92%	93%	89%	91%	91%	95%
% of total funding	41%	34%	40%	41%	48%	46%	38%	36%	39%	43%	49%	47%	43%	45%	55%

Table 4.3 General Funds for Pavement Funding

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
General Fund ($M)	$ 201	$ 120	$ 175	$ 168	$166	$232	$322	$406	$316	$303	$281	$283	$165	$153	$95
# of agencies	132	62	77	72	88	94	104	104	128	132	70	72	38	38	50
% of local funding	27%	16%	28%	25%	19%	24%	29%	33%	30%	25%	21%	20%	40%	39%	14%
% of total funding	7%	4%	8%	8%	7%	9%	14%	16%	15%	11%	8%	8%	19%	18%	5%

Table 4.4 Local Sales Tax Trends

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
Sales Tax ($M)	$ 285	$ 258	$ 256	$ 279	$374	$455	$364	$475	$500	$663	$420	$550	$173	$153	$358
% of local funding	38%	35%	41%	42%	43%	48%	32%	39%	47%	55%	31%	38%	42%	39%	52%
% of total funding	10%	10%	12%	13%	17%	18%	16%	19%	23%	24%	12%	15%	20%	18%	18%

Table 4.5 Breakdown of Pavement Expenditures ($M)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
Preventive Maint.	$ 394	$ 375	$ 273	$ 273	$ 333	$ 367	$ 373	$ 378	$ 479	$ 551	$ 514	$ 561	$ 362	$ 326	$ 798
Rehabilitation & Reconst.	$ 1,224	$ 1,400	$ 817	$ 794	$ 1,132	$ 1,208	$ 1,178	$ 1,194	$ 1,154	$ 1,429	$ 1,238	$ 1,456	$ 1,176	$ 1,190	$ 2,202
Other	$ 200	$ 172	$ 84	$ 82	$ 104	$ 109	$ 194	$ 167	$ 293	$ 332	$ 315	$ 339	$ 117	$ 181	$ 247
Operations & Maint.	$ 573	$ 543	$ 383	$ 381	$ 578	$ 615	$ 619	$ 631	$ 527	$ 563	$ 566	$ 574	$ 718	$ 684	$ 859
Totals	$ 2,391	$ 2,490	$ 1,557	$ 1,530	$ 2,147	$ 2,299	$ 2,364	$ 2,370	$ 2,453	$ 2,875	$ 2,633	$ 2,930	$ 2,373	$ 2,381	$ 4,106

4.2 Pavement Expenditures

The survey also asked for a breakdown of pavement expenditures in 4 categories:

- Preventive maintenance such as slurry seals;
- Rehabilitation and reconstruction such as overlays;
- Other pavement-related activities such as curbs and gutters; and
- Operations and maintenance such as filling potholes, sealing cracks, and street sweeping.

Table 4.5 (on previous page) shows the breakdown in extrapolated pavement expenditures for cities and counties. The decrease in expenditures reported in 2010/2011 reflects the recession. However, since 2012/13, expenditures have increased and now exceed 2008 levels. Pavement expenditures decreased approximately 19% from FY 2020/21 and FY 2021/22 because of COVID. With COVID's impacts largely mitigated, it is estimated that annual expenditures will increase to over $4.1 billion in the future.

Figure 4.2 illustrates trends in pavement expenditures. Rehabilitation and reconstruction consistently account for approximately 50 percent of expenditures. Preventive maintenance expenditure has grown to 20 percent, indicating that many agencies are cognizant of the need to preserve pavements. Operations and maintenance expenditures have decreased to a little under 20 percent.

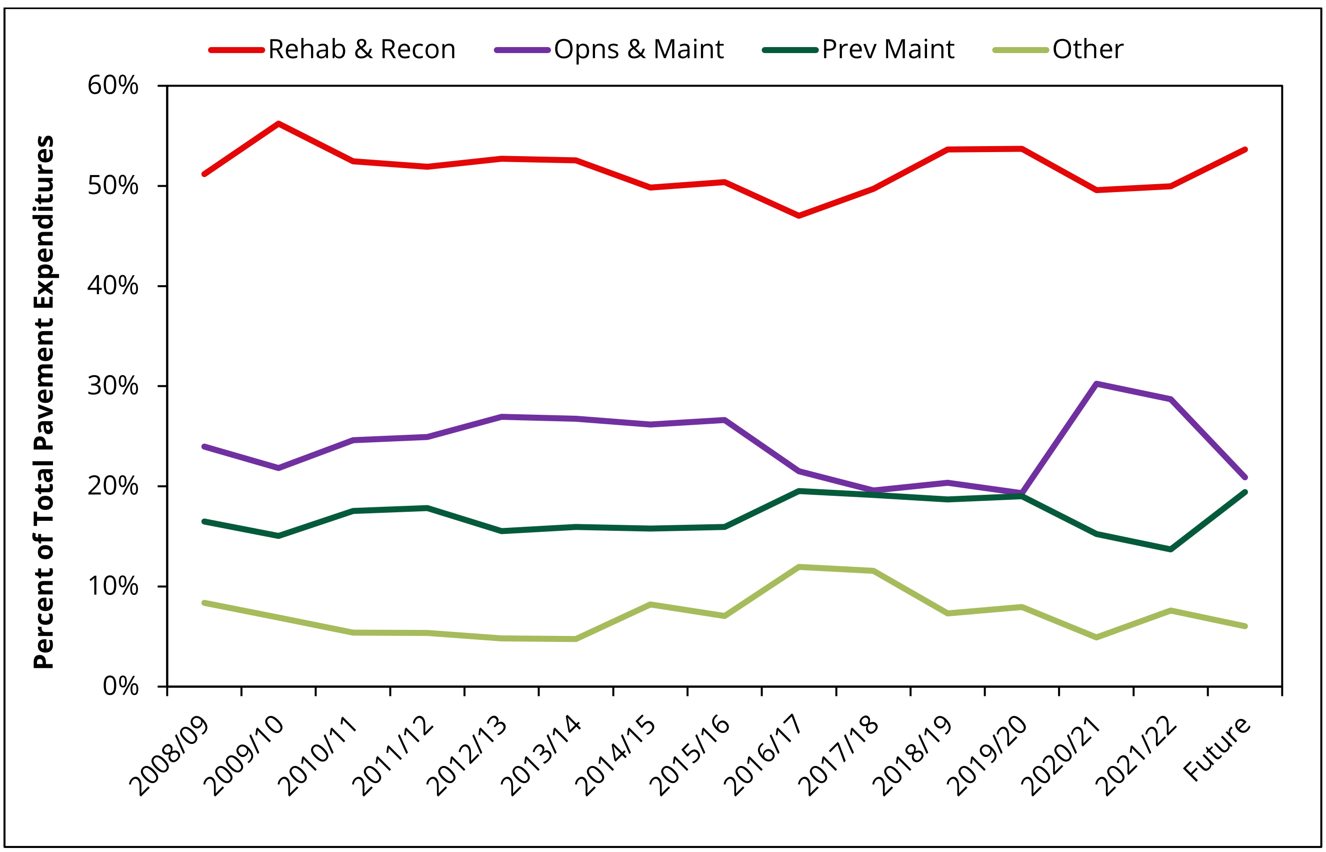


Figure 4.2 Trends in Pavement Expenditures

Finally, projected pavement expenditures for the next 10 years are shown in Table 4.6. As expected, rural counties predict lower expenditures than cities and urban counties. Similarly, rural agencies predict lower expenditures than urban agencies. However, pavement expenditures have increased in all categories since 2020.

Table 4.6 Projected Pavement Expenditures Per Lane Mile

	Pavement Expenditures ($/lane mile)	
	Rural	Urban
County	$8,116	$21,246
City	$12,915	$12,521

The total pavement expenditures for all 539 cities and counties were estimated to be $3.357 billion annually. To put this funding in perspective, $3.357 billion/year is approximately 1.3 percent of the total investment in the pavement network, the value of which is estimated to be $253 billion.

However, our observations of the predicted versus actual expenditures revealed an interesting trend, as illustrated in Figure 4.3. Generally, local agencies were spending 10 to 20 percent more (green line) than estimated (blue line) prior to the passage of SB 1. From discussions with some respondents, it appeared that the estimated expenditures were conservative and reflected a reluctance to rely on federal and state grants/sources in the future as well as the inability to predict how the economy will perform (as sales tax is a key funding source.)

In 2018 this trend changed. In both 2018 and 2019, actual expenditures were LESS than estimated. In 2018, this may have been attributable to uncertainty caused by the potential repeal of SB 1, which may have led to more conservative expenditures. Moreover, it took several months for SB 1 funding to fully phase-in (first allocations were received halfway through the 2017/18 fiscal year). In 2019, actual pavement expenditures were $2.42 billion, still less than expected.

Cities and counties are estimated to spend $3.36 billion on pavements annually.

During COVID, actual expenditures dropped dramatically, to approximately $1.8 billion, despite initial estimated expenditures of $2.4 billion. With the recovery from COVID, survey respondents are estimating future expenditures of $3.36 billion annually, a marked shift upwards. This is the funding amount used for illustrative purposes in one of the pavement scenarios in Section 4.6.

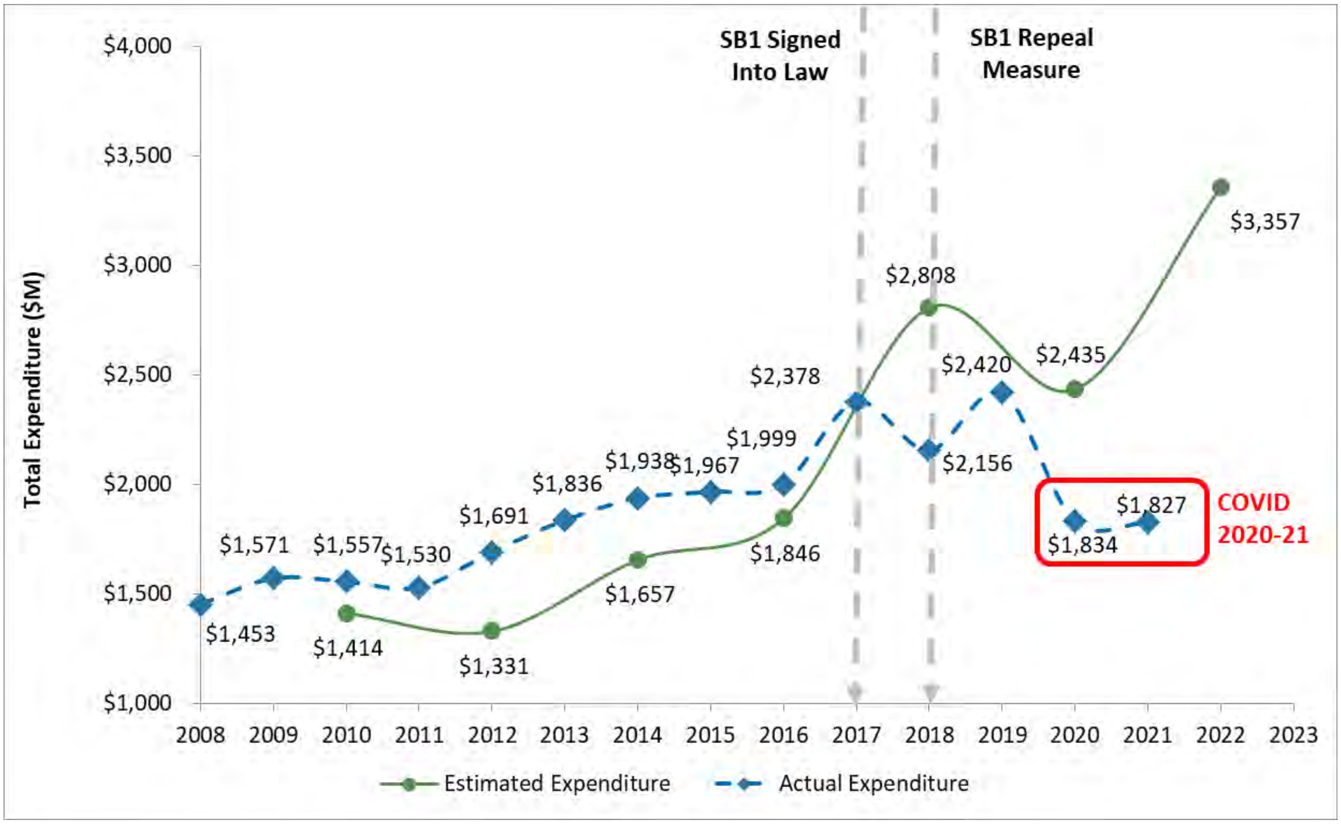


Figure 4.3 Differences Between Predicted and Actual Expenditures

4.3 Impact of Electric and Hybrid Vehicles on the Gas Tax

The Road Repair and Accountability Act of 2017[15] (also known as SB 1) included not only an increase in the per gallon excise tax (Gas Tax) with inflation adjustments, but also a transportation improvement fee to be paid as part of the vehicle licensing process and a zero-emission vehicle (ZEV) registration fee. Note that ZEVs in this case include hybrid vehicles. SB 1 is expected to raise $7.4 billion in 2023[16].

California currently has the largest ZEV population in the nation and has experienced a steady increase in ZEV sales over the last decade. In an effort to significantly reduce vehicle emissions, the California Air Resources Board (CARB) formalized into policy the Advanced Clean Cars II Regulations in August 2022[17].

This policy expands on the already increasing popularity of ZEVs and requires annual increases in the percentages of new passenger cars, trucks, and SUVs sold in California that are ZEVs, starting with 16%

[15] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1

[16]https://lao.ca.gov/Transportation/FAQs#:~:text=updated%3A%20November%202022)-,How%20Does%20the%20State%20Spend%20Gasoline%20Tax%20Revenues%3F,for%20vehicles%20using%20public%20roads.

[17] https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii

in 2023 and culminating in 100% in 2035. California closed out 2022 ahead of schedule with nearly 19% of new vehicle sales being ZEVs18.

As vehicle fleets shift from conventional gas vehicles to ZEV and hybrid vehicles, either by choice or mandate, state gas tax revenues are expected to decrease significantly throughout the country. For example, Connecticut[19] estimates that their gas tax revenues fell by 4.2% between 2012 and 2021 due primarily to vehicle electrification. Similarly, West Virginia[19] estimates that their gas tax revenue will fall 11–20% by 2030 and 31–50% by 2050 due to vehicle electrification. A 2022 study[20] in Michigan estimated that despite ZEVs representing only 6% of the new vehicle market, vehicle electrification resulted in a funding deficit of $20.8 million in 2022. That funding deficit is expected to increase to over $95 million per year by 2030. A 2020 study from the University of California, Berkeley used 2017 National Household Travel Survey data from the US Department of Transportation to estimate that the electrification of vehicles will result in an annual nationwide funding reduction of $250 million[21].

What can be done to backfill this expected decrease in funding? There are 3 main options that have been discussed:

1) Increase the gas tax;

2) Implement a special vehicle registration fee for ZEVs and hybrids; and

3) Implement a vehicle mileage tax (road user charge).

The first option presents an unequitable solution as it places the funding burden on conventional gas vehicle users and will result in a continual decline in funding as vehicle electrification increases.

The second option is already being used by many states throughout the country. Thirty-one states have a special registration fee for electric vehicles, and 18 of these 31 have different special registration fees for hybrid vehicles[19]. These fees typically range from $50 to $225 per year[22]. As previously noted, a special electric/hybrid vehicle registration fee was implemented in California as part of SB 1, and currently, the ZEV registration fee is $108 per year[23]. In contrast, at the current State gas tax rate of $0.539 per gallon[16], a conventional gas vehicle traveling an average of 12,500 miles per year with an average gas economy of 24 mpg would pay $281 per year in gas taxes. Thus, ZEVs contribute approximately one-third of the amount that their gas vehicle counterparts contribute to infrastructure funding.

Since vehicle electrification was expected to impact the revenues raised by SB 1, Section 48 of SB 1 called for the University of California, Davis to evaluate the ZEV registration fee as a funding mechanism.

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[18] https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales

[19] https://www.cpapracticeadvisor.com/2022/11/04/72837/72837/

[20] The Impact of Electric Vehicle Adoption on Road Funding in Michigan (andersoneconomicgroup.com)

[21] Should Electric Vehicle Drivers Pay a Mileage Tax? https://www.journals.uchicago.edu/doi/epdf/10.1086/706793

[22] https://www.ncsl.org/energy/special-fees-on-plug-in-hybrid-and-electric-vehicles

[23] https://www.dmv.ca.gov/portal/vehicle-registration/registration-fees/

That 2018 study[24] estimated that improvements in fuel economy and the increasing adoption of ZEVs would result in approximately $0.9–1.3 billion decrease in funding annually by 2028. This estimate is likely low, considering the more ambitious schedule adopted by CARB in 2022, 4 years after the UC Davis study was published, and the fact that California is already 1–2 years ahead of the CARB schedule requirements. The study concluded that a special ZEV registration fee would not provide sustainable infrastructure funding in the long-term and recommended Option 3 (above) as an alternative funding mechanism.

NCE offers a high-level estimate based on the CARB schedule adopted in 2022 and given the following assumptions (Table 4.7). As previously noted, California is already 1–2 years ahead of the CARB schedule requirements, indicating that annual loss in gas tax revenue is greater than estimated (Figure 4.4). By 2035, there may be a loss of as much as $1.5 billion a year in gas tax revenue.

By 2035 there may be a potential loss of as much as $1.5 billion a year in gas tax revenues due to ZEVs.

Table 4.7 Assumptions Used in Analyzing Impact of ZEVs

Factor	Assumed Value	Source
Average gas vehicle tax ($/yr)	$281	See first paragraph of Option 2 discussion
Average ZEV registration fee ($/yr)	$108	Registration Fees – California DMV
Number of light-duty vehicles in CA	29.1 million	Light-Duty Vehicle Population in California
Number of ZEVs in CA	1.4 million	New ZEV Sales in California
Average number of years between car purchases	8 years	Survey: Average length of car ownership in America (thezebra.com)
Percent of car shoppers buying new vs. used	26%	Consumers 3 times more likely to buy used cars over new (motortrader.com)

The Third option operates under a “user pays” principle, meaning that the more a user uses a service, the more the user pays for it. If this option were adopted in lieu of the traditional gas tax, it would create greater equity in taxation and generate a long-term stable funding source[25]. The primary drawback of this option is that program administrative costs can be high[24].

California performed a feasibility pilot study on implementing a road charge collection in response to 2014 legislation (SB 1077). The study26 involved maintaining over 5,000 participating vehicles over a 9-month period and evaluated 6 reporting and recording methods with various technology options. Feasibility, security, ease, and user acceptability were the primary variables considered. A revenue neutral rate of 1.8 cents per mile was tested. The technologies tested worked to some degree and the

[24] Assessing Alternatives to California’s Electric Vehicle Registration Fee (escholarship.org)

[25] http://caroadcharge.com/about/faqs/

[26] http://caroadcharge.com/about/faqs/

study resulted in high participant satisfaction, but it did not attract representative samples of rural participants, or participants of certain ethnicities/races. A second pilot study was called for in 2021[27] (SB 339) to identify and evaluate issues related to the collection of revenue as part of a road usage charge program. Results from this study are expected in 2023.

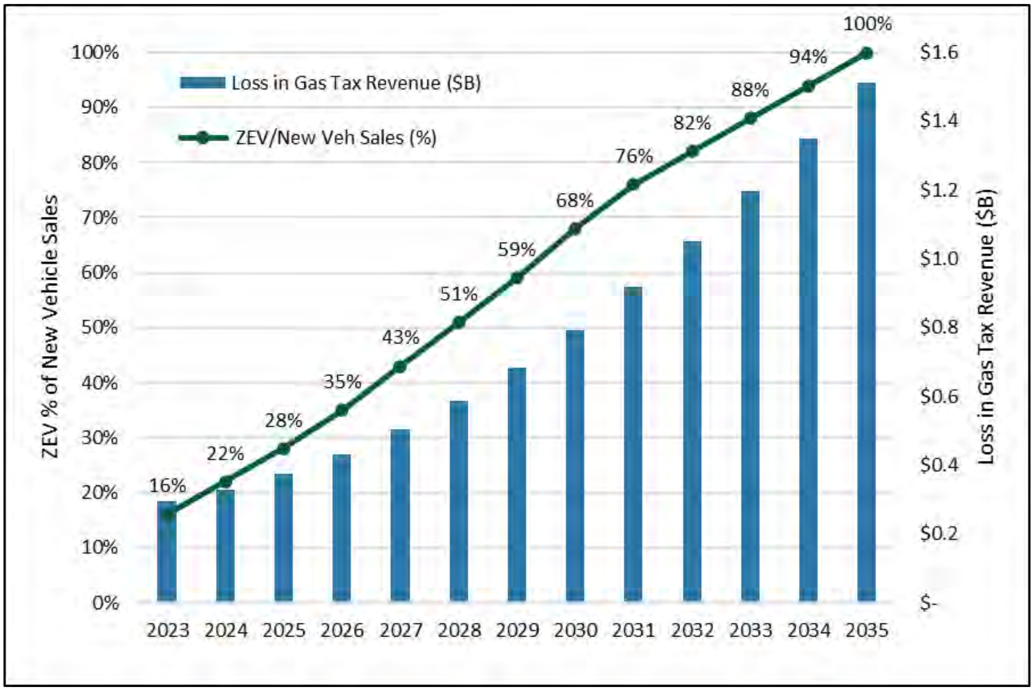


Figure 4.4 Estimated Loss of Gas Tax Over Time

The information provided for this report is informational only and is intended to alert the reader to the expected future reduction in the gas tax.

4.4 Essential Components Revenue Sources

The revenue sources for essential components are shown in Table 4.8. Again, federal funds make only a small contribution (9–15 percent) to the cities and counties. For essential components, unlike pavements, local sources are expected to account for 47 percent of total funding, and state sources (including SB 1) for 44 percent. Figure 4.5 identifies the different funding sources.

[27] https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB339

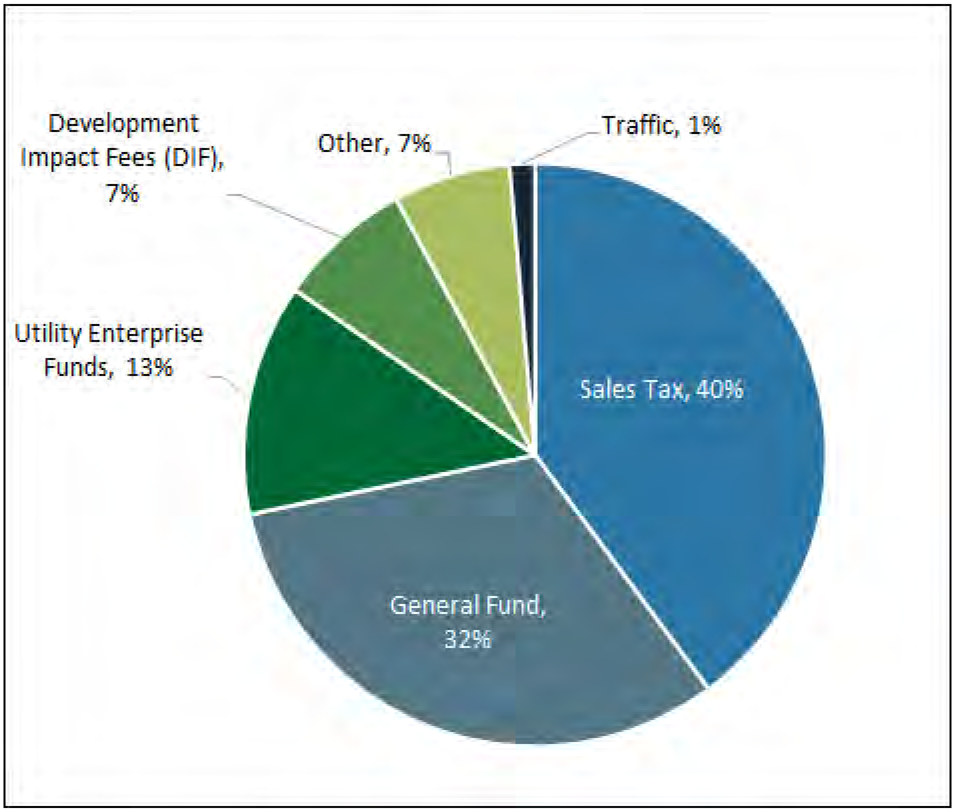


Figure 4.5 Local Revenue Sources for Essential Components

4.5 Essential Components Expenditures

Expenditures on essential components increased to $1.8 billion/year in 2020 but are expected to be only $1.6 billion/year for the next 10 years (see Table 4.9). Combined, the funding for both pavements and essential components is $1.16 billion MORE than it was prior to SB 1. So, although agencies are receiving significantly more funding from SB 1, not all of it is available for pavements, and some is spent on essential components.

Table 4.9 details the expenditures by category. Storm drains and traffic signals continue to be the most expensive components.

Average anticipated expenditures for essential components over the next 10 years are shown in Table 4.10. As before, rural counties and cities are expected to have lower expenditures than their urban counterparts. Total expenditures for all 539 cities and counties were estimated to be over $1.3 billion annually.

Table 4.8 Funding Sources for Essential Components ($M)

Funding type	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future
Funding Available ($M)	$885	$903	$1,204	$1,332	$1,111	$1,184	$1,459	$1,603	$1,597	$1,888	$1,549	$1,712	$1,636
Federal	16%	16%	12%	12%	12%	17%	9%	12%	11%	15%	9%	13%	9%
State	31%	31%	28%	23%	18%	17%	17%	18%	26%	27%	26%	27%	30%
Local	53%	53%	60%	65%	70%	66%	74%	70%	55%	51%	55%	47%	47%
SB1/RMRA							0%	0%	8%	7%	10%	13%	14%

Table 4.9 Breakdown of Expenditures for Essential Components

Essential Components	Annual Expenditures ($M)							% of total
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future	
Storm Drains	$215	$233	$154	$158	$148	$107	$160	10%
*Manholes, Inlets, Culverts, Pump Stations	$43	$50	$56	$61	$44	$35	$89	5%
Curb and Gutter	$38	$50	$57	$62	$71	$97	$112	7%
Sidewalk (public)	$101	$158	$102	$182	$99	$102	$145	9%
Other Pedestrian Facilities	$18	$27	$26	$26	$7	$18	$13	1%
Class 1 Bicycle Path	$29	$56	$29	$31	$96	$67	$93	6%
Other Bicycle Facilities	$17	$29	$6	$55	$6	$5	$33	2%
Curb Ramps	$50	$67	$54	$58	$87	$79	$93	6%
Traffic Signals	$223	$247	$209	$276	$277	$248	$320	20%
Streetlights	$188	$224	$69	$105	$77	$76	$79	5%
Sound/Retaining Walls	$10	$8	$10	$17	$70	$63	$22	1%
Traffic Signs	$54	$55	$51	$51	$68	$62	$71	4%
Tunnels	$4	$4	$8	$0	$0	$1	$2	0%
Other physical assets or expenditures	$88	$90	$172	$232	$176	$189	$208	13%
*Bicycle facilities: Class II bicycle lane			$20	$20	$31	$29	$48	3%
*Bicycle facilities: Class III bicycle routes/sharrow			$3	$7	$9	$15	$26	2%
*Bicycle facilities: Class IV protected bike lanes			$3	$5	$24	$17	$22	1%
*Pedestrian paths			$3	$3	$3	$24	$3	0%
*Multi-use paths			$8	$20	$9	$17	$39	2%

Essential Components	Annual Expenditures ($M)							% of total
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Future	
*Crossing Improvements e.g. high-visibility crossings, rapid flashing beacons, roundabouts, scrambles, bulb-outs, pedestrian refuge islands, etc.			$19	$23	$30	$56	$46	3%
*Transit amenities e.g. benches, shelters, real-time arrival signage, wayfinding signage			$4	$13	$6	$8	$11	1%
Totals	**$1,078**	**$1,300**	**$1,108**	**$1,437**	**$1,339**	**$1,317**	**$1,635**	**100%**

*New items added from 2020 survey

Table 4.10 Breakdown of Expenditures on Essential Components by Agency ($/Lane Mile)

Agency Category	Expenditures	
	Rural	Urban
County	$2,958	$10,454
City	$3,692	$6,145

4.6 Funding Shortfalls

One of the primary objectives of this study was to determine whether a funding shortfall exists for the next 10 years, and if so, the amount of that shortfall. Chapters 2 and 3 described the analysis used to determine the funding needs for both the pavement and essential components, respectively, and the preceding sections analyzed the revenues and expenditures as well.

Table 4.11 summarizes the results of all the preceding analyses and the associated $70 billion funding shortfall for pavements and essential components. An additional shortfall of $3.2 billion was estimated for additional regulatory requirements (e.g., NPDES, ADA, and sign retroreflectivity; see Table 2.7). However, those numbers were not included in Table 4.11 because only half of the agencies provided data, and half of those that provided data indicated that they were "informed estimates" or "guesses" at best.

Table 4.11 Summary of 10-Year Needs & Shortfall (2022 $ Billion)

Transportation Asset	Needs ($B)							2022		
	2008	2010	2012	2014	2016	2018	2020	Needs	Funding	Shortfall
Pavement	$67.6	$70.5	$72.4	$72.7	$70.0	$61.7	$76.0	$ 81.0	$ 33.6	$ (47.4)
Essential Component	$32.1	$29.0	$30.5	$31.0	$32.1	$34.1	$35.5	$ 39.0	$ 16.4	$ (22.6)
Totals	**$99.7**	**$99.5**	**$102.9**	**$103.7**	**$102.1**	**$95.8**	**$111.5**	**$120.0**	**$50.0**	**$ (70.0)**

The funding shortfall identified in the 2020 study was $59.7 billion, so the shortfall has increased by $10.3 billion. The increase in needs is due to the increases in paving costs described in Section 2.1.3 and may also be partly an unanticipated consequence of SB 1. In essence, SB 1 added $5 billion to construction funding, but this was not necessarily matched with increases in contractor capacity. The potential repeal in of SB 1 in 2018 may have discouraged contractors from adding capacity. However, as the market adjusts, we anticipate a more stable cost structure in the future.

4.7 Pavement Funding Scenarios

California, together with the rest of the nation, faced severe economic challenges during the recession that began in 2008, with reductions in revenues, multi-billion-dollar deficits, and high unemployment. While economic growth and tax increases have helped stabilize state and local revenues for many programs, transportation funding lagged for many years.

After 10 years of working with policymakers, and providing the results of the statewide needs studies, the Governor signed SB 1 into law in 2017, making more than $5 billion per year available for transportation. Of that, cities and counties receive approximately $1.5 billion annually for streets and roads. The funding scenarios analyzed below illustrate the benefits of this additional funding.

The shortfall for local streets and roads is $70 billion.

In addition, cities and counties have continued to stretch every existing dollar. One factor in the 2018 analysis was the inclusion of sustainable technologies such as cold-in-place recycling and full-depth reclamation. These saved more than 25 percent relative to conventional treatments and have been included in all the scenarios for 2022.

The funding scenarios analyzed were:

1) Existing funding with SB 1, estimated at $3.36 billion/year;
2) Funding sufficient to maintain current pavement condition at PCI=65; and
3) Funding to achieve best management practices (BMP).

Note that an estimated $510 million of SB 1 funds will be spent of paving, and the remainder will be allocated to essential components and operations and maintenance.

As noted in Chapter 1, an analysis period of 10 years was selected, not just for consistency with the SHOPP, but also because this is a reasonable timeframe to accomplish the BMP goal. Even if local agencies received $37.6 billion to erase the 10-year pavement shortfall today, it would not be possible to build or construct this substantial number of projects in 1, 2, or even 5 years. Few, if any, agencies have the resources to deliver this amount of work in such a short time, and the contracting community is also unlikely to have enough resources available. In discussions with the Oversight Committee, a 10-year timeframe was deemed to be reasonable and practical.

Scenario 1: Existing Funding with SB 1 ($3.36 billion/year)

In this scenario, the most cost-effective treatments, typically preventive maintenance, or preservation strategies, would be funded first. This type of approach optimizes the use of limited funds by treating a larger percentage of the pavement network. With the existing $3.36 billion/year in funding, this would result in a slow decrease in pavement condition to 63 in year 10, and an increase in the unfunded backlog to $53 billion. Figure 4.6 illustrates these trends.

Note that this scenario does not consider the impact of ZEVs, which are estimated to reduce gas taxes by up to $1.5 billion annually by 2035 (see Section 4.3).

Scenario 2: Funding Sufficient to Maintain PCI at 65 ($3.76 billion/year)

In this scenario, approximately $3.76 billion/year would be used to maintain the PCI at its current level of 65. This would increase the unfunded backlog to $49.1 billion. Figure 4.7 illustrates these trends.

Scenario 3: Funding to Achieve Best Management Practices (BMP) ($8.54 billion/year)

In this scenario, $8.54 billion/year would be required to reach a pavement condition where BMPs can be applied, (87 in this case see Figure 4.8). In addition, the unfunded backlog would be eliminated by 2032. **Once the backlog is eliminated, the cost of ongoing maintenance would decrease significantly, requiring only $3.28 billion a year. This is essentially the same as the existing level of funding.**

Once the backlog has been eliminated, $3.28 billion/year will be required to maintain the network at BMP levels.

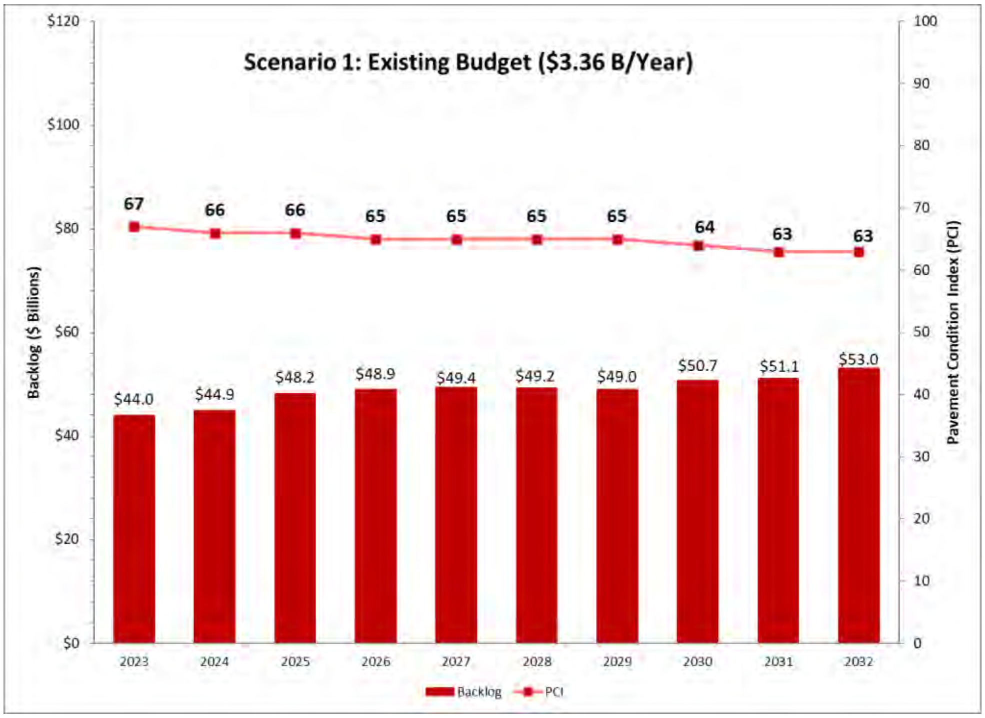


Figure 4.6 Results of Scenario 1: Existing Budget ($3.36 Billion/year)

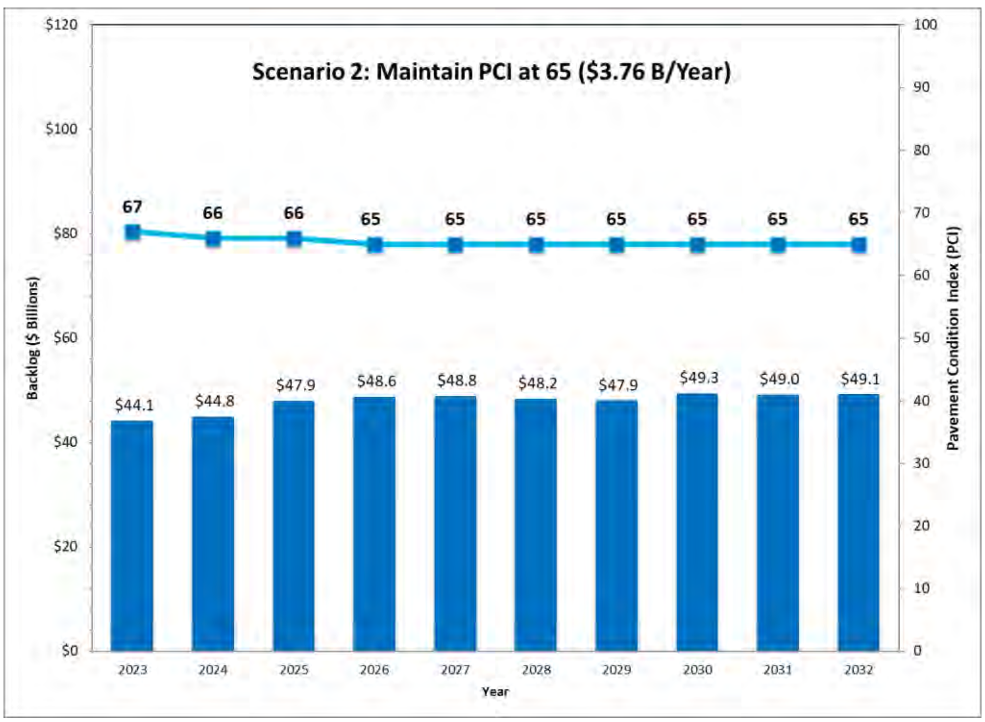


Figure 4.7 Results of Scenario 2: Maintain PCI at 65 ($3.76 Billion/year)

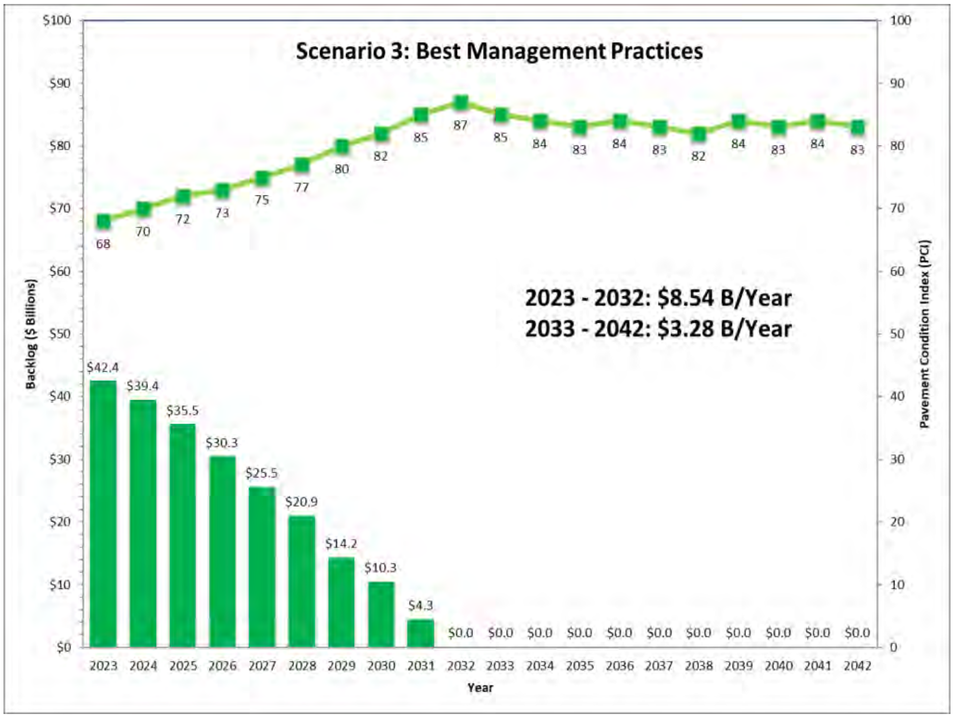


Figure 4.8 Results of Scenario 3: BMP ($8.54 Billion/year)

4.8 Other Performance Measures

Although both PCI and the unfunded backlog are common performance measures for cities and counties, others may be used. One such measure is the percentage of pavement area in different condition categories. Table 4.12 illustrates the breakdown of pavement area in each condition category for each funding scenario.

The most obvious outcome based on these measures is that with the existing budget, the percentage of pavements in good condition will increase to 60.6 percent, and the percentage of pavements in poor condition will decrease to 21 percent. Figure 4.9 shows examples of local streets in poor condition.

Table 4.12 Breakdown of Pavements by Condition Category for Each Scenario (2032)

Condition Category	Current Breakdown (2022)	Scenario 1 Existing Budget ($3.36 B/yr)	Scenario 2 Maintain PCI ($3.76 B/yr)	Scenario 3 BMP in 10 Years ($8.54 B/yr)
PCI 70-100 (Good to Excellent)	55.1%	60.6%	66.0%	100.0%
PCI 50-69 (Fair/At Risk)	21.9%	18.4%	13.9%	0.0%
PCI 0-49 (Poor)	23.0%	21.0%	20.1%	0.0%

Figure 4.9 Examples of Streets in Poor Condition

4.9 How Did We Get Here?

For those who do not work with transportation issues every day, it can be difficult to understand how California's cities and counties have reached this situation. The factors that have led us here can be summarized as:

- The population of California was approximately 30 million in 1990; it is now almost 40 million, an increase of 33 percent. Attendant with that increase in population are increases in traffic, housing, and new roads.
- There are many new regulations that have increased the responsibilities of cities and counties, including ADA, NPDES, and new traffic sign retroreflectivity standards.
- California has statewide goals to reduce reliance on driving and increase opportunities for active transportation. Communities value complete streets and active transportation policies, but these improvements can significantly increase construction costs.
- Cities and counties need to consider, build, and maintain a transportation system that includes multiple transportation modes; e.g., bicycles, pedestrians, trucks, and buses.
- The cost of road repairs and construction has increased at rates that are significantly higher than that of inflation. In the last 15 years, paving costs have increased much more than revenues. These increases can be attributed to rising costs of petroleum products (directly correlated to asphalt costs), labor, and equipment.
- The State Gas Tax did not increase for more than 20 years despite that it is the single most important funding source for transportation. Cities and counties have relied on a diminishing revenue source for a transportation system that is aging and deteriorating rapidly. SB 1 provides the first significant infusion of new funding in many years.
- The increased fuel economy of vehicles and the popularity of hybrid and electric vehicles has led to decreasing gas consumption, and, in turn, a reduction in gas tax revenue.

4.10 Summary

Based on the survey results and the projections from the funding scenarios:

- Total expenditures for pavements are projected to be $3.36 billion annually over the next 10 years. Of this, 58 percent is expected to come from state sources (almost entirely gas tax and SB 1), 7 percent from federal sources, and the remainder from local sources (mostly sales tax). This does not account for any potential reduction in gas tax revenue from ZEVs.
- Total expenditures for essential components are projected to grow to $1.6 billion annually. Forty-eight percent of the funding is expected to come from local sources, and 44 percent is expected to come from state sources.
- With SB 1, the total funding shortfall for pavements and essential components is expected to be $69.7 billion over the next 10 years.
- If funding remains at its existing level ($3.36 billion/year) (Scenario 1), the PCI will decrease from 65 to 63 and the unfunded backlog will increase to $53 billion. In addition, 21 percent of the pavement network will be in “failed” condition by 2032.
- To maintain the existing pavement condition (Scenario 2), $3.76 billion/year would be required. This would dramatically increase the amount of pavement in the “good to excellent” category from 55 percent to 66 percent.
- The BMP scenario would require approximately $8.54 billion annually to eliminate the backlog of work and raise the statewide average PCI to the mid-80s. Once the BMP goal has been reached, it would require $3.28 billion/year to maintain the condition of the pavement network.

5 Bridge Needs & Funding Analysis[28]

Bridges are an integral part of the transportation system, and therefore this study would be incomplete without a discussion of their needs. The catastrophic nature of a bridge failure is exemplified by the collapse of the I-35W bridge in Minneapolis during rush hour in August 2007. Thirteen people were killed and 145 injured. Failures in local bridges can also have significant consequences. Many rural bridges provide the only access to homes and communities, and, if a bridge collapses, access to help is limited or not available. In other cases, detours of more than 4 hours may be necessary.

Addressing bridge investment needs is both a local and national challenge. In its report *Bridging the Gap*, the American Association of State Highway and Transportation Officials (AASHTO) describes age and deterioration as the first of 5 top problems facing the nation's bridge population[29]. Other problems include congestion, increased construction costs, maintaining safety, and addressing new bridge needs. The Federal Highway Administration (FHWA) estimated that the national backlog of needed bridge investment was $121 billion in 2012, and that a national investment level of $11.9 billion was needed to keep the backlog from rising. This figure does not include addressing congestion or other new bridge needs[30]. California's bridge population is one of the largest in the country, and California bridge conditions have a significant bearing on any national-level analyses.

