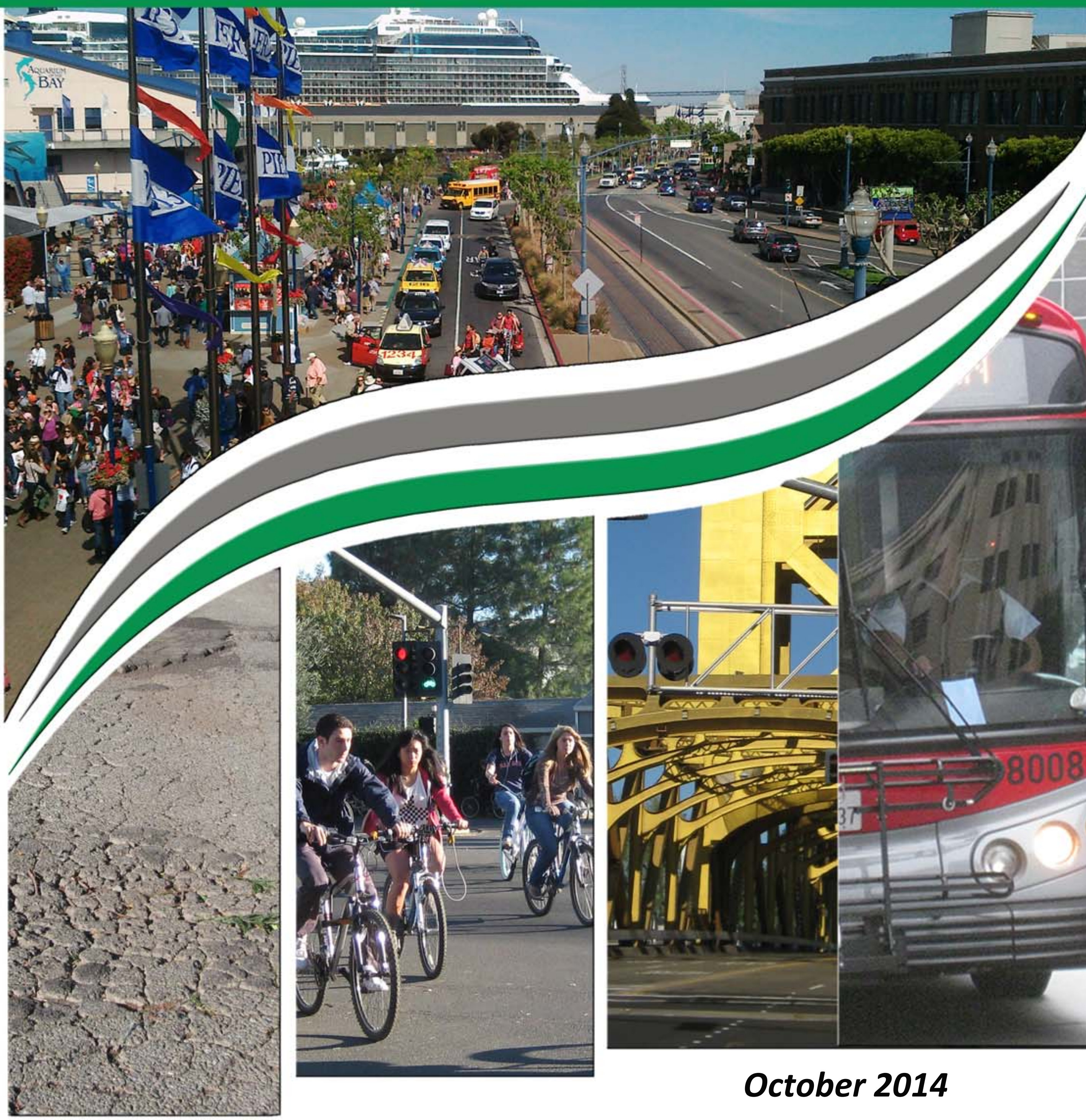
SAVE CALIFORNIA STREETS

California Local Streets & Roads Needs Assessment 2014 Update



October 2014

Prepared By:

NCE

California Local Streets & Roads Needs Assessment 2014 Update

SAVE CALIFORNIA STREETS

Sponsored By:

CSAC LEAGUE OF CALIFORNIA CITIES RTPA RCTF

October 2014

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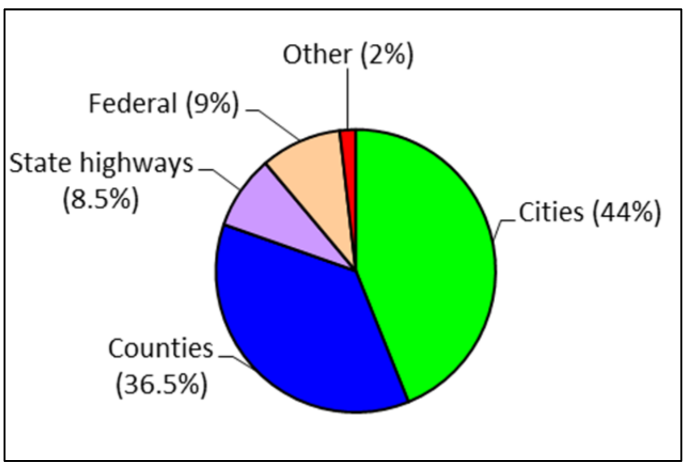
Executive Summary

California's local street and road system continues to be in crisis.

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. Unfortunately, these continue to be challenging times for our street and road system due to increased demand and unreliable funding. There is a significant focus on climate change and building sustainable communities, yet sustainable communities cannot function without a well-maintained local street and road system. The need for multi-modal opportunities on the local system has never been more essential. 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.

The first comprehensive statewide study of California's local street and road system in 2008 provided critical analysis and information on the local transportation network's condition and funding needs. Conducted biennially, the needs assessment provides another look at this vital component of the state's transportation system and once again finds a significant funding shortfall.

The 2014 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 are the needs for the essential components to a functioning system? How large is the funding shortfall? What are the solutions?



Breakdown of Road Centerline Miles by Agency

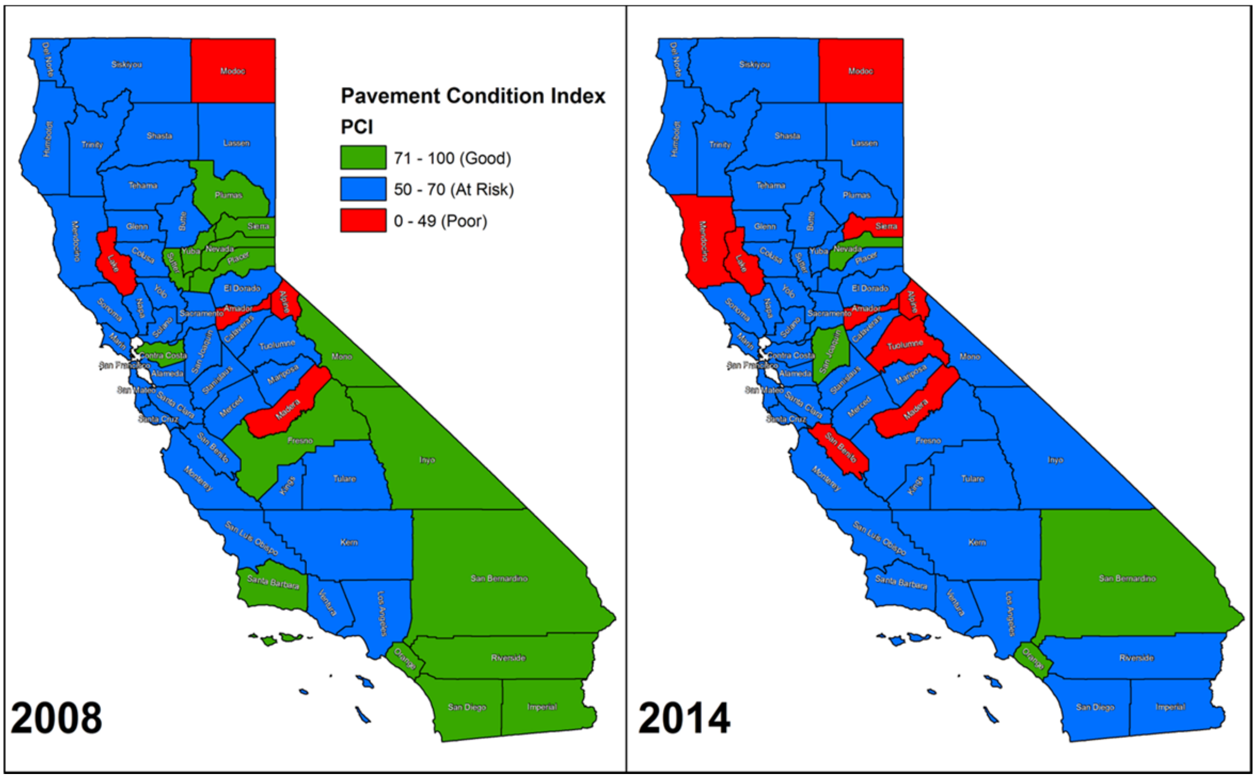
Responsible for almost 81 percent of the state's roads, cities and counties find this study of critical importance for several reasons. While federal and state governments' regularly assess their system needs, no such data existed for the local component of the state's transportation network prior to the initial study conducted in 2008. Historically, statewide transportation funding investment decisions have been made without local pavement condition data. This biennial assessment provides a critical piece in providing policy makers with a more complete picture of California's transportation system funding needs.

The goal is to use the results to educate policymakers at all levels of government about the infrastructure investments needed to provide California with a seamless, multi-modal transportation system. The findings provide a credible and defensible analysis to support a dedicated, stable funding source for maintaining the local system at an optimum level. The study 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.