Although a compelling case can be made for investing in California's local bridges, local budgets are tightly constrained, there is significant uncertainty about future funding, and there are many competing needs for available funds. Thus, bridge owners, taxpayers, and legislators need the most accurate information available to make the best decisions about how to allocate scarce resources.

For the 2020 update, Quincy Engineering and Spy Pond Partners prepared a companion report to analyze both bridge needs and funding scenarios. This chapter summarizes their findings and has not been updated for 2022 and does not reflect funding changes from IIJA.

As with previous updates, 2 bridge inventory data sets were used for this study. First is the 2019 National Bridge Inventory (NBI) database. Caltrans collects data on behalf of local agencies on a biennial basis and provides this data to the FHWA to be included in the NBI database. Second is local agency bridge inventory data that are gathered from the Statewide survey on short (less than 20 feet in length) and non-vehicular bridges (these are excluded from the NBI database).

[28] Results presented are from the 2020 update.

[29] AASHTO. 2008. *Bridging the Gap: Restoring and Rebuilding the Nation's Bridges.*

[30] FHWA. *2013 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance*. Report to the United States Congress. http://www.fhwa.dot.gov/policy/2013cpr/pdfs.cfm.

A total of 12,339 bridges are owned, maintained, and operated by cities, counties, and other municipalities, and they comprise approximately 48 percent of the 25,499 vehicular bridges in California. Bridges owned by others (e.g., State, Bay Area Rapid Transit, private, railroad, and federal bridges) are not considered local agency bridges and were not included in this study.

Figure 5.1 illustrates local bridge count by county. Most counties (including city bridges within the county) contain several hundred bridges (approximately 200 per county). In general, the counties with larger populations have a significantly higher number of bridges than those with lower populations. Los Angeles County has the most locally owned bridges (over 1,400).

12,339 local bridges represent 48 percent of the bridges in California.

Figure 5.2 illustrates the age distribution of all local bridges statewide. Even with routine investment, every bridge eventually reaches the end of its useful structural lifespan. Modern bridges are designed with a 75-year service life in mind, and 75 to 100 years is a reasonable service life for a typical local-agency bridge.

At current funding levels, local bridges will need to be in service for more than 200 years, or 3 times their intended lifespan.

California's local bridges have an average age of 53.4 years, while the national average is only 44 years. There are 2,332 local bridges (18.8 percent) that are at least 80 years old. Nearly half of the state's local bridges (46 percent) were constructed between the mid-1950s and the mid-1970s and are currently between 40 and 70 years old. During this building boom, an average of 230 local bridges were being constructed every year. Through the past decade, the number of major local bridge projects completed in any given year has been less than 50.

To prevent the local bridge inventory from further advancing in age would require a replacement rate greater than 6 times the current rate, i.e. approximately 250 bridges per year. At the current replacement rate, California's local bridges will need to be in service more than 200 years each, or nearly 3 times the current intended lifespan.

As bridges age, the need for rehabilitation or replacement becomes greater. As with streets and roads, it is more cost-effective to maintain bridges in good condition than it is to allow them to deteriorate rapidly and thus require replacement sooner.

The average age is more than 53 years old, and more than half are in fair to poor condition.

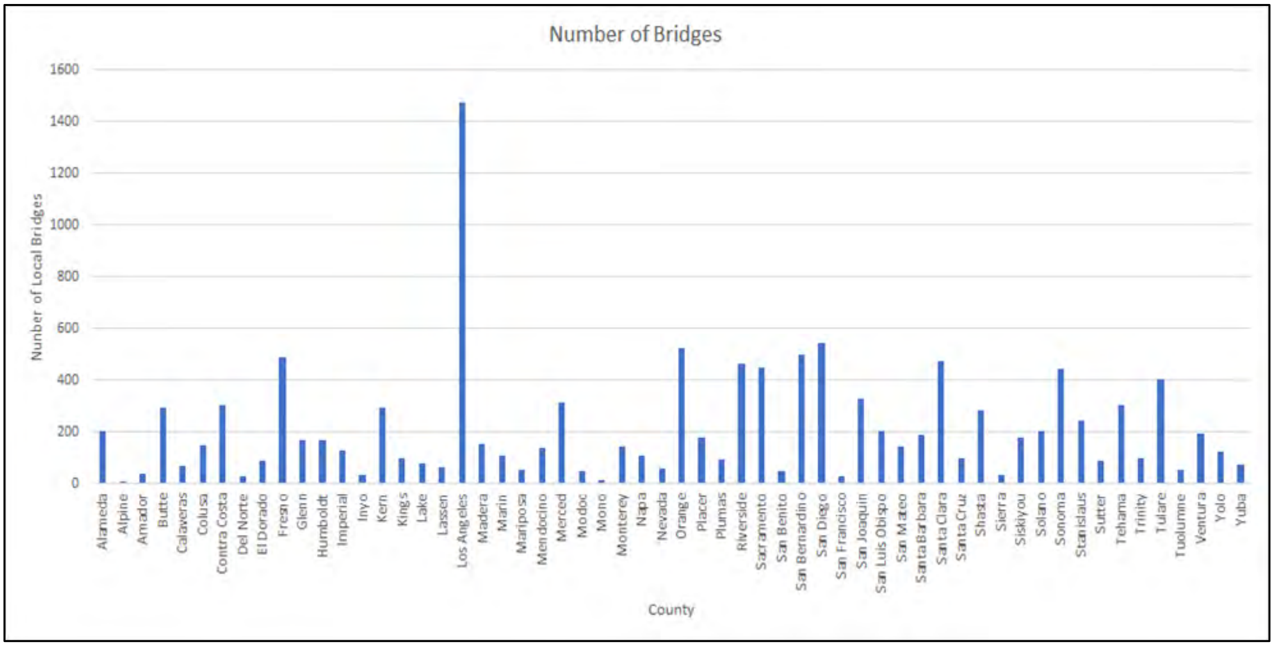


Figure 5.1 Number of Local Bridges by County (includes Cities within County)

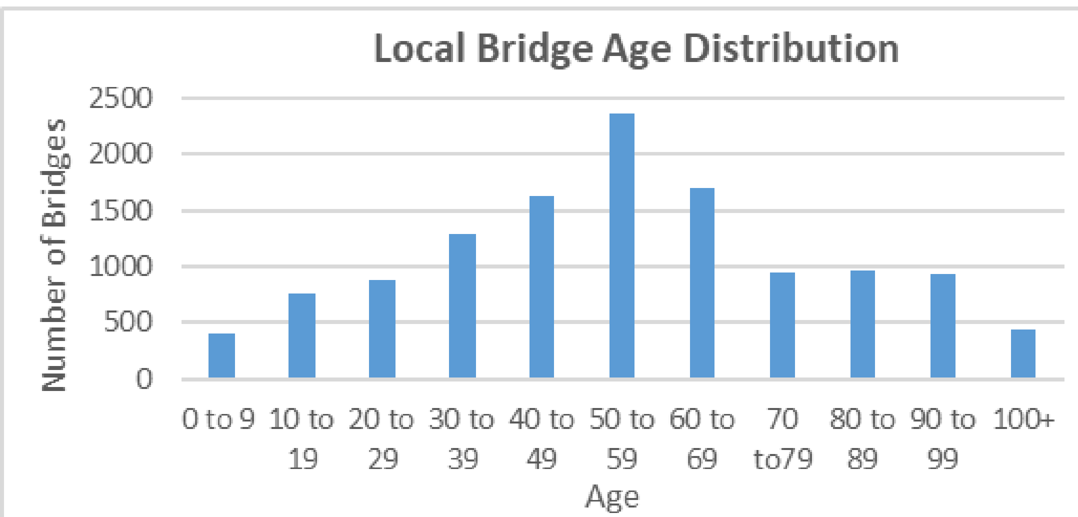


Figure 5.2 Local Bridge Age Distribution

The total needs for work activities such as bridge replacement, major rehabilitation, scour mitigation, seismic retrofit, and structure widening were estimated based on bridge conditions, calculated load ratings, traffic volumes and width capacities, scour vulnerabilities, and seismic retrofit status for the entire local bridge inventory. **The 2020 bridge needs are estimated to be $7.2 billion** (Figure 5.3), not including the cost of future maintenance and replacement of structures that are currently in sufficient condition. Completing this amount of work at the current level of investment would take more than 25 years, even with no additional projects.

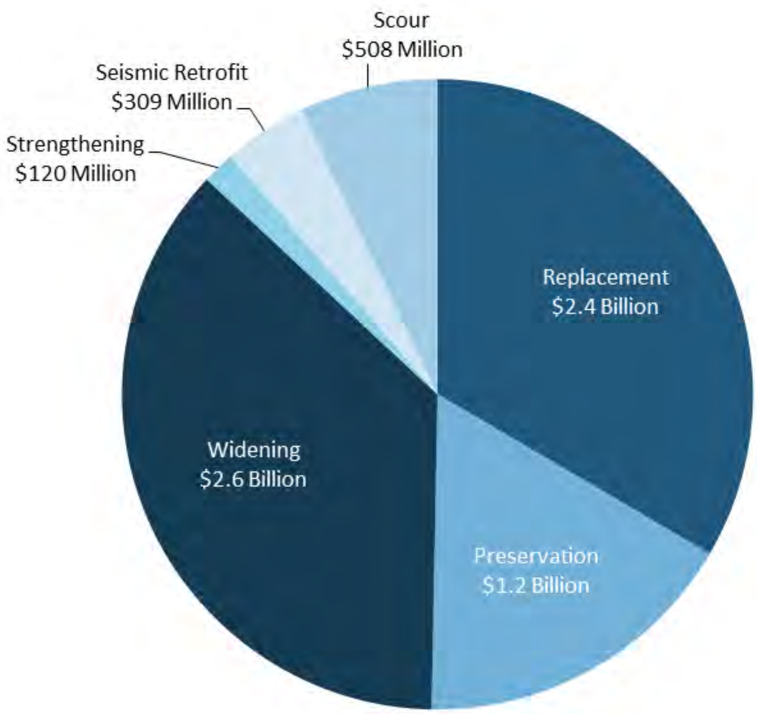


Figure 5.3 Local Bridge Needs Summary (2020)

Federal funding, administered by Caltrans through the Highway Bridge Program, has traditionally been the primary funding source for local bridges. This funding has been stagnant at approximately $290 million annually for the past 10 years. At this investment, more than 50 percent of bridges will be in poor condition within the next 20 years. Between $700 to $800 million in funding annually over the next 10 years will be required to simply prevent the number of bridges in poor condition from increasing (Figure 5.4).

In summary, the needs of California's local bridge population are significant and are increasing as the inventory ages. The costs of bridge projects have increased over time, beyond inflation, due to an increase in project complexity based on design features, traffic widths, modern traffic loads, environmental regulations and permitting, and other project requirements. The result is that bridge construction projects cost considerably more today than they did at the time of their original construction. In addition, bridge replacement and major rehabilitation projects are not keeping pace with bridges reaching the end of their expected service lives. Maintenance needs within the aging bridge population are also increasing. At a minimum, it is estimated that the current level of investment in local bridges must double to maintain California's local bridges in their current condition. Significantly more

Local bridge needs are $7.2 billion but funding is only $2.9 billion.

An annual funding level of $800 million is needed just to maintain current conditions.

investment is required to improve the general condition of the population and address the aging bridges originally constructed during the highway building boom period.

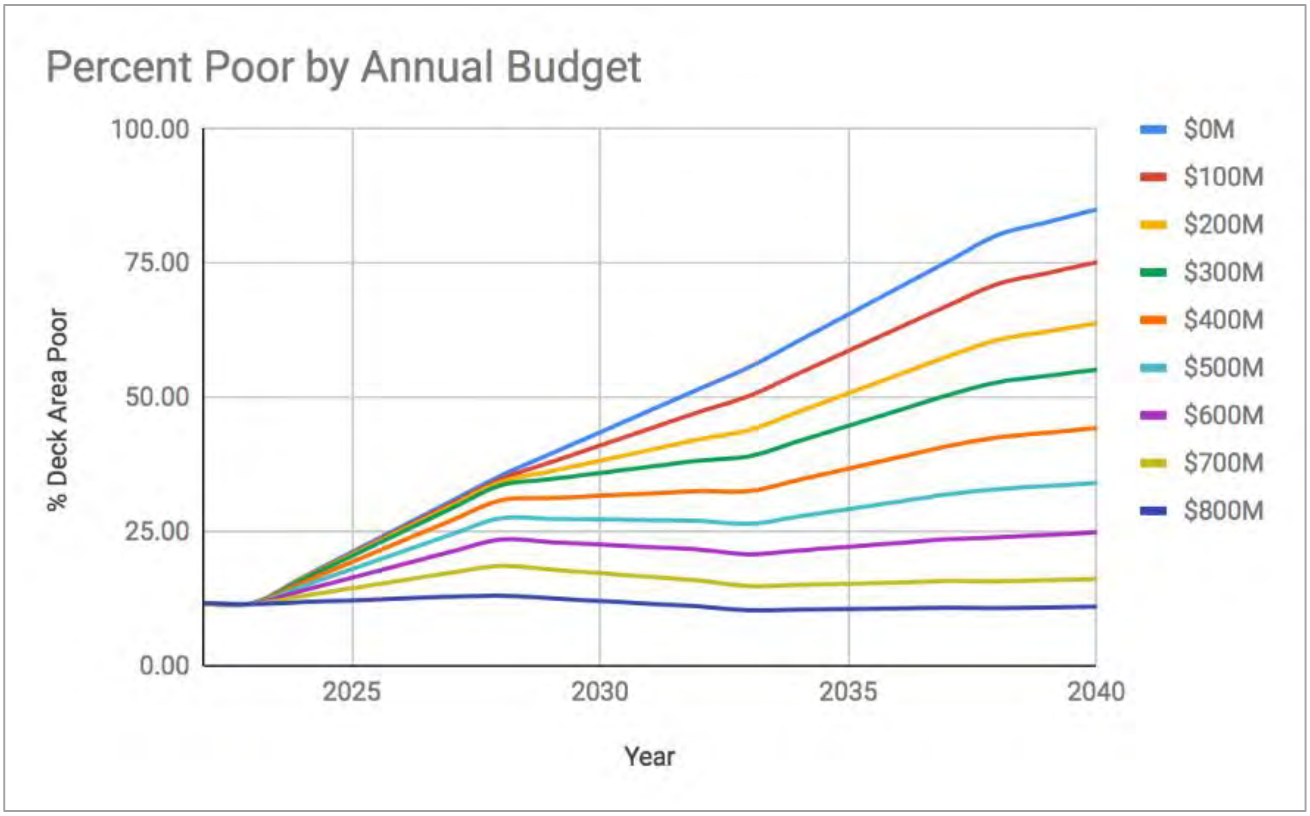


Figure 5.4 Percent of Bridges in Poor Condition by Annual Budget

6 Summary and Conclusions

SB 1 funding made a difference in the condition of California pavements and slowed the decline of the local street and road network. However, it is too soon to conclude that the deterioration of the last 14 years has been arrested permanently.

As this report shows, while pavement conditions did stabilize, other factors have come into play:

1. The 2018 study assumed that $3.083 billion/year would be spent on pavements. However, the data indicated that this was not the case; instead, average annual expenditures were $2.2 billion. In 2018/19, the potential repeal of SB 1 may have led to agencies hesitating to commit all of their SB 1 funding to paving. However, the funding for essential components increased by an average of $390 million in the same 2 years.

   In addition, COVID played a significant role in reducing pavement expenditures for both 2020/21 and 2021/22 to just over $1.67 billion a year (a decrease of over $700 million).

   We can conclude that more SB 1 funding was spent on essential components than was originally estimated. Both uncertainty from the measure to repeal SB 1 and COVID resulted in lower pavement expenditure than was estimated in 2018.

2. The pavement expenditures for the next 10 years are predicted to recover to $3.36 billion. It would appear that as cities and counties are expecting to “catch up” with paving as we emerge from the pandemic, funding for essential components is estimated to remain essentially stable at $1.6 billion a year.

3. Finally, construction costs for paving continue to increase, between 4 and 7 percent annually. With the higher inflation experienced in 2022, this may continue for the foreseeable future.

Table 6.1 summarizes the 10-year needs and shortfalls for pavements, essential components, and bridges. The total funding needs over the next 10 years are $127.2 billion, and the resulting shortfalls are $47.4 billion for pavements, $22.6 billion for essential components, and $4.3 billion for bridges. The total shortfall is $74.3 billion over the next 10 years.

Table 6.1 Summary of 10-Year Needs and Shortfall Calculations (2022 $ Billion)

Transportation Asset	Needs ($B)							2022 ($B)		
	2008	2010	2012	2014	2016	2018	2020	Needs	Funding	Shortfall
Pavement	$ 67.6	$ 70.5	$ 72.4	$ 72.7	$ 70.0	$ 61.7	$ 76.0	$ 81.0	$ 33.6	$ (47.4)
Essential Components	$ 32.1	$ 29.0	$ 30.5	$ 31.0	$ 32.1	$ 34.1	$ 35.5	$ 27.8	$ 16.4	$ (22.6)
Active Transportation								$ 11.2		
Bridges		$ 3.3	$ 4.3	$ 4.3	$ 4.6	$ 5.5	$ 7.2	$ 7.2	$ 2.9	$ (4.3)
Totals	**$ 99.7**	**$ 102.8**	**$ 107.2**	**$ 108.0**	**$ 106.7**	**$ 101.3**	**$ 118.7**	**$ 127.2**	**$ 52.9**	**$ (74.3)**

For pavements, the annual funding of $3.36 billion a year, will result in a slight decrease in the PCI from 65 to 63 and an unfunded backlog of $53 billion by 2032. In addition, almost 61 percent of the network will be in good condition, and the percentage of streets in poor/failed condition will drop slightly to 21 percent (Table 6.2).

Table 6.2 Summary of Funding Analysis

Scenarios	Annual Budget ($B)	PCI in 2032	Condition Category	% Pavements in Poor/Failed Condition	% Pavements in Good Condition
Current Condition (2022)	-	65	At Risk	23.0%	55.1%
1. Existing Funding	$3.36	63	At Risk	21.0%	60.6%
2. Maintain PCI at 66	$3.76	65	At Risk	21.1%	66.0%
3. Best Management Practice	$8.54	87	Excellent	0.0%	100.0%

To bring the transportation network to a level where BMPs can occur would require more than twice the existing level of funding. For pavements, that would require $8.54 billion per year for 10 years. However, once this has been achieved, it would require only $3.28 billion annually to maintain the pavement network.

Essential components will require $22.6 billion to address the 10-year needs, and bridges will require $4.3 billion, for a total of $74.3 billion.

Appendix A

List of Fiscal Sponsors

FISCAL SPONSORS COUNTIES	
Alameda	Placer
Alpine	Plumas
Amador	Riverside
Butte	Sacramento
Calaveras	San Benito
Colusa	San Bernardino
Contra Costa	San Diego
Del Norte	San Francisco
El Dorado	San Joaquin
Fresno	San Luis Obispo
Glenn	San Mateo
Humboldt	Santa Barbara
Imperial	Santa Clara
Inyo	Santa Cruz
Kern	Shasta
Kings	Sierra
Lake	Siskiyou
Los Angeles	Solano
Madera	Sonoma
Marin	Stanislaus
Mariposa	Sutter
Mendocino	Tehama
Merced	Trinity
Modoc	Tulare
Mono	Tuolumne
Monterey	Ventura
Napa	Yolo
Nevada	Yuba
Orange	

FISCAL SPONSORS CITIES		
Agoura Hills	Calabasas	Davis
Alameda	Calexico	Del Mar
Albany	Calipatria	Del Rey Oaks
Alhambra	Calistoga	Delano
Aliso Viejo	Canyon Lake	Dinuba
Anderson	Capitola	Dorris
Antioch	Carlsbad	Downey
Arcadia	Carmel-by-the-Sea	Dublin
Arroyo Grande	Carson	Dunsmuir
Atascadero	Chico	El Centro
Atwater	Chino	El Cerrito
Auburn	Chino Hills	El Segundo
Avenal	Chowchilla	Elk Grove
Azusa	Citrus Heights	Escalon
Bakersfield	Clearlake	Eureka
Baldwin Park	Clovis	Fairfax
Banning	Coachella	Fairfield
Beaumont	Coalinga	Farmersville
Bell	Colfax	Fillmore
Bell Gardens	Colma	Folsom
Bellflower	Colton	Fontana
Belmont	Colusa	Fort Bragg
Belvedere	Commerce	Fountain Valley
Benicia	Compton	Fremont
Berkeley	Concord	Fresno
Beverly Hills	Corcoran	Galt
Big Bear Lake	Corning	Garden Grove
Bishop	Corona	Gardena
Blue Lake	Coronado	Gilroy
Blythe	Corte Madera	Glendale
Brea	Costa Mesa	Glendora
Brentwood	Cotati	Goleta
Brisbane	Covina	Gonzales
Buena Park	Culver City	Greenfield
Burbank	Dana Point	Gustine
Burlingame	Danville	Hanford

FISCAL SPONSORS CITIES		
Hayward	Larkspur	Morgan Hill
Healdsburg	Lathrop	Morro Bay
Hercules	Lemon Grove	Mountain View
Hermosa Beach	Lincoln	Mt. Shasta
Hesperia	Lindsay	Napa
Hidden Hills	Live Oak	National City
Highland	Livingston	Needles
Hillsborough	Lodi	Newark
Hollister	Lompoc	Newport Beach
Huntington Beach	Long Beach	Norwalk
Huntington Park	Loomis	Oakdale
Huron	Los Altos	Oakley
Imperial	Los Altos Hills	Ojai
Indian Wells	Los Banos	Ontario
Indio	Los Gatos	Orange Cove
Industry	Madera	Orinda
Inglewood	Manhattan Beach	Orland
Ione	Manteca	Oxnard
Irvine	Maricopa	Pacific Grove
Jackson	Marina	Pacifica
Kerman	Martinez	Palm Desert
King City	Maywood	Palm Springs
La Canada Flintridge	McFarland	Palmdale
La Mirada	Mendota	Palo Alto
La Palma	Menifee	Palos Verdes Estates
La Puente	Menlo Park	Patterson
La Quinta	Mill Valley	Perris
La Verne	Mission Viejo	Petaluma
Lafayette	Modesto	Piedmont
Laguna Beach	Montclair	Pinole
Laguna Hills	Monte Sereno	Pismo Beach
Lake Elsinore	Montebello	Pittsburg
Lake Forest	Monterey	Placerville
Lakeport	Moorpark	Pleasant Hill
Lakewood	Moraga	Plymouth
Lancaster	Moreno Valley	Pomona

FISCAL SPONSORS **CITIES**		
Port Hueneme	Sanger	Trinidad
Portola	Santa Ana	Truckee
Portola Valley	Santa Barbara	Tulare
Rancho Cordova	Santa Clarita	Tustin
Rancho Cucamonga	Santa Cruz	Twentynine Palms
Rancho Mirage	Santa Monica	Ukiah
Redding	Santa Rosa	Upland
Redondo Beach	Saratoga	Vacaville
Redwood City	Sausalito	Ventura
Richmond	Seal Beach	Victorville
Rio Dell	Seaside	Villa Park
Rio Vista	Selma	Visalia
Ripon	Shafter	Walnut
Riverside	Signal Hill	Walnut Creek
Rocklin	Simi Valley	Wasco
Rohnert Park	Solana Beach	Waterford
Rosemead	Soledad	Watsonville
Ross	Solvang	Weed
Sacramento	Sonoma	West Covina
Salinas	South Lake Tahoe	West Hollywood
San Anselmo	South Pasadena	West Sacramento
San Bruno	South San Francisco	Westlake Village
San Carlos	St. Helena	Westminster
San Dimas	Stockton	Wheatland
San Gabriel	Suisun City	Whittier
San Jacinto	Sunnyvale	Wildomar
San Juan Bautista	Susanville	Williams
San Juan Capistrano	Taft	Willows
San Leandro	Tehachapi	Winters
San Marcos	Temecula	Woodland
San Mateo	Temple City	Yountville
San Pablo	Thousand Oaks	Yuba City
San Rafael	Tiburon	Yucaipa
San Ramon	Torrance	Yucca Valley
Sand City	Tracy	

FISCAL SPONSORS REGIONAL TRANSPORTATION PLANNING AGENCIES (RTPA)	
Calaveras Council of Governments	Nevada Co. Transportation Commission
Council of San Benito Co. Governments	Placer Co. Transportation Planning Agency
Del Norte Local Transportation Commission	Plumas Co. Transportation Commission
El Dorado Co. Transportation Commission	Riverside Co. Transportation Commission
Fresno Council of Governments	Sacramento Area Council of Governments
Glenn Co. Transportation Commission	San Bernardino Associated Governments
Humboldt Co. Association of Governments	San Diego Association of Governments
Imperial Co. Transportation Commission	San Joaquin Council of Governments
Inyo Co. Local Transportation Commission	Santa Barbara Co. Association of Governments
Kern Council of Governments	Santa Cruz Co. Regional Transportation Commission
Kings Co. Association of Governments	Shasta Regional Transportation Agency
Lake Co./City Area Planning Council	Sierra Co. Transportation Commission
Los Angeles Co. Metropolitan Transportation Authority	Stanislaus Council of Governments
Madera Co. Transportation Commission	Tahoe Regional Planning Agency
Mendocino Council of Governments	Transportation Agency for Monterey Co.
Merced Co. Association of Governments	Trinity Co. Transportation Commission
Metropolitan Transportation Commission	Tulare Co. Association of Governments
Modoc Co. Transportation Commission	Tuolumne Co. Transportation Council
	Ventura Co. Transportation Commission

Appendix B

Data Collection

This appendix describes the data collection efforts for this update. The goal was to ensure participation by all 58 Counties and 481 Cities.

B.1 Outreach Efforts

As with the previous studies, significant efforts were made to reach all 539 agencies in March – June 2022. This included letters sent out by NCE on behalf of the League and CEAC/CSAC. The contact database had over 2,000 contacts for all the cities and counties. This was compiled from a variety of sources including contacts from the previous surveys in 2020, the memberships of both CSAC and the League, the email listserv for the Regional Transportation Agencies (RTPA) and NCE's client contacts.

The contacts included Public Works staff (Directors of Public Works, City Engineers or engineers responsible for pavement/asset management), Directors of Finance, City Managers, County Administrative Officers, RTPAs (Regional Transportation Planning Agencies), and MPOs (Metropolitan Planning Agencies).

Over 2,000 contact letters were mailed out in mid-March 2022 (see Exhibit B-1) with instructions on how to access the online survey and a fact sheet explaining the project. The deadline for responding to the survey was May 13th, 2022.

B.2 Project Website

The website at www.SaveCaliforniaStreets.org (see Figure B.1) was originally designed and developed for the 2020 study. This was subsequently modified to accommodate the 2022 survey. The intent of this website was to act as both an information resource and as a repository of related reports that might be of interest to cities and counties. More importantly, it was a portal to the online survey described in Section B.3. CSAC currently hosts the website.

B.3 Online Survey Questionnaire

A survey questionnaire was prepared and finalized in early March 2022, and a blank example is included in Exhibit B-1. Briefly, it included a request for the following information:

1) Contact name and information for both pavements and financial data
2) Streets and pavements data (including sustainable pavements and complete streets)
3) Essential components (safety, traffic, and regulatory) data
4) Regulatory requirements
5) Funding and expenditure data

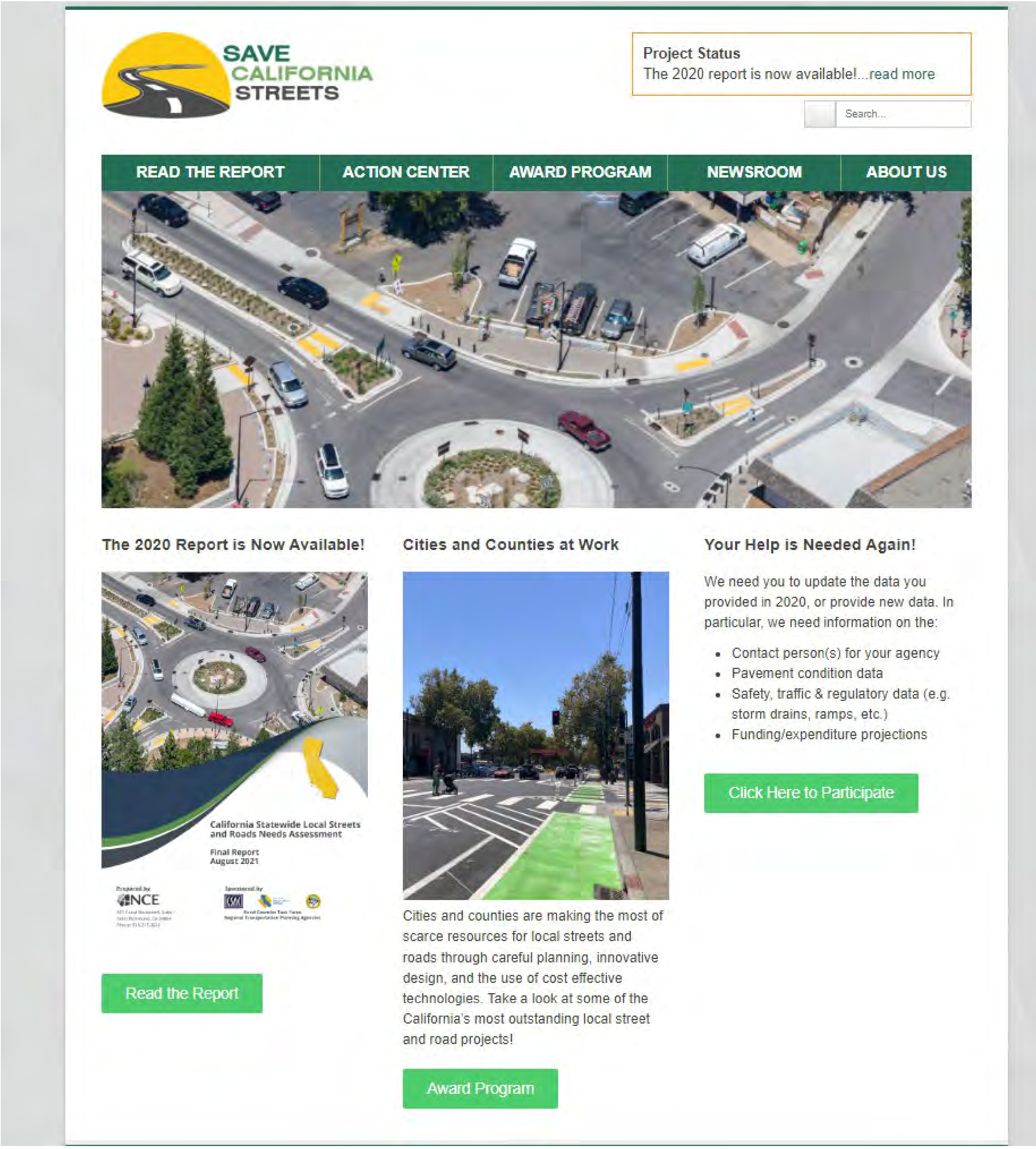


Figure B.1 Home Page of www.SaveCaliforniaStreets.org Website

Like the previous studies, no hardcopy surveys were available to the cities and counties, thus requiring all data entry to be made online. The online survey made data aggregation much simpler and faster. The custom database was updated for 2022.

Data from 99.9% of the state's local streets and roads are included in this study.

B.4 Results of Data Collection

A total of 379 agencies (70 percent) responded to the survey, which was a decrease from 426 agencies in 2020. This is still a respectable response considering that more than two thirds of agencies responded. Combined with agencies who responded in previous years, the responses represented 99.9 percent of the total centerline miles of local streets and roads in the state (see Figure B.2).

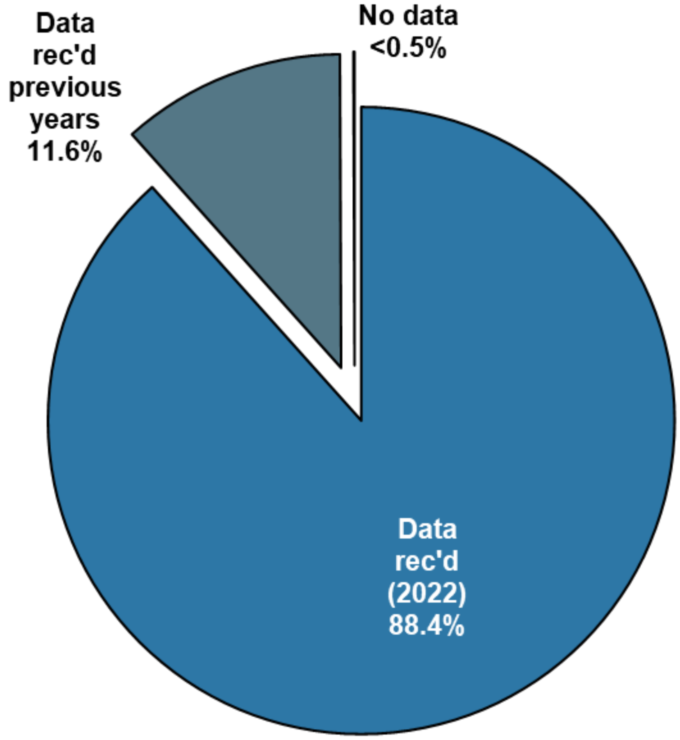


Figure B.2 Responses to Survey (% centerline miles)

Only four[1] agencies have not responded to this or any previous survey; all have less than 100 centerline miles, and all have populations less than 50,000.

[1] Cities of Orange Cove, Calipatria, and Sonora. The City of Rolling Hills is not included since they do have any publicly owned streets.

Table B.1 illustrates the survey responses by type of data. The pavement data continues to have the most responses (353), and overall, there is a decrease from 2020. Note that the cells with blanks indicated that those data elements were not requested during the applicable survey years.

Table B.1 Number of Agencies Responding by Data Type

Data Type	2008	2010	2012	2014	2016	2018	2020	2022
Pavement data	314	344	273	371	454	484	426	353
Unit costs	50	260	211	177	187	225	173	148
Sustainable practices	-	-	280	269	428	472	412	339
Complete streets	-	-	269	250	421	469	405	341
Safety, Traffic & Regulatory	188	296	159	152	197	239	121	122
Bridges	-	-	177	-	400	-	352	-
Additional Regulatory Requirements	-	-	220	199	382	427	355	72
Financial	137	300	238	276	340	415	338	270

B.4.1 Are Data Representative?

Throughout the data collection phase, it was important to ensure that the data received were representative in nature. This was critical for the analyses – as with the previous studies, the criterion used was network size.

The distribution of responses with respect to network size is shown in Figure B.3. Small agencies are those that have less than 100 centerline miles; medium between 101 to 300 miles, and large agencies have more than 300 miles. Figure B.3 shows all the agencies who responded in 2022 (blue), those who responded in previous surveys (green) and the ones who have never responded in red. Clearly, the bulk of the agencies who did not respond had less than 100 miles of pavement network (small cities), but we still had 257 responses in this category, so our confidence in the responses were validated.

An important point to note is that small agencies account for a very small percentage of the state's pavement network. There are 261 cities with less than 100 centerline miles of streets, and 162 cities with less than 50 centerline miles of streets. However, they comprise only 8.1 percent and 3.0 percent of the total miles in the state, respectively. Their impact on the statewide needs is consequently minimal.

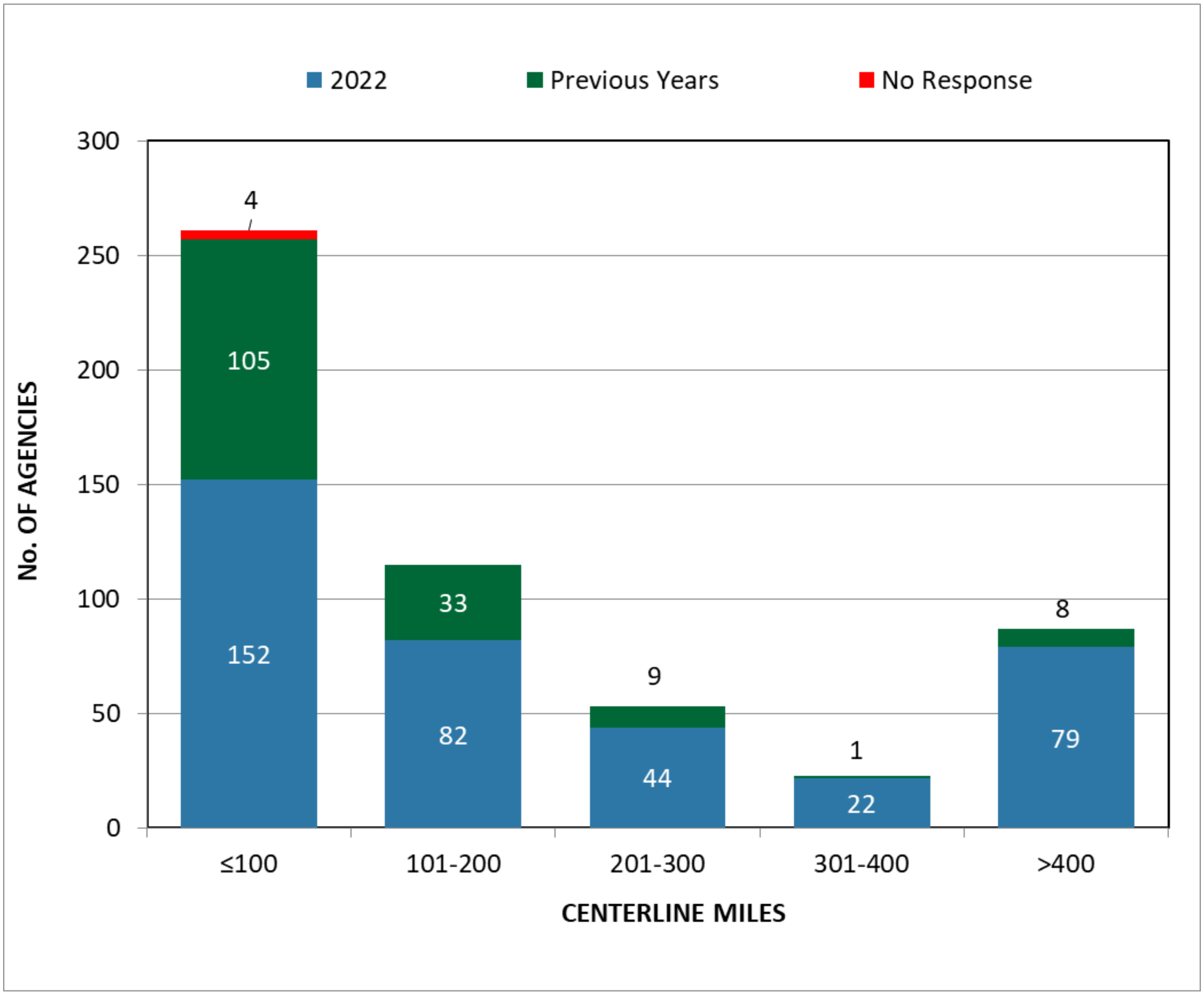


Figure B.3 Distribution of Agency Responses by Network Size (centerline miles)

B.4.2 PMS Software

The survey responses also indicated that 88 percent of the responding agencies had a pavement management system (PMS) in place (see Figure B.4). The StreetSaver® (58 percent) and PAVER (17 percent) software were the two main ones in the state. StreetSaver® was developed and supported by the Metropolitan Transportation Commission (MTC) and PAVER is supported by Colorado State University (CSU).

Due to the widespread use of a PMS, the quality of the pavement data received contributed immensely to the validity of this study's results.

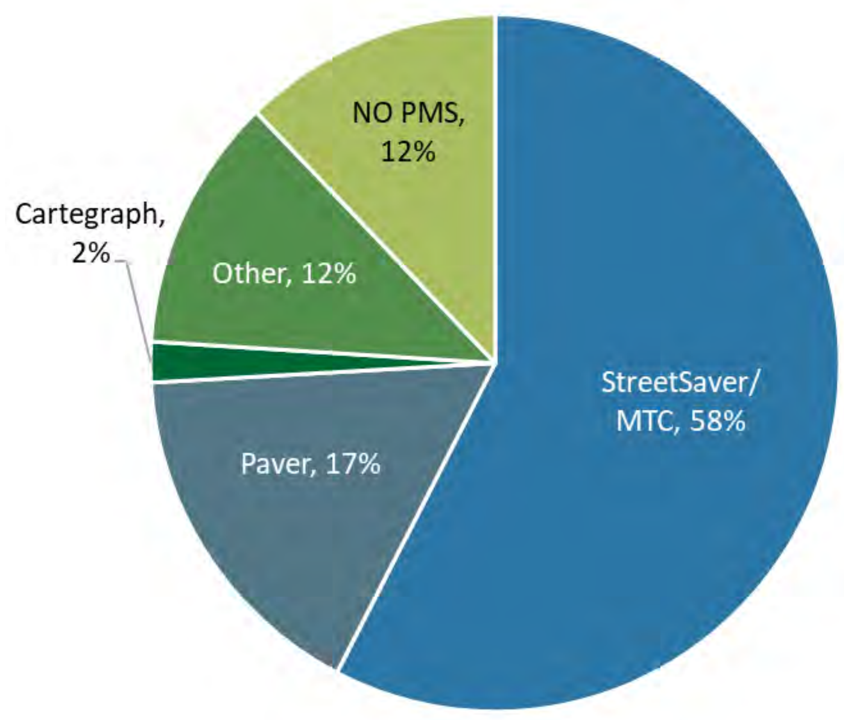


Figure B.4 PMS Software Used By Cities And Counties

What is more important is that approximately 98 percent of the total miles owned by cities and counties are included in a pavement management system, which lead to a high confidence in the data submitted.

B.5 Summary

Overall, the number and quality of the survey responses received met the needs of this study. To obtain data on more than 98 percent of the state's local streets and roads network was a remarkable achievement. That most agencies had a pavement management system in place removed many obstacles in the technical analyses. In particular, the consistency in the pavement conditions reported contributed enormously to the validity of the study.

Exhibit B-1

Contact Letter, Instructions for Online Survey, Fact Sheet & Survey Questionnaire

March 14, 2022

TO CALIFORNIA CITIES & COUNTIES

SUBJECT: 2022 CALIFORNIA STATEWIDE LOCAL STREETS AND ROADS NEEDS ASSESSMENT

Dear Madam/Sir:

Your help in responding to previous surveys made a difference! Due to your efforts to provide timely and accurate data on the condition of your local roads, our Statewide Needs Assessment has provided definitive information needed to increase and protect funding for our local transportation network. Data from the 2020 report has already been vital to current efforts by CSAC and Cal Cities to secure a fair share of the funding available to California from the federal Infrastructure Investment and Jobs Act for local government roads and bridges. An example of this is the on-going negotiations with Caltrans on the share of Highway Bridge Program (HBP) between Cities, Counties and Caltrans. The bridge needs assessment showed that 15% of the local bridges are in poor condition while Caltrans has 3.6% of their bridges and culverts in poor condition.

Since 2008, the California Statewide Local Streets and Roads Needs Assessment Report has been invaluable to the California State Association of Counties (CSAC) and the League of California Cities (Cal Cities) on numerous transportation efforts at both the state and federal level. We have used the findings to educate elected officials, policy- and decision-makers, and the public about the condition of the local transportation network and the funding needed to bring the system into a state of good repair. CSAC and Cal Cities have also used the findings to advocate for additional funding such as SB1 and to deter negative policies and budget decisions. The 2020 report is available at www.SaveCaliforniaStreets.org.

In 2022, there is one main objective; to show the public the positive impacts of SB1 and that the money has been spent cost-effectively for maintenance of our local streets and roads. The impacts of COVID in 2020-21 blunted some of the expected impacts due to delays or deferrals in paving.

As in the past, this project is being funded through contributions from stakeholders. Regional Transportation Planning Agencies (RTPAs), cities and counties have each contributed approximately one-third of the total costs to fund the 2020 and 2022 editions of this study. It is essential that each agency contribute toward this study in order to demonstrate how critical this issue is to sustaining our state's transportation infrastructure.

An ongoing effort is needed to update the local streets and roads needs on a regular, consistent basis, much like the State does in preparing the State Highway Operation and Protection Program (SHOPP). Our consultant, NCE, will assist us in performing the 2022 update of the Statewide Needs Assessment.

YOU CAN CONTINUE TO MAKE A DIFFERENCE!

We need your immediate assistance on the following items:

1. To ensure a widespread dissemination of this request, this letter has been sent to the Public Works Director, City/County Engineer, and Finance Director. We recognize that the data may come from multiple sources, so we ask your agency to coordinate among yourselves to ensure

that the most recent and accurate information is entered. Please provide NCE with your agency's contact information if you are not the appropriate contact. This person(s) should be able to provide all the information requested in the survey. We need information on two main areas:

a. Technical – pavement, safety, regulatory and traffic needs.
b. Financial – projected funding revenues/expenditures.

2. Fill out the online survey at www.SaveCaliforniaStreets.org. Instructions for filling out the survey are enclosed. Your agency's verification code is shown below.

It is essential that we have this data no later than **May 13th, 2022 in order to complete the 2022 Local Streets and Roads Needs Assessment on time**. Should you have any questions, please do not hesitate to contact:

Ms. Margot Yapp, P.E.
Project Manager
NCE
501 Canal Blvd, Suite I
Pt. Richmond, CA 94804
(510) 215-3620
myapp@ncenet.com

City/County Name & Verification Code

We appreciate your help in providing this information.

Sincerely,

Howard N. Dashiell

Jason Nutt
President, Public Works Officers Department
League of California Cities
Assistant City Manager & Director of Transportation
City of Santa Rosa

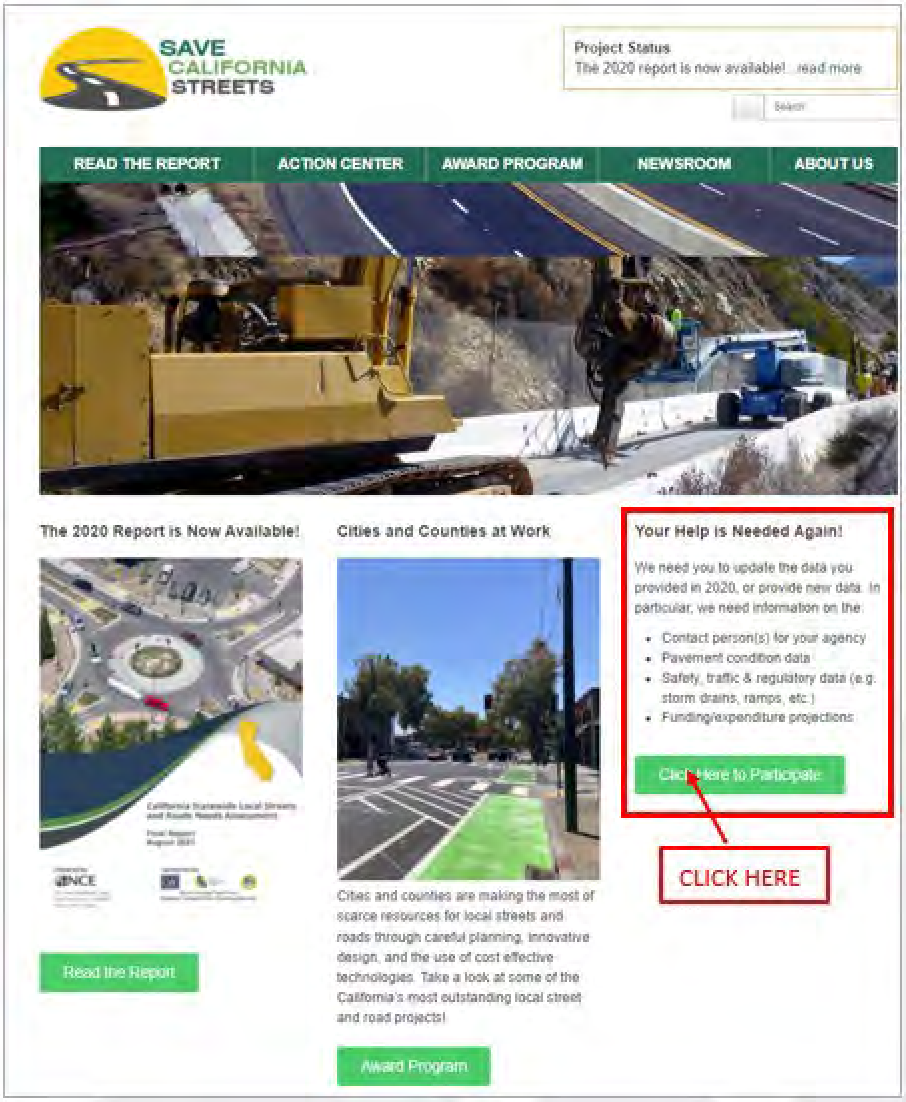
Howard Dashiell, President
County Engineers Association of California
Department of Transportation, Director
County of Mendocino

Enclosures: Instructions for Online Survey

Collaboration. Commitment. Confidence.™

Instructions for Online Survey

Step 1. Go to http://www.savecaliforniastreets.org. Click on the button that says "Click here to participate".



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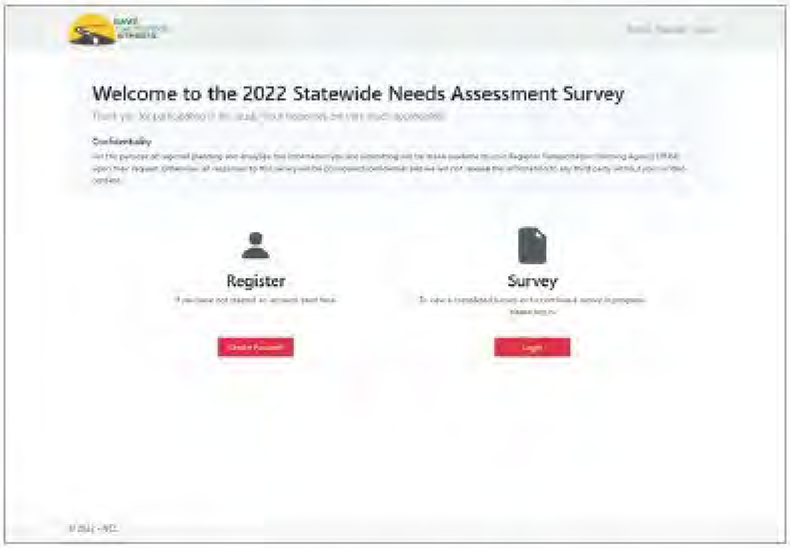
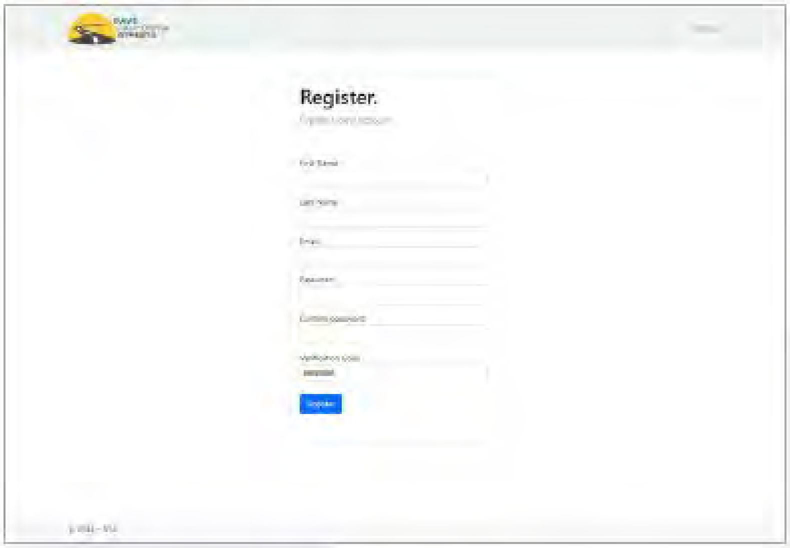
Step 2. Create a user account by selecting "Create Account". If you already have an account created, select "Login" to access the survey.



Step 3. To register: enter your First Name, Last Name, and Email address; create and confirm your preferred password based on the password requirements; then enter your agency's Verification Code which is printed on the cover letter. If you do not have this information, please contact Lydia Alderete at (510) 215-3620 or at lalderete@ncenet.com.



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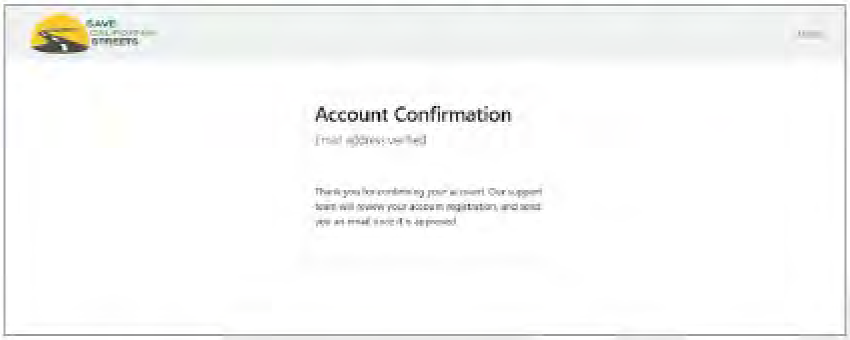
Step 4. Once the information is entered into the required fields, select "Register".

Step 5. You will be taken to a confirmation page that will instruct you to verify your email address. An email will be sent to the registered address that will contain a verification link. Select the link to verify your email address.

Step 6. When the link is selected, an Account Confirmation page will appear in your default browser confirming that your email is now verified. Once your email is verified, the support team will then need to review the account registration.



Step 7. After the registration is reviewed and approved, an approval email will be sent confirming your account registration and activation.

Step 8. Once you receive the approval email, you can then go back to the Survey login site by selecting the link in the approval email and logging into your account.

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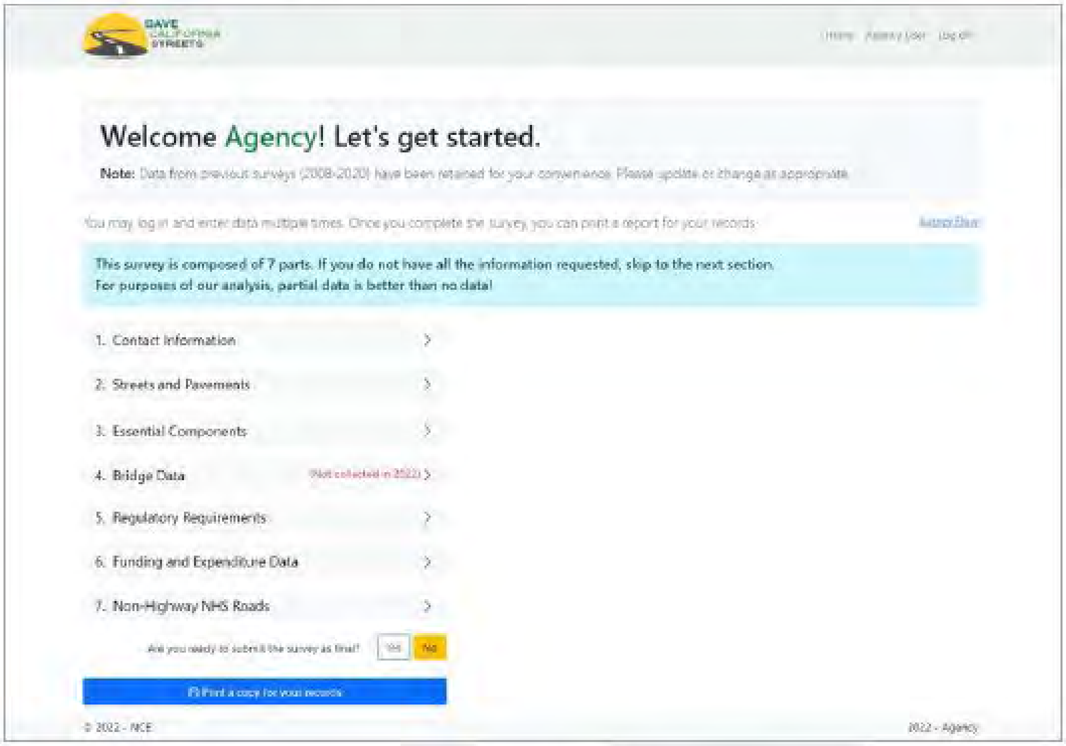
Step 9. There are seven (7) parts in this survey (see image below). Select each option to enter the relevant information. <u>If you do not have all the information requested, skip to the next section.</u>



Step 10. Once data entry is complete, you can view and print your entry by clicking on the "Print a copy for your records" button. If there are no more changes, select "Yes" on the "are you ready to submit the survey as final?" question.

Step 11. Click the "Logout" button when done.

THANK YOU FOR YOUR PARTICIPATION!

California Statewide Local Streets & Roads Needs Assessment 2021
www.SaveCaliforniaStreets.org

FACT SHEET

Background

The local street, road, and bridge system holds California's entire transportation network together. From the moment we open our front door and drive to work, bike to school, or walk to the bus stop, we depend on safe, reliable roads, bridges, and essential street components. Police, fire, and emergency medical services need safe, reliable roads to react quickly to calls – delay can be a matter of life and death. Further, California's economy relies upon an efficient, multi-modal transportation network to safely move people and goods.

Local streets and roads make up over 85% of the roadway network in California. There are 12,339 local bridges, making up 48% of all the bridges in California. Conservatively, this network is valued at over $220 billion. Nearly all public and active transportation modes, including buses, bicycles, and walking, require access to the local system.

Problem

For decades, transportation funding needs have far outpaced available revenues. This is not only a problem in California– it's a national crisis. At the federal level, gasoline taxes have not kept pace with inflation and rising construction costs. Until recently, the same was true for the state's gasoline taxes. This is coupled with the trend towards more fuel efficient and electric vehicles. These vehicles provide important environmental benefits, but until 2017, dedicated state road maintenance funding relied almost exclusively on fuel taxes.

Aging infrastructure, rising construction costs, and new regulatory requirements have all contributed to a significant funding shortfall. Other factors, such as heavier vehicles, increasing traffic, and the need to accommodate transit, bicyclists, and pedestrians, have put increased demands on the transportation infrastructure.

California Takes Action

In April 2017, the California State Legislature and Governor Jerry Brown heeded the call and reached agreement on a robust, bipartisan, long-term, and multi-modal transportation funding solution to help close the funding gap and repair and improve the state's transportation system. Senate Bill (SB) 1 – the Road Repair and Accountability Act of 2017 – generates over $5 billion annually for state highways and bridges, local streets and roads, transit systems, active transportation, and key freight and trade corridors.

Cities and counties receive an average of $1.5 billion in flexible funding annually; this means $15 billion over the next 10 years in additional revenue for local agencies to maintain and repair streets and roads, rehabilitate or replace aging bridges, and address safety issues.

Purpose

The 2020 Report is a comprehensive statewide assessment of the local road and bridge network. The purpose is to inform the public and policymakers at all levels of government about the infrastructure investments needed to provide California with a seamless, safe, and efficient multi-modal transportation system.

To download the report, visit: www.SaveCaliforniaStreets.org

California Statewide Local Streets & Roads Needs Assessment 2021

www.SaveCaliforniaStreets.org

FACT SHEET

Findings

The most significant finding of the 2020 Report is that SB 1 has accomplished its first goal: it has arrested the historical deterioration of the local transportation network. The average condition of local pavements statewide has improved slightly from 65 to 66, as measured according to the Pavement Condition Index (a scale of zero [failed] to 100 [excellent]). SB 1 has also enabled cities and counties to make life-saving safety improvements; expand pedestrian, bicycle, and transit access and safety; and reduce the overall maintenance funding shortfall.

Despite the significant increase in flexible local road maintenance funding from SB 1, dedicated funding for local bridge rehabilitation and replacement projects in California has been flat since 2009. California's local bridges are deteriorating rapidly, with 4,401 bridges in need of repair and 451 in need of replacement. Almost a fifth of these bridges are over 80 years old. At current funding levels, local bridges will need to be in service for more than 200 years, or 3 times their intended lifespan.

Finally, while the initial increase in statewide PCI is promising and provides evidence that local agencies are prioritizing fix-it-first investments with new SB 1 funding, the longer-term picture is less clear. The 2020 Report estimates the needs of the local transportation infrastructure at $118.7 billion over the next 10 years. With SB 1, the available funding is $54.7 billion, resulting in a shortfall of $64 billion. Uncertainty surrounding the attempt to repeal SB 1 in late 2018 may have affected the industry response to the increased availability of funding. Based on projects completed in the 2020 fiscal year, local agencies reported significantly higher bid prices in the 2020 survey than in prior years.

Finally, the COVID-19 pandemic resulted in significant transportation revenue reductions for cities and counties in 2020 and 2021. The pandemic also undoubtedly had impacts on bid prices and project delivery at the local level. These impacts, as well as the ongoing effect of additional funding from SB 1, will be further analyzed in the 2022 Report.

Recommendations

First, the state and local agencies must maintain all existing sources of revenue, with a primary focus on fix-it-first investments to preserve the existing road network. Once the system is in a state of good repair, the need for maintenance will be reduced.

Second, the state and local agencies must identify and pursue opportunities, including increased federal infrastructure funding, to bolster investment in the rehabilitation and replacement of California's locally owned bridges. Many of these projects are too costly for local agencies to fund on their own, but the benefits of safe and well-maintained bridges warrant dedicated statewide funding.

Who should I contact for more information?

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Damon Conklin, Legislative Representative
League of California Cities
dconklin@calcities.org

To download the report, visit: www.SaveCaliforniaStreets.org

Statewide Needs Assessment Survey
2022

1. Contact Information

Main Contact Person

Full Name	Job Title	Email	
Department		Phone	
Address 1	Address 2	City	Zip

Alternative Contact Person

Full Name	Job Title	Email	
Department		Phone	
Address 1	Address 2	City	Zip

Contact Person for Financial Data

Full Name	Job Title	Email	
Department		Phone	
Address 1	Address 2	City	Zip

Alternative Contact Person for Financial Data

Full Name	Job Title	Email	
Department		Phone	
Address 1	Address 2	City	Zip

2. Streets and Pavements

2.1 Pavement Management System and Pavement Distress Survey Procedures

1. Does your agency use Pavement Management System (PMS) software?

1a
PMS Software

1b
PMS Software Other

2. What pavement distresses do you collect for Asphalt Concrete (AC)? If you collect distresses that are not listed below, please enter in the "Other AC Distresses" box.

- ☐ Alligator Cracking
- ☐ Distortions
- ☐ Patch & Util. Cut Patch
- ☐ Weathering & Raveling
- ☐ Block Cracking
- ☐ Long. & Trans. Cracking
- ☐ Rutting/Depression

Other AC distresses your agency collects, if any:

3. Does your agency have Portland Cement Concrete (PCC) pavements?

What pavement distresses do you collect for PCC?

- ☐ Corner Break
- ☐ Faulting
- ☐ Patching & Utility Cuts
- ☐ Spalling
- ☐ Divided Slab
- ☐ Linear Cracking
- ☐ Scaling/Map Cracking/Crazing

Other PCC distresses your agency collects, not listed above.

4. What other condition data do you collect?

Deflection N/A
Ride Quality N/A
Friction N/A
Drainage N/A
Structure/Cores N/A
Complaints N/A
Pavement Age N/A

Other condition data your agency collects, if any:

5. What is the scale of the pavement condition index/rating used (e.g. 0-100, A-F)?

Lowest possible rating (e.g. 0):   Highest possible rating(e.g. 100):

6. How much will you require annually to maintain existing conditions (e.g. if your current PCI is 70, indicate the annual funding required to maintain the pavement network at 70.)

7. Any notes you would like to add regarding your pavement distress survey procedures (e.g. collected by consultant, in-house, frequency of collection, etc.), or any comments/notes you have regarding any portion of this survey/your data

8. Are larger/heavier vehicles (e.g. buses, refuse/recycling trucks, snow removal vehicles, etc) impacting pavement performance or your maintenance practices? If so, please explain the type of vehicles and how they impact performance:

2. Streets and Pavements

2.2 Sustainable Pavement Practices

1. What sustainable pavement practices does your agency utilize?

Sustainable Pavement Practice	Does your agency Utilitze?	Unit Cost ($/sq)	Additional Costs or Savings	Percentage of Additional Costs or Savings
Use of reclaimed Asphalt Pavement (RAP in pavements				
Cold In-place Recycling (CIR)				
Hot In-place Recycling (HIPR)				
Cold Central Plant Recycling				
Warm Mix Asphalt				
Permeable/Porous Pavements				
Full Depth Reclamation (FDR)				
Subgrade Stabilization				
Rubberized Asphalt Concrete (RAC)				
Pavement Preservation Stategies e.g. chip seals, fog seals, microsurfacting, cape seals				
Other (please explain below)				

2. Will you continue applying sustainable pavement practices?

3. If you do not employ sustainable practices, please indicate the reason(s) why (check all that apply):

- ☐ High Construction cost
- ☐ Lack of knowledge
- ☐ No local contractors
- ☐ No street/road candidates
- ☐ Other (please explain below)

4. Other comments regarding sustainable pavement practices:

2. Streets and Pavements

2.3 Inventory and Condition Information

Funcitonal Class	Year of last Inspection	Current Pavement Condition Rating (Weigthed Average)	Centerline Miles	Lane Miles *	Area ** (sq. yd.)	PCC (as % of the area
Urban Major Roads						
Urban Residential/Local Roads						
Rural Major Roads						
Rural Residential/Local Roads						
Unpaved Roads						0.00%

* Lanes are defined as travel lanes only; ** Areas should include parking lanes, cul-de-sacs, turn pockets, etc.

2. Streets and Pavements

2.4 Pavement Treatment Policy and Unit Costs

2.4.1 Pavement Treatment for Urban Major Roads

Pavement Treatment	PCI Range	Average Unit Cost ($/sq.yd.)
Do Nothing	90 - 100	$0.00
Preventive Maintenance (e.g. slurry, chip seal, cape seal)	70 - 89	
Thin overlay (e.g. less than or equal to 2 inches)	50 - 69	
Thick overlay (e.g. more than 2 inches)	25 - 49	
Reconstruction (e.g. remove & replace)	0 - 24	

2.4.2 Pavement Treatment for Urban Residential/Local Roads

Pavement Treatment	PCI Range	Average Unit Cost ($/sq.yd.)
Do Nothing	90 - 100	$0.00
Preventive Maintenance (e.g. slurry, chip seal, cape seal)	70 - 89	
Thin overlay (e.g. less than or equal to 2 inches)	50 - 69	
Thick overlay (e.g. more than 2 inches)	25 - 49	
Reconstruction (e.g. remove & replace)	0 - 24	

2.4.3 Pavement Treatment for Rural Major Roads

Pavement Treatment	PCI Range	Average Unit Cost ($/sq.yd.)
Do Nothing	90 - 100	$0.00
Preventive Maintenance (e.g. slurry, chip seal, cape seal)	70 - 89	
Thin overlay (e.g. less than or equal to 2 inches)	50 - 69	
Thick overlay (e.g. more than 2 inches)	25 - 49	
Reconstruction (e.g. remove & replace)	0 - 24	

2.4.4 Pavement Treatment for Rural Residential/Local Roads

Pavement Treatment	PCI Range	Average Unit Cost ($/sq.yd.)
Do Nothing	90 - 100	$0.00
Preventive Maintenance (e.g. slurry, chip seal, cape seal)	70 - 89	
Thin overlay (e.g. less than or equal to 2 inches)	50 - 69	
Thick overlay (e.g. more than 2 inches)	25 - 49	
Reconstruction (e.g. remove & replace)	0 - 24	

2.4.5 Pavement Treatment for Unpaved/Gravel Roads

How much annually does your agency spend to maintain unpaved roads?

/mile

2. Streets and Pavements

2.5 Complete Streets and Active Transportation Program(ATP)

2.5.1 Complete Streets Policy

1. Has your agency adopted a "Complete Streets Policy"?

If your answer is "No" or "Don't know", skip this section. Please explain below why not if known.

2. What complete streets elements are included or assumed in the policy? (Check all that apply):

- ☐ Bicycle facilities
- ☐ Pedestrian facilities
- ☐ Green infrastructure e.g. bioswales, planters, pervious strip
- ☐ Medians
- ☐ Lighting
- ☐ Roundabouts
- ☐ Traffic Calming e.g. reducing lane widths
- ☐ Signs
- ☐ Curb Ramps
- ☐ Transit elements

Comments/Additional items:

3. Do you have other plans that incorporate these elements even if you do not have a Complete Streets policy?

4. What percentage of roads will have Complete Streets elements? (e.g. enter 10 for 10%)

5. What is the estimated average incremental costs to provide Complete Street enhancements ($/sq. yd) i.e. in addition to conventional costs?

6. Do you have a representative project that included Complete Streeets elements that was recently constructed? If yes, please provide a brief description.

7. Do you anticipate more of these projects in the future? If so, approximately how many?

8. What are the major challenges you face in implementing a Complete Streets Policy? (Check all that apply):

- ☐ Insufficient right-of-way
- ☐ Trees/environmental features
- ☐ Existing structures
- ☐ Insufficient funding
- ☐ Other (please explain below:)

9. Other comments or notes you would like to add regarding Complete Streets:

2. Streets and Pavements

2.5.2 Active Transportation - Bicycles

1. Has your agency adoped a Bicycle master plan?

If your answer is "No" or "Don't know", skip this section. Please explain below why not if known.

2. Please fill out the information below to the best of your abilities.

Category	Current Facilities: Inventory (Quantity)	Unit	Total Replacement Cost	Accuracy	Planned Facilities: Inventory (Quantity)	Unit	Estimated Construction Cost	Accuracy
Class I bicycle path		mile				mile		
Class II bicycle lane		mile				mile		
Class III bicycle routes/sharrow		mile				mile		
Class IV protected bike lanes		mile				mile		
Other bicycle facilities, e.g. bike shelters/lockers, etc.		ea				ea		

3. What is the time frame for construction of planned facilities?

4. Are there other planned projects not in the Master Plan?

If so, estimate their construction cost & timeframe for construction.

$ Estimate total: *Time Frame:*

2.5.3 Active Transportation - Pedestrians

1. Has your agency adoped a Pedestrian master plan?

If your answer is "No" or "Don't know", skip this section. Please explain below why not if known.

2. Please fill out the information below to the best of your abilities.

Category	Current Facilities: Inventory (Quantity)	Unit	Total Replacement Cost	Accuracy	Planned Facilities: Inventory (Quantity)	Unit	Estimated Construction Cost	Accuracy
Pedestrian facilities (sidewalks)		mile				mile		
Pedestrian paths		mile				mile		
Multi-use paths		mile				mile		
Other pedestrian facilities, e.g. over-crossings		ea				ea		

3. What is the time frame for construction of planned facilities?

4. Are there other planned projects not in the Master Plan?

If so, estimate their construction cost & timeframe for construction.

$ Estimate total: *Time Frame:*

2022 - Printed: 3/17/2022

2. Streets and Pavements

2.6 SB1 (RMRA)

1. How is your agency spending SB1 funds?

Road preventive maintenance e.g. seals
Road rehabilitation e.g. overlays
Safety projects
Railroad grade separations
Complete street components
Traffic control devices
Match for state/federal funds for eligible projects
Other

2. Is SB1 funding sufficient to maintain or improve pavement conditions?

No

If no, please indicate annual funding shortfall

3. Has SB1 changed your approach to preventive maintenance?

No

Please explain:

4. Do you prioritize preventive maintenace needs over rehabilitation?

No

Please explain:

3. Essential Components (as related to the road network)

Category	Inventory (Quantity)	Unit	Total Replacement Cost	Accuracy
05 - Storm Drains - pipelines		mile		
19 - Other elements e.g. manholes, inlets, culverts, pump stations etc		ea		
01 - Curb and gutter		ft		
02 - Curb ramps		ea		
07 - Traffic signals		ea		
06 - Street Lights		ea		
04 - Sound Walls/Retaining walls		sq. ft.		
08 - Traffic signs		ea		
21 - Tunnels		ft		
20 - Other physical assets or expenditures that constitute >5% of total non-pavement asset costs e.g. heavy equipment, corporation yards etc. Note: Do NOT include bridges (handled separately)		ea		
17 - Crossing Improvements e.g. high visibility crossings, rapid flashing beacons, roundabouts, scrambles, bulbouts, pedestrian refuge islands, etc.		ea		
18 - Transit amenities e.g. benches, shelters, real-time arrival signage, wayfinding signage		ea		

If you are not responding to this section, please indicate the reasons why. (choose all that apply)

- ☐ Don't have data
- ☐ Other
- ☐ Don't have time/staff

5. Regulatory Requirements

Does your agency have regulatory requirements such as Americans with Disabilities Act (ADA), National Pollutant Discharge Elimination System (NPDES) requirements or Traffic Sign Retroreflectivity?

May we contact you if we have follow-up questions?

Additional comments regarding "Regulatory Requirements":

Regulatory Requirements	Do you track costs separately?	Estimated 10-Year Needs ($)	Estimated 10-Year Expenditures ($)	Accuracy
ADA				
NPDES				
Traffic Sign Retroreflectivity				

6. Funding and Expenditure Data

6.1 Actual/Estimated Revenues for Pavement-Related Activities

Funding Source	Type	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Missing Funding Source				

**Funding Source not in list*

6.2 Actual/Estimated Revenues for Essential Components

Funding Source	Type	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Missing Funding Source				

**Funding Source not in list*

6.3 Actual/Estimated Expenditures on Pavement-Related Activities

Expenditure Category	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Preventive Maintenance e.g. crack seals, slurry seals etc			
Rehabilitation & reconstruction e.g. overlays			
Other (pavement related)			
Other Operations & Maintenance (non-pavement related e.g. vegetation, cleaning ditches, sweeping, markings, signs, etc.)			

Of the totals reported above, what percentages will be spent on "Sustainable Pavement Practices", "Complete streets Components" and "Regulatory Requirements"?

Category	% of Amount (FY 20/21) Total	% of Amount (FY 21/22) Total	Estimated % of Annual Average (FY 22/23 to 31/32) Total
Sustainable Pavement Practices			
Complete Streets Components			
Additional Regulatory Requirements			

6. Funding and Expenditure Data

6.4 Actual/Estimated Expenditures on Safety, Traffic and Regulatory Components

6.4.1 Expenditures on Complete Streets

Expenditure Category	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Curb and gutter			
Curb ramps			
Sound Walls/Retaining walls			
Storm Drains - pipelines			
Street Lights			
Traffic signals			
Traffic signs			
Crossing Improvements e.g. high visibility crossings, rapid flashing beacons, roundabouts, scrambles, bulbouts, pedestrian refuge islands, etc.			
Transit amenities e.g. benches, shelters, real-time arrival signage, wayfinding signage			
Other elements e.g. manholes, inlets, culverts, pump stations etc			
Other physical assets or expenditures that constitute >5% of total non-pavement asset costs e.g. heavy equipment, corporation yards etc. Note: Do NOT include bridges (handled separately)			
Tunnels			

Of the above total expenditures, what percentages are due to "Complete Streets Components"?

Category	% of Amount (FY 20/21) Total	% of Amount (FY 21/22) Total	Estimated % of Annual Average (FY 22/23 to 31/32) Total
Complete Streets Components			

6.4.2 Expenditures on Bicycle Facilities

Expenditure Category	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Class I bicycle path			
Class II bicycle lane			
Class III bicycle routes/sharrow			
Class IV protected bike lanes			
Other bicycle facilities, e.g. bike shelters/lockers, etc.			

6.4.3 Expenditures on Pedestrian Facilities

Expenditure Category	Amount (FY 20/21)	Amount (FY 21/22)	Estimated Annual Average (FY 22/23 to 31/32)
Pedestrian facilities (sidewalks)			
Pedestrian paths			
Multi-use paths			
Other pedestrian facilities, e.g. over-crossings			

6. Funding and Expenditure Data

6.5 Financial Questions

1. What innovative methods is your agency doing to "stretch" the dollar? e. g. new technologies, use of recycling techniques, partnering with other agencies for lower bids, preventive maintenance, etc.

2. Are there new revenues sources that your agency is considering?

3. Is there a city/county wide sales tax solely for transportation?

4. Is there a city/county wide sales tax that is partially used for transportation?

5. If you answered "Yes" above, please describe how it is used. (e.g. local match for highways, local streets & roads only, transit, etc).

7. Non-Highway NHS Roads

1. For the roads/streets that are included in the National Highway System (NHS), do you collect the following information as per the proposed rule from FHWA?

☐ 1) International Roughness Index (IRI) ☐ 3) Rutting
☐ 2) Percent cracking (as measured by the HPMS) ☐ 4) Faulting

2. If you currently do not collect the above information, how will you plan on collecting it? e.g. in-house staff, consultant, Caltrans, etc.

3. If known, please estimate the cost for data collection for roads/streets in the NHS.

4. ☐ Do you allocate any money for NHS roads? If so, how much money per year do you allocate ?

Street	From	To	Length (ft)	Width (ft)	Area (sf)	Speed Limit	IRI	PSR	Cracking	PCI	Surface Type	Rutting (in)	Faulting (in)

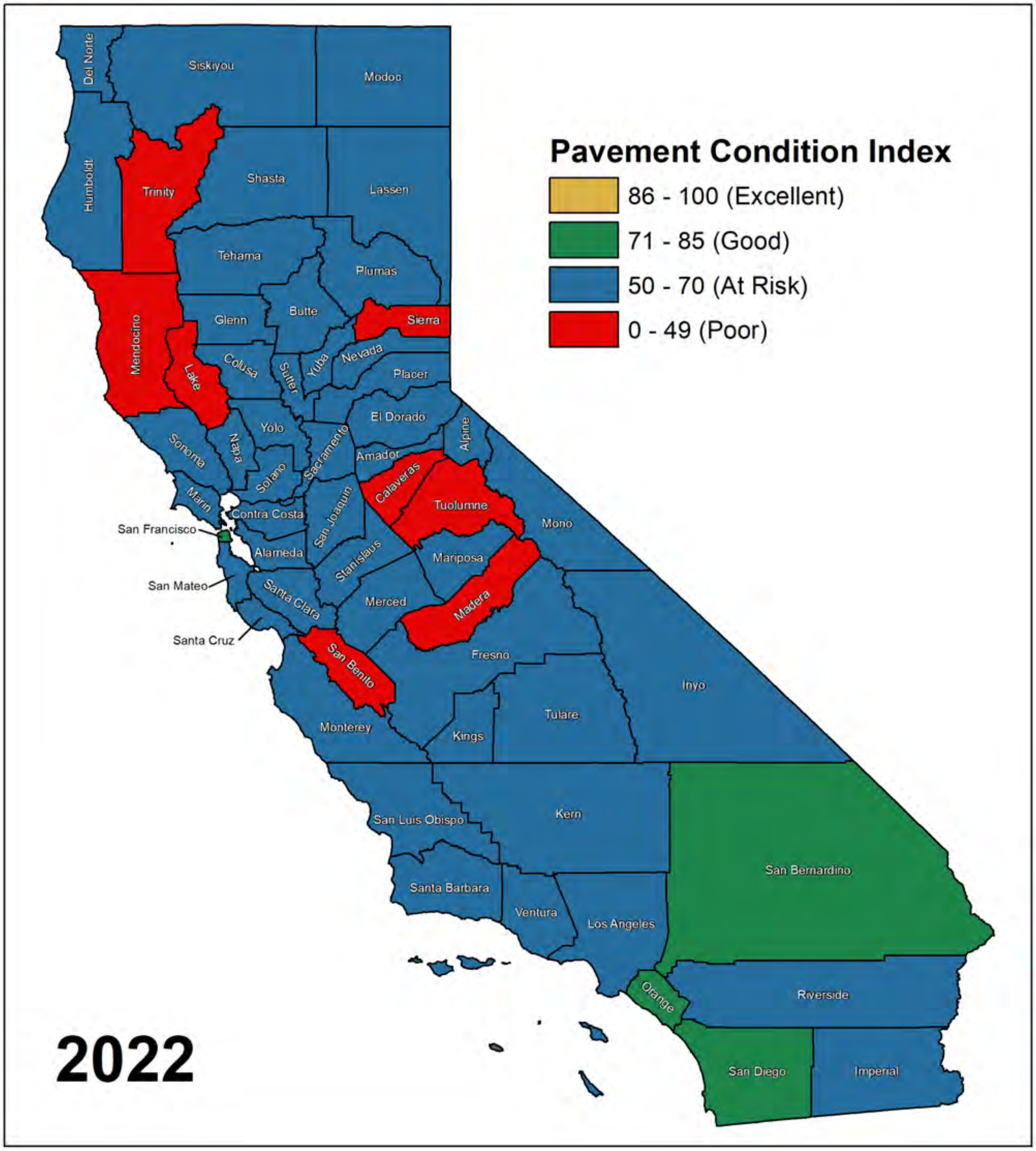
Pavement Condition* & Needs by County

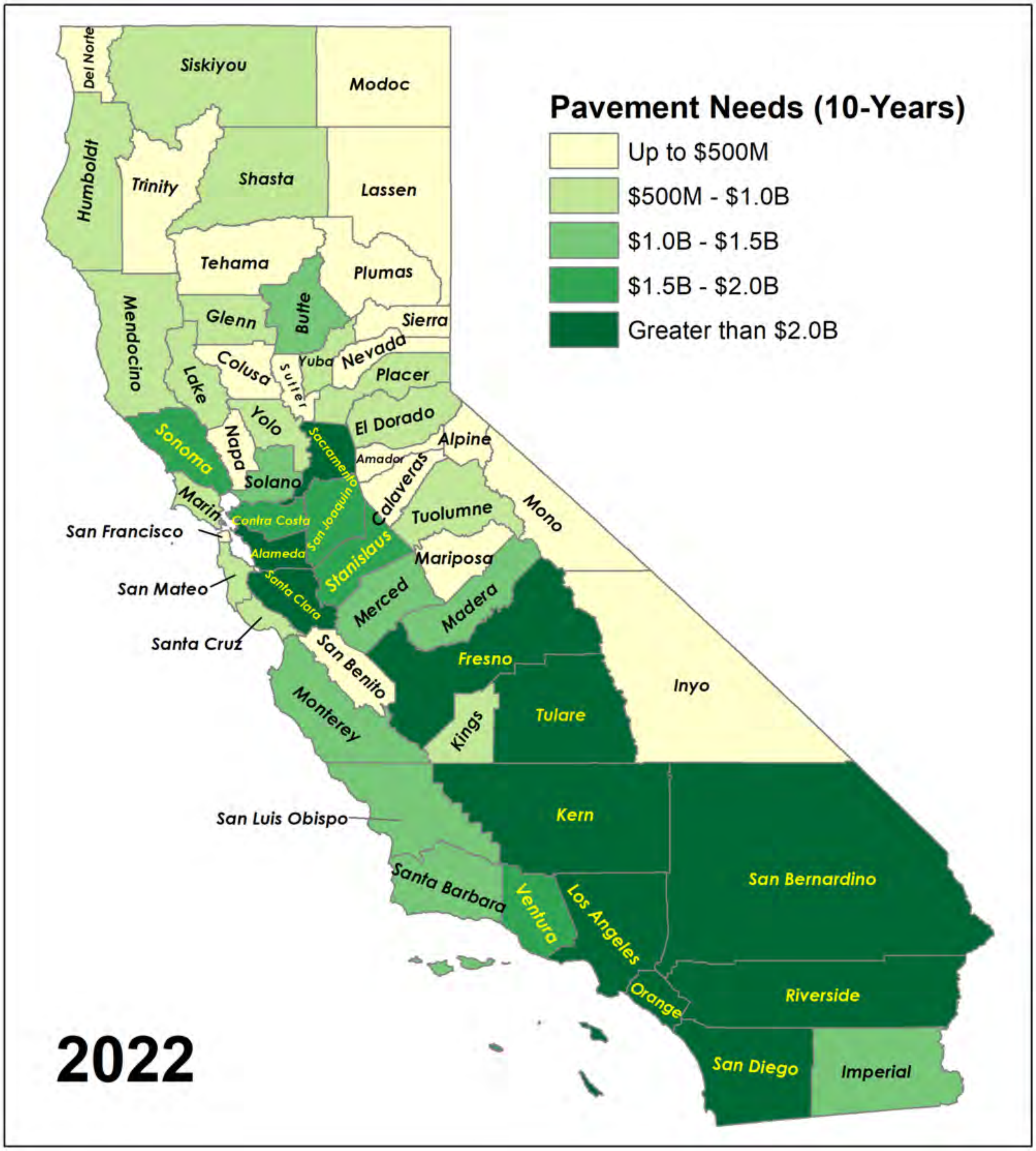
*Pavement condition data for the MTC region provided by MTC in 2022

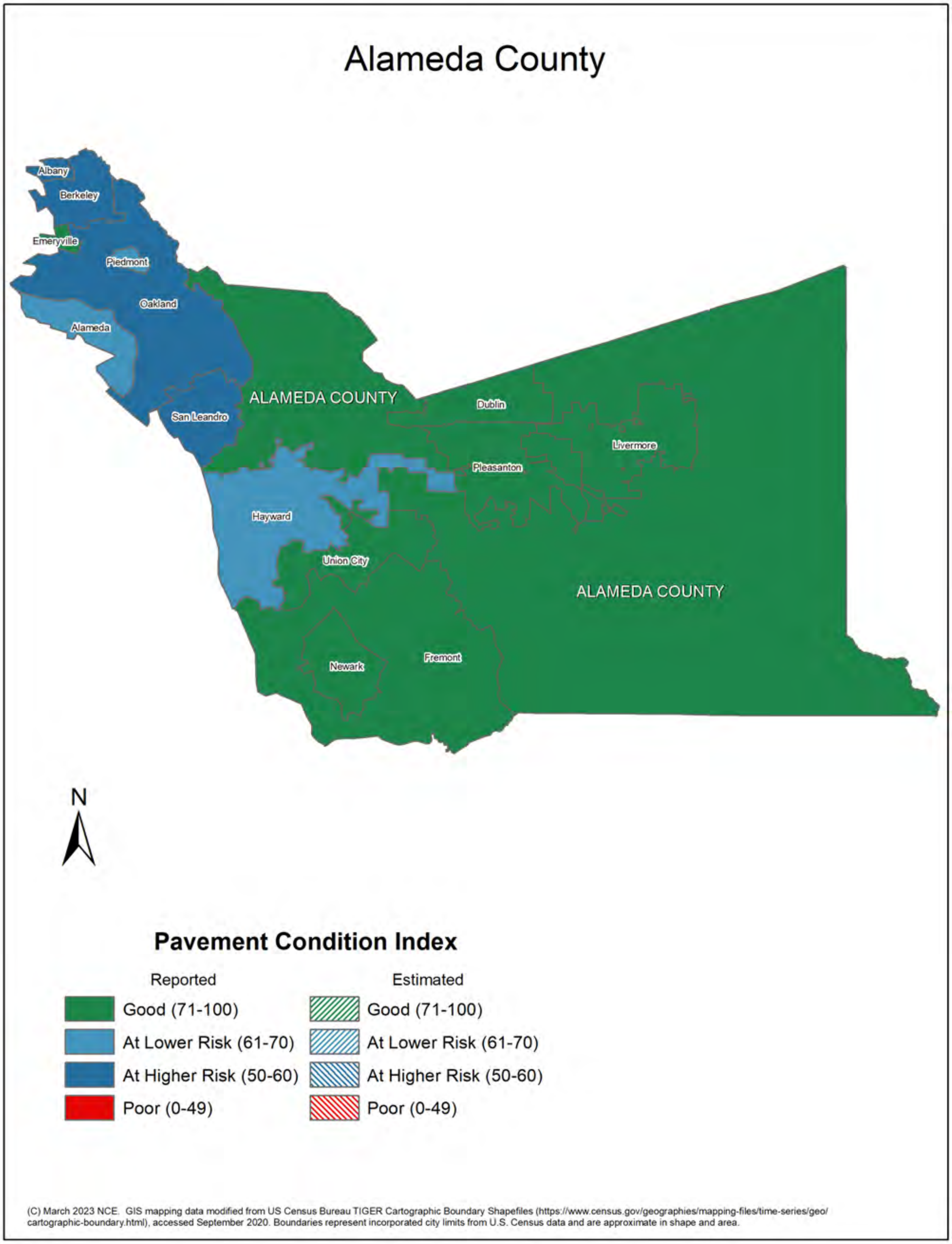
Table C.1 Pavement Needs by County* (2022)