This update surveyed all of California's 58 counties and 482 cities in 2014. The information captured data from more than 99 percent of the state's local streets and roads – a level of participation that makes clear the local interest in addressing the growing problems of crumbling streets and roads.

Pavements

The conditions of California's local streets and roads are rolling toward a cliff's edge. On a scale of zero (failed) to 100 (excellent), the statewide average Pavement Condition Index (PCI) has deteriorated to 66 ("at risk" category) in 2014. Even more alarming, 54 of 58 counties are either at risk or have poor pavements (the maps below illustrate the average pavement deterioration that has resulted in each county since 2008). If current funding remains the same, the unfunded backlog will swell from $40 billion to $61 billion by 2024.



In order to use taxpayer money wisely, it makes more sense to preserve and maintain our roads in good condition, than to let them crumble further and cost more to fix. The costs developed in this study are based on achieving a roadway pavement condition that the industry calls Best Management Practices (BMP). At this condition level, preventive maintenance treatments (i.e., slurry seals, chip seals, thin overlays) are most cost-effective. Preventive maintenance interferes less with the public's mobility and commerce and is more environmentally friendly than rehabilitation and reconstruction.

The importance of this approach is significant. As roadway pavement conditions deteriorate, the cost to repair them increases exponentially. For example, it costs twelve times less to maintain a BMP pavement compared to a pavement that is at the end of its service life. Even a modest resurfacing is four times more expensive than maintenance of a pavement in the BMP condition. Employing maintenance practices consistent with BMP, results in treating four to twelve times more road area for the same cost.

By bringing the roads to BMP conditions, cities and counties will be able to maintain streets and roads at the most cost-effective level. It is a goal that is not only optimal, but also necessary. This study examines three funding scenarios in order to determine their impacts on the condition of the roads over the next decade. Note that these are in constant 2014 dollars.

1. **Existing funding levels of $1.657 billion/year** – this is the current funding level available to cities and counties.
2. **Funding to maintain existing conditions ($3.328 billion/year)** – this is the funding level required to maintain the pavement conditions at its current PCI of 66.
3. **Funding required to reach Best Management Practices ($7.275 billion/year)** – the optimal scenario is to bring all pavements into a state of good repair within ten years so that best management practices can prevail. After this, it will only require $2.4 billion a year to maintain the pavements at that level.

Scenarios	Annual Budget ($B)	PCI in 2024	Condition Category	% Pavements in Failed Condition	% Pavements in Good Condition
Current Conditions	-	66	At Risk	6.2%	56.5%
1. Existing Funding	$ 1.657	55	At Risk	24.5%	52.0%
2. Maintain PCI = 66	$ 3.328	66	At Risk	19.9%	77.3%
3. Best Mgmt. Practices	$ 7.275	84	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. These components will require $31 billion to maintain over the next 10 years, yet there is an estimated funding shortfall of $20.9 billion.

Bridges

Local bridges are also an integral part of the local streets and roads infrastructure. There are 11,863 local bridges in California. There is an estimated shortfall of $1.3 billion to maintain the safety and integrity of the bridge infrastructure.

Total Funding Shortfall

The table below shows the total funding shortfall of $78.3 billion (*constant 2014 dollars*) over the next 10 years. For comparison, the results from the previous updates are also included.

	Needs ($B)			2014		
Transportation Asset	**2008**	**2010**	**2012**	**Needs**	**Funding**	**Shortfall**
Pavement	$ 67.6	$ 70.5	$ 72.4	$ 72.7	$ 16.6	$ (56.1)
Essential Components	$ 32.1	$ 29.0	$ 30.5	$ 31.0	$ 10.1	$ (20.9)
Bridges	-	$ 3.3	$ 4.3	$ 4.3	$ 3.0	$ (1.3)
Totals	$ 99.7	$102.8	$ 107.2	$ 108.0	$ 29.7	$ (78.3)

What are the Solutions?

The conclusions from this study are inescapable. Given existing funding levels available to cities and counties, California's local streets and roads will deteriorate rapidly over the next 10 years. It is alarming that local streets and roads have decayed to the point that funding will need to be doubled just to maintain current conditions.

While bringing the state's local street and road system to a cost-effective best management practice level will require more now, investing in local streets and roads sooner will reduce the need for exponentially more spending in the future. To reach that level – at which taxpayer money can be spent most cost-effectively – will require an additional $56.1 billion for pavements alone, or $78.3 billion total for a functioning transportation system, over the next decade. Only $2.4 billion per year will be needed to maintain the pavements after reaching a level at which they can be maintained with best management practices.

To bring the local system back into a cost-effective condition, thereby preserving the public's $188 billion pavement investment and stopping further costly deterioration, $7.8 billion annually in new funds are needed – that's equivalent to a 54-cent-per-gallon gas tax increase.

Failure to invest more would be disastrous – not only for local streets and roads but for California's entire interrelated transportation system. It is imperative that cities and counties receive a stable and dedicated revenue stream for cost-effective maintenance of the local system in order to reverse this crisis.

1. Introduction

California's 58 counties and 482 cities[1] own and maintain over 143,000 centerline-miles of local streets and roads[2]. This is an impressive 80.5 percent of the state's total publicly maintained centerline miles (see Figure 1.1 below). Conservatively, this network is valued at over $188 billion.

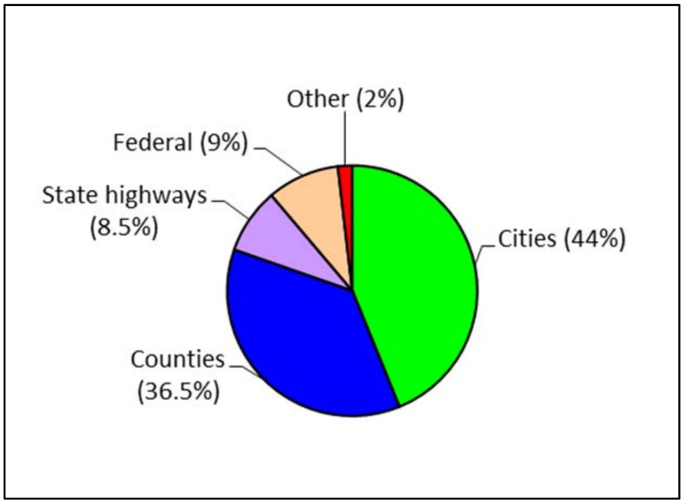


Figure 1.1 Breakdown of Maintained Road Centerline Miles by Agency[2]

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 depiction of pavement areas), Table 1.1 shows the breakdown of lane-miles for local streets and roads by functional classification, as well as 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 defined as those that have either dirt or gravel surfaces.

In addition, streets and roads are separated into urban and rural classifications. The distinction between urban and rural roads is defined by the U.S. Census Bureau: rural areas have population centers less than 5,000, or are areas with a population density below 1,000 persons per square mile. 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 corporation lines. Ultimately, however, the decision to determine the miles in either category was left to the individual city or county.

[1] Four new Cities, Wildomar, Menifee, Eastvale and Jurupa Valley were incorporated after the original 2008 study. The first two were included in the 2010 updates, and all were included in the 2014 assessment. Note too that San Francisco is traditionally counted as both a city and a county, but for purposes of analysis, their data have been included as a city only.

[2] *2012 California Public Road Data – Statistical Information Derived from the Highway Performance Monitoring System*, State of California Department of Transportation, Division of Transportation System Information, October 2013. The total miles come from a combination of this reference and survey results.

Table 1.1 Breakdowns of Functional Classification & Unpaved Roads[2]

	Lane-Miles by Functional Class					
	Urban		Rural		Unpaved	Total
	Major	Local	Major	Local		
Cities	79,904	105,188	1,454	2,975	943	190,464
Counties	17,285	25,758	28,411	41,748	16,801	130,002
Totals	**97,189**	**130,946**	**29,864**	**44,723**	**17,744**	**320,466**

Note: San Francisco is included as a city only.

From Table 1.1, it can be seen over 75 percent of the total paved lane miles are in urban areas, with the remaining 25 percent in rural areas. It should also come as no surprise that more than 94 percent of rural roads belong to the counties. Conversely, 81 percent of urban roads belong to the cities. Finally, unpaved roads comprise approximately 5.5 percent of the total network, and over 94 percent of this belongs to the counties.

1.1 Study Objectives

In 2008, a study was conducted to assess the statewide needs for the local streets and roads network and the final report released in October 2009[3]. The intent of the 2008 study was to determine the funding required to maintain the local streets and roads system for the next 10 years, so that the information could be reported to the State Legislature and the California Transportation Commission (CTC), 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?

In 2010 and 2012, updates were performed and the objectives were essentially the same. This report is the culmination of the 2014 update, and in addition to addressing the same objectives above, also includes a discussion on funding scenarios for almost 12,000 local bridges.

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

Finally, since the development of the pavement methodology to answer these questions was well documented in the 2008 study (in Appendix B), they have not been included in this 2014 update. Copies of all previous reports dating back to 2008 are available on www.SaveCaliforniaStreets.org.

1.2 Study Assumptions

As before, there were some important assumptions that were made during the analyses of the data received from cities and counties. Most are consistent with those used in the Caltrans 2013 State Highway Operation and Protection Program (SHOPP)[4]. The assumptions include (see Table 1.2):

- The analysis period used in this study is 10 years, which is consistent with the SHOPP.
- All numbers reported in this study are in constant 2014 dollars – this is consistent with the SHOPP.
- The pavement condition goal was to reach a condition where best management practices (BMP) can occur. This translates to a PCI in the low 80s (on a scale of 0 to 100, where zero is failed and 100 is excellent) and where there are no failed pavements. Caltrans SHOPP defines performance goals quite differently, i.e., the goal is to reduce the percentage of distressed highways from 25 percent to 10 percent. This is further discussed in Section 4.7.
- It is assumed that no new streets or roads are added within the analysis period. In addition, capital improvement or expansion projects are not included, e.g. realignments, widenings, grade separations etc. This is also consistent with the SHOPP.
- The inclusion of safety, traffic and regulatory components of the roadway system such as sidewalks, ADA ramps, storm drains, etc. is consistent with the SHOPP. Bicycle and pedestrian facilities are also included.
- A detailed bridge needs assessment was included in this study, including the needs and the results of various funding scenarios.