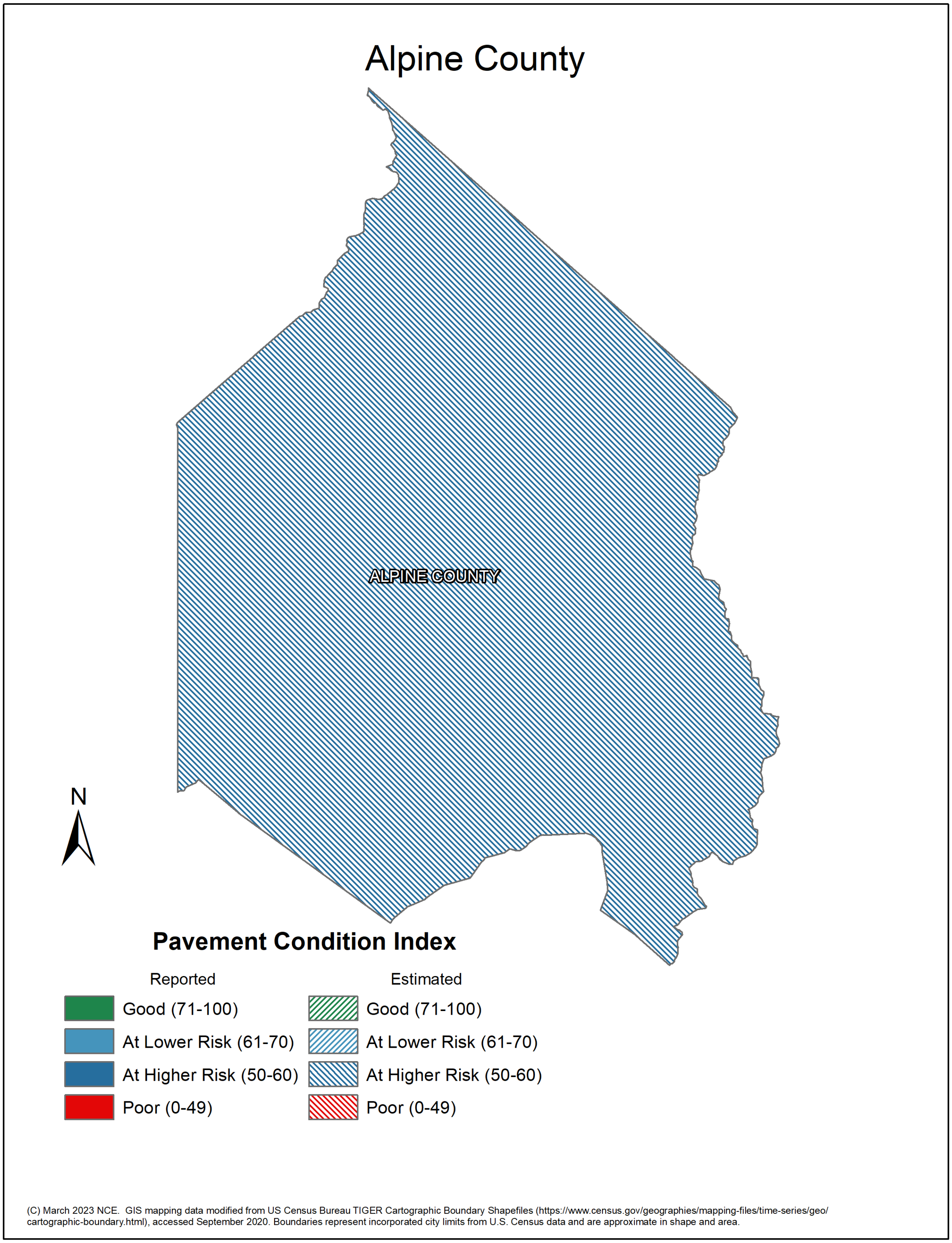
County (Cities Included)	Center Line Miles	Lane Miles	Area (sq. yd.)	2022 PCI	10 Year Needs (2022 $M)
Alameda	3,596	8,150	73,382,886	67	$2,092
Alpine	151	302	2,139,517	58	$37
Amador	477	945	3,598,703	50	$154
Butte	1,816	3,644	28,691,159	55	$1,057
Calaveras	831	1,340	8,201,768	44	$370
Colusa	761	1,247	13,240,593	61	$362
Contra Costa	3,348	7,012	65,788,024	68	$1,821
Del Norte	323	646	4,418,399	67	$83
El Dorado	1,399	2,684	21,458,907	63	$671
Fresno	6,335	12,563	112,879,098	59	$4,103
Glenn	848	2,017	11,940,355	50	$512
Humboldt	1,163	2,354	16,791,631	53	$707
Imperial	3,024	6,103	76,823,230	56	$1,093
Inyo	1,133	1,832	13,681,682	62	$270
Kern	5,725	12,615	117,170,333	63	$3,653
Kings	1,324	2,710	21,044,749	61	$722
Lake	643	1,275	8,629,265	35	$503
Lassen	431	879	6,282,324	61	$228
Los Angeles	21,192	57,160	472,476,391	67	$13,394
Madera	1,829	3,663	24,879,499	40	$1,457
Marin	1,068	2,151	20,882,530	67	$601
Mariposa	365	724	4,606,318	51	$218
Mendocino	1,132	2,249	16,243,134	47	$574
Merced	2,349	4,975	39,594,831	57	$1,479
Modoc	1,018	2,036	19,339,238	64	$224
Mono	737	1,473	9,613,552	64	$104
Monterey	1,907	3,859	30,940,471	50	$1,457
Napa	778	1,568	8,926,445	60	$338
Nevada	806	1,625	10,348,493	69	$253
Orange	6,599	16,412	164,099,105	79	$2,966
Placer	2,190	4,625	35,366,855	68	$929
Plumas	706	1,412	9,070,195	69	$183
Riverside	7,933	18,117	158,987,995	69	$4,125
Sacramento	5,077	10,983	97,772,868	58	$3,724
San Benito	492	758	5,140,912	38	$343
San Bernardino	8,898	22,014	167,917,566	71	$3,890
San Diego	7,761	18,852	175,610,151	71	$4,569

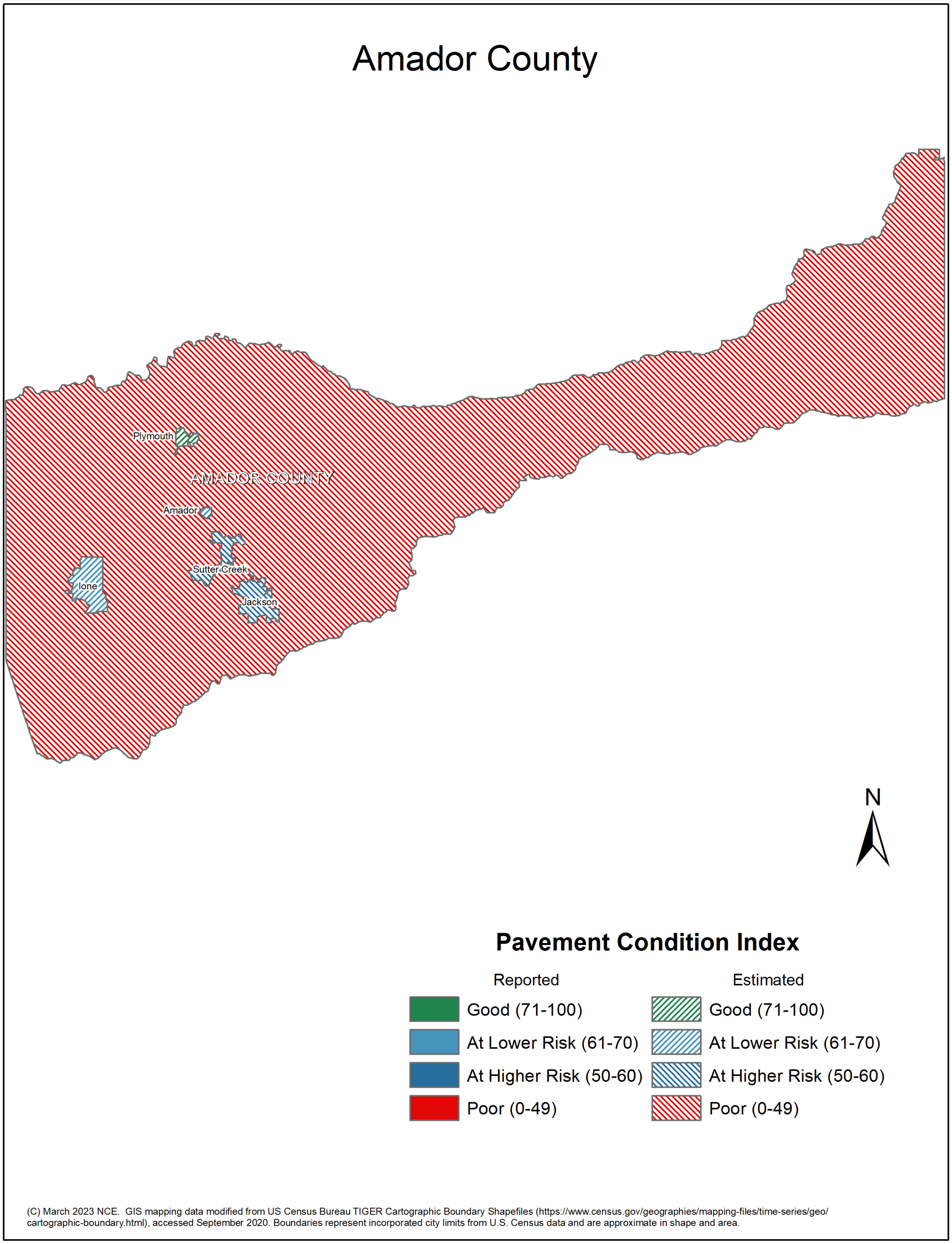
County (Cities Included)	Center Line Miles	Lane Miles	Area (sq. yd.)	2022 PCI	10 Year Needs (2022 $M)
San Francisco	943	2,142	21,249,793	74	$464
San Joaquin	3,208	6,697	59,355,738	68	$1,589
San Luis Obispo	2,123	3,549	37,101,898	58	$1,401
San Mateo	1,886	3,957	33,244,304	70	$870
Santa Barbara	1,689	3,519	30,687,410	60	$1,078
Santa Clara	4,473	9,969	98,505,116	69	$2,554
Santa Cruz	863	1,768	14,127,507	54	$603
Shasta	1,682	3,100	24,430,506	52	$992
Sierra	399	800	5,566,517	45	$178
Siskiyou	1,488	2,985	20,233,539	63	$513
Solano	1,781	3,840	33,604,534	67	$1,012
Sonoma	2,400	5,010	49,579,092	58	$1,876
Stanislaus	2,899	5,953	51,942,357	64	$1,630
Sutter	1,032	2,079	16,016,764	57	$479
Tehama	1,202	2,406	8,484,455	51	$310
Trinity	592	1,112	7,477,638	48	$254
Tulare	4,091	8,253	66,849,672	59	$2,399
Tuolumne	661	1,276	8,504,648	24	$595
Ventura	2,545	5,590	56,349,603	68	$1,541
Yolo	1,341	2,687	23,513,907	56	$882
Yuba	1,066	1,504	19,557,588	67	$515
California	**144,530**	**321,170**	**2,764,361,757**	**65**	**$81,001**
* Includes Cities within County					

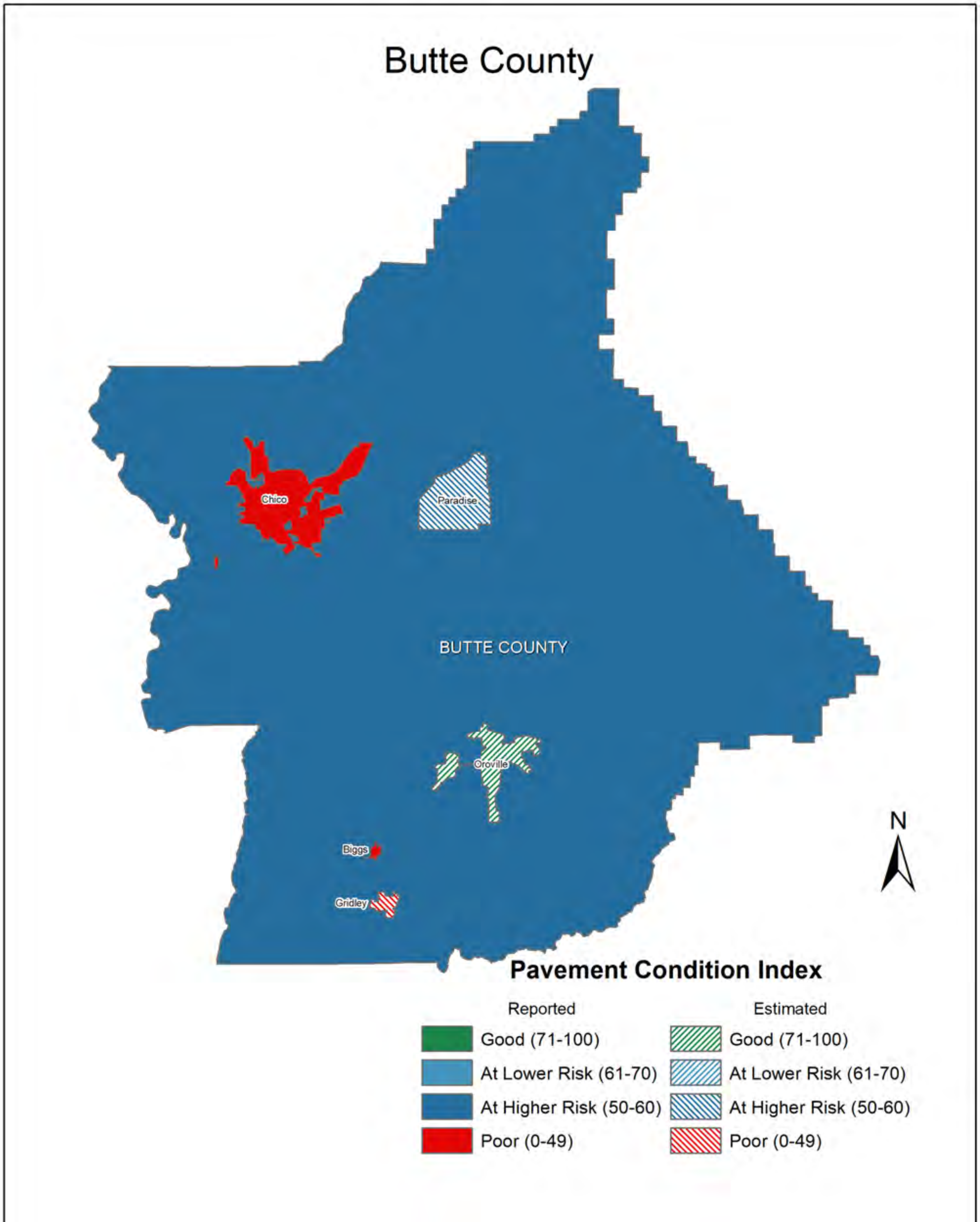

Pavement Condition Index
86 - 100 (Excellent)
71 - 85 (Good)
50 - 70 (At Risk)
0 - 49 (Poor)
2022
Del Norte
Siskiyou
Modoc
Humboldt
Trinity
Shasta
Lassen
Tehama
Plumas
Mendocino
Glenn
Butte
Sierra
Lake
Colusa
Sutter
Yuba
Nevada
Placer
Yolo
El Dorado
Sonoma
Napa
Sacramento
Alpine
Amador
Solano
Calaveras
Marin
Contra Costa
San Joaquin
Tuolumne
Mono
San Francisco
Alameda
Mariposa
Stanislaus
San Mateo
Santa Clara
Madera
Merced
Santa Cruz
San Benito
Fresno
Inyo
Monterey
Tulare
Kings
San Luis Obispo
Kern
San Bernardino
Santa Barbara
Ventura
Los Angeles
Orange
Riverside
San Diego
Imperial


Pavement Needs (10-Years)
Up to $500M
$500M - $1.0B
$1.0B - $1.5B
$1.5B - $2.0B
Greater than $2.0B
2022
Del Norte
Siskiyou
Modoc
Humboldt
Trinity
Shasta
Lassen
Tehama
Plumas
Glenn
Butte
Sierra
Mendocino
Colusa
Sutter
Yuba
Nevada
Placer
Lake
Yolo
El Dorado
Sonoma
Napa
Sacramento
Alpine
Amador
Solano
Calaveras
Marin
Contra Costa
San Joaquin
Tuolumne
Mono
San Francisco
Alameda
Stanislaus
Mariposa
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
San Benito
Fresno
Inyo
Monterey
Kings
Tulare
San Luis Obispo
Kern
San Bernardino
Santa Barbara
Ventura
Los Angeles
Orange
Riverside
San Diego
Imperial

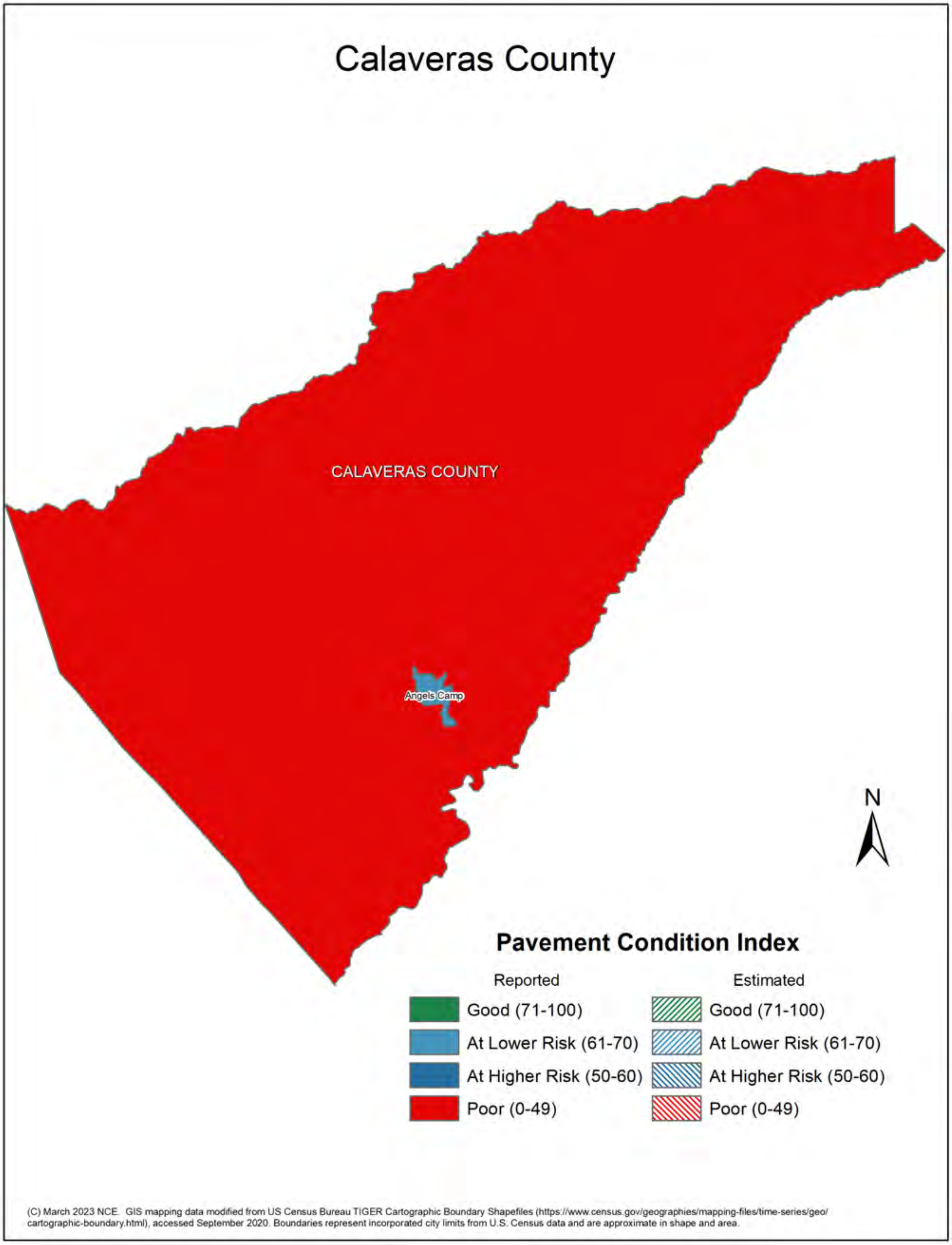

Alameda County
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Leandro
ALAMEDA COUNTY
Dublin
Livermore
Pleasanton
Hayward
Union City
ALAMEDA COUNTY
Fremont
Newark
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Alpine County
ALPINE COUNTY
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

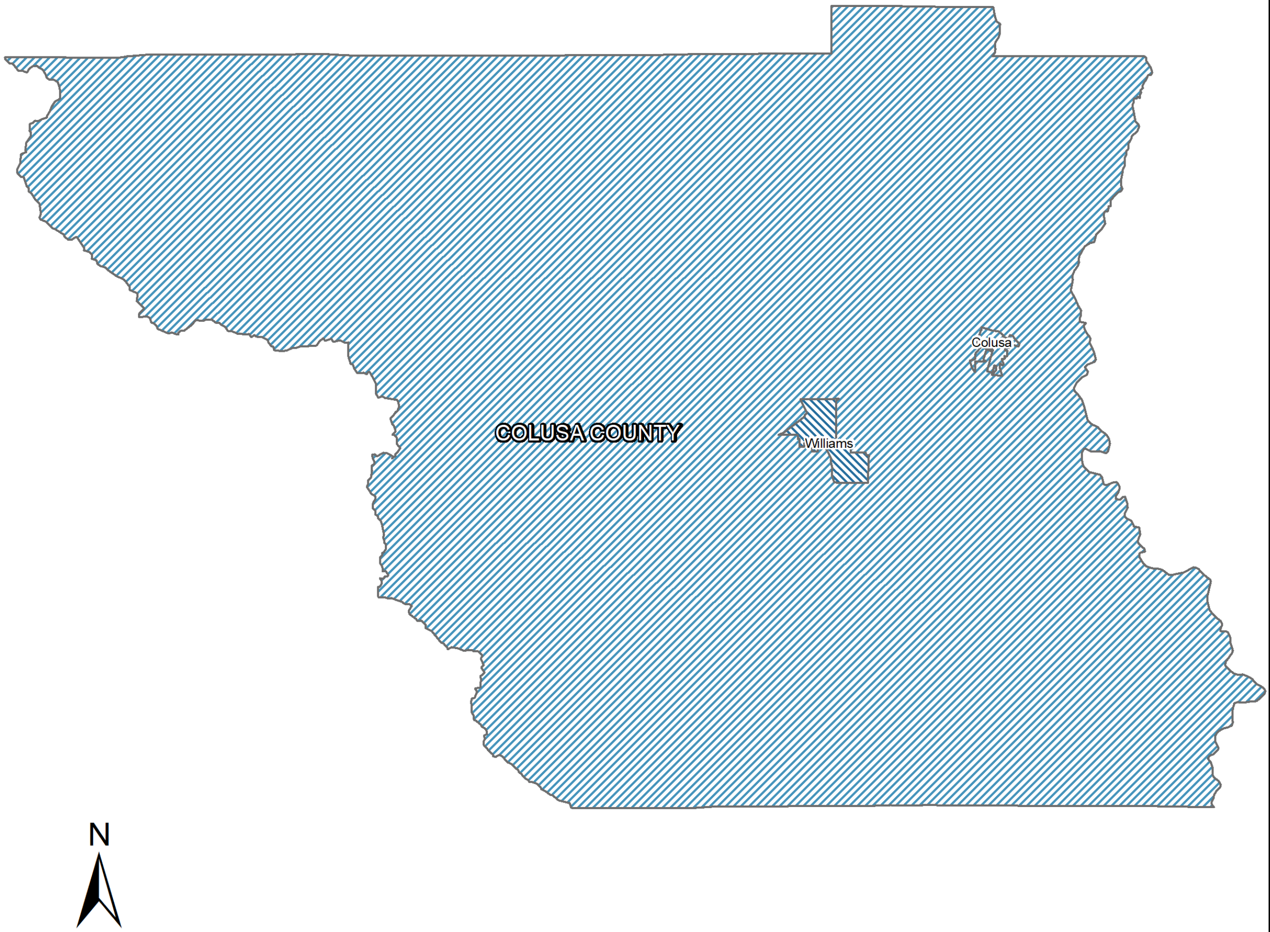

Amador County
Plymouth
AMADOR COUNTY
Amador
Sutter Creek
Ione
Jackson
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.



(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Calaveras County
CALAVERAS COUNTY
Angels Camp
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

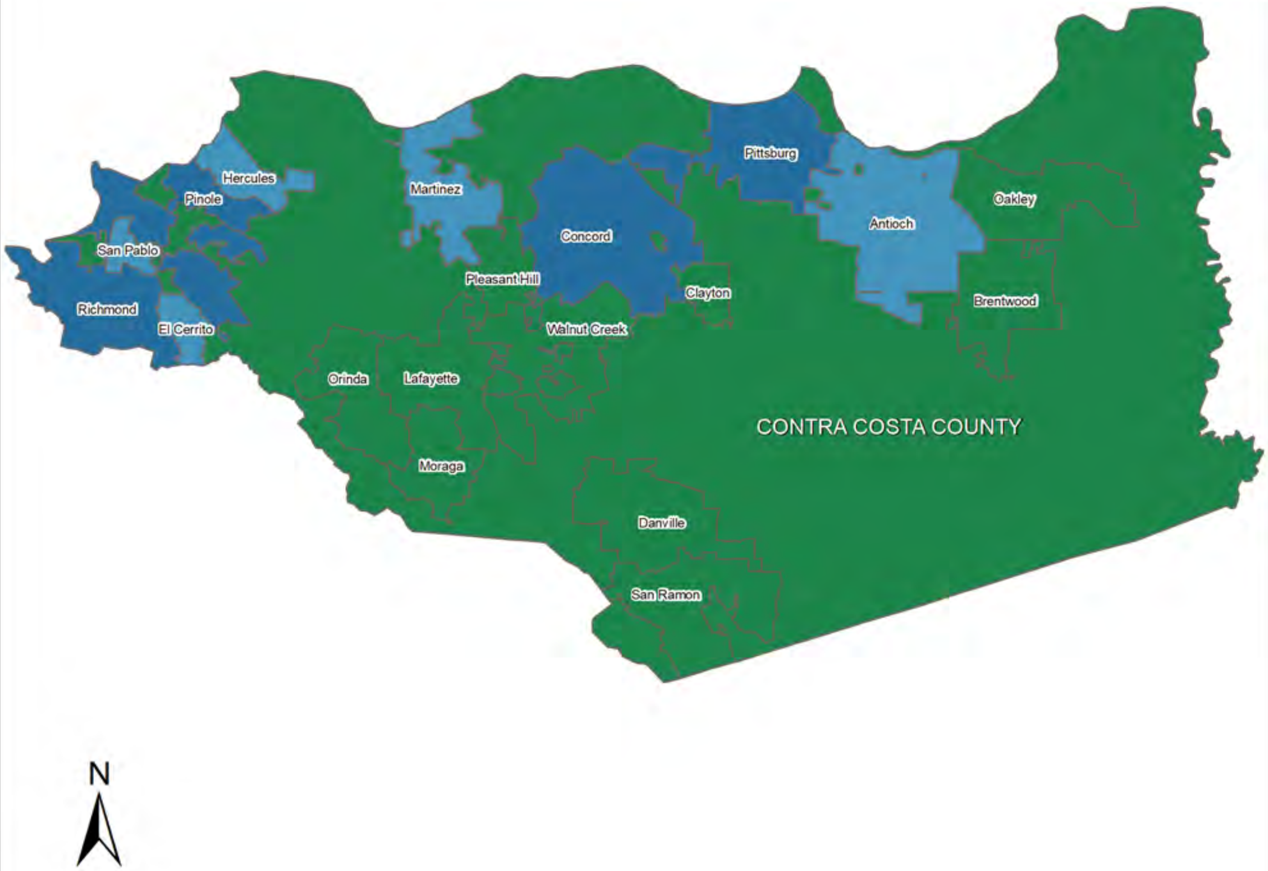
Colusa County



Pavement Condition Index

Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)

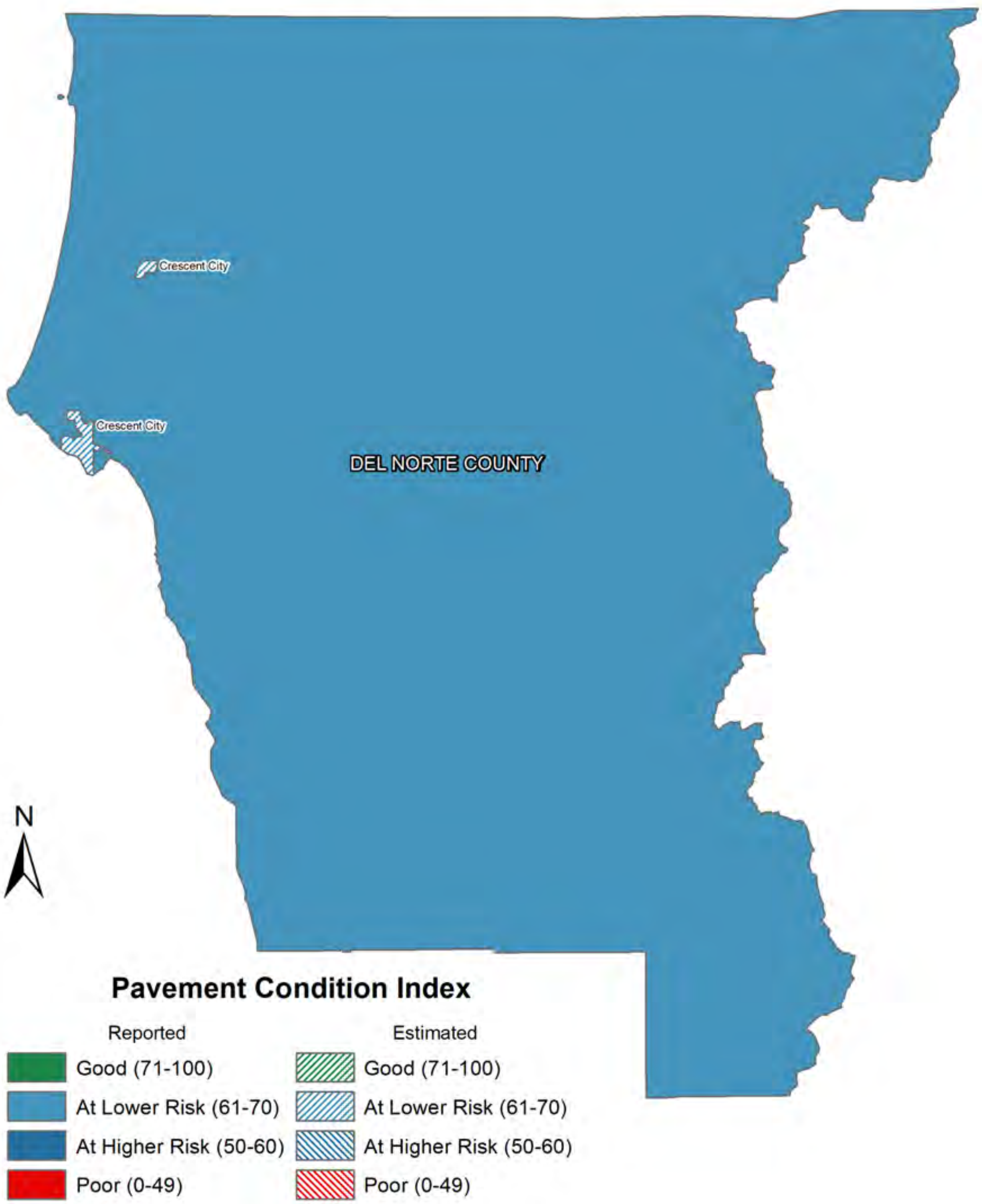
Contra Costa County



Pavement Condition Index

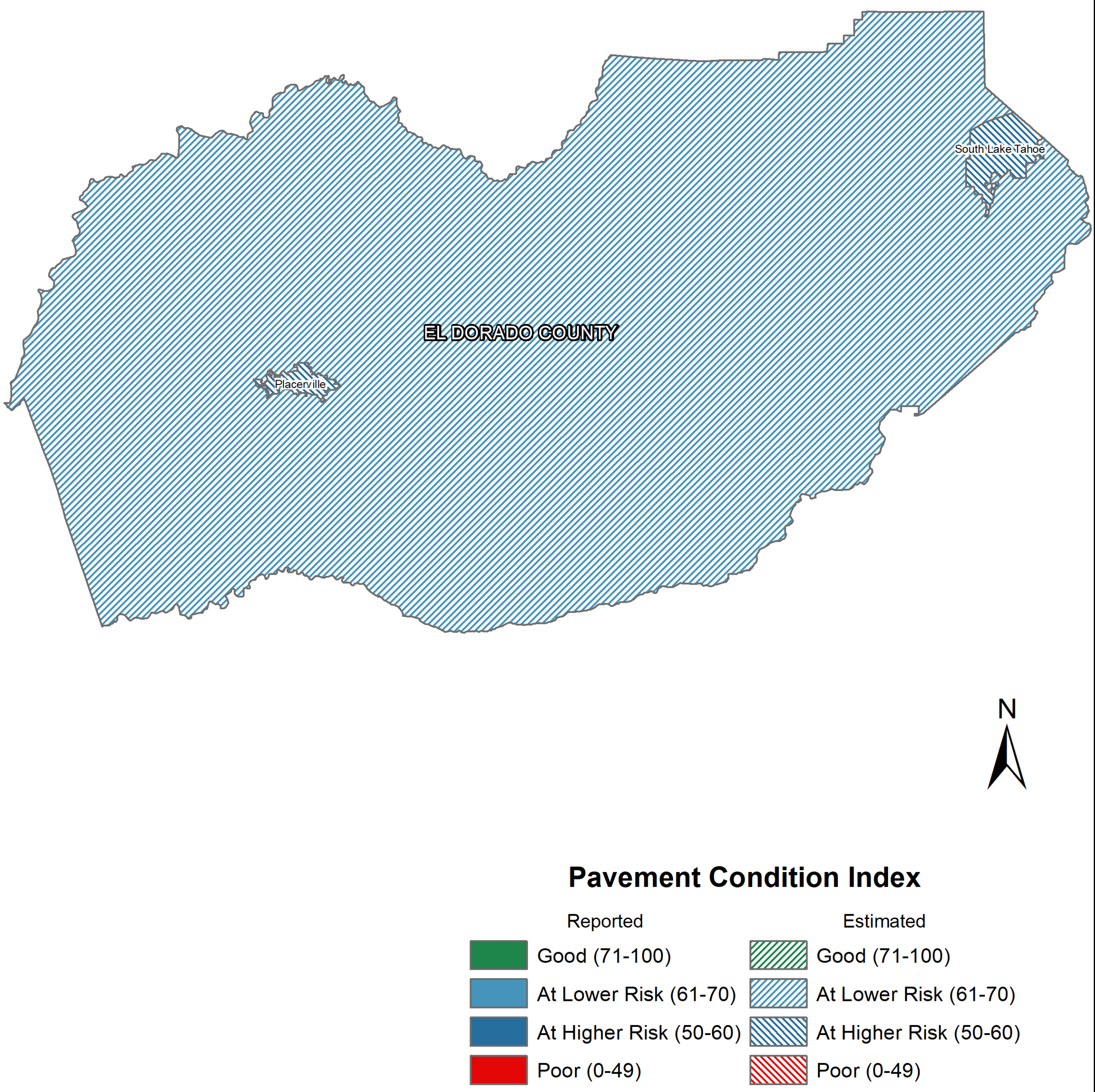
Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)

Del Norte County



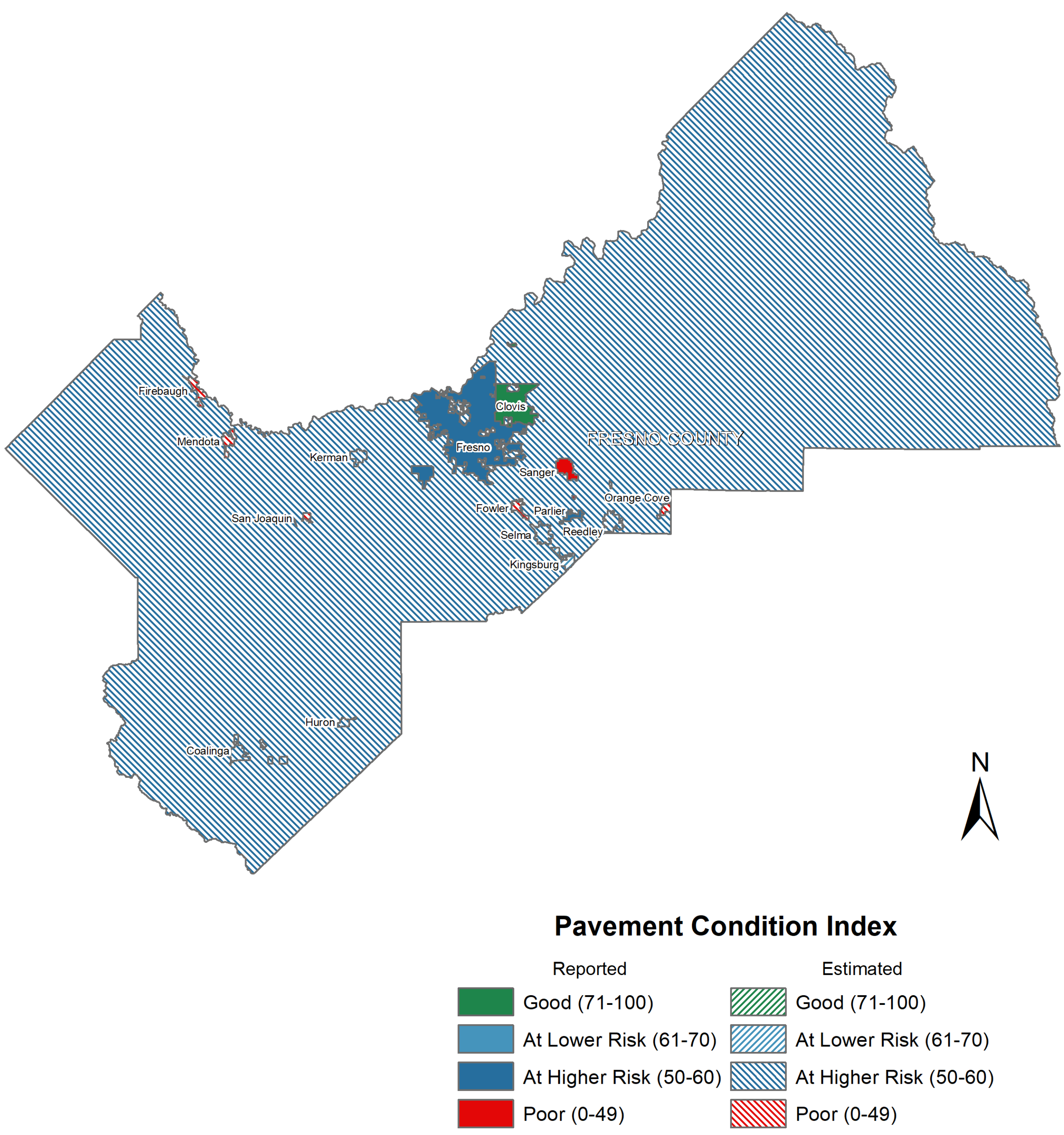
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

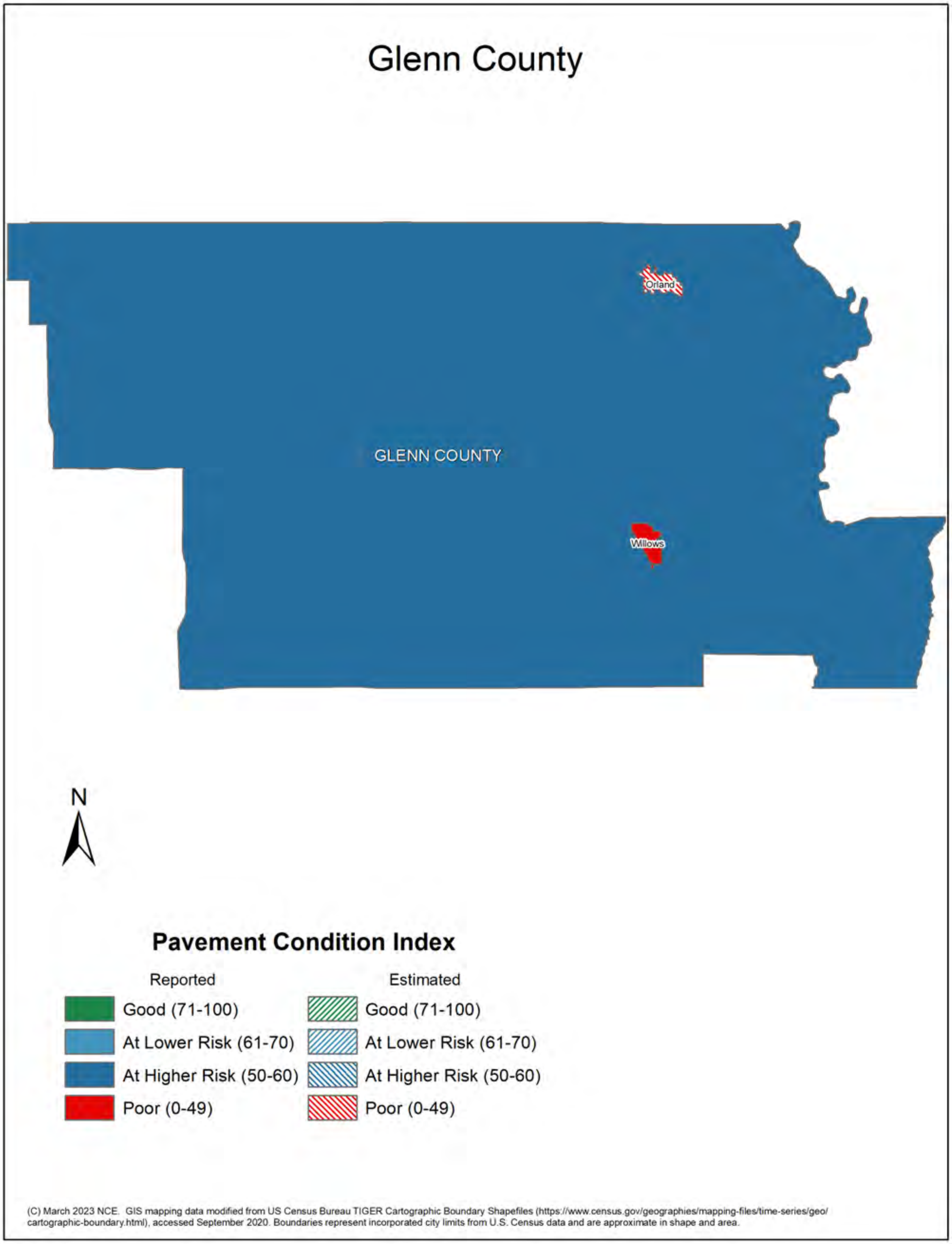
El Dorado County



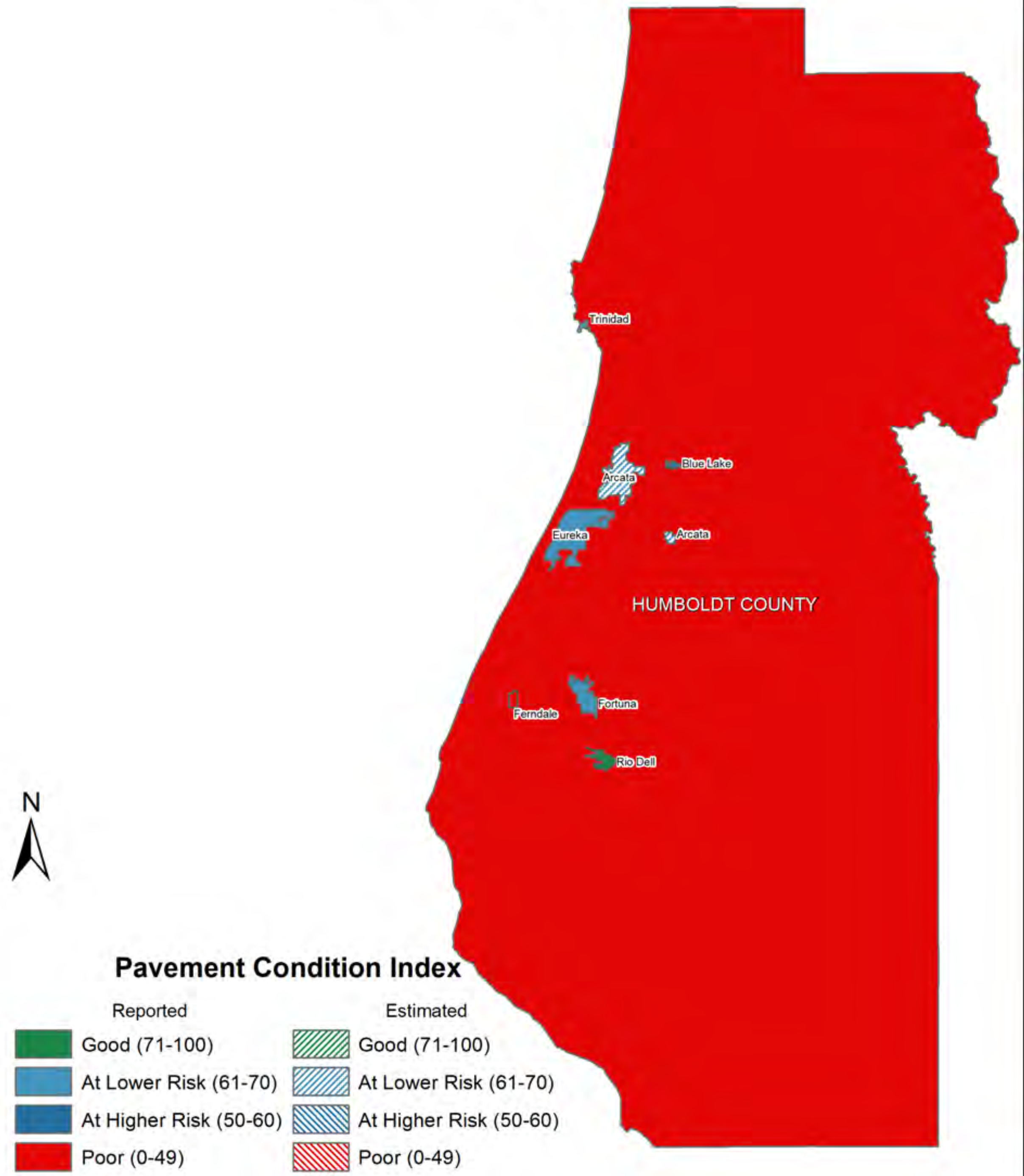
 GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Fresno County