Table 1.2 Summary of Assumptions Used in 2014 Statewide Study and SHOPP

Assumptions	2014 Statewide Study	Caltrans SHOPP
Analysis Period	10 years	10 years
Cost Basis	2014 dollars	2013 dollars
Goals	Best management practices (PCI = low 80's & no failed pavements)	% of distressed pavements < 10%
Total Scenarios Evaluated	3	1
Capital Improvement Projects	No	Only related to operational improvement
Essential Components	Yes	Yes
Bridges	Yes	Yes

[4] *Final 2013 Ten-Year State Highway Operation & Protection Program (FY 2014/15 to 2023/24)*, Caltrans, March 2013.

1.3 Study Sponsors

This study was sponsored by the cities and counties of California and managed by the Metropolitan Transportation Commission (MTC). The Oversight Committee is composed of representatives from the following:

- League of California Cities (League)
- California State Association of Counties (CSAC)
- County Engineers Association of California (CEAC)
- Regional Transportation Planning Agencies (RTPA)
- Rural Counties Task Force (RCTF)
- Metropolitan Transportation Commission (MTC)
- County of Los Angeles, Department of Public Works

The Oversight Committee members include:

- Jim Biery, City of Buena Park
- Kiana Buss, CSAC
- Keith Cooke, City of San Leandro
- Pat DeChellis, Los Angeles County
- Merrin Gerety, CEAC
- Charles Herbertson, City of Culver City
- Greg Kelley, Los Angeles County
- Sarkes Khachek, Santa Barbara County Association of Governments
- Steve Kowalewski, Contra Costa County
- Meghan McKelvey, League of California Cities
- Peter Rei, Mariposa County
- William Ridder, Los Angeles County Metropolitan Transportation Authority
- Theresa Romell, MTC
- Mike Sartor, City of Palo Alto
- Jennifer Whiting, League of California Cities
- Mike Woodman, Nevada County Transportation Commission

Appendix A includes a list of all the agencies that made a financial contribution to this study. All 58 counties, 401 cities (out of 482), and 43 of 48 RTPAs contributed.

2. Pavement Needs Assessment

In this chapter, the methodology and assumptions used for the pavement needs assessment are discussed, and the results of our analyses presented. 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 January 20th and April 7th, 2014. All cities and counties were contacted and asked to participate in the survey. A total of 399 agencies responded to the survey and either updated or confirmed the data that was provided in previous surveys.

2.1 Methodology and Assumptions

Since not all 540 cities and counties responded to the survey, a methodology had to be developed to estimate the pavement needs of the missing agencies. The following paragraphs describe in detail the methodology that was used in the study (note that this is consistent with previous updates).

2.1.1 Filling In the Gaps

Inventory Data

Briefly, this process was to determine the total miles (both centerline and lane-miles) and pavement areas, as this is crucial in estimating the pavement needs for an agency. Missing inventory data were populated based on the following rules:

- If no updated inventory data were provided, then previous survey data (2008, 2010 or 2012) were used.
- If the inventory data provided was incomplete, Table 2.1 was used to populate the missing information. The average number of lanes and average lane width are summarized from agencies who submitted complete inventory data in the previous surveys.

Table 2.1 Assumptions For Populating Missing Inventory Data

Functional Class	Average Number of Lanes	Average Lane Width (feet)
Urban Major Roads	2.8	15.5
Urban Residential/Local Roads	2.1	15.5
Rural Major Roads	2	13.2
Rural Residential/Local Roads	2	11.7
Unpaved Roads	1.8	11.4

Pavement Condition Data

To assist those agencies who had no pavement condition data, the online survey provided a table with the average pavement condition index (PCI) collected in the 2012 study. They were then encouraged to look at the data from neighboring cities or counties to make their best estimate of the pavement condition in their agency.

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

- If the PCI is 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 2014, the last PCI provided was used, but it was extrapolated based on the statewide PCI trend i.e. if the statewide average deteriorated one point, then it was also assumed to have deteriorated one point.
- The only exception was for the San Francisco Bay area agencies, where the data came from the Metropolitan Transportation Commission (MTC).

2.1.2 Pavement Needs Assessment Goal

The same needs assessment goal from previous studies was used in the 2014 update. To reiterate, the goal is for pavements to reach a condition where best management practices (BMP) can occur, so that only the most cost-effective pavement preservation treatments are needed. Other benefits such as a reduced impact to the public in terms of delays and environment (dust, noise, energy usage) would also be realized.

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

In short, the BMP goal is to reach a PCI in the low 80s and the elimination of the unfunded backlog. The deferred maintenance or "unfunded backlog" is defined as work that is needed, but is not funded. To perform these analyses, MTC's StreetSaver® pavement management system program was used. 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 may 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, as well as ***when*** to apply it. This is typically outlined in an M&R decision tree.

Figure 2.1 summarizes the types of treatments assigned in this study. Briefly, good to excellent pavements (PCI>70) are best suited for pavement preservation techniques, (e.g., preventive maintenance treatments such as chip seals or slurry seals). These are usually applied at intervals of five to seven years depending on the type of road and their traffic volumes.

As pavements deteriorate, treatments that address structural adequacy are required. Between a PCI of 25 to 69, hot mix asphalt (HMA) overlays are usually applied at varying thicknesses. This may be accompanied by milling or recycling techniques.

Finally, when the pavement has failed (PCI<25), reconstruction is typically required. Note that if a pavement section has a PCI between 90 and 100, no treatment is applied. The descriptions used for each category are typical of most agencies, although there are many variations on this theme. For example, it is not unusual for local streets to have slightly lower thresholds indicating that they are held to lower standards. The PCI thresholds shown in Figure 2.1 are generally accepted industry standards.

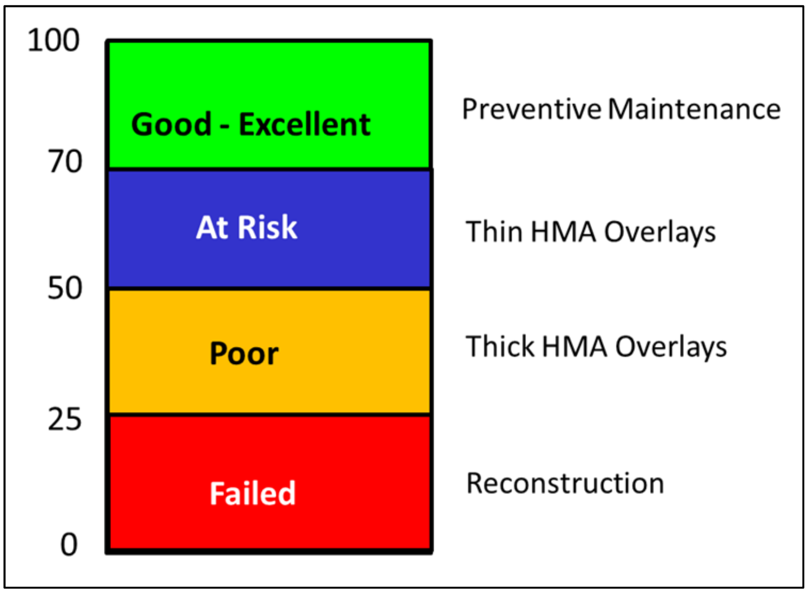


Figure 2.1 PCI Thresholds & Treatments Assigned

Unit cost data from 177 agencies were summarized and averaged for the analysis (see Table 2.2). The range in costs for each treatment is for the different functional classes of pavements i.e., major roads have a higher cost than local roads. They are unchanged from the 2012 unit costs.

Table 2.2 Unit Costs Used for Different Treatments & Road Classifications

Classification	Unit Costs ($/square yard)			
	Preventive Maintenance	Thin AC Overlay	Thick AC Overlay	Reconstruction
Major Roads	$4.85	$18.82	$29.73	$68.48
Local Roads	$4.61	$18.04	$28.44	$60.31

It should be noted that the costs for preventive maintenance treatments (e.g., seals) increased significantly from 2008. This is attributed to the higher demand for seals in the past six years. There could be two reasons for this:

- The recent economic recession forced many agencies to use less expensive treatments such as seals, when compared to overlays or reconstruction; and/or
- More agencies understand the advantages and cost-effectiveness of seals, and therefore their use is more widespread.

Interestingly, the cost for overlays and reconstruction actually declined in 2010 by approximately 5 percent for overlays, and as much as 30 percent for reconstruction. However, costs in 2012 and 2014 showed small increases. Figures 2.2 and 2.3 illustrate the trends in the unit costs since 2008 for preventive maintenance and thin HMA overlays, respectively.

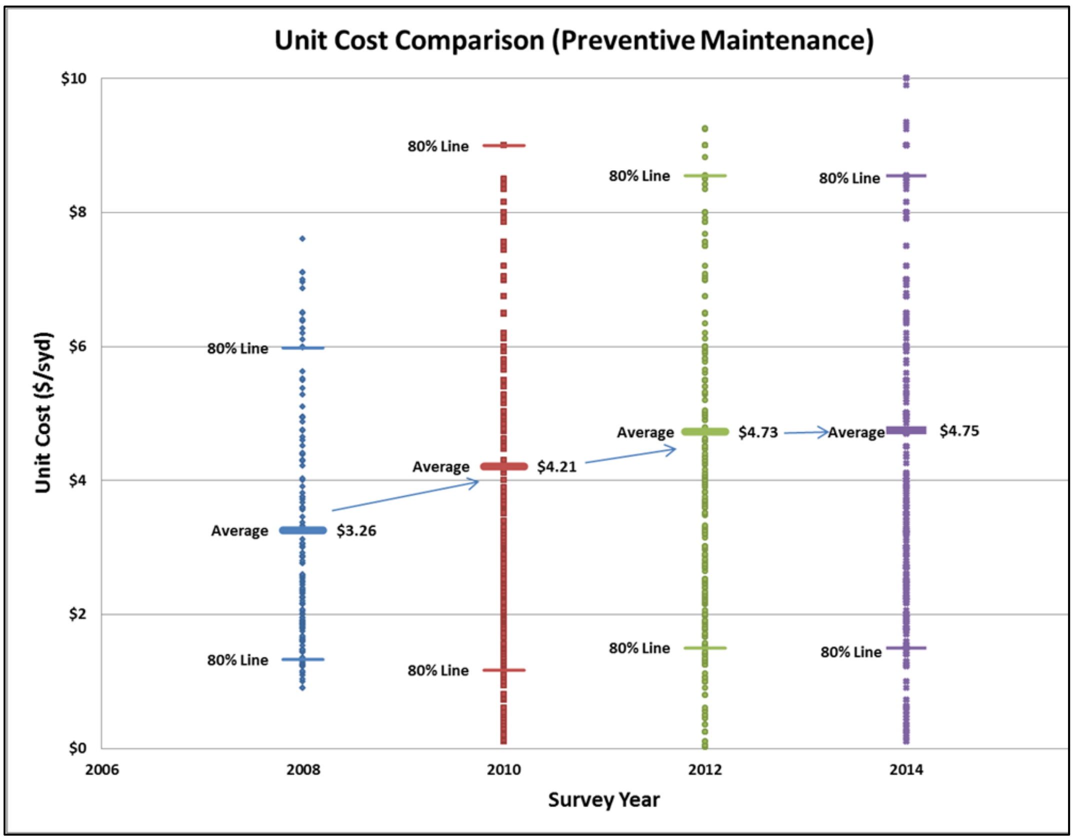


Figure 2.2 Unit Price Trends for Preventive Maintenance Treatments

These trends are reflected in the Asphalt Price Index[5] tracked by Caltrans (see Figure 2.4), which shows more than a 10-fold increase from 2000 to 2008, but then a drop of almost 50 percent in 2009 followed by increases since then.

5 http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html

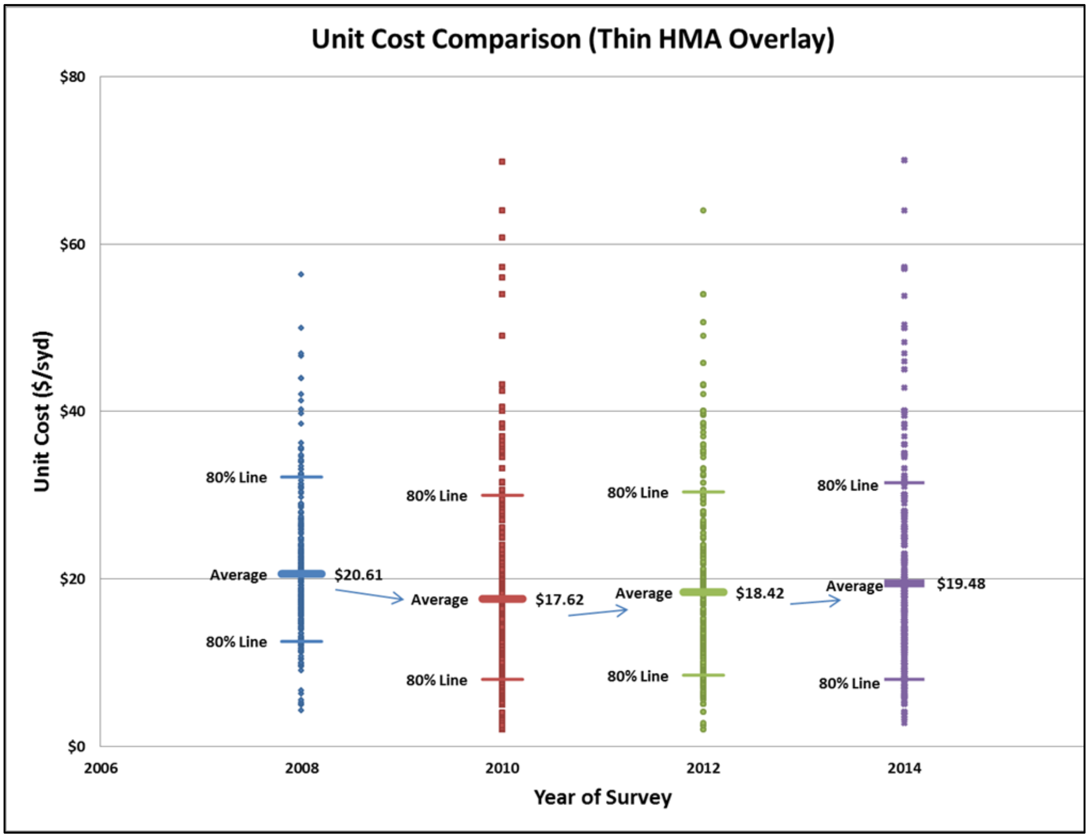


Figure 2.3 Unit Price Trends for Thin HMA Overlays

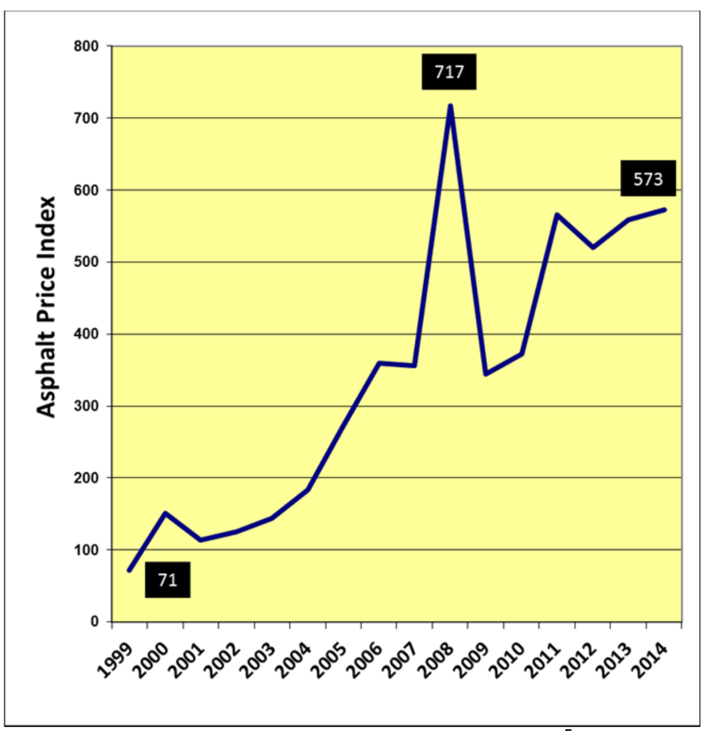


Figure 2.4 Caltrans Asphalt Price Index[5]

However, there is no expectation that the cost of road construction during the worst recession since the Great Depression will stay at this level for the next 10 years. Rather, most agencies have the opinion that this is a temporary situation. Given the volatility of crude petroleum prices in recent years, ***it was decided that the 2008 unit costs for overlays and reconstruction would be used in this analysis.***

Finally, it should be noted that only asphalt concrete roads were considered in this analysis. The percentage of Portland cement concrete pavements was so small (less than 0.5 percent of the total network), that it was deemed not significant for this study.

2.1.4 Escalation Factors

As with the previous studies, no escalation factors were used in this analysis. All numbers are in constant 2014 dollars, and this is consistent with the SHOPP as well as many Regional Transportation Plans (RTPs).

2.2 Average Network Condition

Based on the results of the surveys, the current (as of April 2014) pavement condition statewide is 66, a drop of approximately two points from 2008, when it was estimated to be 68. There is less than a half point drop from 2012, but due to rounding, remains at 66. The average for Cities is 67.4 and that for Counties is 62.

The average pavement condition index for streets and roads statewide is 66. This rating is considered to be in the "at risk" category.

Table 2.3 includes the current pavement condition index (PCI) for each county (includes cities within the County). Again, this is based on a scale of 0 (failed) to 100 (excellent). This is weighted by the pavement area, i.e., longer roads have more weight than short roads when calculating the average PCI.

Again, it should be emphasized that the PCI reported above is only the ***weighted average*** for each county and ***includes*** the cities within the county. This means that Amador County and the cities may well have pavement sections that have a PCI of 100, although the average is 33.

The average PCI trend since 2008 is slightly downward, although some counties do show small improvements. This could be attributed to the better data collection (the quality of the pavement data collected in 2014 is significantly better than in 2008), better use of pavement preservation treatments, or the availability of additional funds such as local sales taxes or bonds.

In addition, Table 2.4 indicates that major streets or roads continue to be in better condition than local roads. In fact, rural local roads have a significantly lower PCI of 57 than urban locals (PCI = 66).