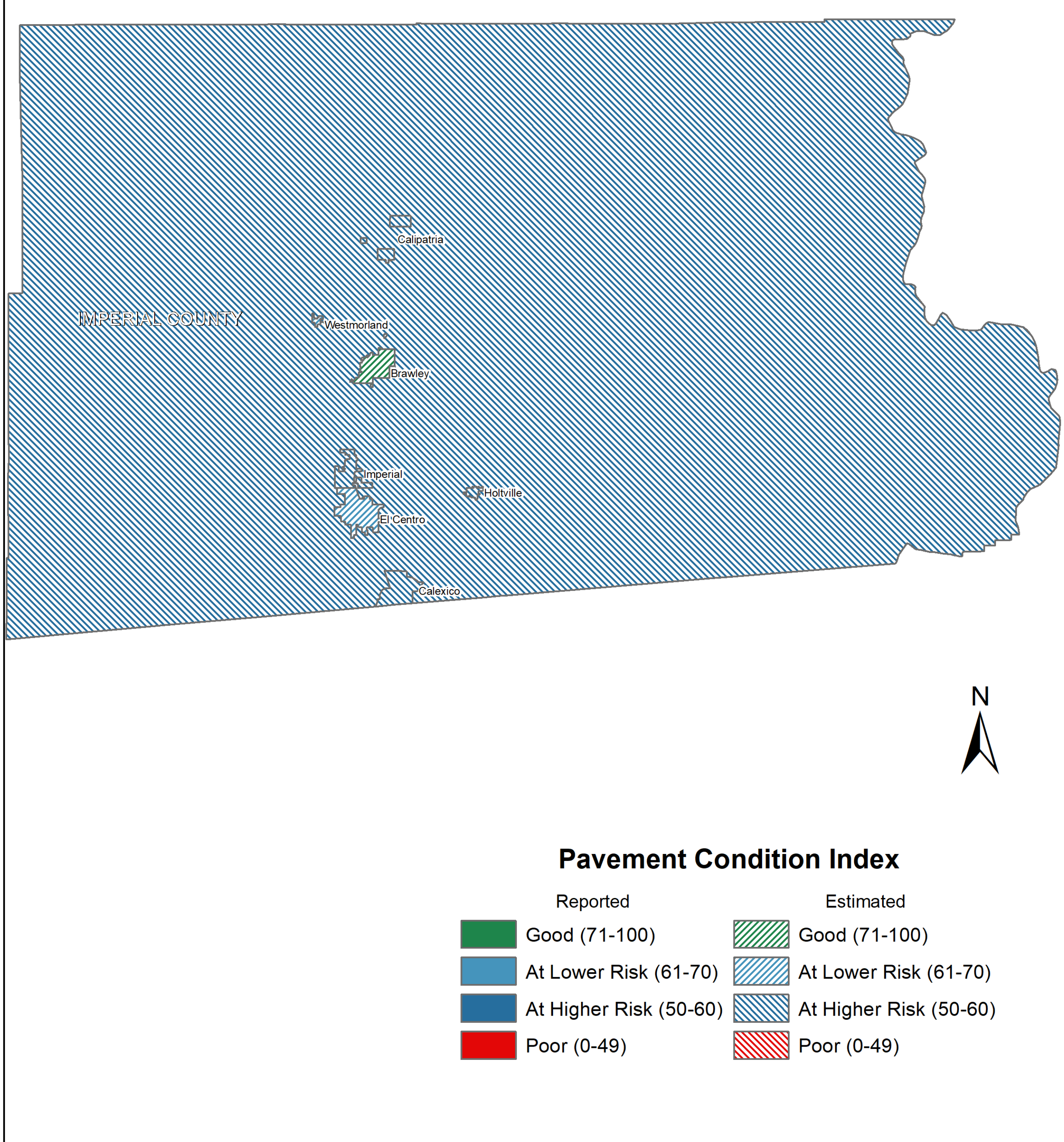

Glenn County
Orland
GLENN COUNTY
Willows
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Humboldt County

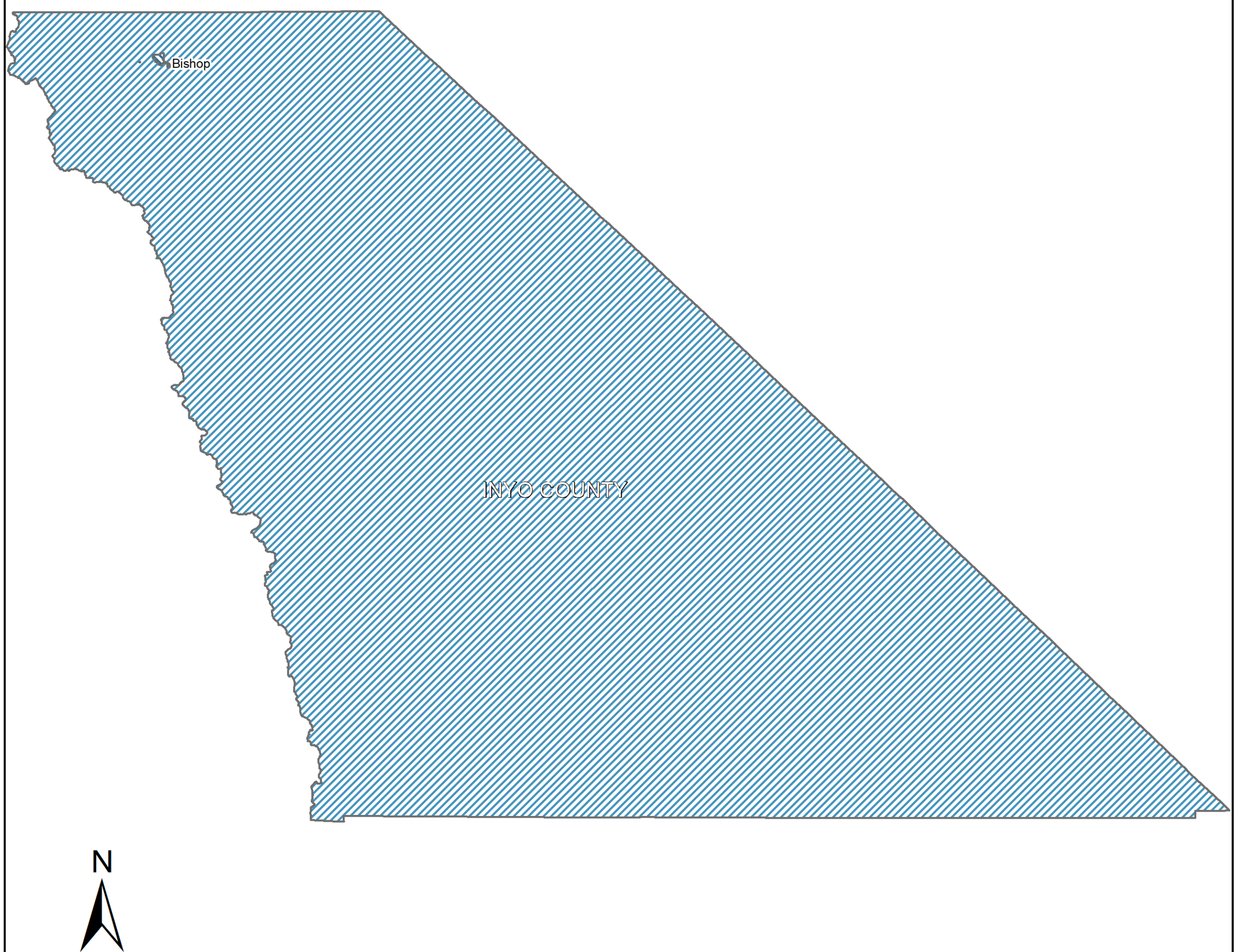


(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Imperial County



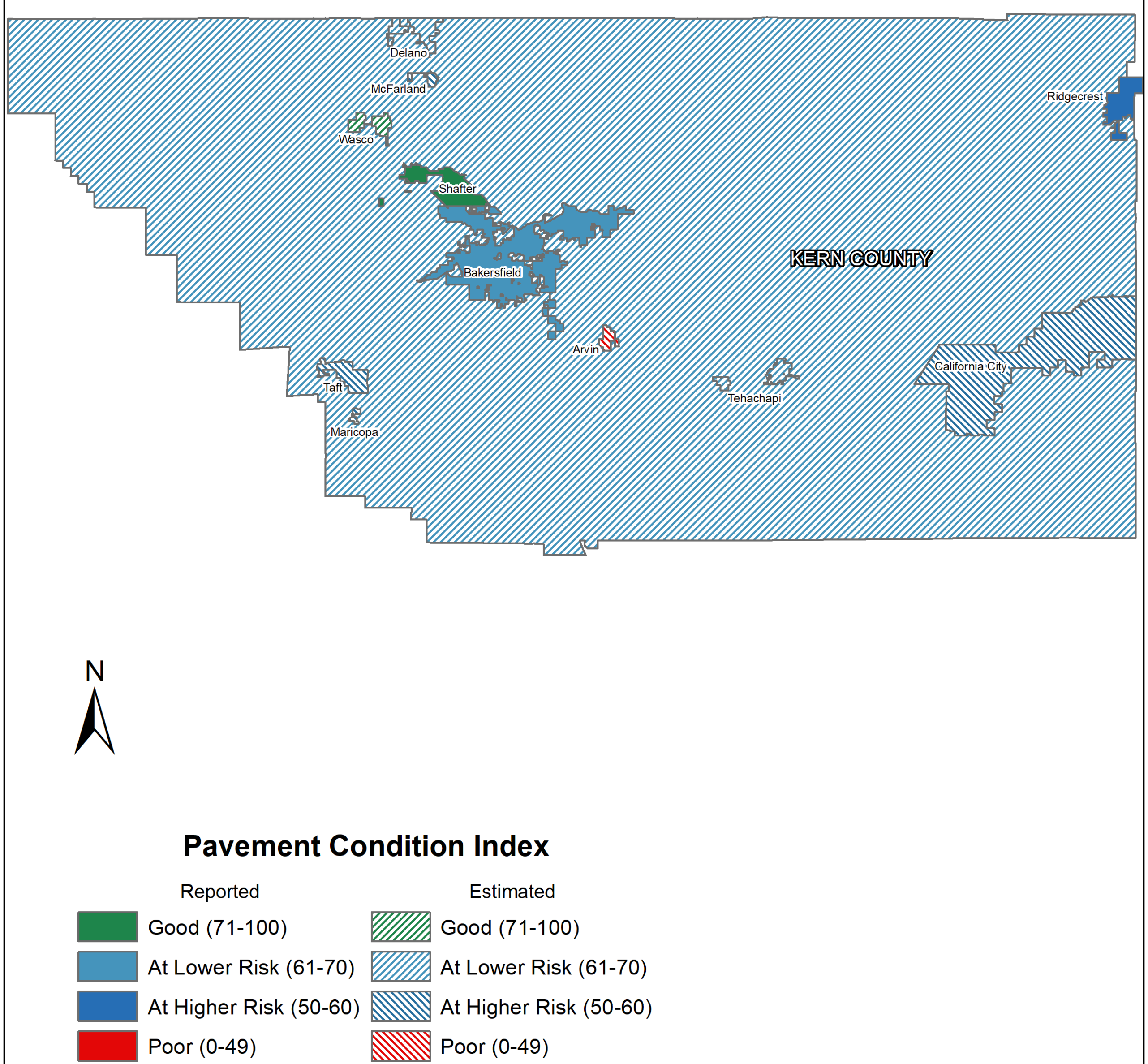
Inyo County



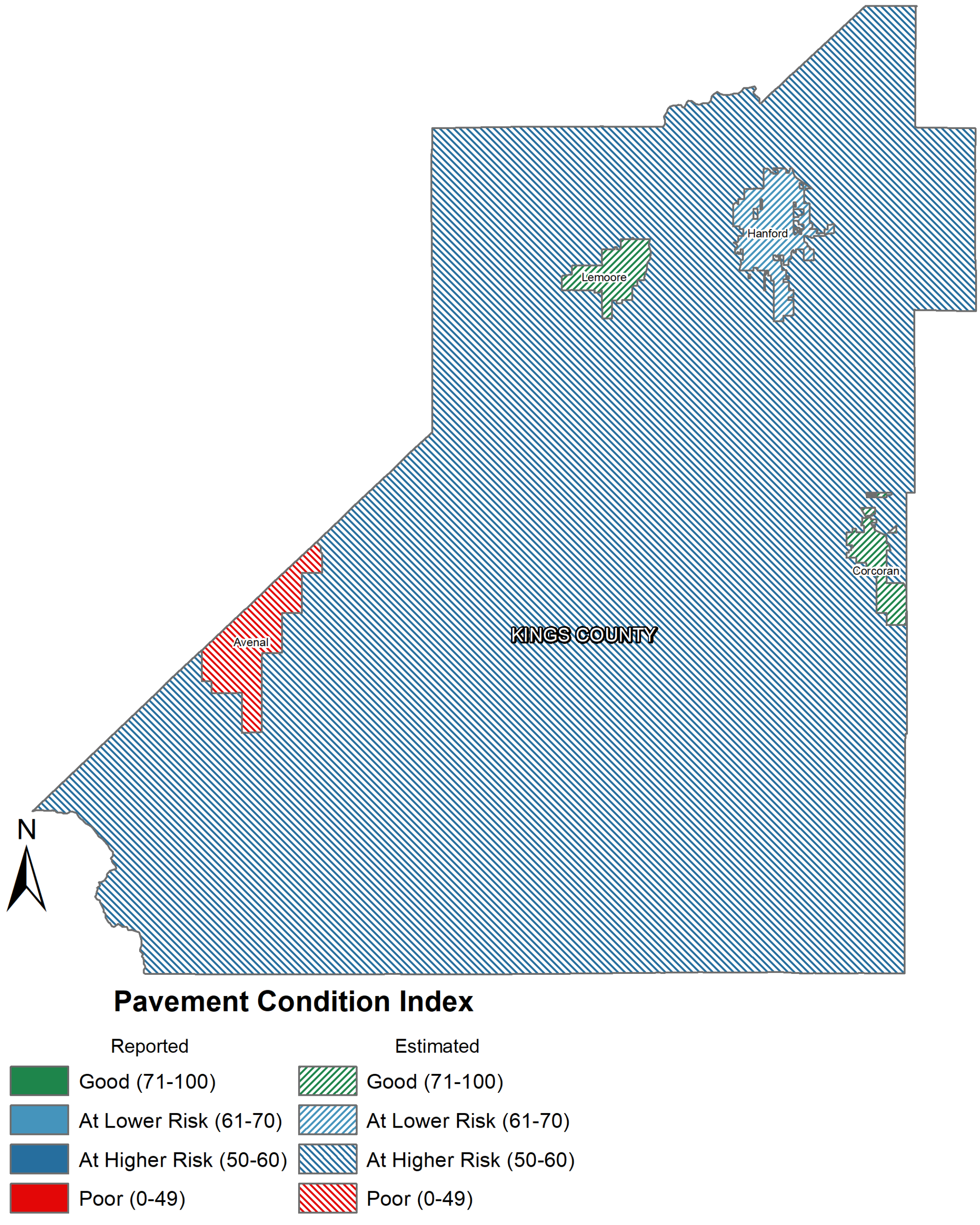
Pavement Condition Index

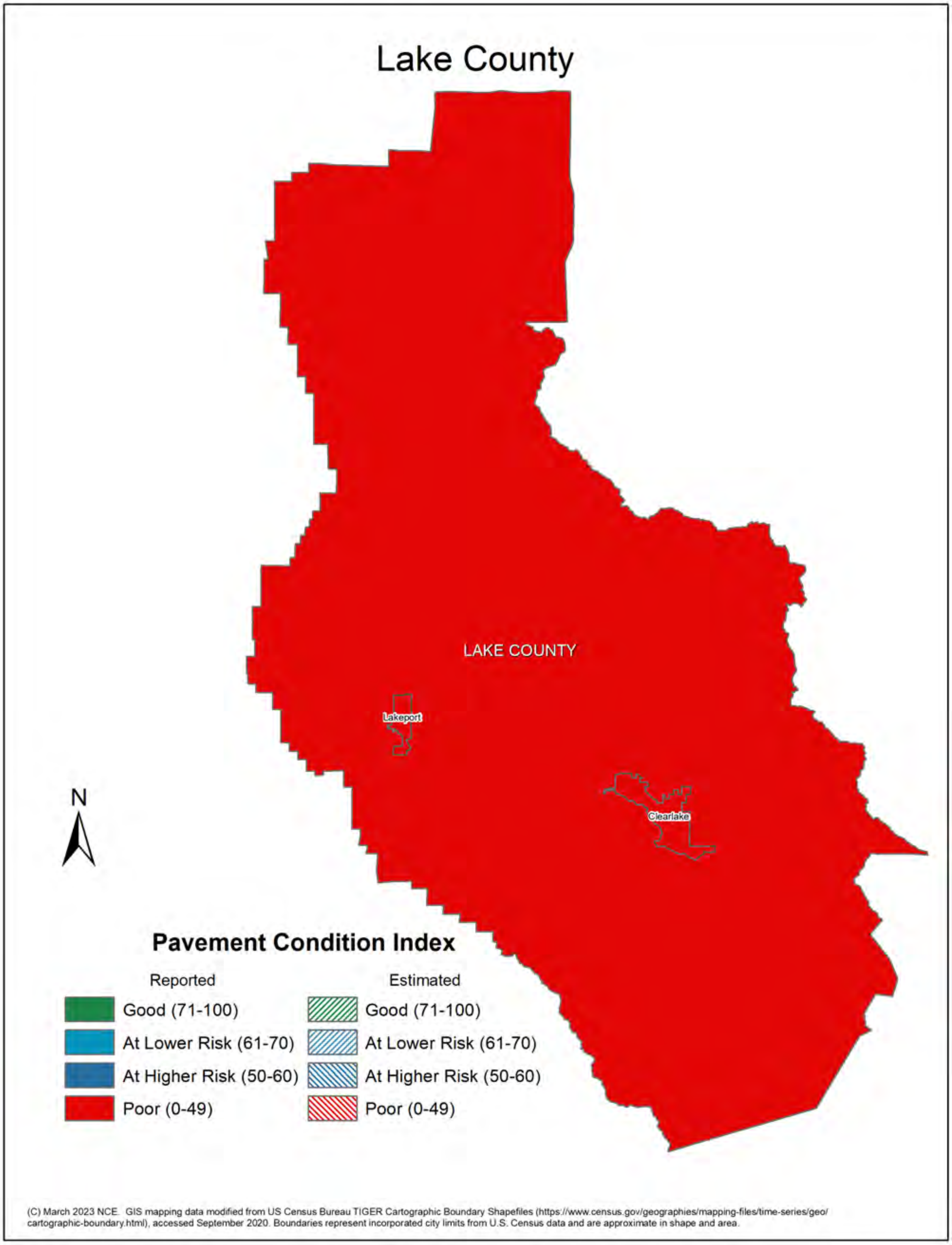
Reported		Estimated	
	Good (71-100)		Good (71-100)
	At Lower Risk (61-70)		At Lower Risk (61-70)
	At Higher Risk (50-60)		At Higher Risk (50-60)
	Poor (0-49)		Poor (0-49)

Kern County

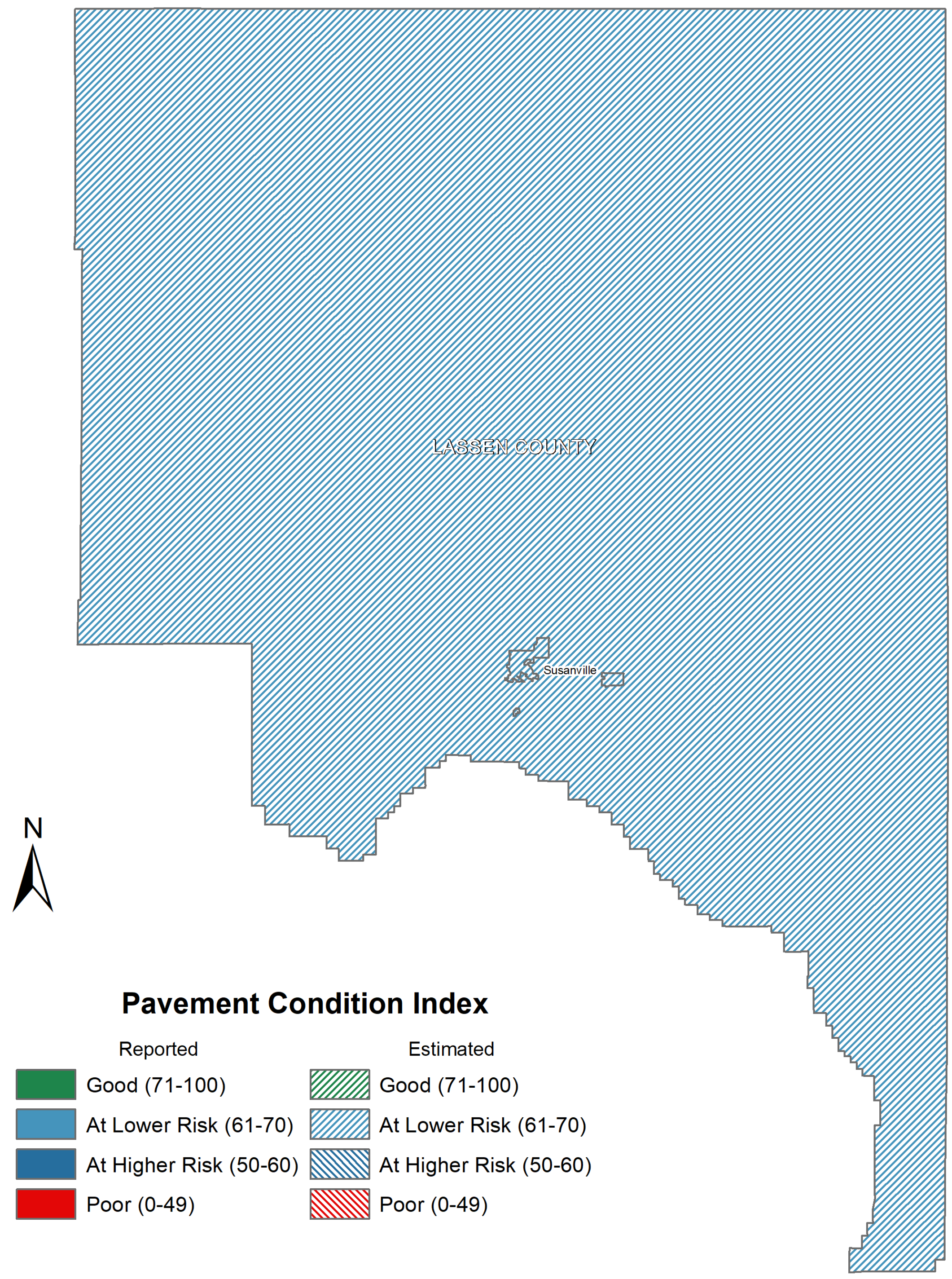

Delano
McFarland
Wasco
Shafter
Bakersfield
Ridgecrest
KERN COUNTY
Arvin
Taft
Maricopa
Tehachapi
California City
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)

Kings County



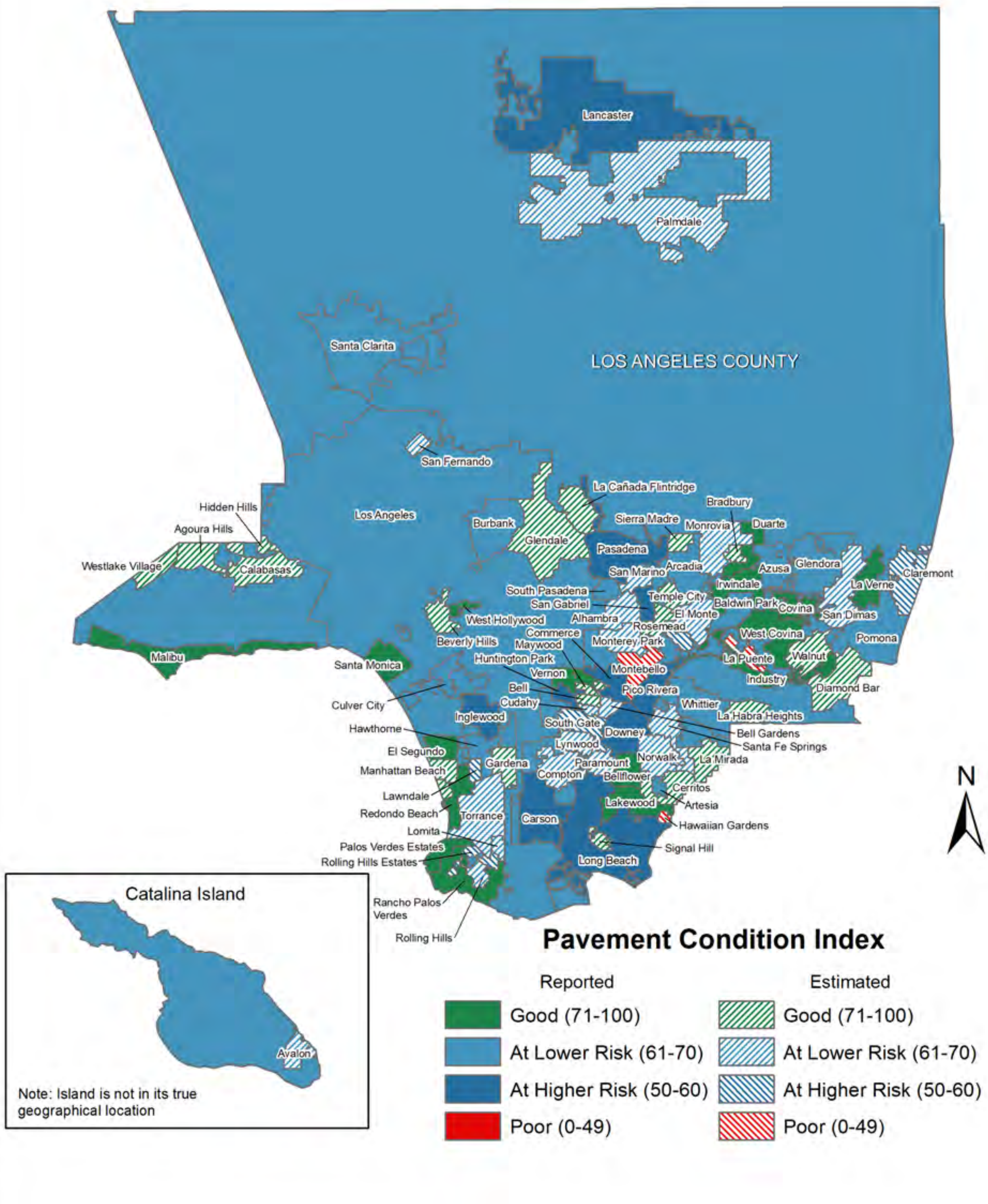

Lake County
LAKE COUNTY
Lakeport
Clearlake
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Lassen County

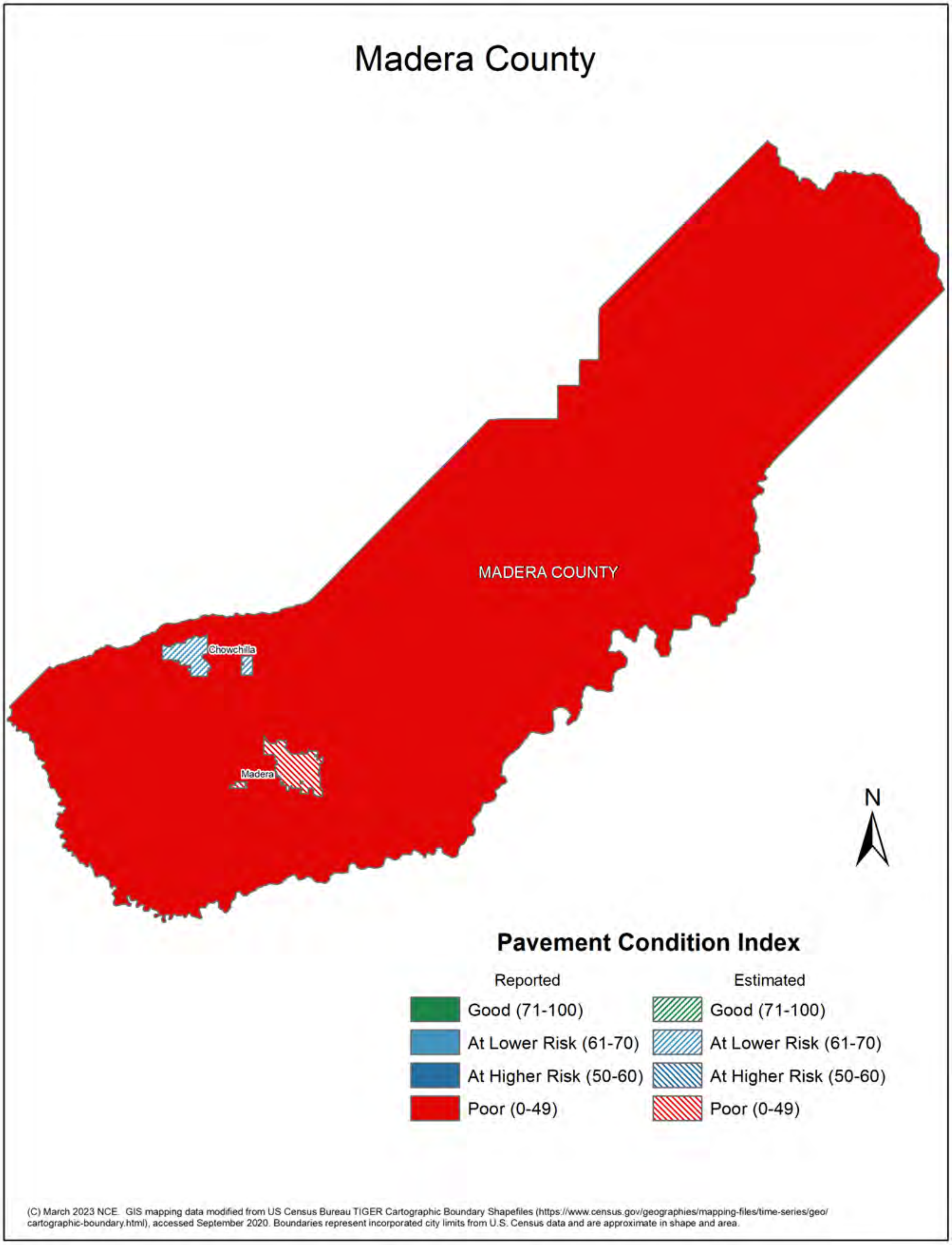


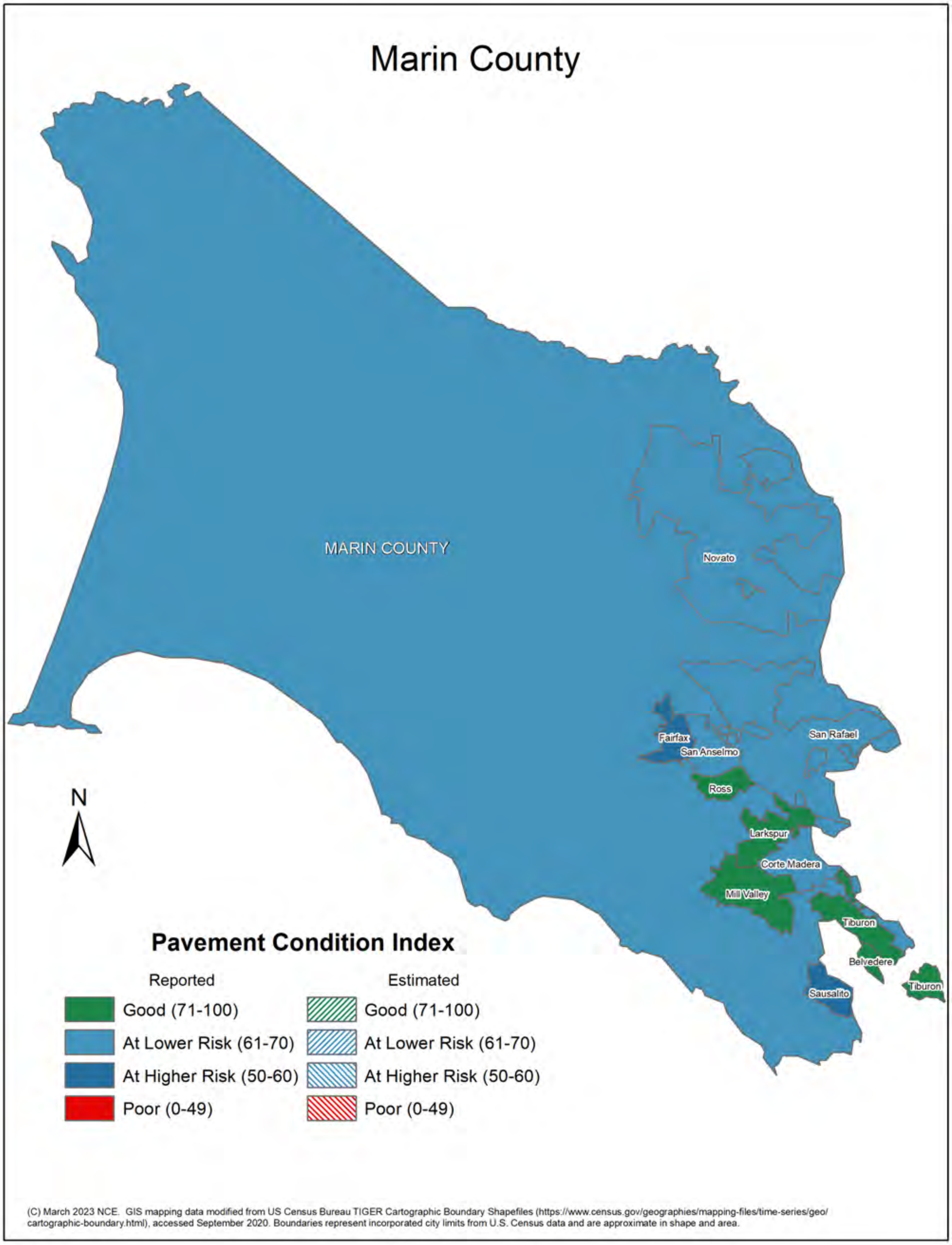
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

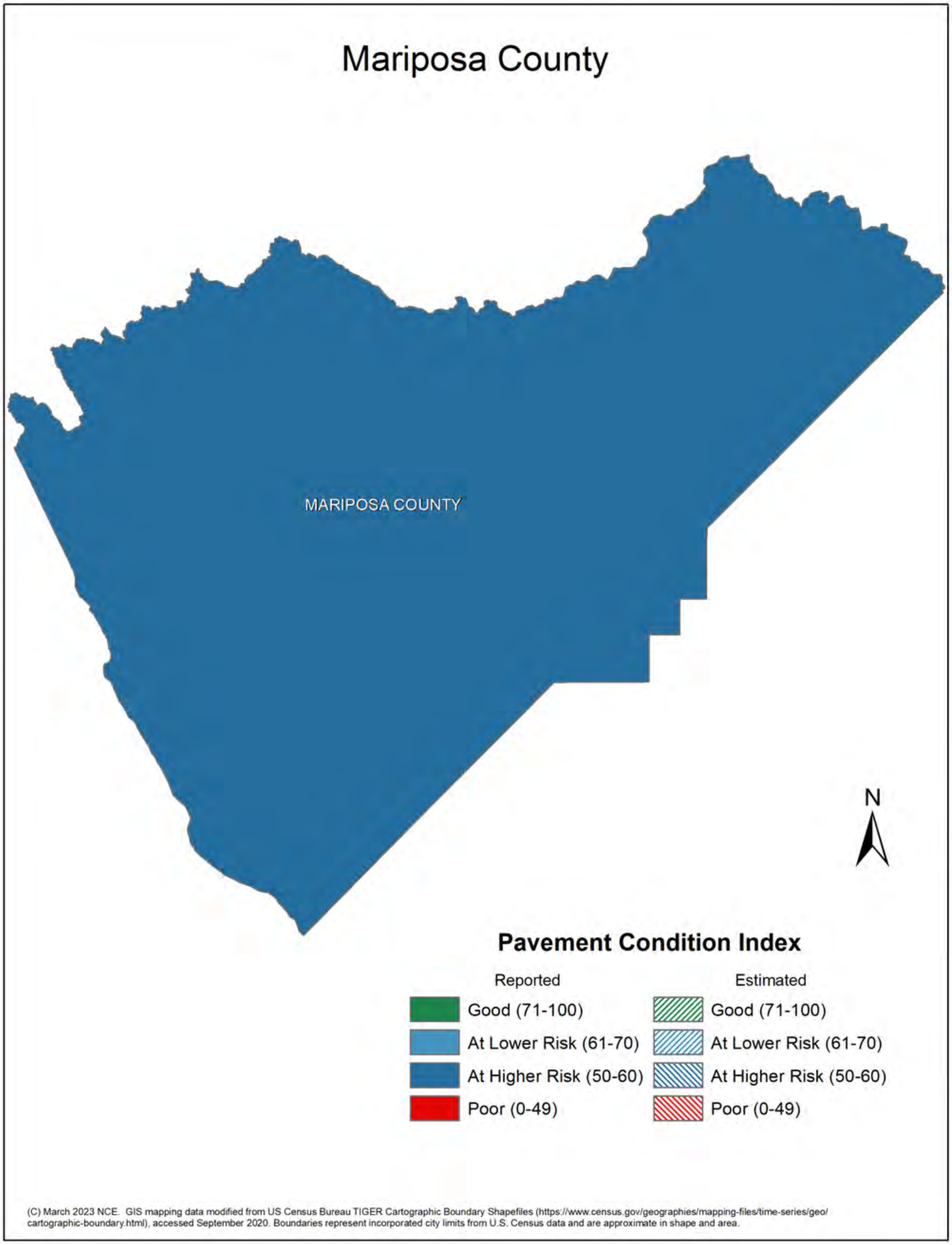
Los Angeles County



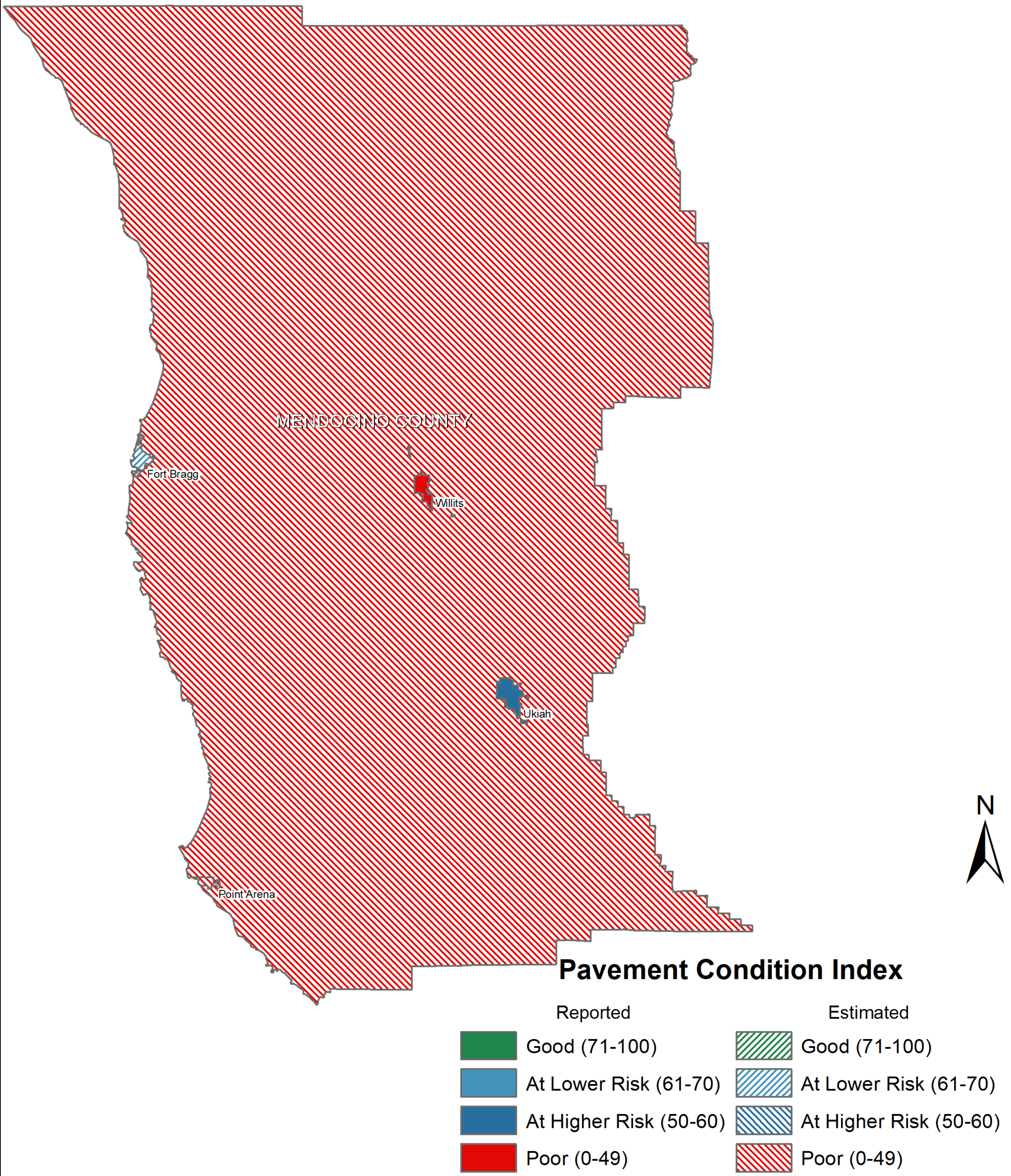
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Madera County
MADERA COUNTY
Chowchilla
Madera
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

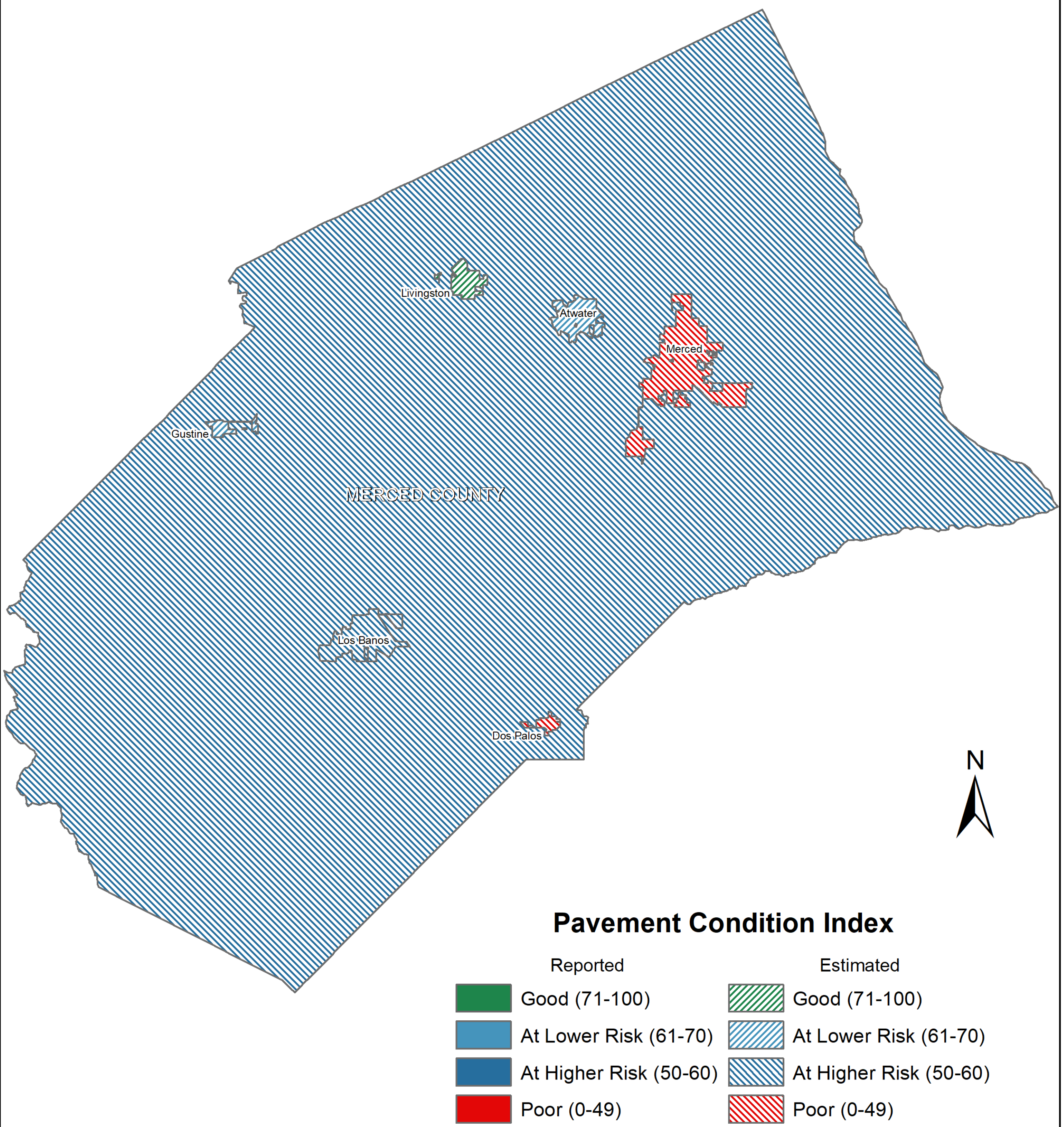

Marin County
MARIN COUNTY
Novato
San Rafael
Fairfax
San Anselmo
Ross
Larkspur
Corte Madera
Mill Valley
Tiburon
Belvedere
Sausalito
Tiburon
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Mariposa County
MARIPOSA COUNTY
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Mendocino County