Table 2.3 Summary of PCI Data by County (including Cities) for 2008-2014

County (Cities Included)	Center Line Miles	Lane Miles	Area (sq. yd.)	Average Weighted PCI* 2008	2010	2012	2014
Alameda County	3,538	7,999	82,401,946	66	67	68	66
Alpine County	135	270	1,900,800	40	45	45	44
Amador County	478	958	6,485,201	31	34	33	33
Butte County	1,800	3,676	26,771,323	70	67	65	66
Calaveras County	717	1,333	8,937,332	55	53	51	51
Colusa County	987	1,524	12,503,304	61	60	60	62
Contra Costa County	3,376	7,048	63,500,917	72	70	71	68
Del Norte County	324	644	5,334,695	70	68	64	63
El Dorado County	1,253	2,508	21,671,673	62	58	63	63
Fresno County	6,196	12,680	106,057,018	74	70	69	69
Glenn County	910	1,822	13,917,626	68	68	68	68
Humboldt County	1,471	2,933	24,234,864	61	56	64	64
Imperial County	3,000	6,087	45,427,410	74	72	57	57
Inyo County	1,135	1,803	13,700,999	75	57	60	62
Kern County	5,026	11,648	103,132,477	66	63	64	64
Kings County	1,328	2,796	20,026,009	63	62	62	62
Lake County	753	1,494	9,997,345	33	31	40	40
Lassen County	431	879	6,282,324	55	69	66	66
Los Angeles County	21,330	57,630	459,830,656	68	67	66	66
Madera County	1,822	3,680	23,490,290	48	48	47	47
Marin County	1,021	2,055	17,166,574	61	61	61	63
Mariposa County	1,122	561	3,949,440	53	44	44	53
Mendocino County	1,124	2,256	16,004,034	51	49	37	35
Merced County	2,330	4,954	37,182,870	57	58	58	58
Modoc County	1,491	2,983	17,545,534	42	40	56	46
Mono County	727	1,453	10,071,369	71	68	66	67
Monterey County	1,779	3,726	33,599,361	63	45	50	50
Napa County	726	1,508	12,896,309	53	60	59	59
Nevada County	802	1,617	10,370,868	72	71	72	71
Orange County	6,601	16,808	150,276,239	78	76	77	77
Placer County	1,986	4,194	34,182,680	79	77	71	69
Plumas County	704	1,409	11,409,902	71	66	66	64

* PCI is weighted by area.

County (Cities Included)	Center Line Miles	Lane Miles	Area (sq. yd.)	Average Weighted PCI* 2008	2010	2012	2014
Riverside County	7,561	16,835	149,403,177	71	72	70	70
Sacramento County	5,053	11,285	95,918,441	68	66	64	62
San Benito County	452	916	5,951,814	68	66	66	48
San Bernardino County	9,107	22,249	181,002,241	72	70	70	71
San Diego County	7,814	18,596	170,696,012	74	69	67	66
San Francisco County	989	2,135	17,758,676	62	63	65	66
San Joaquin County	3,288	6,807	60,571,515	70	70	67	73
San Luis Obispo Co.	1,966	4,079	32,385,537	64	64	63	64
San Mateo County	1,865	3,904	33,272,016	69	70	71	70
Santa Barbara County	1,587	3,376	30,610,681	72	70	67	66
Santa Clara County	4,173	9,431	92,436,719	70	69	73	68
Santa Cruz County	874	1,790	14,190,207	52	48	48	57
Shasta County	1,687	3,479	26,243,076	64	67	57	60
Sierra County**	398	799	3,669,765	73	71	71	45
Siskiyou County	1,519	3,050	20,519,624	57	57	57	57
Solano County	1,700	3,582	27,706,938	66	66	67	65
Sonoma County	2,371	4,923	39,557,359	53	50	50	52
Stanislaus County	2,916	6,032	53,459,748	60	51	52	55
Sutter County	982	2,011	15,199,498	73	56	56	65
Tehama County	1,197	2,401	15,834,143	69	65	65	62
Trinity County	693	1,114	11,757,354	52	50	50	60
Tulare County	3,937	8,132	60,195,390	66	68	68	68
Tuolumne County	553	1,116	8,200,702	62	62	62	47
Ventura County	2,513	5,530	50,382,156	64	66	69	70
Yolo County	1,328	2,458	21,290,870	69	67	63	60
Yuba County	724	1,504	12,862,583	74	56	56	60
TOTALS	**143,671**	**320,466**	**2,661,335,629**	**68**	**66**	**66**	**66**

* PCI is weighted by area.

** Sierra County's PCI in 2008, 2010 and 2012 were not accurately reported.

From this table, we can see that the statewide ***weighted average*** PCI for all local streets and roads is 66. Orange County maintains its position with the best pavements, at an average PCI of 77. Unfortunately, Amador County remains the lowest ranked county, with an average PCI of 33. Appendix C includes maps of each county that illustrates the PCI for each city and county.

Table 2.4 Average 2014 PCI by Type of Road

Type	Average 2014 PCI	
	Major	Local
Urban Streets	68	66
Rural Roads	67	57

As was discussed in the 2010 study, an average pavement condition of 66 is not especially good news. While it seems just a few points shy of the "good/excellent" category, it has significant implications for the future. Figure 2.5 illustrates the rapid pavement deterioration 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 significantly, as much as ten times. The financial advantages of maintaining pavements in good condition are many, including saving the taxpayers' dollars with less disruption to the traveling public, as well as environmental benefits.

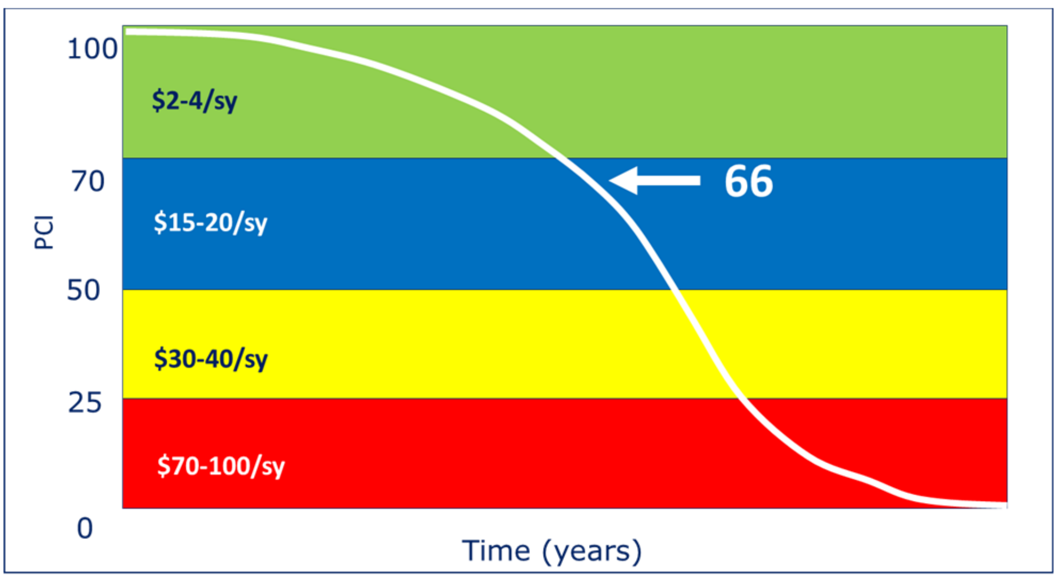


Figure 2.5 Generalized Pavement Life Cycle Curve

Many factors contribute to this rapid deterioration in pavement condition and they include:

- 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 single 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 66 should be viewed with caution – it indicates that our local streets and roads are, as it were, poised on the edge of a cliff. Figure 2.6 is an example of a local street with an average condition of 66.

Figure 2.6 Example of Local Street with PCI = 66

Only 56% of California's local streets and roads are in good condition.

Figure 2.7 shows the distribution of pavement conditions by county for both 2008 and 2014. As can be seen, a majority of the counties in the state have pavement conditions that are either "At Risk" (blue) or in "Poor" (red) condition. There has been an increase in the "blue" and "red" counties from 2008. Of the 58 counties, 54 are either "At Risk" or in "Poor" condition.

Finally, despite their color, none of the four "green" counties have a PCI greater than 77; in fact, aside from Orange County, the other three (San Joaquin, San Bernardino and Nevada are at 73 or 71), indicating that they will turn "blue" in a few years unless there are significant improvements in funding.