Merced County



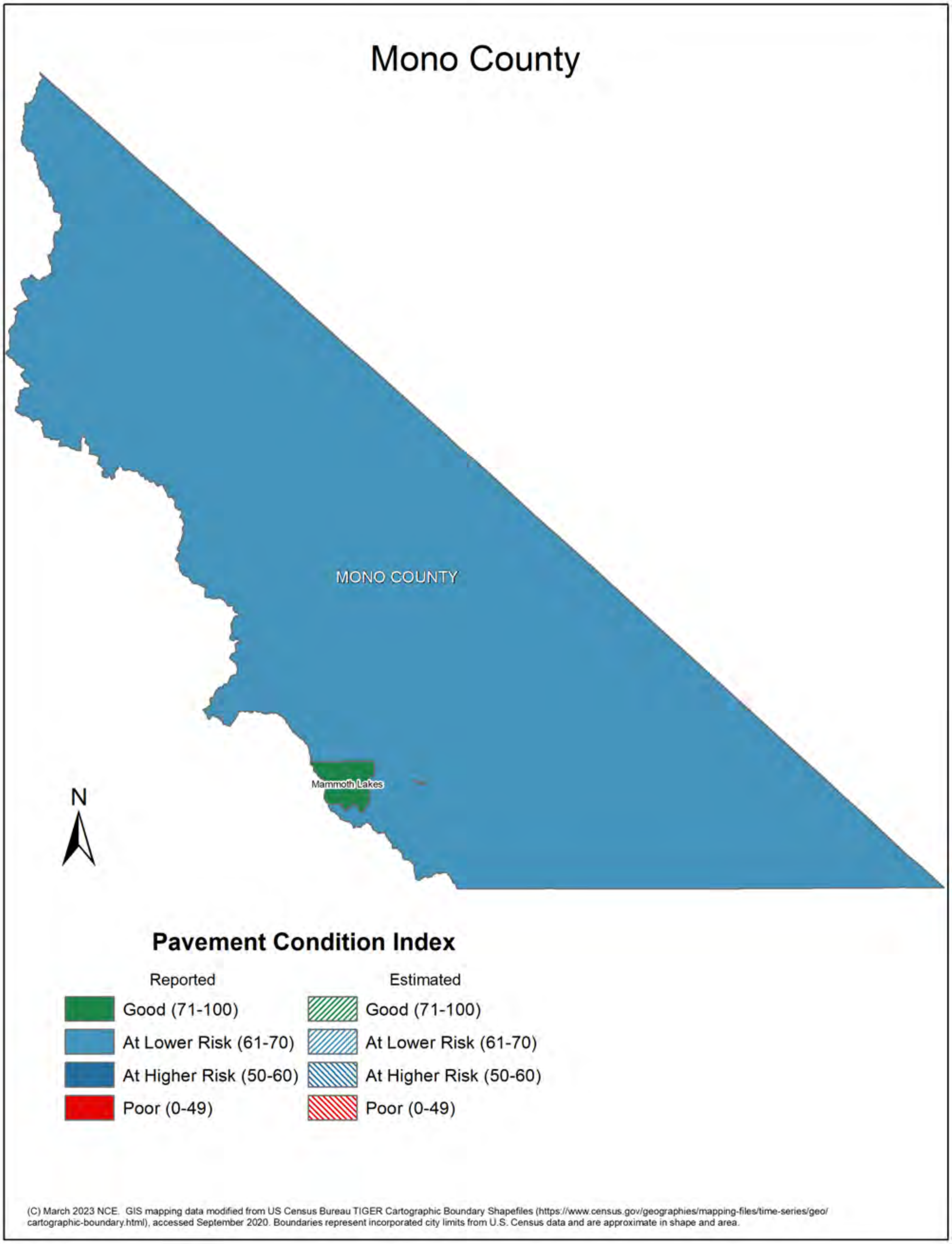
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

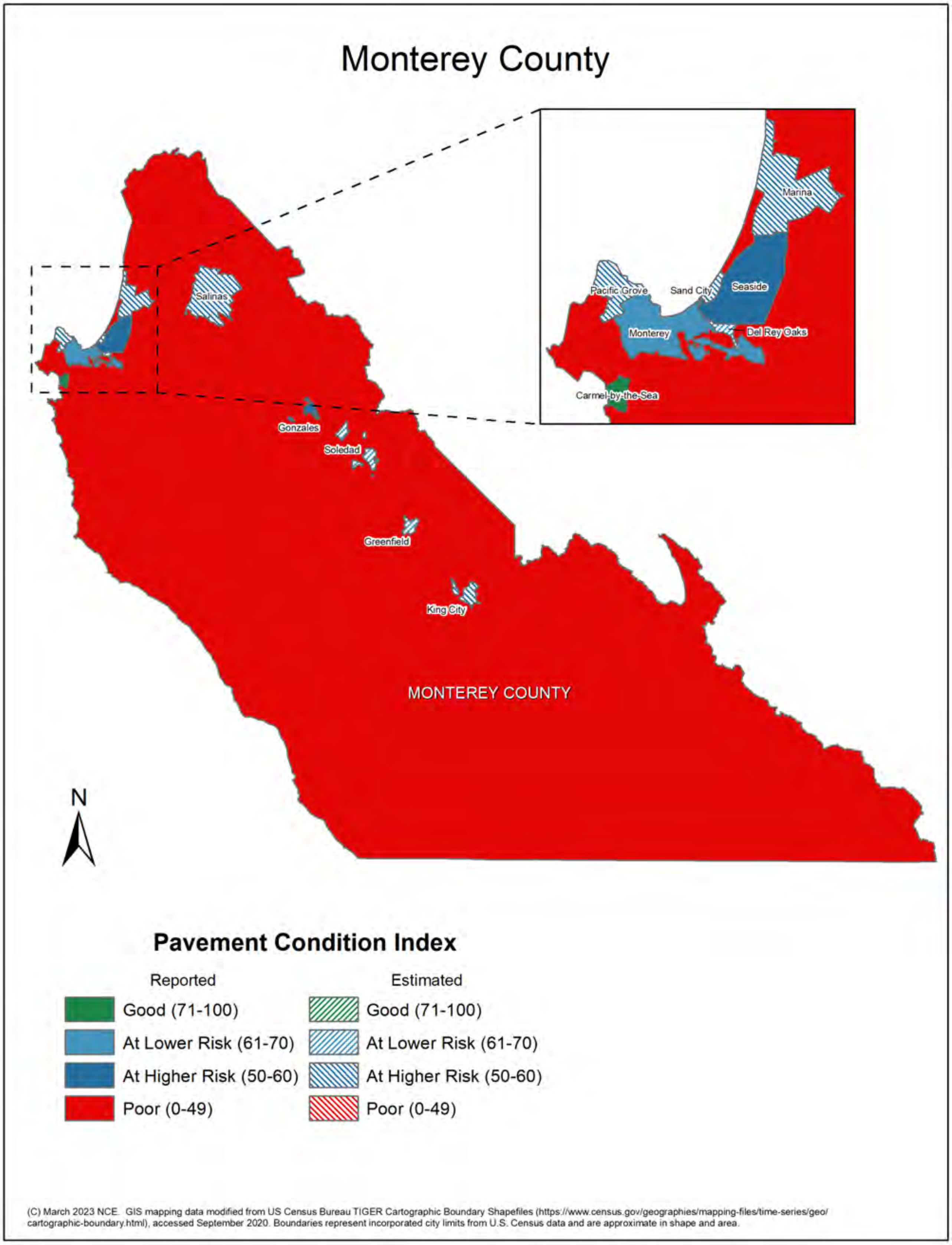
Modoc County

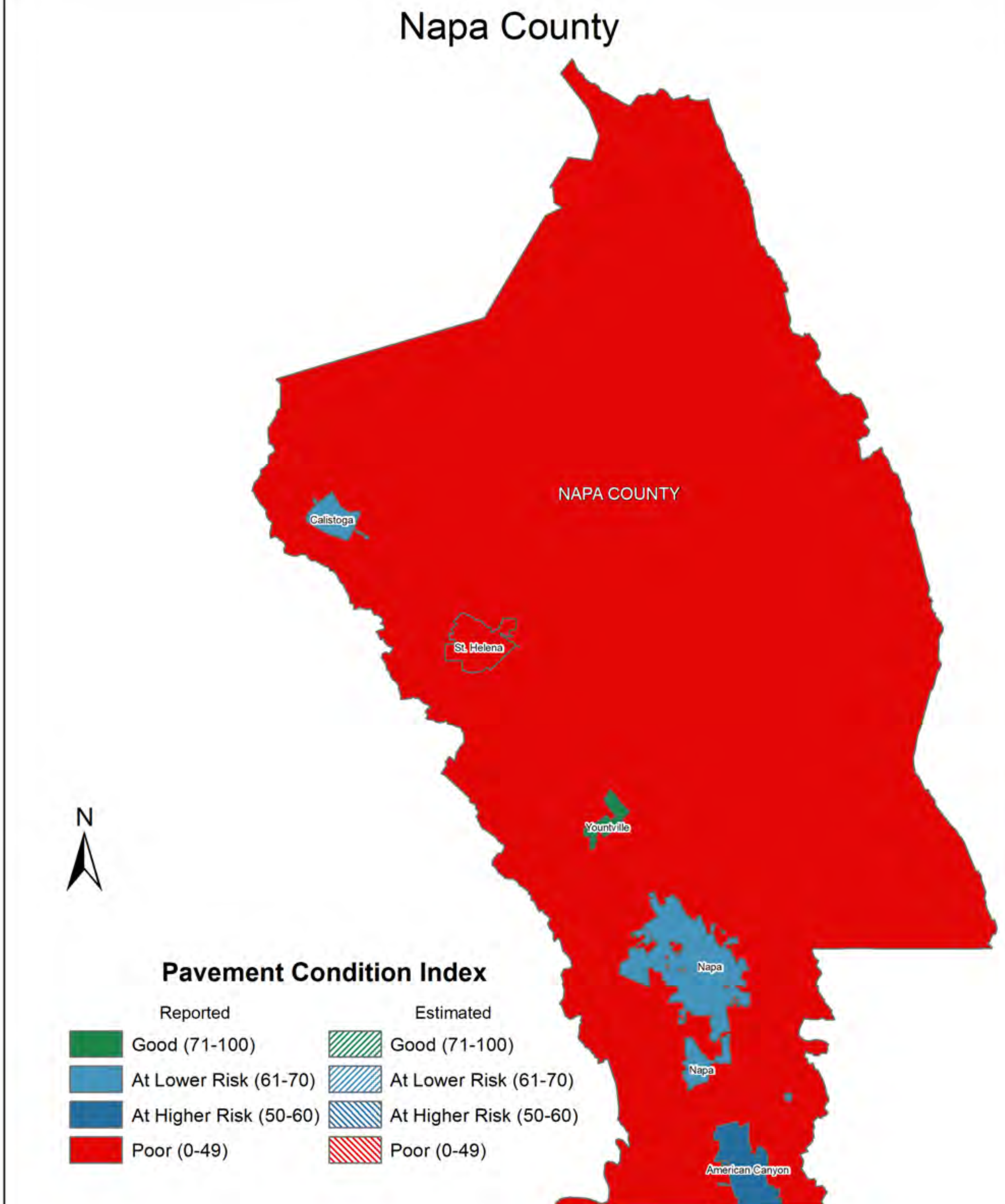
Pavement Condition Index

Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)

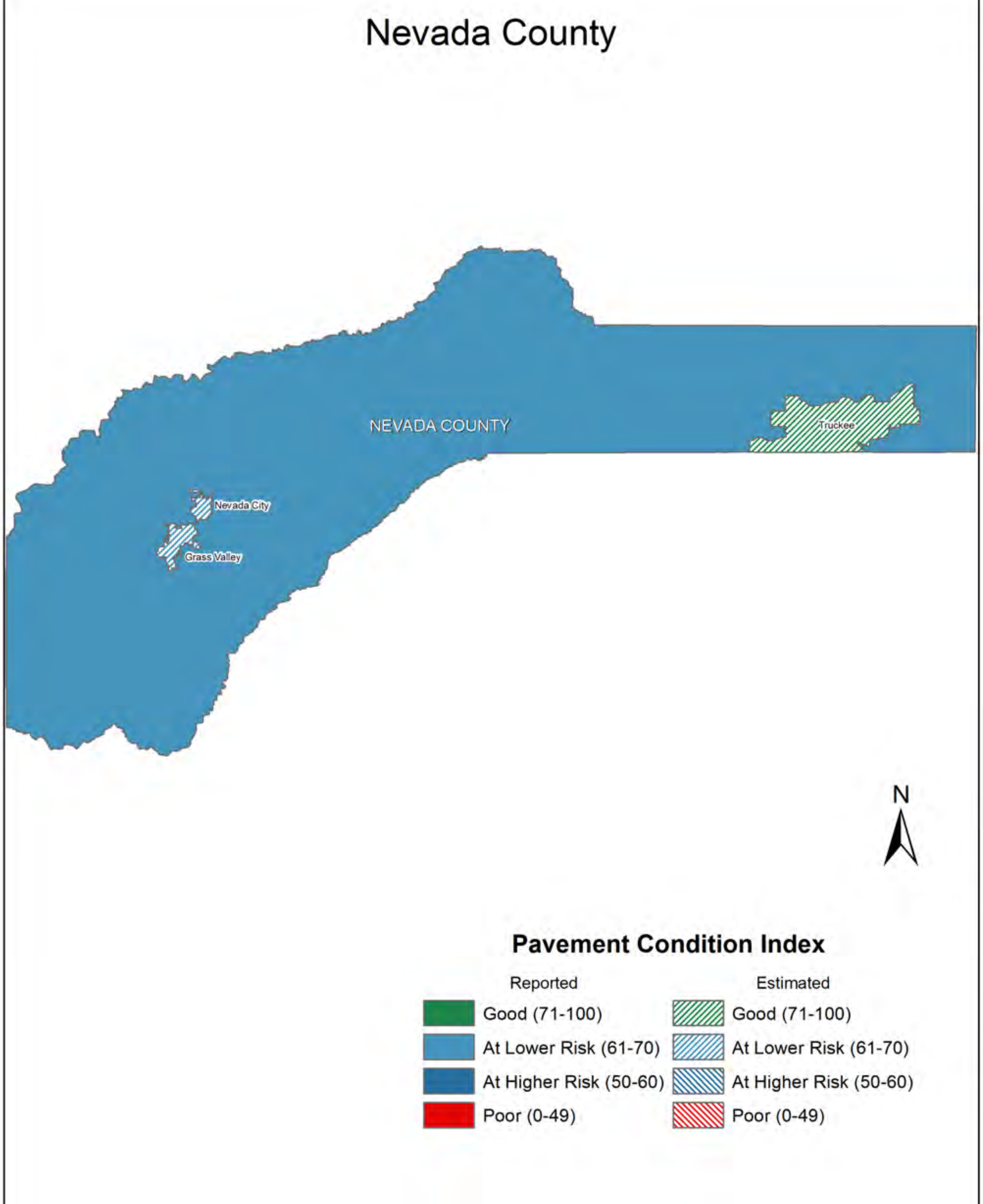
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

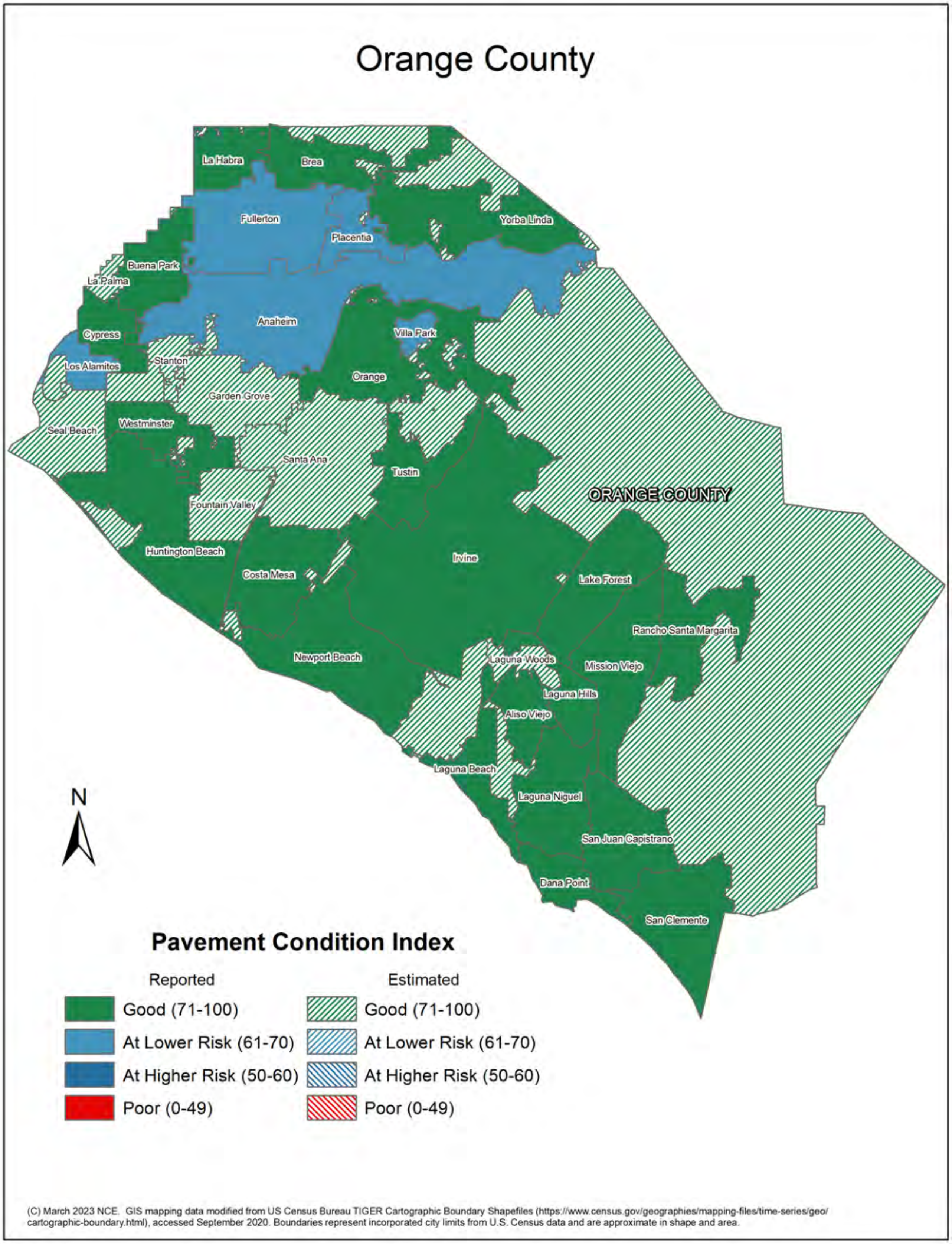

Mono County
MONO COUNTY
Mammoth Lakes
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

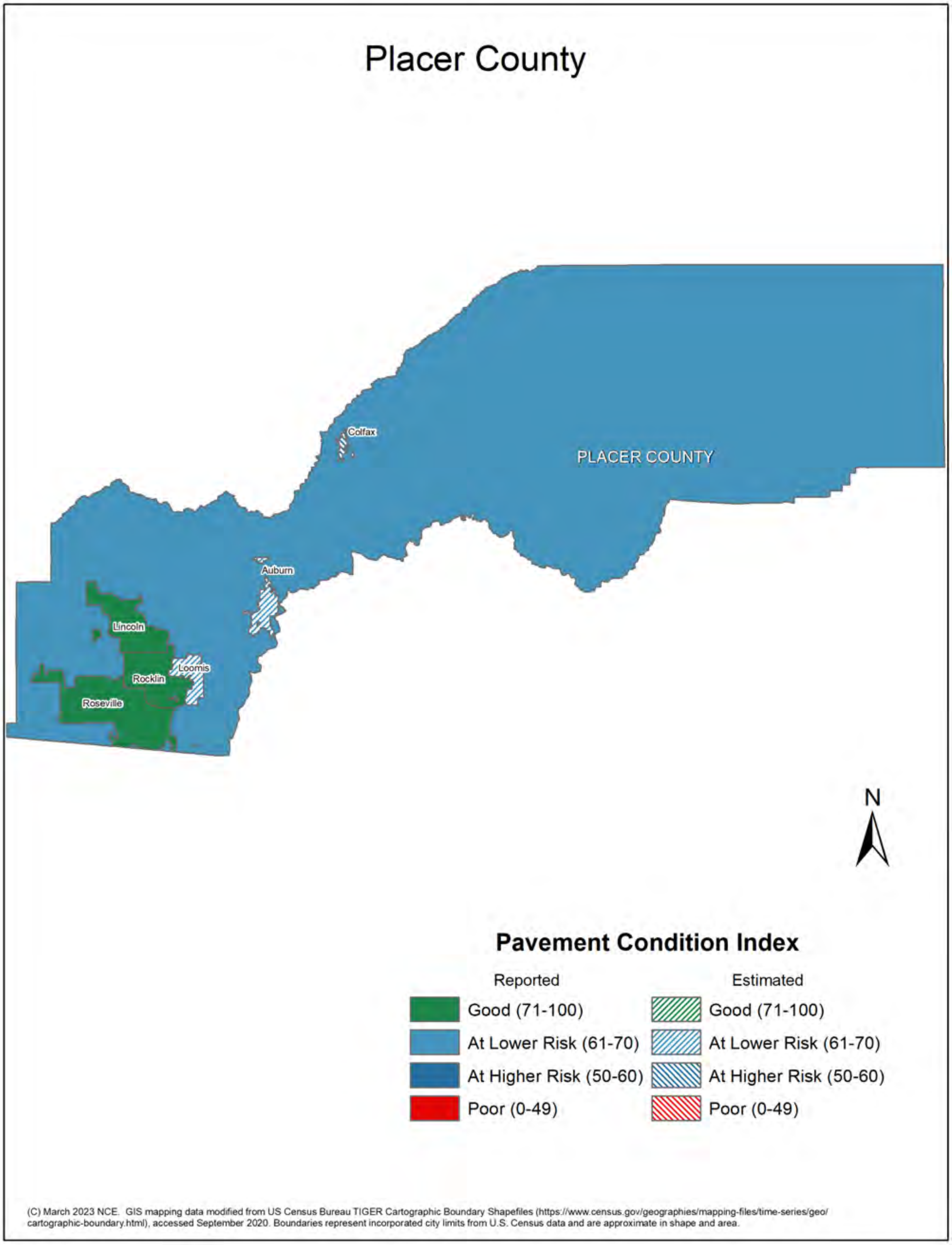

Monterey County
Marina
Pacific Grove
Sand City
Seaside
Monterey
Del Rey Oaks
Carmel-by-the-Sea
Salinas
Gonzales
Soledad
Greenfield
King City
MONTEREY COUNTY
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.



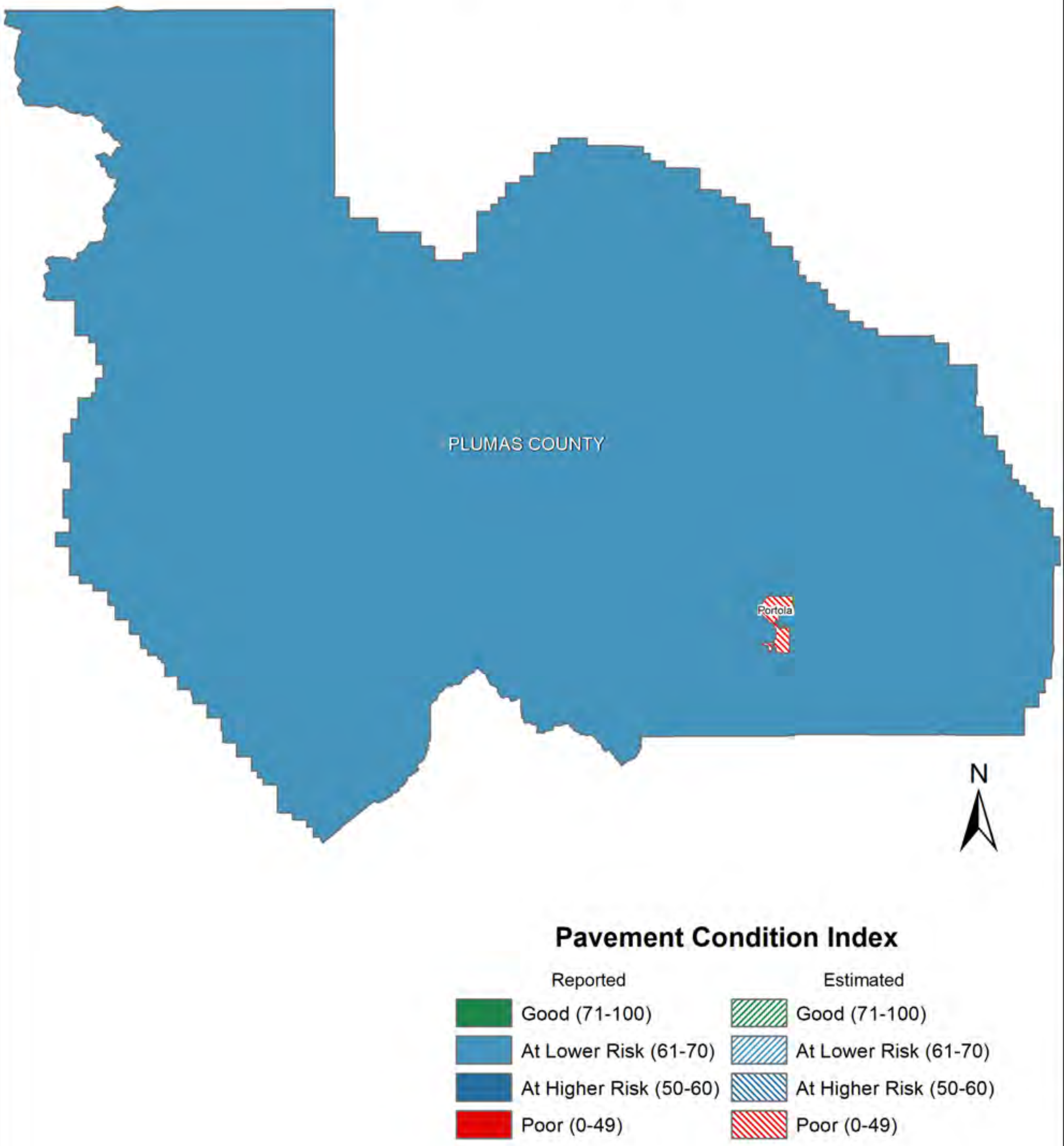
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Nevada County
NEVADA COUNTY
Truckee
Nevada City
Grass Valley
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)

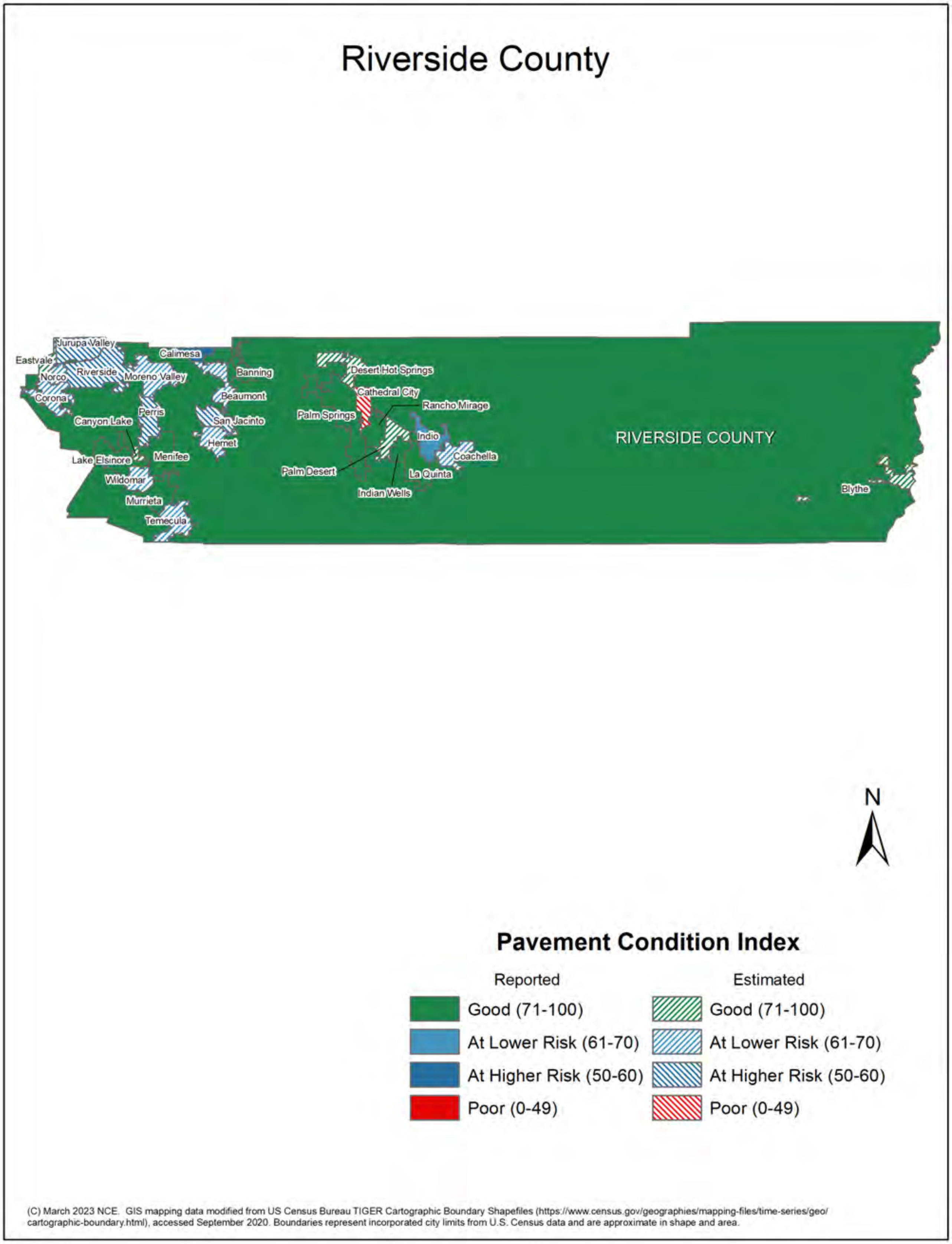

Orange County
La Habra
Brea
Fullerton
Placentia
Yorba Linda
Buena Park
La Palma
Anaheim
Cypress
Villa Park
Los Alamitos
Stanton
Orange
Garden Grove
Seal Beach
Westminster
Santa Ana
Tustin
ORANGE COUNTY
Fountain Valley
Huntington Beach
Irvine
Costa Mesa
Lake Forest
Rancho Santa Margarita
Newport Beach
Laguna Woods
Mission Viejo
Laguna Hills
Aliso Viejo
Laguna Beach
Laguna Niguel
San Juan Capistrano
Dana Point
San Clemente
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

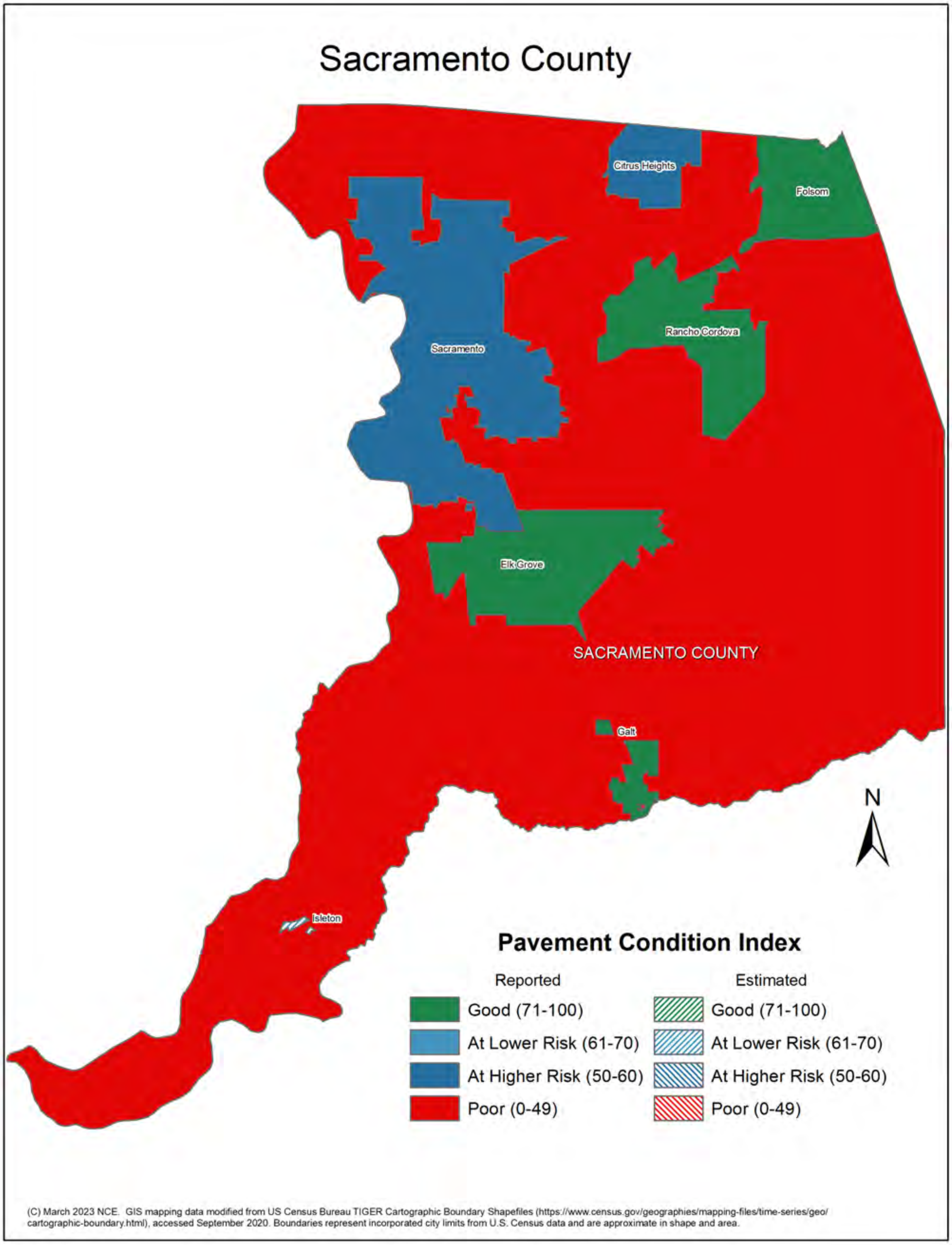

Placer County
Colfax
PLACER COUNTY
Auburn
Lincoln
Loomis
Rocklin
Roseville
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Plumas County

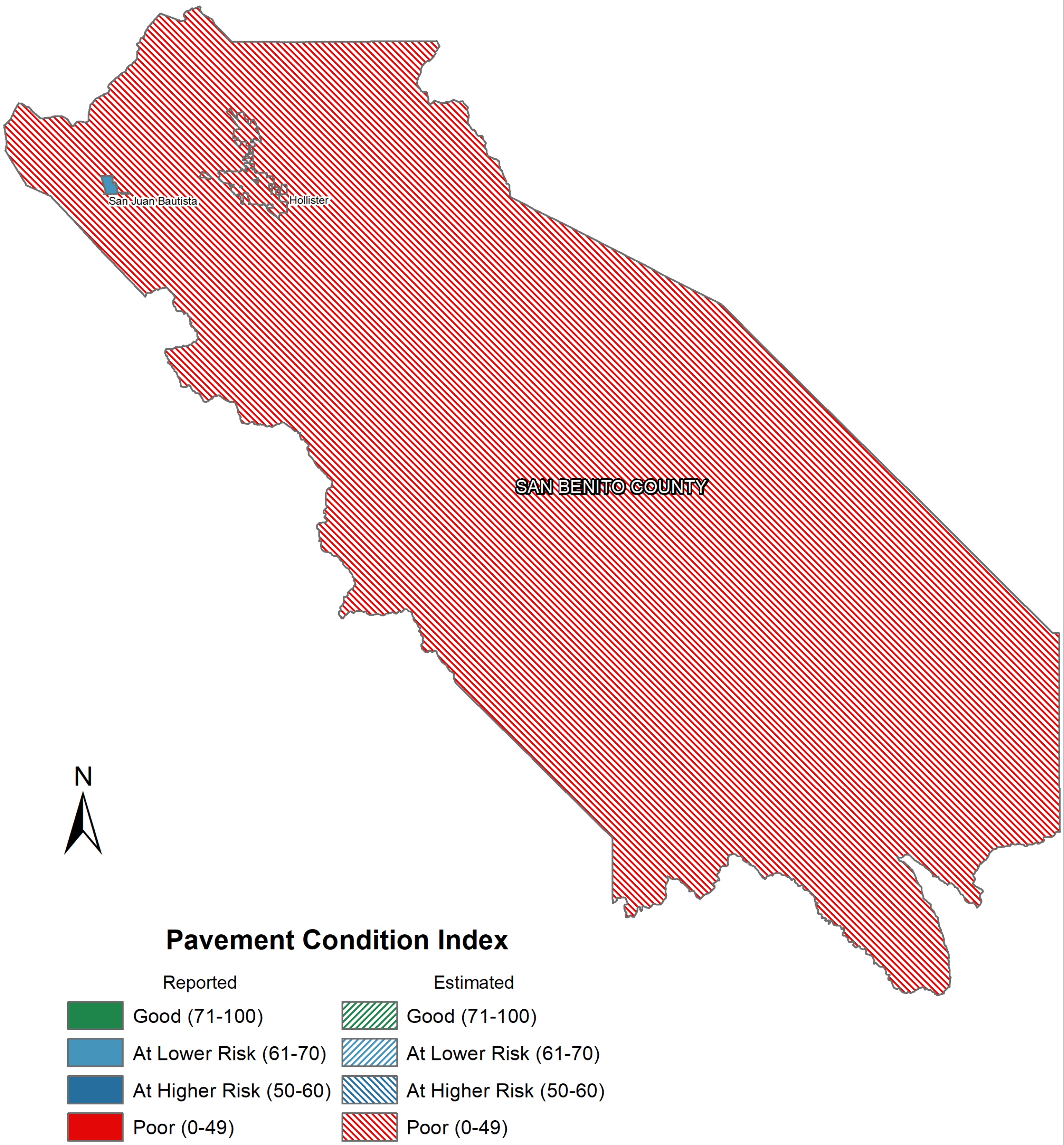


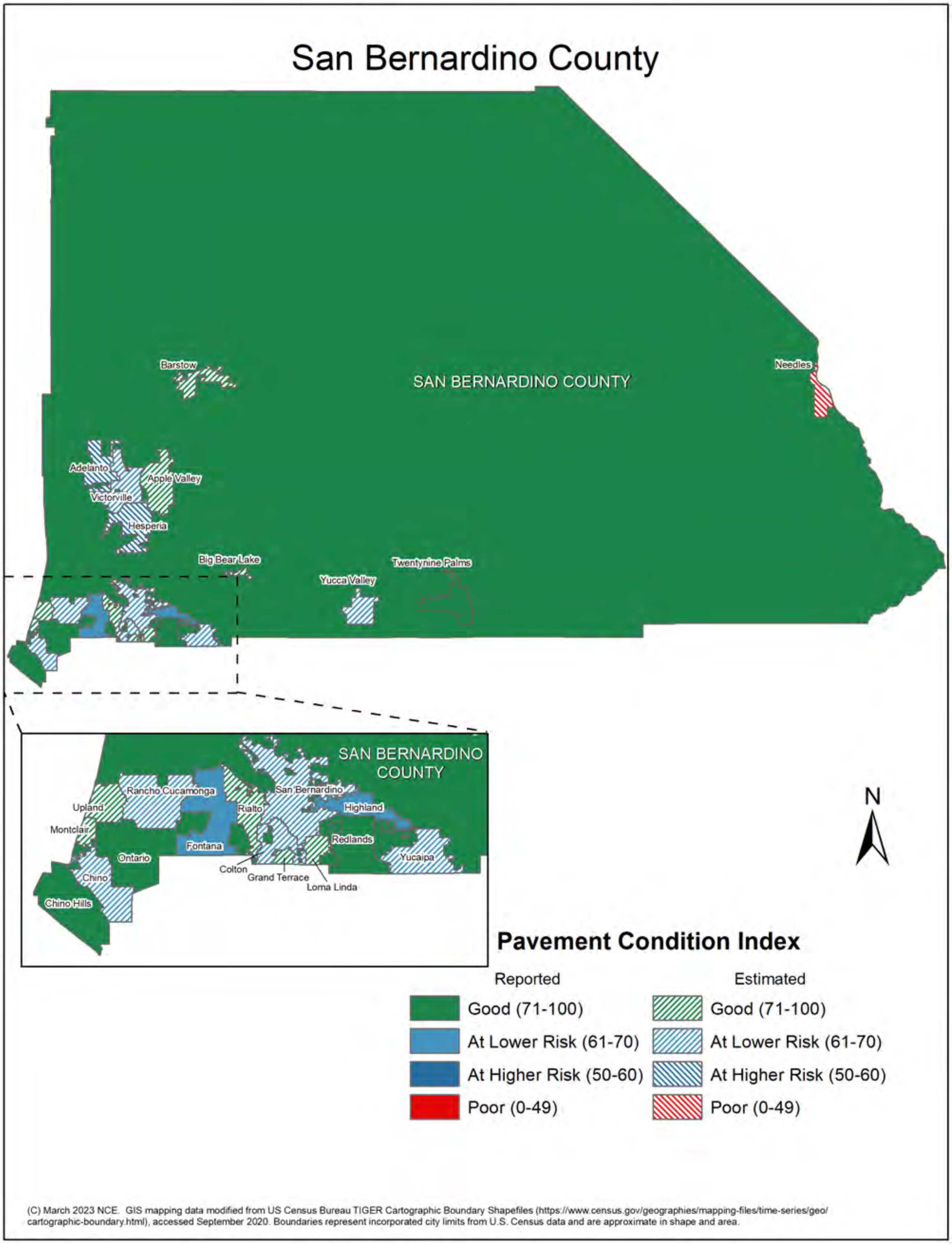
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