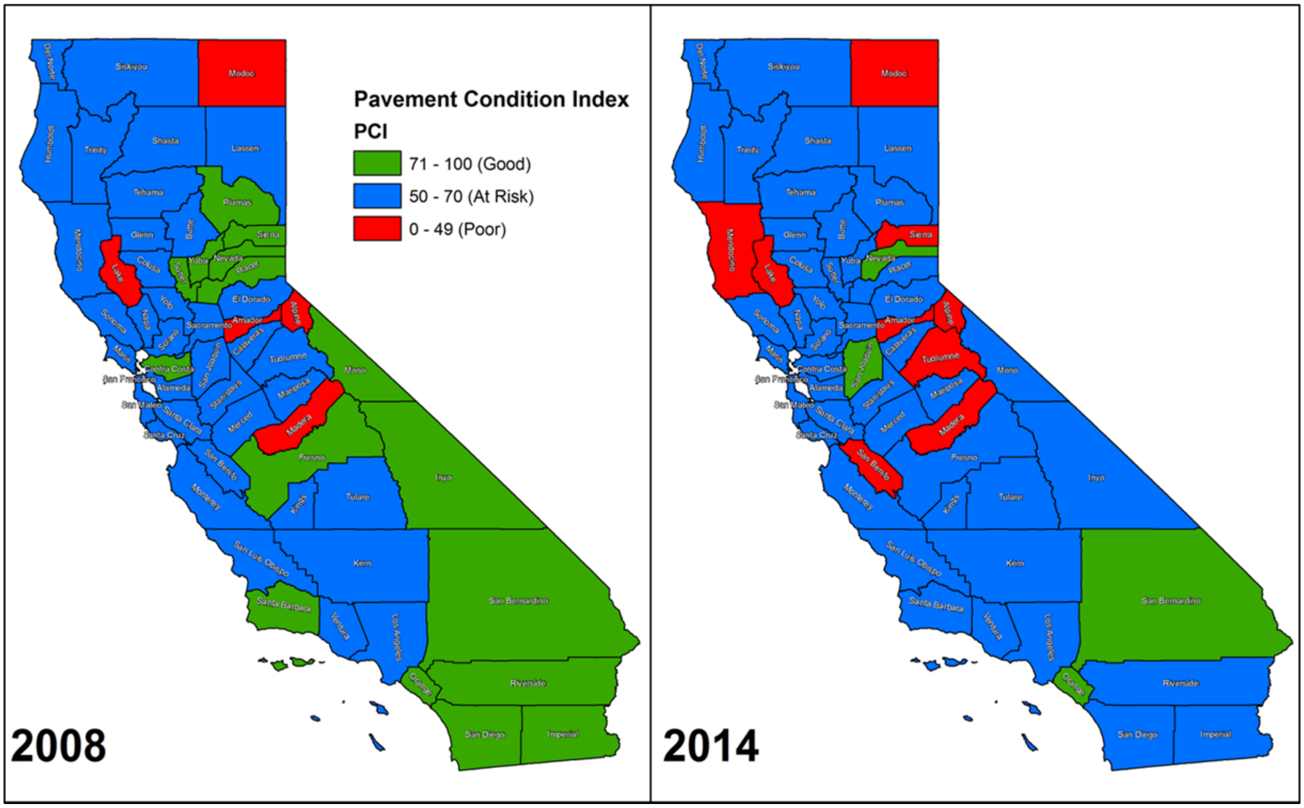


Figure 2.7 Average PCI by County for 2008 and 2014

2.3 Sustainable Pavement Practices

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

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

Some sustainable pavement strategies may have cost savings up to 35%.

The responses were very encouraging; over 300 agencies responded with some information on the types of sustainable practices. Table 2.5 summarizes these responses; significantly more agencies reported using some form of recycling compared to 2012. In some cases, the number of agencies increased by more than 50 percent.

Table 2.5 Summary of Responses on Sustainable Pavement Strategies

Sustainable Pavement Strategies	No. of Agencies			Average % Savings	Average % Additional costs
	No. of Responses	Savings	Add'l Costs		
Reclaimed AC Pavement (RAP)	129	46	7	11%	-
Cold in place recycling (CIR)	69	30	7	30%	-
Full depth reclamation (FDR)	102	22	10	32%	-
Pavement Preservation	223	52	28	35%	-
Warm mix asphalt (WMA)	63	7	8	-	-
Rubberized HMA (RHMA)	187	15	67	-	12%
Porous/Pervious pavements	27	2	6	-	-

CIR, FDR and pavement preservation strategies were reported to have the highest cost savings when compared with conventional treatments, in the order of 30 percent, 32 percent and 35 percent, respectively. These were similar to the savings reported in 2012.

Other sustainable treatments incurred additional costs, particularly rubber hot mix asphalt (RHMA), which had 12 percent higher costs (although this is lower than the 18 percent reported in 2012). The responses for warm mix asphalt and porous/pervious pavements were insufficient to draw any conclusions.

The most common reasons cited for using sustainable practices were:

- Cost savings or cost effective;
- Environmental benefits e.g. greenhouse gas reduction, reduces energy consumption, uses less natural resources, reduces landfills, reuses existing pavement materials, recycles tires etc. (Note that every lane-mile that is recycled in-place is equivalent to removing approximately 11 cars off the road);
- Extends pavement life, and
- Positive community benefits e.g., quieter pavements.

Every lane-mile that is recycled in-place is the equivalent of removing 11 cars off the road.

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

- Additional costs (mostly related to RHMA) or higher up-front costs;
- Not enough technical information available – design, specifications etc.;
- Lack of experienced contractors to bid on projects;
- Not all streets are good candidates for these treatments e.g. limited right of way;
- More inspections required from agency staff; and
- Uncertainty over pavement performance.

The fact that almost 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. This is clearly evidence of local agencies using newer technologies to "stretch the dollar". The overwhelming majority (93%) of the agencies also indicated that they will 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. For purposes of this study, the focus is on bicycle and pedestrian facilities. Figure 2.8 is an example of a street that considers alternative modes of transportation i.e. pedestrians, bicyclists, buses and drivers, as well as curb ramps that are in compliance with the American Disabilities Act (ADA).

Figure 2.8 Elements of a Complete Street

There were 391 responses in 2014, significantly more than in 2012. Of these, 155 indicated that they had a complete streets policy, which is a tripling of the number from 2012! An additional 189 indicated they had none, and 47 indicated they did not know. Of the 189 who did not have a policy, 117 indicated that they had elements of a complete street policy in place. The following elements were included in their policies (in order of respondents, with highest first):

- Pedestrian facilities
- Bicycle facilities
- Curb ramps
- Signs
- Traffic calming

- Landscaping
- Medians
- Street Lighting
- Roundabouts

On average, the respondents also indicated that 30 percent of their street and road network were eligible for including some of the above elements, and that the average additional costs were over $120 per square yard. However, there was a large range in the cost data provided ($15/square yard to $700/square yard) – this is understandable, since there are so many elements as described above, and local agencies may only incorporate one or two, or all of those elements.

However, complete streets may have very different applications in a rural road vs. an urban street. Many rural roads are long, in remote areas and may have as little as 50 vehicles a day, with no pedestrians or bicyclists. Obviously, these will not be candidates for a complete street approach. The typical examples tend to be focused on urban roads, where the population supports multiple modes of transportation.

2.5 Additional Regulatory Requirements

In addition to the many pavement and safety policies, cities and counties identified three additional regulatory requirements they have to comply with:

1. American Disabilities Act of 1990 (ADA);
2. National Pollutant Discharge Elimination System (NPDES); and
3. Traffic sign retroreflectivity requirements.

There were 181 responses on ADA, 161 on NPDES and 140 on traffic sign retroreflectivity. Of the respondents, they identified $4.449 billion in needs and only $1.02 billion in funding, or approximately 23 percent (see Table 2.6). This is a significant change from 2012, and the estimates are three times as high as previously reported.

However, since many of the agencies did not track these costs separately, the data provided were identified as “informed estimates” or “guesses”.

Table 2.6 Additional Regulatory Requirements (Ten Year Needs and Funding)

Regulatory Requirements	Needs ($M)	Funding ($M)	Shortfall ($M)
ADA	$1,335	$208	($1,127)
NPDES	$2,979	$812	($2,167)
Traffic Signs	$135	$0	($135)
Totals	**$4,449**	**$1,020**	**($3,429)**

2.6 Unpaved Roads

Unpaved roads (gravel or dirt surfaced) are not a large component of the local transportation network statewide, and only comprises 4.4 percent of the total area. Nonetheless, they are important in many rural counties, where unpaved roads can form a significant percentage. For example, in Imperial County, unpaved roads comprise more than 48% of the road system!

Figure 2.9 Example of Unpaved Roads

The needs assessment for unpaved roads is not complicated – 98 agencies reported a total unpaved road network of 9,801 centerline miles. The average cost of maintenance is $9,800 per centerline mile per year. Since pavement management software like StreetSaver® only analyzes paved roads, the average cost for unpaved roads from the survey was used for those agencies that did not report any funding needs.

Unpaved roads need $960 million over the next 10 years.

This results in a total 10-year need of $960.5 million for the next 10 years.

2.7 Pavement Needs

The determination of pavement needs and unfunded backlog were described in detail in the 2008 report (see Appendix B of the 2008 report) and is therefore not duplicated here, but to briefly summarize, it requires four main elements for the analysis:

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

The calculation of the pavement needs is conceptually quite simple. Once the PCI of a pavement section is known, a treatment and unit cost can be applied. This is performed for all sections within the 10-year analysis period. A section may receive multiple treatments within this time period, 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 possible to fully fund ***all*** the needs in the first year, thereby reducing the backlog to zero. However, the funding constraint for the scenario is to achieve our BMP goal within 10 years. Assuming a constant annual funding level for each scenario, the backlog will gradually decrease to zero by the end of year 10.

The results are summarized in Table 2.7 and indicate that $72.7 billion is required to achieve the BMP goals in 10 years. Again, this is in constant 2014 dollars. Detailed results by county are included in Appendix C.

Table 2.7 Cumulative Pavement Needs

Cumulative Needs (2014 dollars)		
Year No.	Year	Reach BMP Goal in 10 Years ($ Billion)
1	2015	$7.3
2	2016	$14.5
3	2017	$21.8
4	2018	$29.1
5	2019	$36.4
6	2020	$43.6
7	2021	$50.9
8	2022	$58.2
9	2023	$65.5
10	2024	$72.7

In 2012, the total 10-year needs was $72.4 billion, so this is a small increase of $0.3 billion.

Pavement needs have increased to $72.7 billion.

3. Essential Components' Needs Assessment

The transportation system includes other essential components (i.e., safety, traffic and regulatory elements) apart from pavements and bridges. The safety of the traveling public is the highest priority for local agencies, so components such as traffic signals, street lights and signs, while not the most expensive, are critical. Since the transportation system is intended to serve all modes of travel (pedestrians, bicyclists, buses, the handicapped etc.) and not just vehicles, local streets and roads must consider their needs as well.

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

Underground pipes, since they are often invisible, are often overlooked when establishing priorities, yet their failure can have disastrous consequences. The recent failure of a 90-year old water main near UC Los Angeles in July 2014 illustrates how much damage can occur. By the time emergency crews patched the pipe, an estimated 20 million gallons of water had flooded the UCLA campus (see Figure 3.1).

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

3.1 Data Collection

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

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

A total of 152 survey responses were received compared to 188 in 2008 and 296 in 2010. This was a significant drop. However, data from the previous surveys were included in the analysis, which resulted in data points from 352 agencies.

3.2 Needs Methodology

The analyses for the essential components are quite different from those for the pavements. In 2008, a regression equation was developed to determine first the replacement costs, and from that, the ten-year needs were calculated. In 2012, the regression equation was re-evaluated and minor adjustments made, which were discussed in the 2012 report and therefore not duplicated here. The regression model developed in 2012 for the replacement cost is:

$$Ln\ Cost = 15.0 + 0.726\ Total\ Miles^{1/3} - 0.00268\ Total\ Miles - 2.13\ Type\_Rural + 0.329\ Climate\_Central + 3.5\ Large$$

Where:

Cost = total replacement cost, dollars
Total miles = total centerline miles of roads or streets
Type_Rural = indicator variable and is equal to 1 if agency is rural, 0 otherwise
Climate_Central = indicator variable and is equal to 1 if agency is along the central coast, south coast or inland valley
Large = indicator variable for agencies with more than 1900 centerline miles.

Using this model, Figure 3.2 shows the comparisons between "actual" and "predicted" replacement costs. As can be seen, the predicted costs for the large agencies now closely match the actual costs.

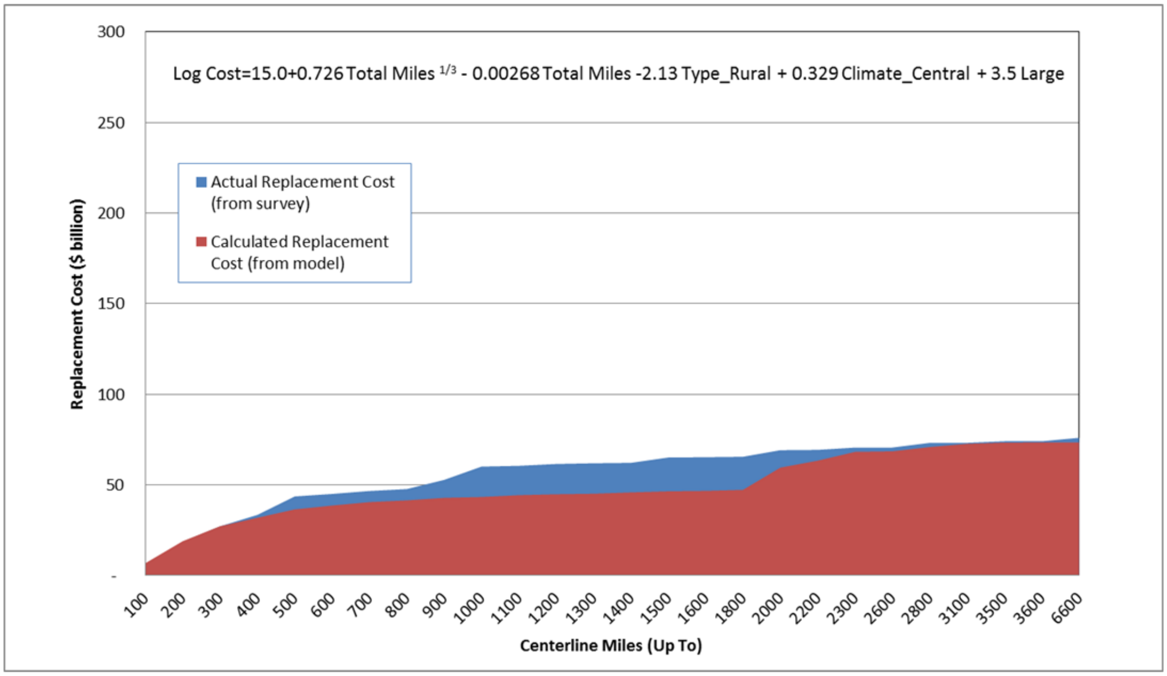


Figure 3.2 Comparisons of Actual and Predicted Replacement Costs (2012 Model)

3.3 Determination of Essential Components' Needs

The 2012 regression model estimates the total replacement cost for only the first eight components. To estimate the needs, this cost needs to be converted to an annual amount based on the estimated service life of the different non-pavement assets. The costs of the remaining four components (other storm drain elements, NPDES, ADA and other physical assets) are then added. This procedure was described in detail in Appendix D of the 2008 report and has not been duplicated here.

The 10-year needs figure was estimated to be $31 billion, which is a small increase from the $30.5 billion reported in 2012. Appendix D summarizes the essential components' needs for each county.

The funding needs for essential components is $30.5 billion.

4. Funding Analyses

4.1 Pavement Revenue Sources

The online survey asked agencies to provide both their revenue sources and pavement expenditures for FY 2012-13, FY 2013-14, as well as estimating an annual average for future years. A total of 276 agencies responded with financial data this year; this is an improvement over the 238 responses received in 2012.

As before, cities and counties identified a myriad of sources of funds for their pavement expenditures, broadly categorized into federal, state, or local. For local funds alone, more than a hundred different sources were identified. They included the following examples (this is by no means an exhaustive list):

Federal Funding Sources

- Community Development Block Grants (CDBG)
- Congestion Mitigation & Air Quality Improvement (CMAQ)
- Secure Rural Schools and Community Self-Determination Act
- Surface Transportation Program (STP)
- Highway Safety Improvement Program (HSIP)
- HSIP High Risk Rural Roads Set-Aside (HR3)
- Safe Routes to School (SRTS)
- Transportation Alternatives Program (TAP)
- Others such as emergency relief

State Funding Sources

- Gas taxes (Highway User Tax Account or HUTA)
- Bicycle Transportation Account (BTA)
- Proposition 1B: Local Streets and Roads Program
- State Transportation Improvement Program (STIP)
- AB 2766 (vehicle surcharge)
- Safe Routes to School (SR2S)
- AB 1546 Vehicle License Fees (VLF)
- CalRecycle grants
- Prop 1B: State Local Partnership Program (SLPP)
- State Water Resource Control Board
- Transportation Development Act (TDA)
- Traffic Safety Fund
- Transportation Uniform Mitigation Fee (TUMF)

Figure 4.1 Gas Prices in California (October 2012)

Local Funding Sources

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

The funding data was 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 modified appropriately. 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. The funding and expenditures data per lane-mile results were then reviewed for outliers. With the outliers 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 determine the estimated total funds and expenditures for all cities and counties. Then the total expenditures and funds for these categories were then summed to determine the statewide total values.

Cities and counties receive more than 50% of their funding from the State.

Table 4.1 and Figure 4.2 summarize the total pavement funding available as well as the percentage of funding sources from the different categories for FY 2008/09 to FY 2013/14 and the estimated funds available for future years. Note that there is a small increase in funding reported in 2012/13 and 2013/14 compared to the previous years. One reason is the annual revenue neutrality adjustment on a portion of the state gas tax as a source of revenue, as well as the bond measures that have essentially "front-loaded" the funding pavement expenditures. However, future funding is projected to drop slightly overall.

Table 4.1 Funding Sources for Pavements

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Future
Pavement Funding ($M)	$1,453	$1,571	$1,557	$1,530	$1,691	$1,836	$1,657
Federal	10%	23%	18%	16%	10%	11%	13%
State	62%	49%	53%	53%	52%	50%	54%
Local	28%	27%	29%	30%	38%	38%	34%

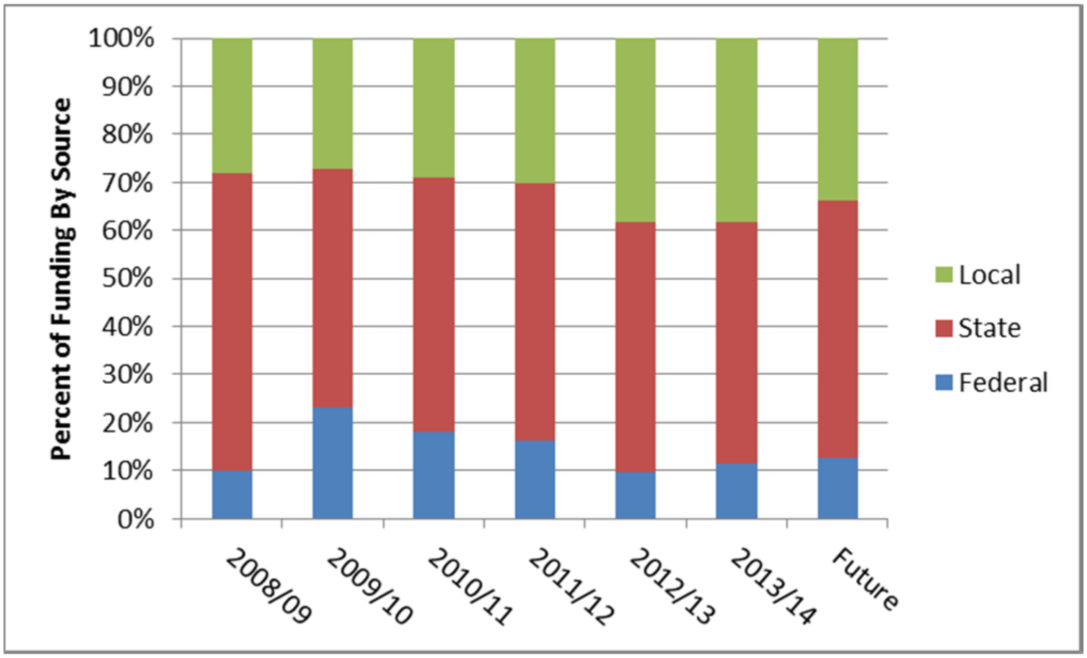


Figure 4.2 Percent of Pavement Funding By Source

In terms of the breakdown by revenue sources, there is little change from the 2012 study. Note that federal funding was a significant component in 2009/10 and 2010/11, reflecting the influx of American Recovery and Reinvestment Act (ARRA) funding which occurred during the recession. Since then, the percentage of federal funds has fluctuated between 10 to 13 percent. This is an important item to note since it indicates that cities and counties, in general, do not rely heavily on federal funds. Rather, state and local funds typically make up almost 90 percent of pavement funding, with state funds as the predominant source at more than 50 percent.