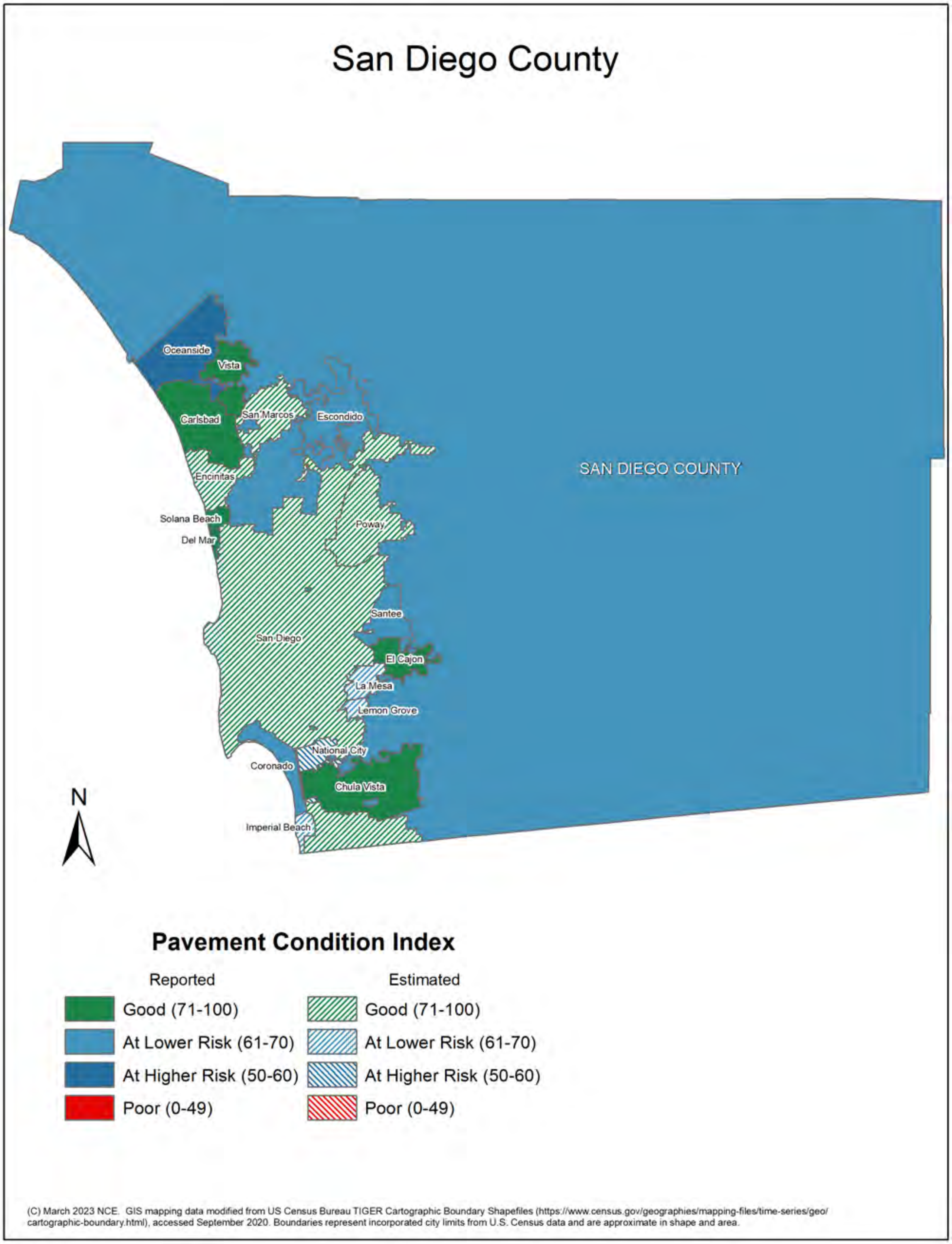

Riverside County
Jurupa Valley
Eastvale
Calimesa
Norco
Riverside
Moreno Valley
Banning
Corona
Beaumont
Perris
Canyon Lake
San Jacinto
Hemet
Lake Elsinore
Menifee
Wildomar
Murrieta
Temecula
Desert Hot Springs
Cathedral City
Rancho Mirage
Palm Springs
Indio
Coachella
Palm Desert
La Quinta
Indian Wells
RIVERSIDE COUNTY
Blythe
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

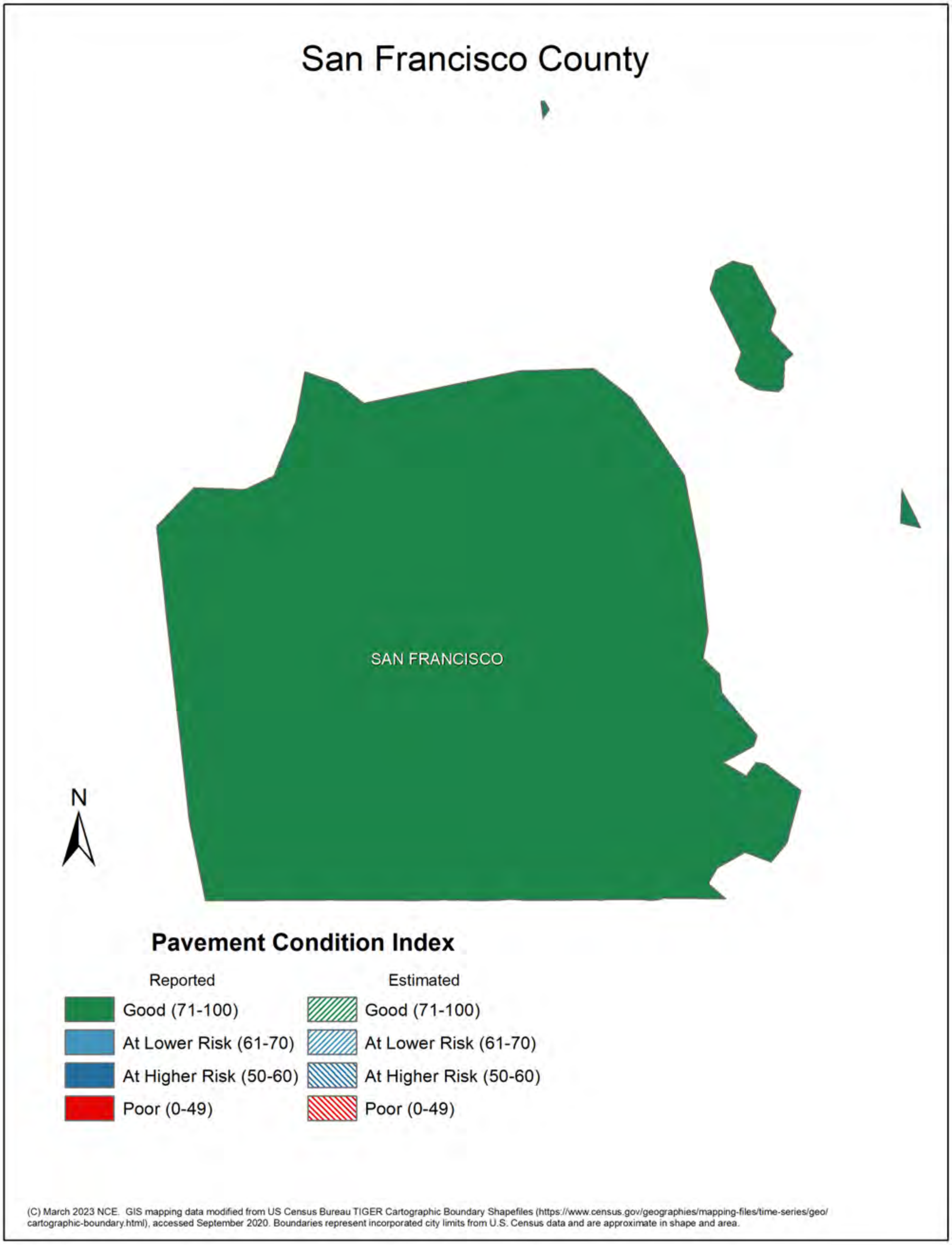

Sacramento County
Citrus Heights
Folsom
Sacramento
Rancho Cordova
Elk Grove
SACRAMENTO COUNTY
Galt
Isleton
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

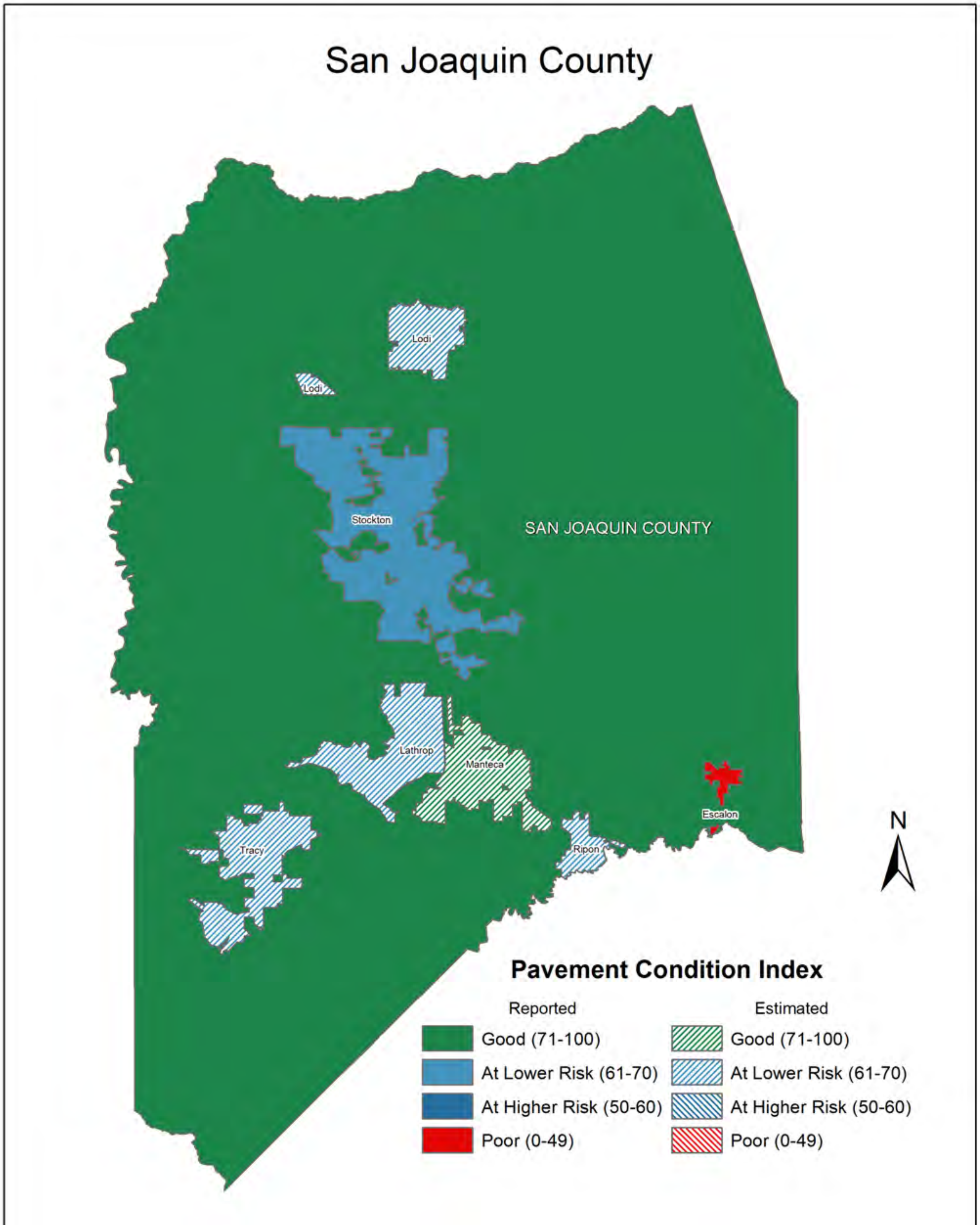
San Benito County



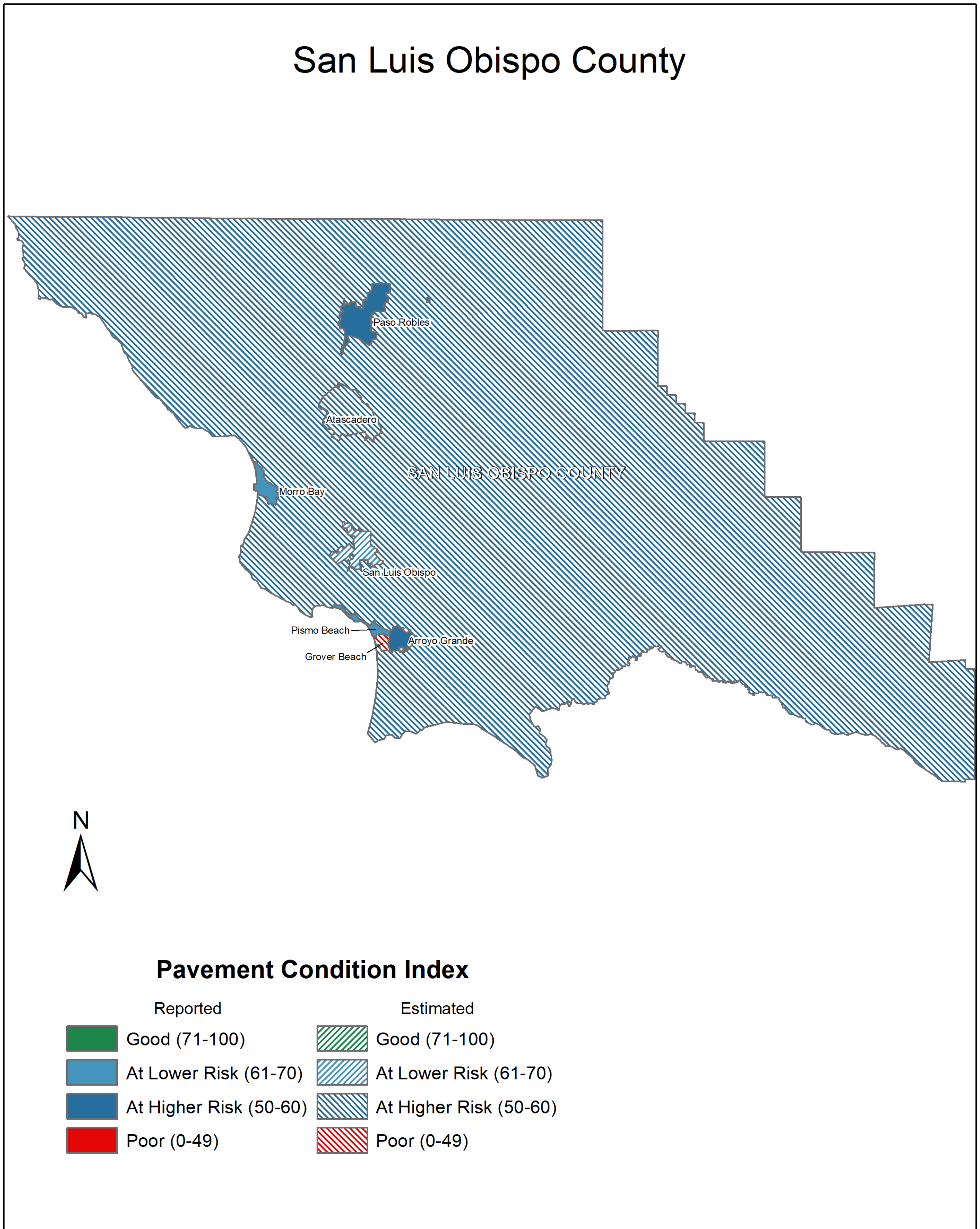

San Bernardino County
SAN BERNARDINO COUNTY
Barstow
Needles
Adelanto
Apple Valley
Victorville
Hesperia
Big Bear Lake
Twentynine Palms
Yucca Valley
SAN BERNARDINO COUNTY
Rancho Cucamonga
San Bernardino
Upland
Rialto
Highland
Montclair
Fontana
Redlands
Ontario
Yucaipa
Colton
Grand Terrace
Loma Linda
Chino
Chino Hills
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

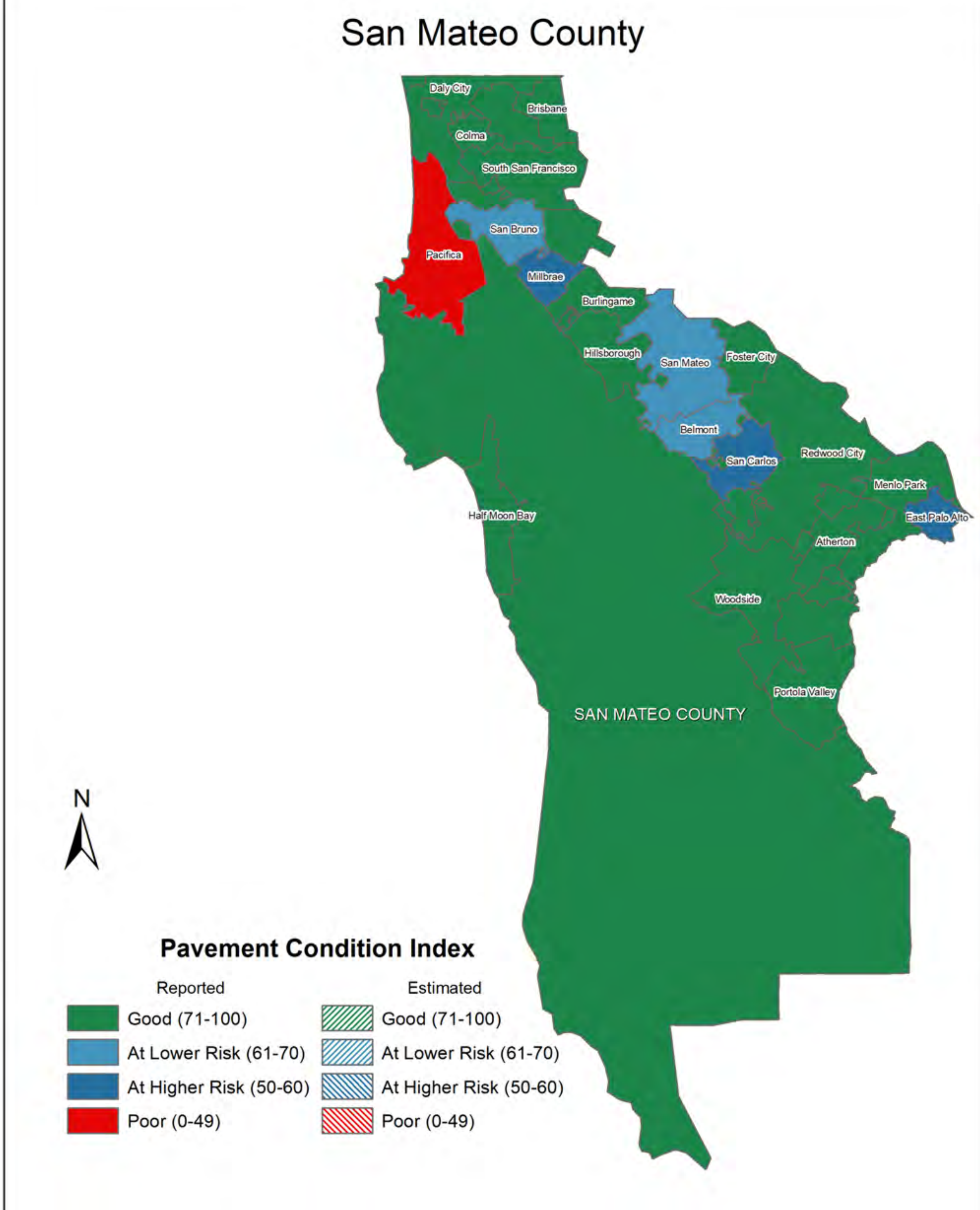

San Diego County
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
SAN DIEGO COUNTY
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


San Francisco County
SAN FRANCISCO
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

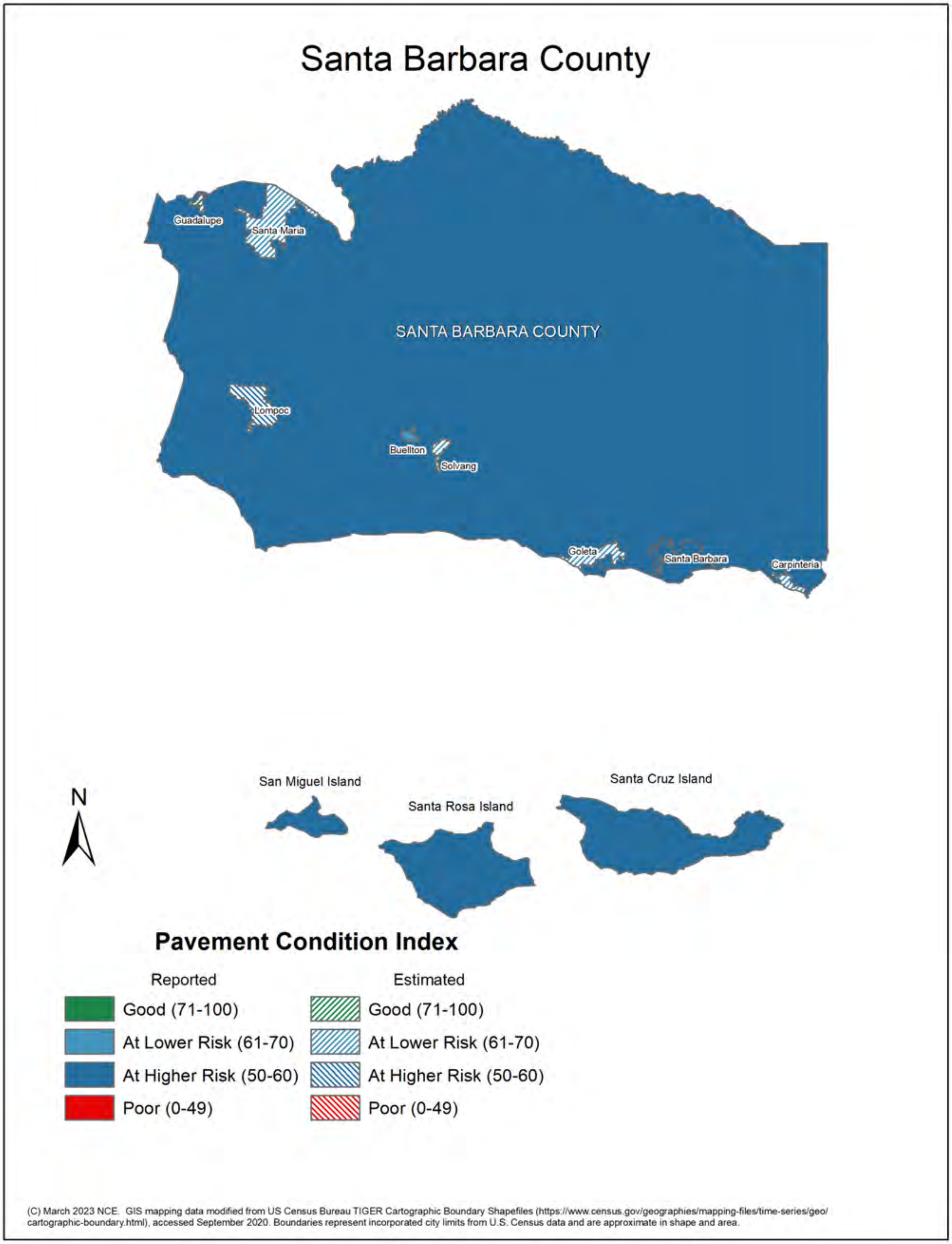


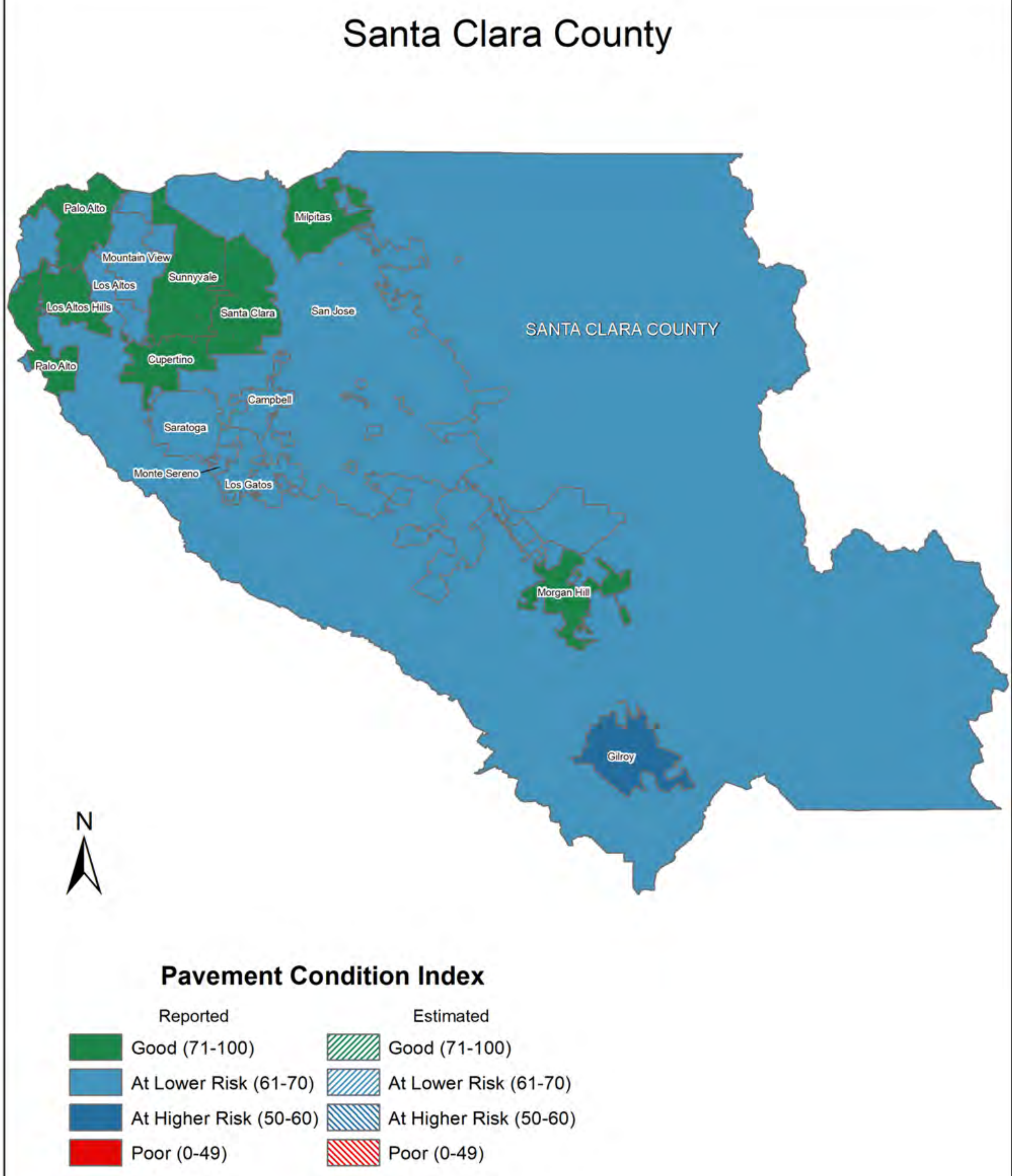
 GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


San Luis Obispo County
Paso Robles
Atascadero
SAN LUIS OBISPO COUNTY
Morro Bay
San Luis Obispo
Pismo Beach
Arroyo Grande
Grover Beach
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)

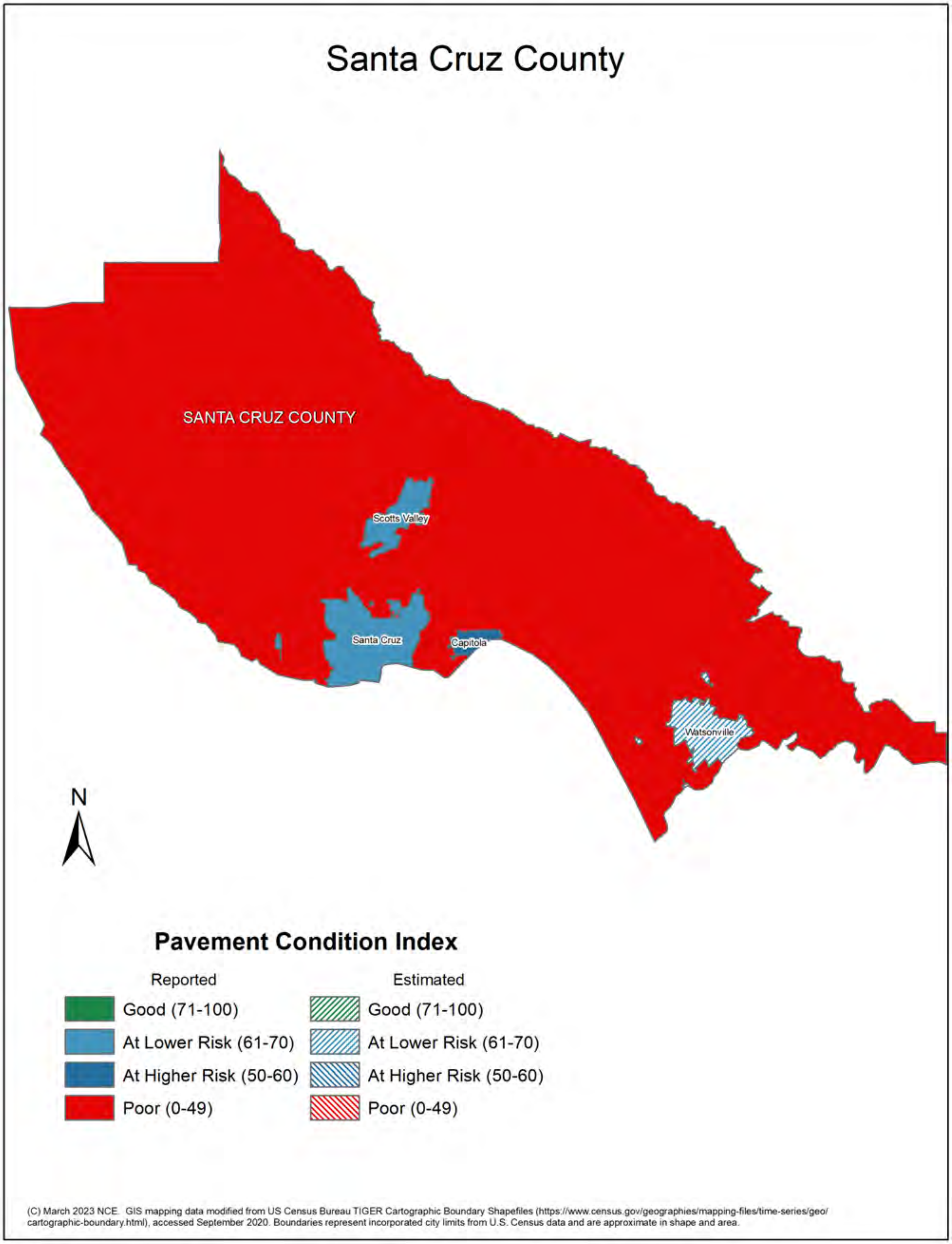


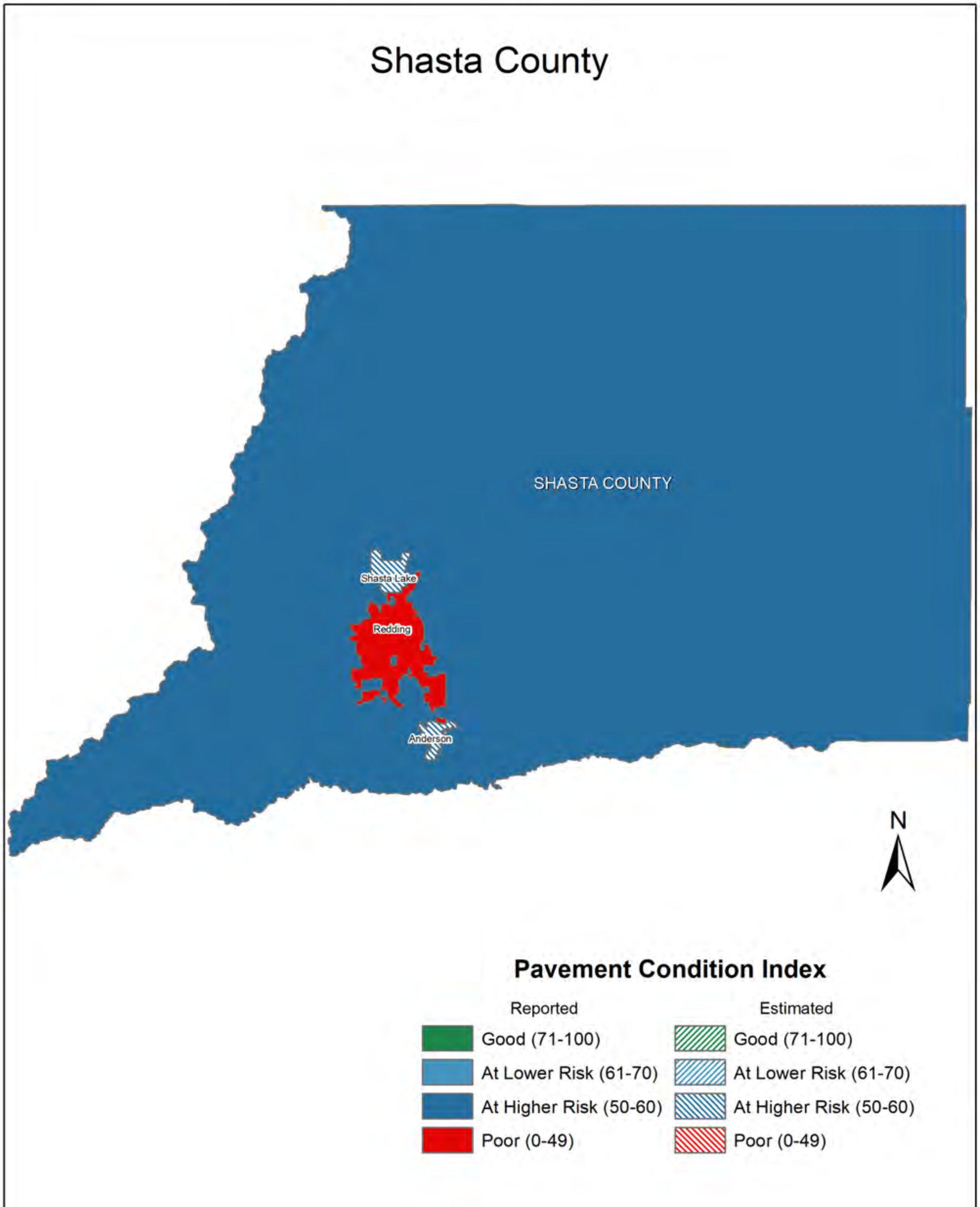
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Santa Barbara County
Guadalupe
Santa Maria
SANTA BARBARA COUNTY
Lompoc
Buellton
Solvang
Goleta
Santa Barbara
Carpinteria
San Miguel Island
Santa Rosa Island
Santa Cruz Island
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

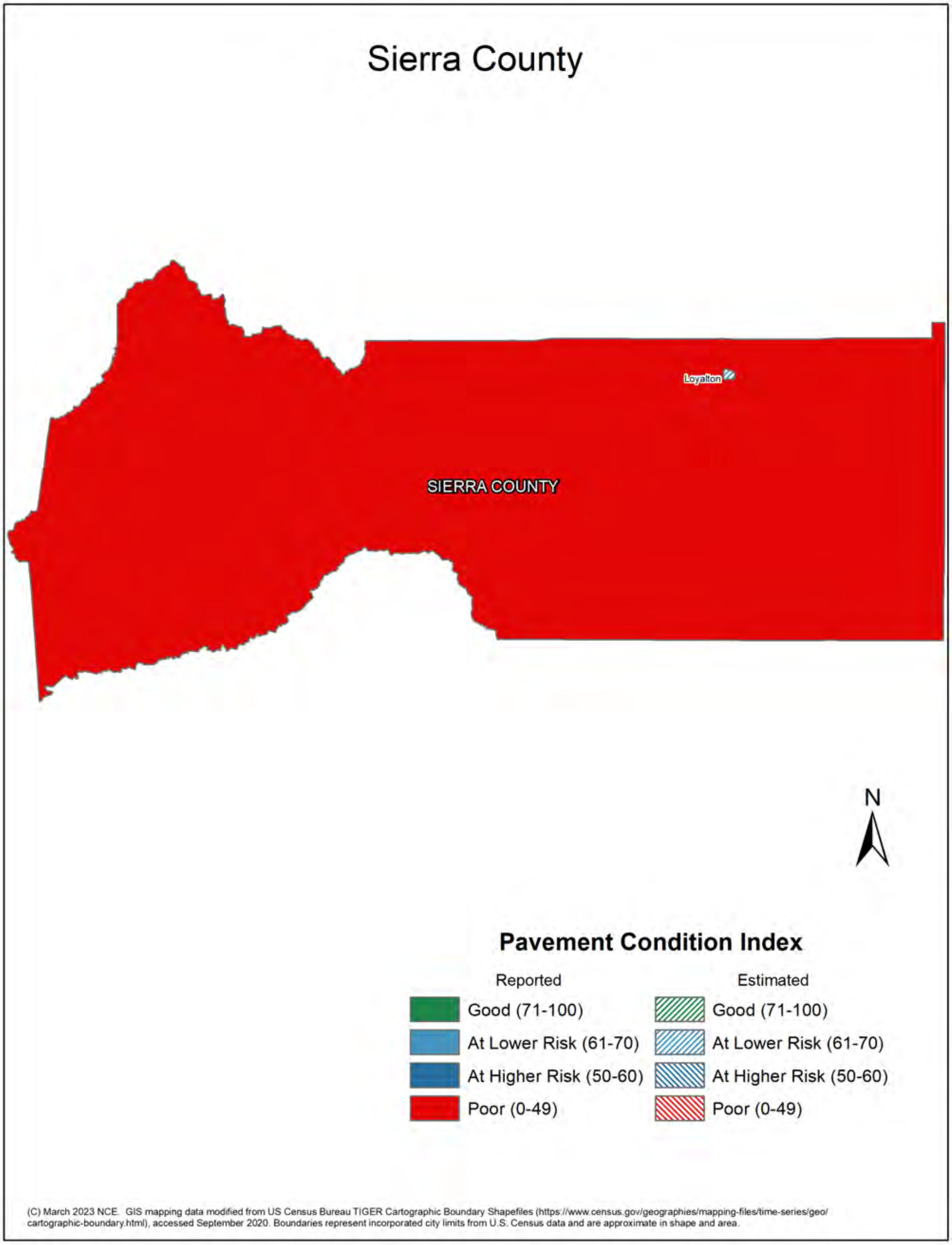


(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

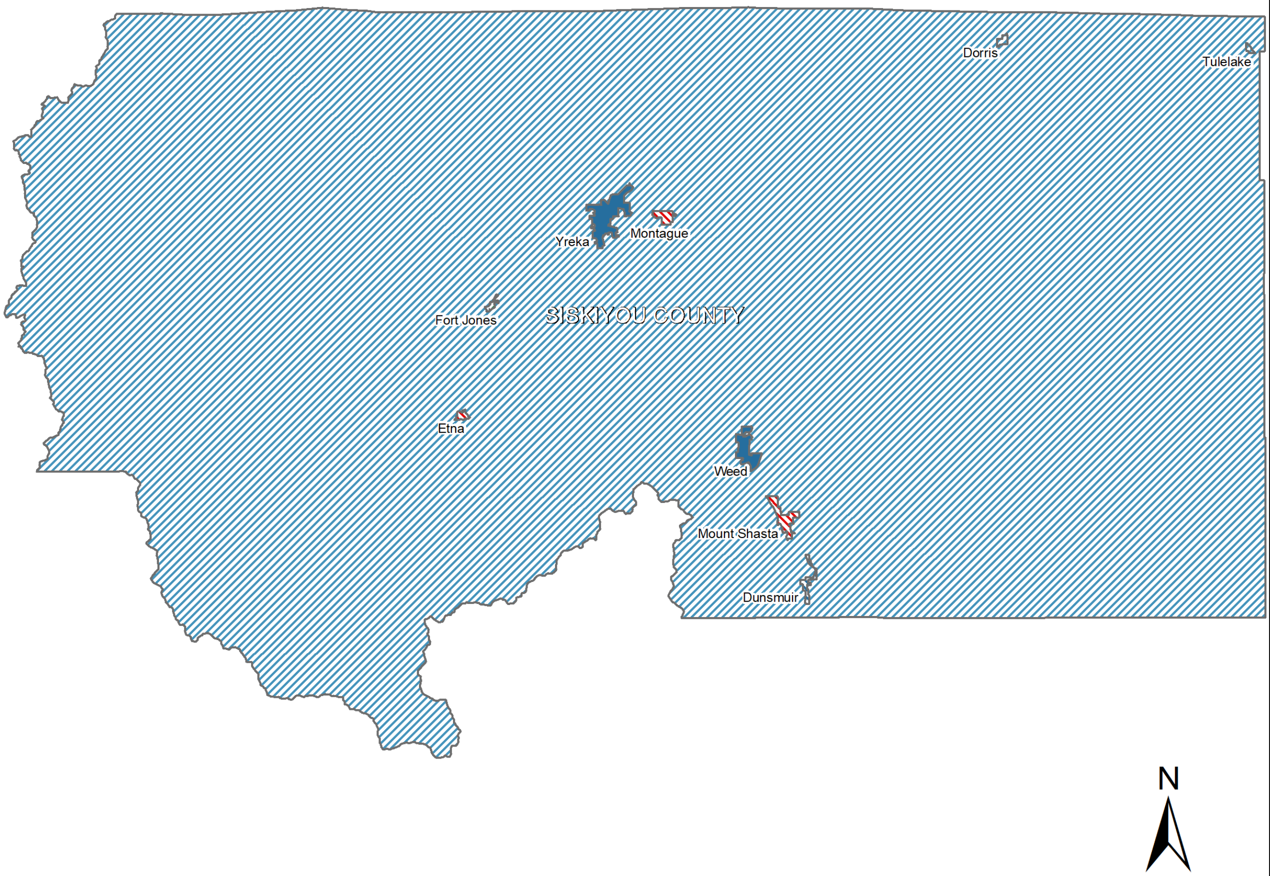

Santa Cruz County
SANTA CRUZ COUNTY
Scotts Valley
Santa Cruz
Capitola
Watsonville
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.



(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

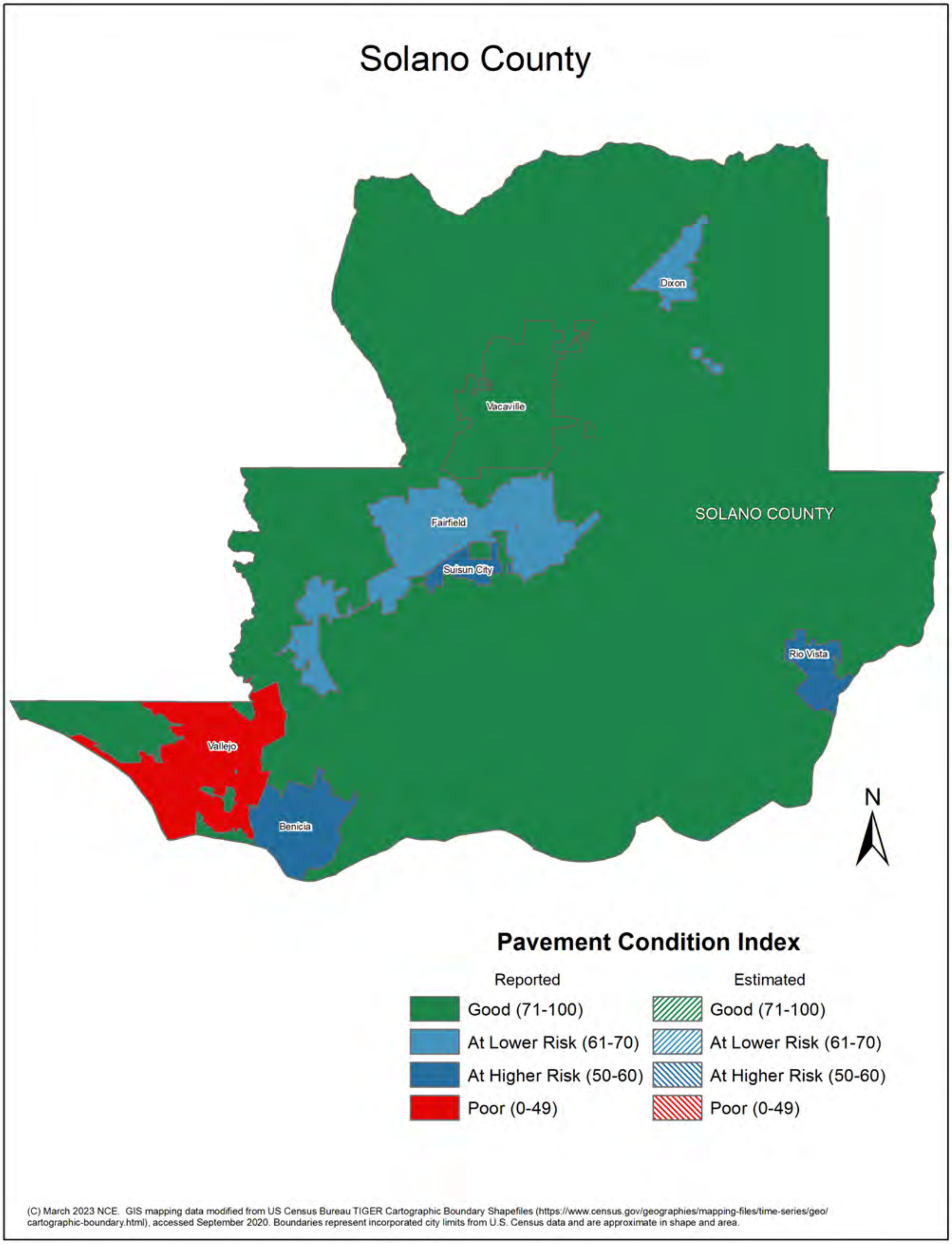

Sierra County
SIERRA COUNTY
Loyalton
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

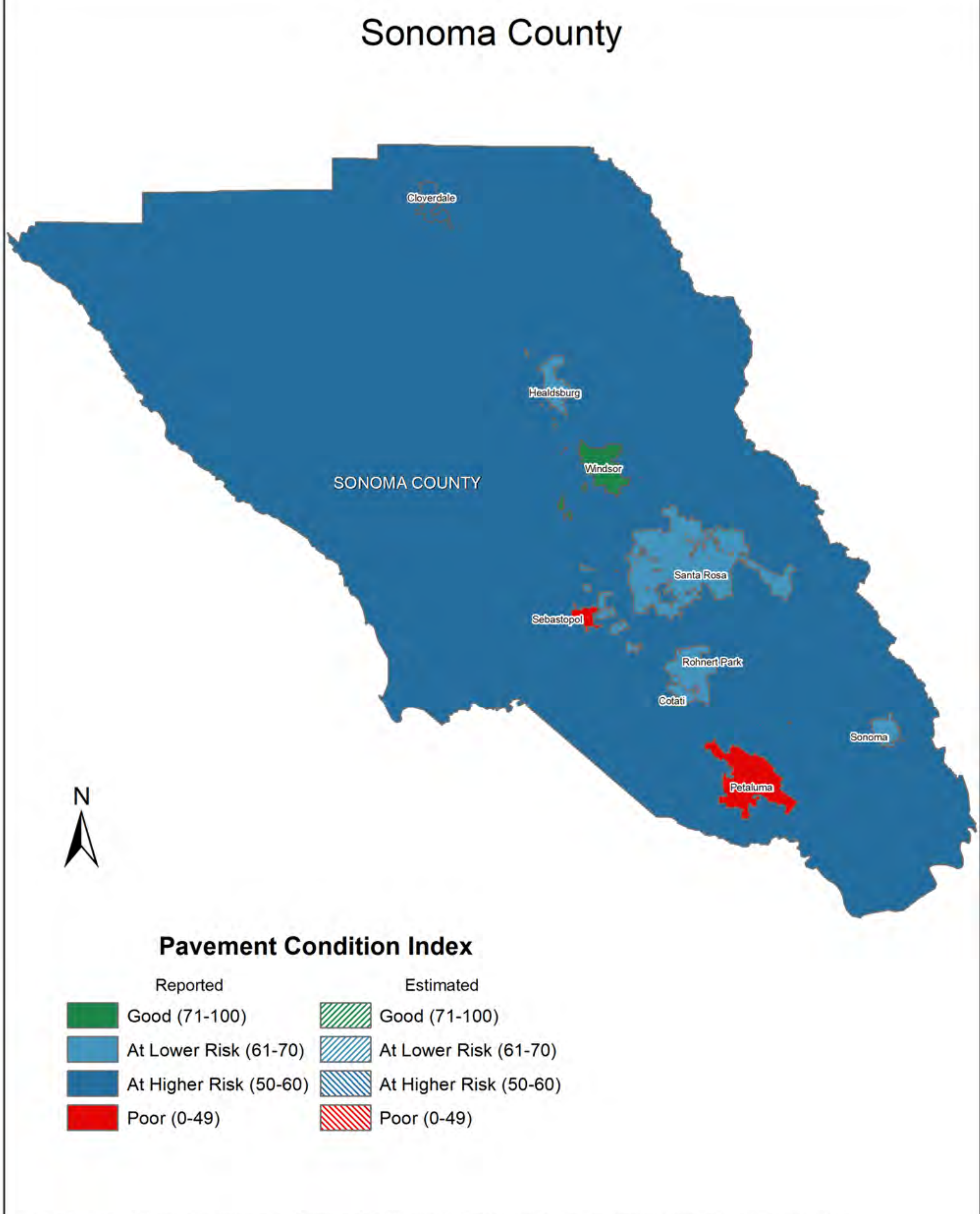
Siskiyou County



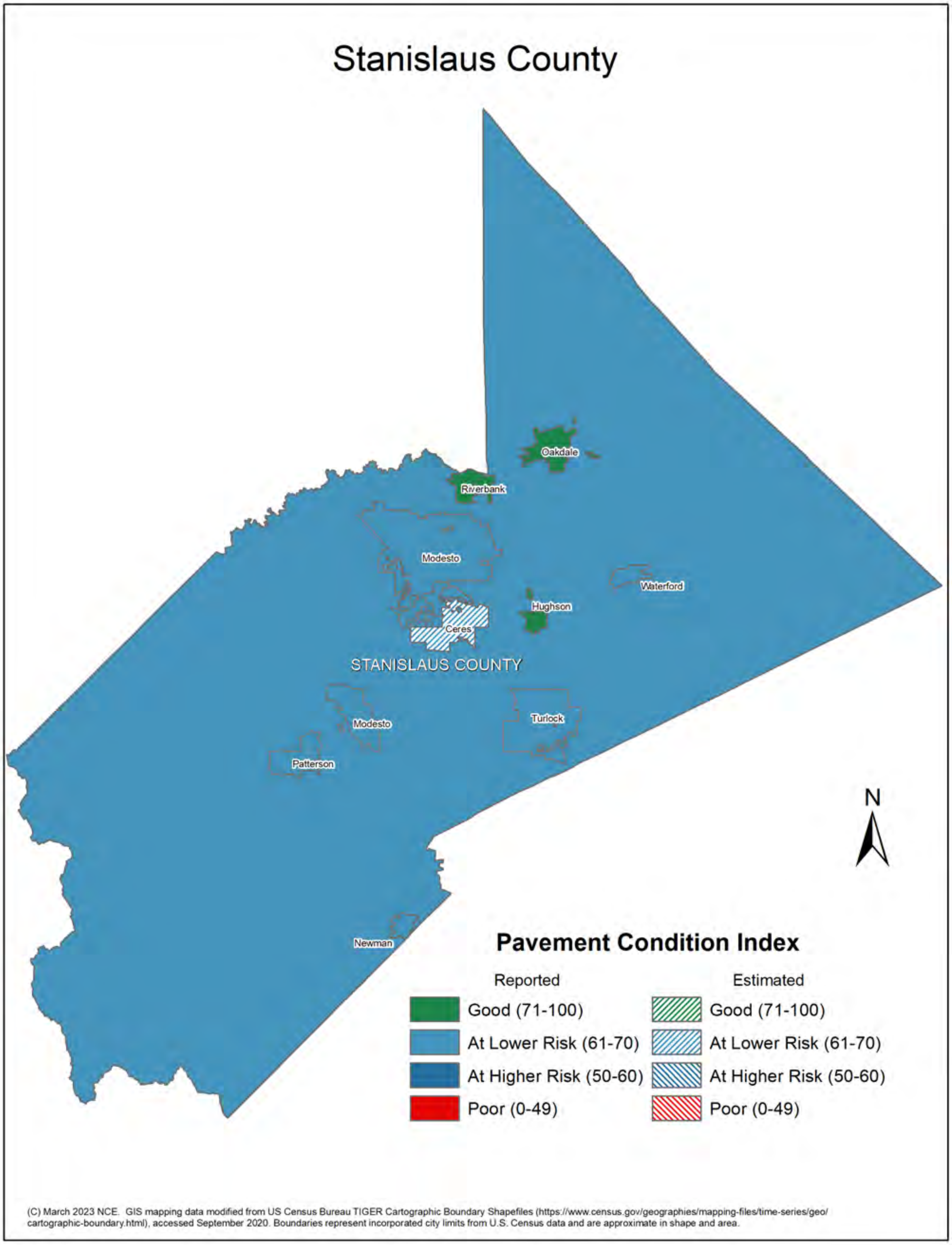
Pavement Condition Index

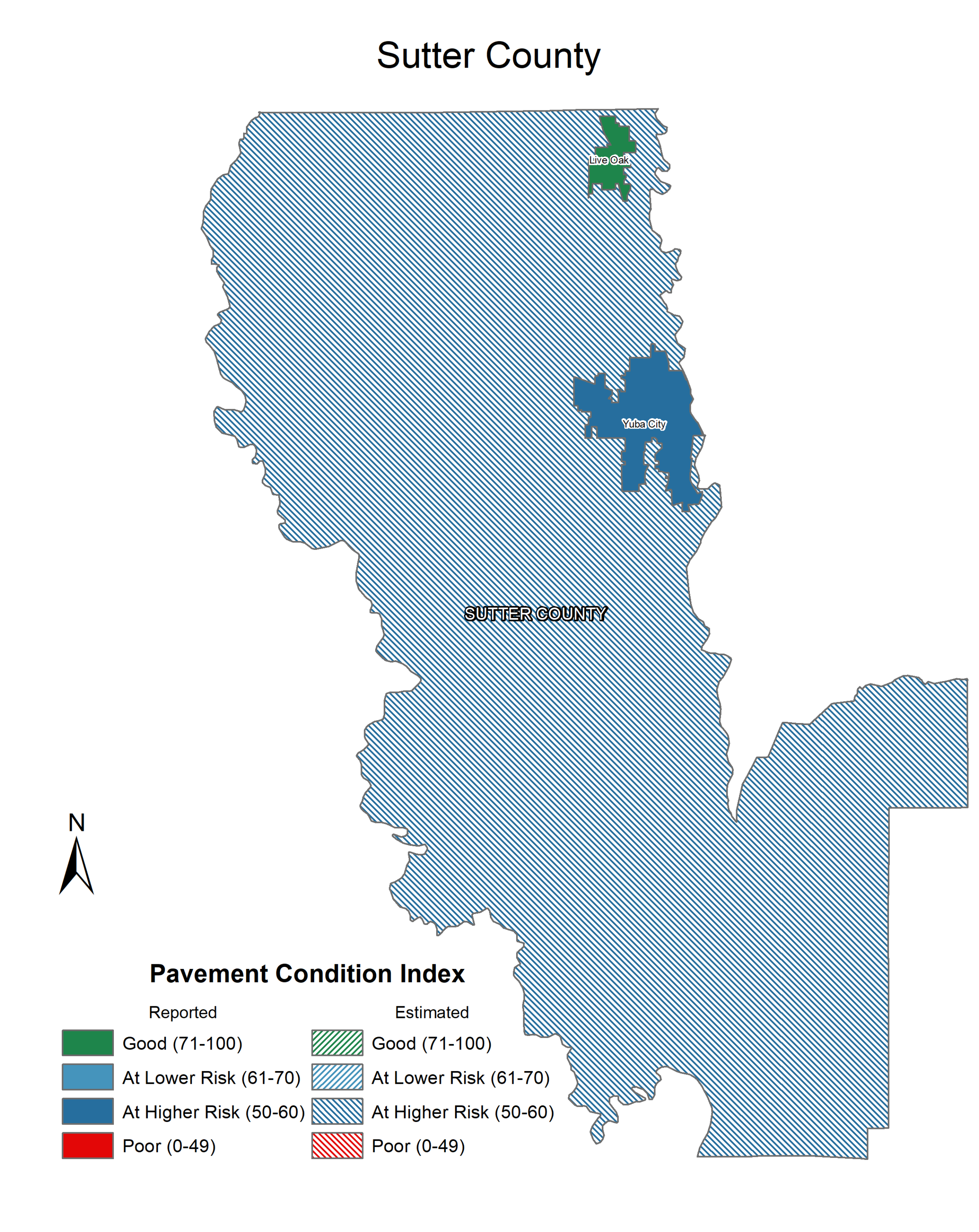
Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)


Solano County
Dixon
Vacaville
Fairfield
Suisun City
SOLANO COUNTY
Rio Vista
Vallejo
Benicia
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

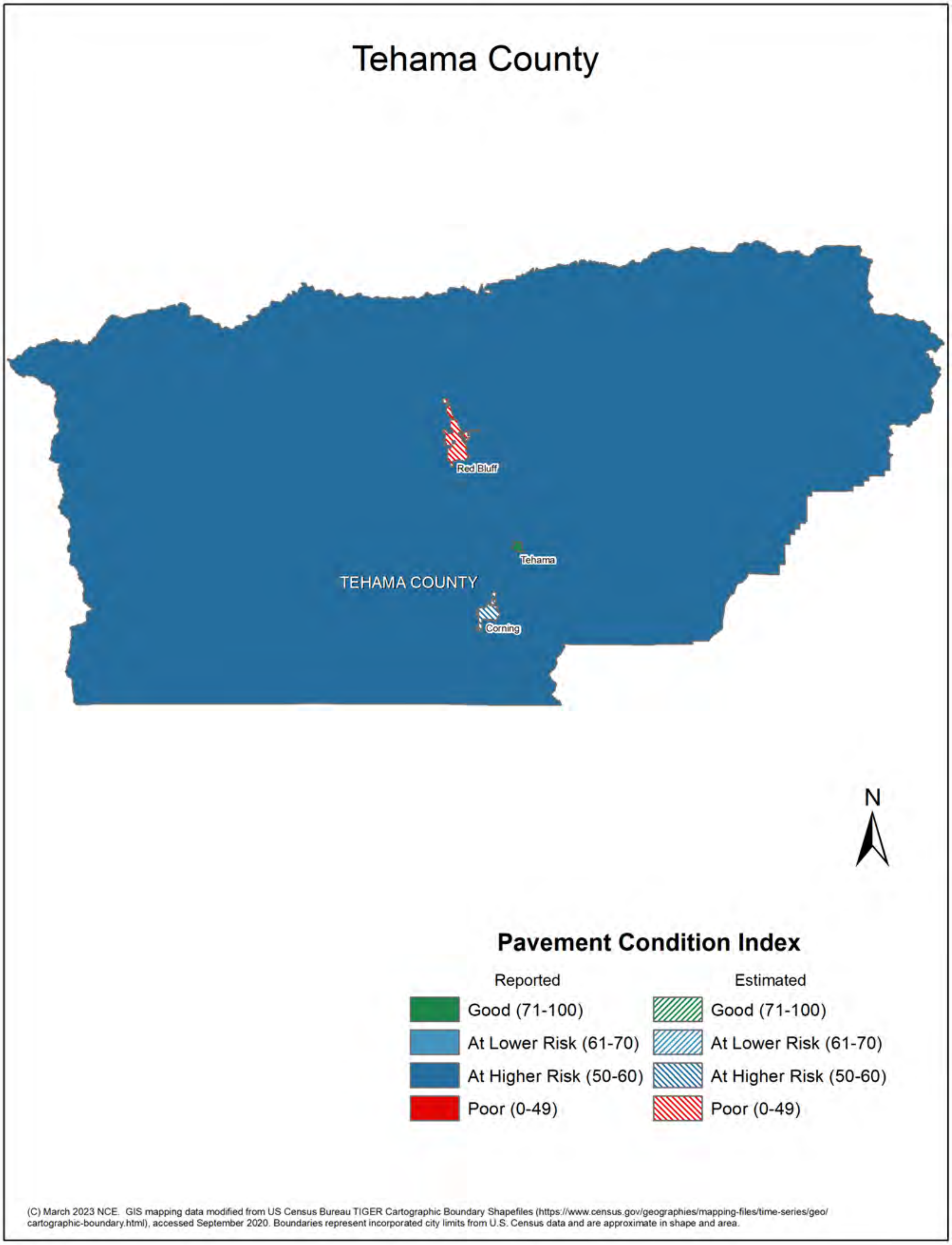


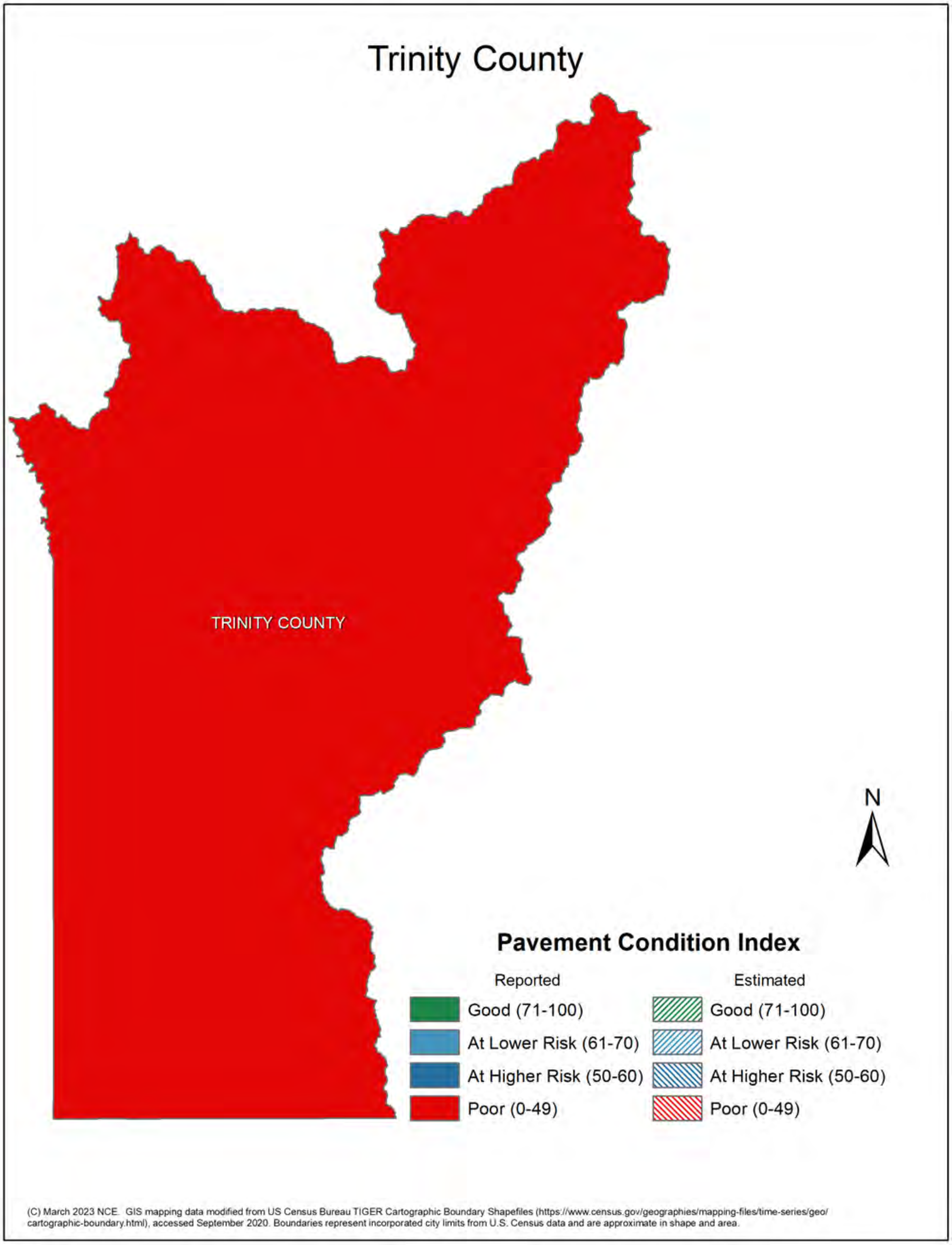
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Stanislaus County
Oakdale
Riverbank
Modesto
Waterford
Hughson
Ceres
STANISLAUS COUNTY
Modesto
Turlock
Patterson
Newman
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

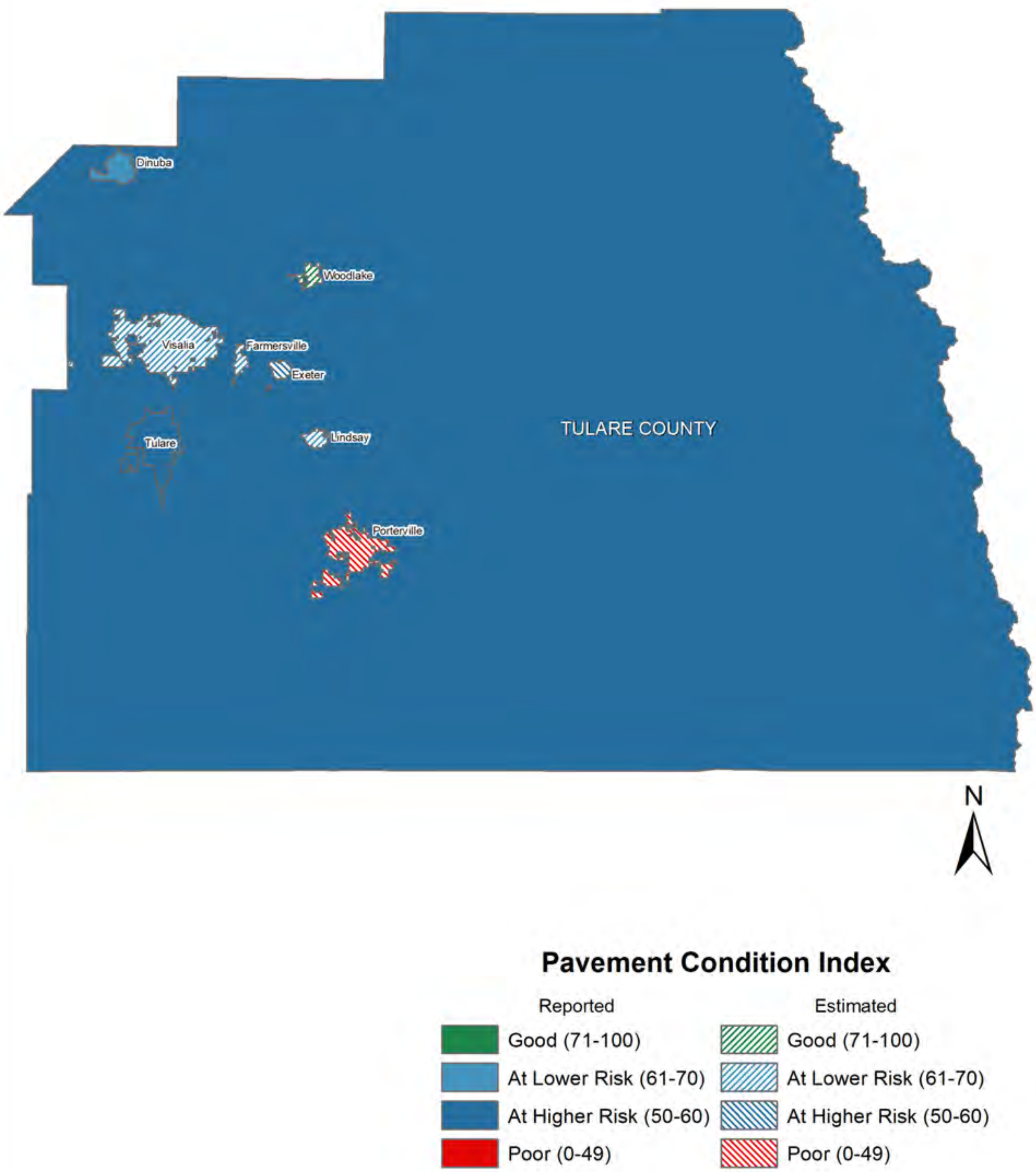


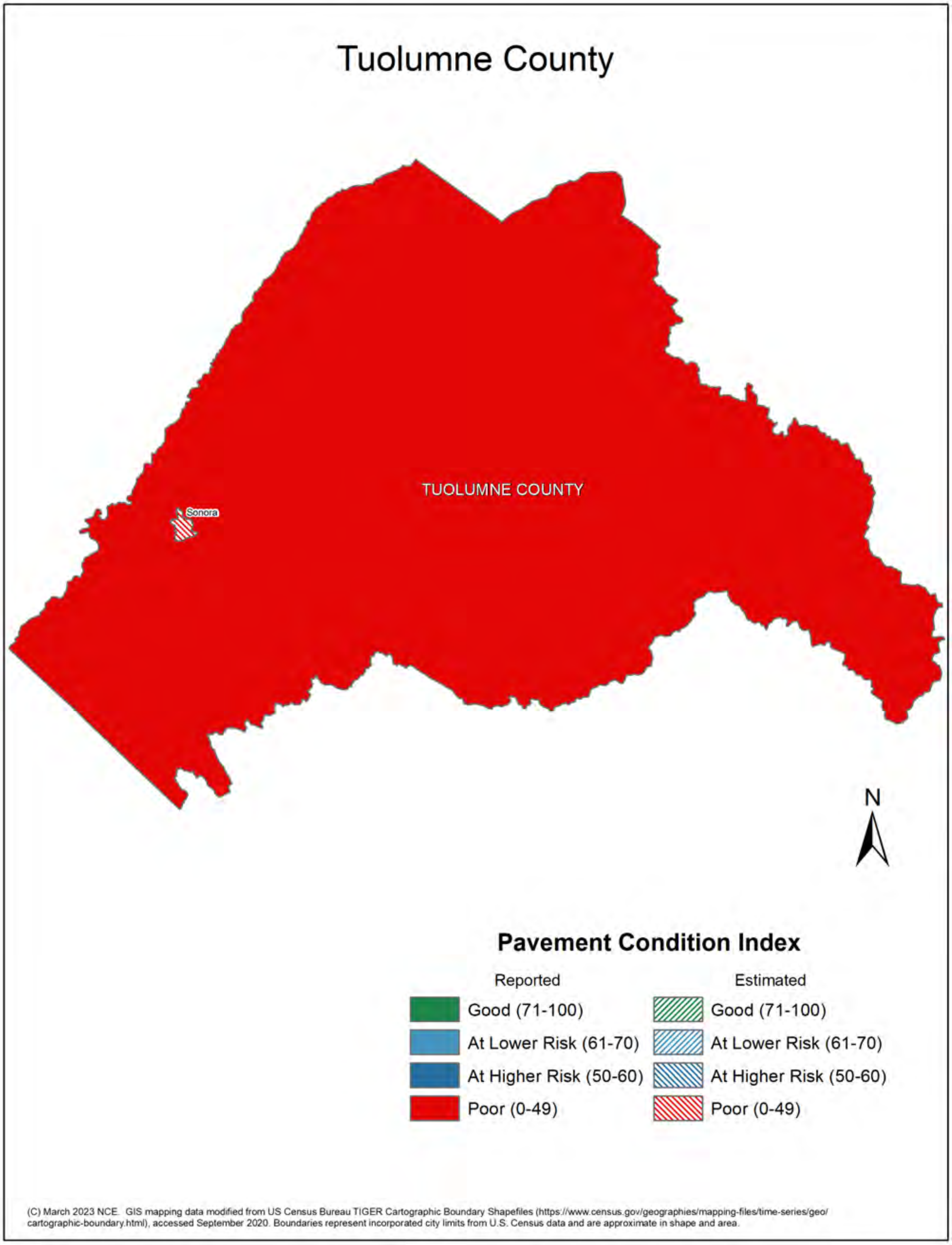
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

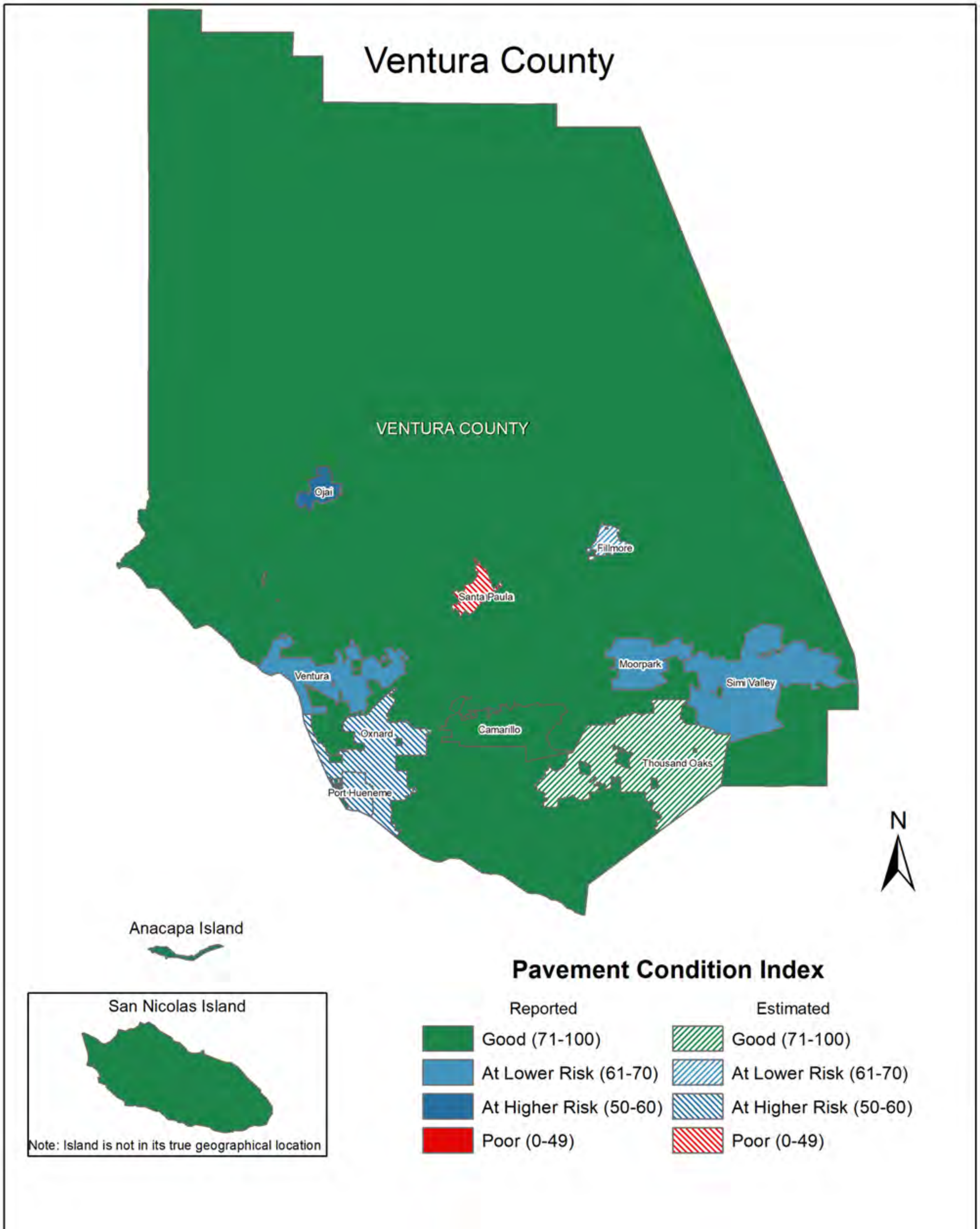

Tehama County
Red Bluff
Tehama
TEHAMA COUNTY
Corning
N
Pavement Condition Index
Reported
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.


Trinity County
TRINITY COUNTY
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Tulare County

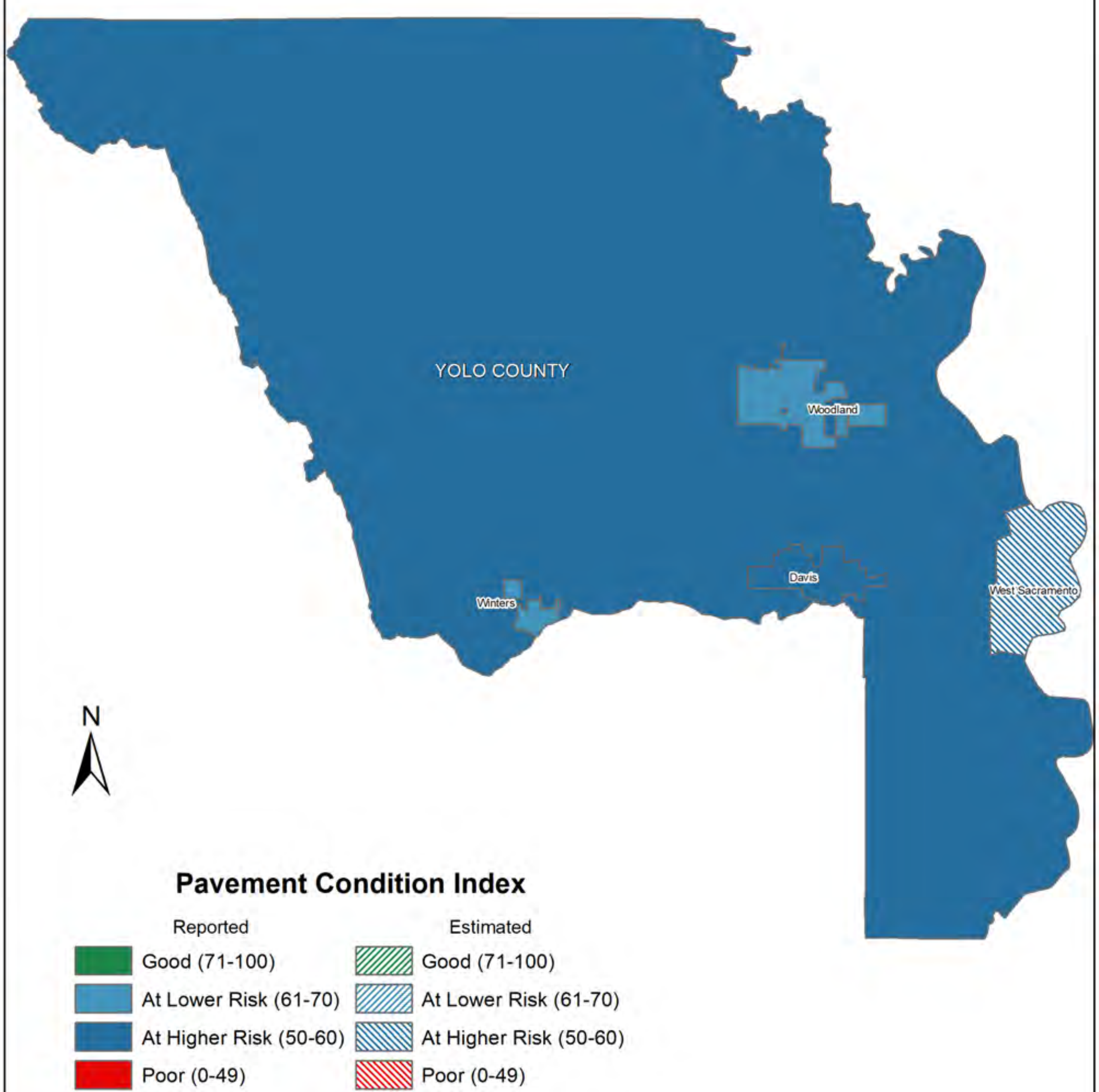


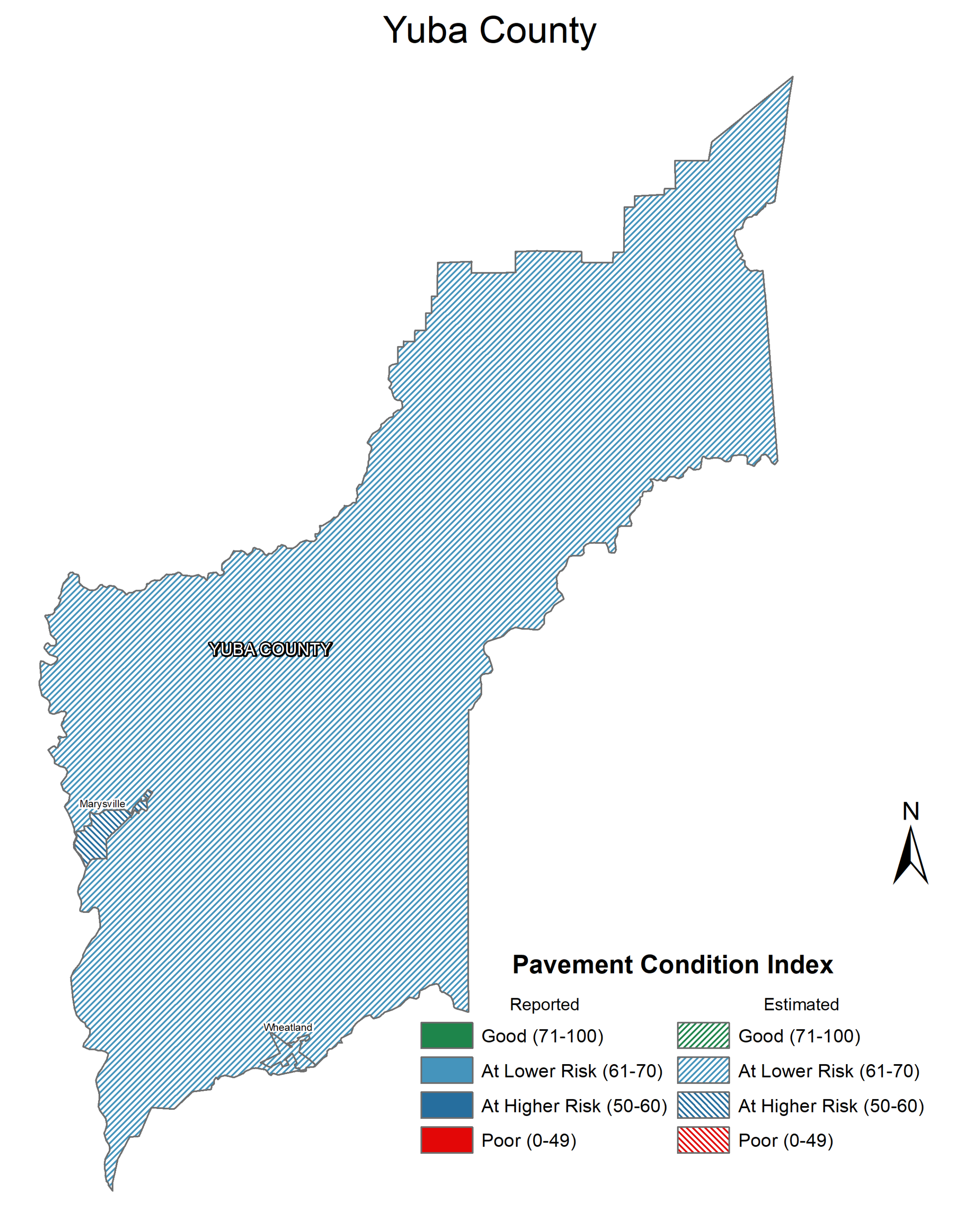

Tuolumne County
TUOLUMNE COUNTY
Sonora
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.



(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

Yolo County


YOLO COUNTY
Woodland
Davis
Winters
West Sacramento
N
Pavement Condition Index
Reported
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)
Estimated
Good (71-100)
At Lower Risk (61-70)
At Higher Risk (50-60)
Poor (0-49)



(C) March 2023 NCE. GIS mapping data modified from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geographies/mapping-files/time-series/geo/cartographic-boundary.html), accessed September 2020. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape and area.

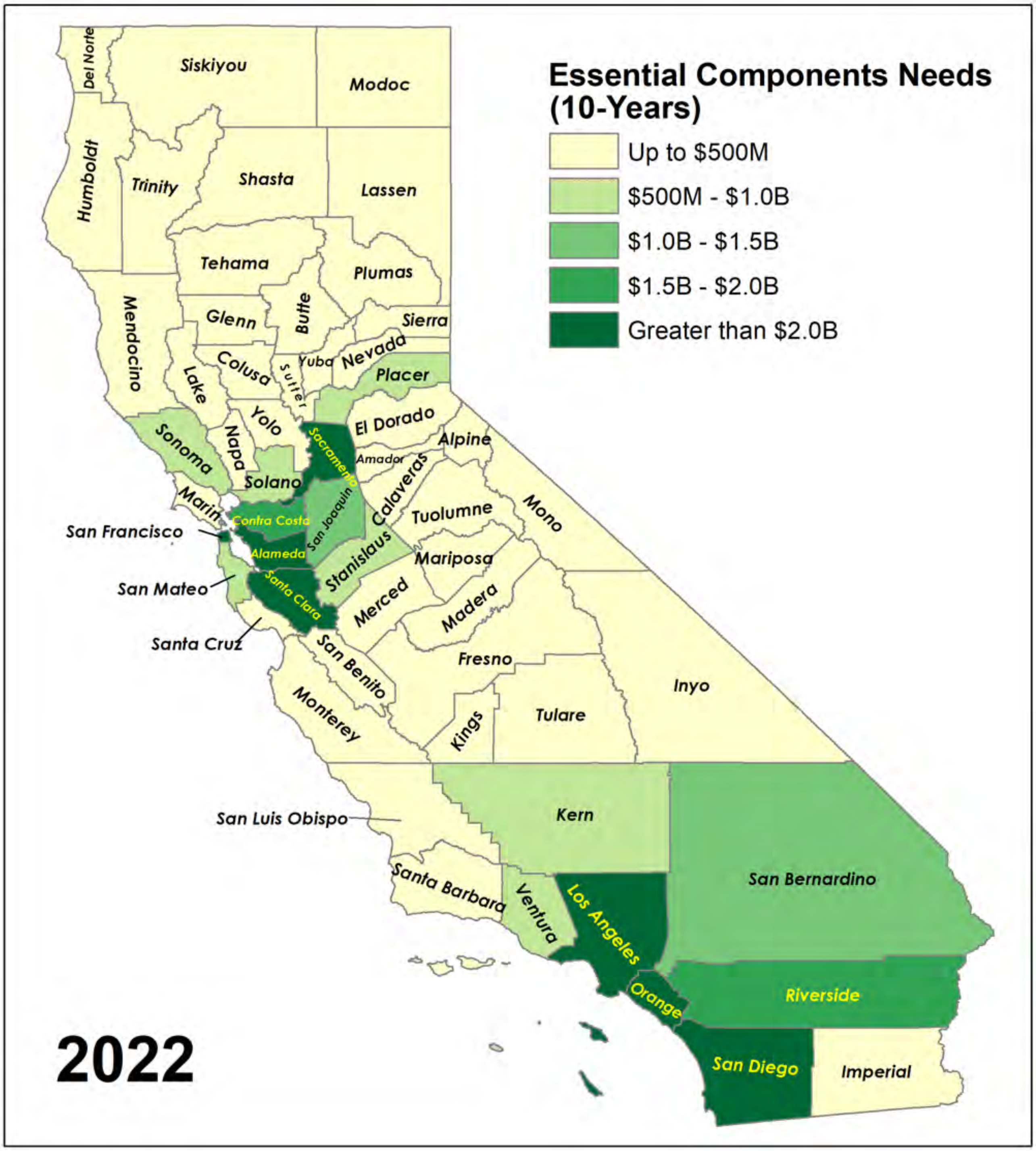
Appendix D

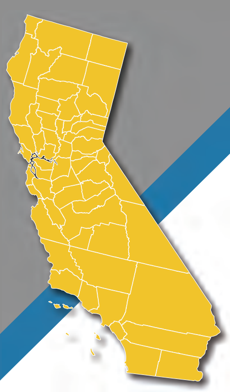
Essential Component Needs by County

Table D.1 Summary of Essential Components Needs by County*

County	10 year Needs ($M)	County	10 year Needs ($M)
Alameda	$2,657	Orange	$2,576
Alpine	$0.03	Placer	$500
Amador	$12	Plumas	$32
Butte	$216	Riverside	$1,971
Calaveras	$12	Sacramento	$2,672
Colusa	$24	San Benito	$10
Contra Costa	$1,673	San Bernardino	$1,301
Del Norte	$23	San Diego	$2,676
El Dorado	$82	San Francisco	$3,044
Fresno	$396	San Joaquin	$1,344
Glenn	$16	San Luis Obispo	$351
Humboldt	$217	San Mateo	$916
Imperial	$155	Santa Barbara	$374
Inyo	$13	Santa Clara	$2,039
Kern	$534	Santa Cruz	$325
Kings	$109	Shasta	$136
Lake	$29	Sierra	$2
Lassen	$14	Siskiyou	$35
Los Angeles	$7,393	Solano	$538
Madera	$104	Sonoma	$836
Marin	$357	Stanislaus	$766
Mariposa	$1	Sutter	$119
Mendocino	$125	Tehama	$15
Merced	$141	Trinity	$7
Modoc	$8	Tulare	$383
Mono	$17	Tuolumne	$35
Monterey	$267	Ventura	$897
Napa	$170	Yolo	$211
Nevada	$25	Yuba	$69
		Totals	**$38,970**

* Includes Cities within County


Essential Components Needs (10-Years)
Up to $500M
$500M - $1.0B
$1.0B - $1.5B
$1.5B - $2.0B
Greater than $2.0B
Del Norte
Siskiyou
Modoc
Humboldt
Trinity
Shasta
Lassen
Tehama
Plumas
Mendocino
Glenn
Butte
Sierra
Colusa
Yuba
Nevada
Lake
Sutter
Placer
Sonoma
Yolo
Napa
El Dorado
Sacramento
Alpine
Amador
Solano
Calaveras
Marin
San Joaquin
Mono
Tuolumne
Contra Costa
San Francisco
Alameda
Stanislaus
Mariposa
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
San Benito
Fresno
Inyo
Monterey
Tulare
Kings
San Luis Obispo
Kern
San Bernardino
Santa Barbara
Ventura
Los Angeles
Orange
Riverside
San Diego
Imperial
2022



Prepared by

NCE

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Point Richmond, CA 94804
Phone: 510.215.3620

Sponsored by

RTPA
RCTF

Rural Counties Task Force
Regional Transportation Planning Agencies