The gas tax is the single largest funding source for cities and counties, yet this is projected to decline statewide and nationally.

The Highway User Tax Account (HUTA), more commonly known as the state gas tax, is by far the single largest funding source for cities and counties. Table 4.2 shows an increasing dependence on a revenue source that is projected to decline. Part of this is because of declining gas consumption due to more gas-efficient and electric vehicles, and partly this is due to the additional responsibilities for most cities and counties e.g. compliance with the American Disabilities Act (ADA) in the form of curb ramps and sidewalk, which reduces the amount of funding available for pavements. Table 4.2 indicates that gas tax funds are projected to be around $1 billion a year.

Table 4.2 Gas Tax Trends for Pavements

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Future
Total Gas Tax ($M)	$ 1,115	$ 911	$ 861	$ 907	$ 1,096	$1,137	$ 1,055
% of State funding	66%	69%	75%	78%	93%	91%	92%
% of total funding	41%	34%	40%	41%	48%	46%	50%

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 who receive General Funds has markedly declined since 2008, and they are projected to decrease in the future.

Table 4.3 General Funds for Pavement Funding

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Future
Total General Fund ($M)	$201	$120	$175	$168	$166	$232	$180
# of agencies	132	62	77	72	88	94	82
% of local funding	27%	16%	28%	25%	19%	24%	25%
% of total funding	7%	4%	8%	8%	7%	9%	8%

Of final interest is the trend in local sales tax measures that have passed. Table 4.4 shows an increasing reliance on the revenues from this source. Although it was only 10 percent of total pavement revenues in 2008/09, this has steadily increased and is expected to reach 19 percent in FY 2014-15.

Table 4.4 Local Sales Tax Trends

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Future
Total Sales Tax ($M)	$285	$258	$256	$279	$374	$455	$409
% of local funding	38%	35%	41%	42%	43%	48%	57%
% of total funding	10%	10%	12%	13%	17%	18%	19%

4.2 Pavement Expenditures

The survey also asked for a breakdown of pavement expenditures in four 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.

Table 4.5 shows the breakdown in extrapolated pavement expenditures for cities, counties and cities/counties combined. There was a drop in expenditures reported in 2010/2011, perhaps reflecting the recession. However, since 2012/13, expenditures have gradually increased, although they have not reached 2008 levels.

Table 4.5 Breakdown of Pavement Expenditures ($M)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Future
Preventive Maintenance	$394	$375	$273	$ 273	$ 333	$ 367	$ 372
Rehabilitation & Reconstruction	$1,224	$ 1,400	$817	$ 794	$ 1,132	$ 1,208	$ 1,023
Other	$200	$ 172	$84	$ 82	$ 104	$ 109	$ 113
Operation & Maintenance	$573	$ 543	$383	$ 381	$ 578	$ 615	$ 636
Totals	**$ 2,391**	**$2,489**	**$1,557**	**$ 1,530**	**$ 2,147**	**$ 2,298**	**$2,144**

Figure 4.3 illustrates the trends for all pavement expenditures graphically. Encouragingly, approximately 17 percent of future pavement expenditures are for preventive maintenance, which indicates that many agencies are cognizant of the need to preserve pavements. One category, “operations and maintenance” are expenditures that are related to the pavements, such as filling potholes, sealing cracks, street sweeping, etc. This category has grown significantly since 2008 and is expected to continue to grow due to regulatory requirements such as street sweeping to comply with NPDES requirements, compliance with new traffic sign retroreflectivity standards and upgrading curb ramps in compliance with the American Disabilities Act (ADA).

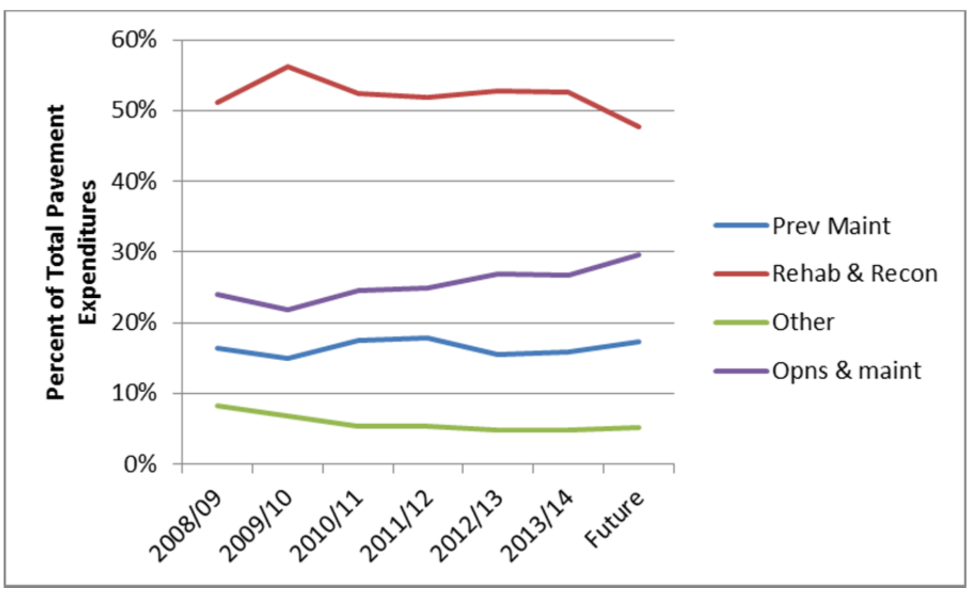


Figure 4.3 Trends in Pavement Expenditures (2008-2014)

Finally, projected pavement expenditures for the next ten years are shown in Table 4.6. As expected, counties indicate lower projected expenditures than cities, and similarly, rural agencies project lower expenditures when compared to urban agencies.

Table 4.6 Projected Pavement Expenditures Per Lane-Mile

	Pavement Expenditures ($/lane-mile)	
	Rural	Urban
County	$2,751	$4,901
City	$6,282	$7,420

Cities and counties are estimated to spend $1.657 billion annually on pavements. This is only 0.88% of the total invested in the pavement network.

The resulting total pavement expenditures for all 540 cities and counties were therefore estimated to be $1.657 billion annually. To put this funding level in perspective, $1.657 billion/year is only 0.88 percent of the total investment in the pavement network, the value of which is estimated at $188 billion.

4.3 Essential Components' Revenue Sources

Similarly to the analysis in Section 4.1, the revenue sources for essential components are shown in Table 4.7. Again, federal funds make a small contribution to the cities and counties, in the order of 11 to 13 percent. However, unlike pavements, local sources now account for 60 percent or more of total funding, with state sources accounting for only 30 percent. This indicates that there is no one single funding source like the gas tax.

Table 4.7 Funding Sources for Essential Components ($M)

Funding type	2010/11	2011/12	2012/13	2013/14	Future
Funding Available ($M)	$885	$903	$1,204	$1,332	$987
Federal	16%	16%	12%	13%	11%
State	31%	31%	28%	23%	31%
Local	53%	53%	60%	65%	58%

Since local revenues form the majority of the funding, Table 4.8 explores the four main funding sources: general funds, development impact fees, local sales taxes and other. The last category includes stormwater, sanitary and NPDES related sources. Future funding projections indicate a decrease from existing levels is expected, down to 2011/12 levels.

Table 4.8 Local Revenue Sources for Essential Components ($M)

Funding type	2010/11	2011/12	2012/13	2013/14	Future
Local Sales Tax	$ 112	$ 114	$ 129	$ 148	$ 121
General Fund	$ 104	$ 124	$ 83	$ 93	$ 71
Development Impact Fees	$ 34	$ 37	$ 24	$ 32	$ 35
Other	$ 249	$ 255	$ 460	$ 556	$ 329
Totals	$ 498	$ 530	$ 696	$ 830	$ 556

4.4 Essential Components' Expenditures

Table 4.9 details the expenditures by category. Storm drains and traffic signals continue to be the largest components. As was noted in the previous tables, this is projected to decline in future years to approximately $1 billion a year.

Table 4.9 Breakdown of Expenditures for Essential Components

Essential Components	**Annual Expenditures ($M)**					**% of total**
	2010/11	**2011/12**	**2012/13**	**2013/14**	**Future**	
Storm Drains	$224	$243	$241	$341	$332	33%
Curb and Gutter	$44	$47	$69	$68	$59	6%
Sidewalk (public)	$118	$117	$117	$153	$101	10%
Other Pedestrian Facilities	$12	$13	$13	$18	$9	1%
Class 1 Bicycle Path	$14	$25	$22	$19	$17	2%
Other Bicycle Facilities	$16	$13	$27	$14	$16	2%
Curb Ramps	$51	$51	$59	$61	$36	4%
Traffic Signals	$232	$240	$215	$215	$181	18%
Street Lights	$104	$108	$106	$98	$85	8%
Sound/Retaining Walls	$9	$8	$9	$17	$8	1%
Traffic Signs	$54	$54	$72	$63	$62	6%
Other	$62	$82	$112	$117	$103	10%
Totals	**$940**	**$1,001**	**$1,062**	**$1,184**	**$1,008**	**100%**

On average, anticipated expenditures for essential components over the next ten years are shown in Table 4.10. As before, rural counties and cities are expected to have lower expenditures than their urban equivalents.

Table 4.10 Breakdown of Expenditures for Essential Components

	Expenditures on Essential Components ($/lane-mile)	
	Rural	Urban
County	$981	$3,525
City	$2,834	$4,044

The resulting total expenditures for all 540 cities and counties were estimated to be over $1 billion annually.

Cities and counties are estimated to spend over $1 billion annually on essential components.

4.5 Funding Shortfalls

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

Table 4.11 summarizes the results of all the preceding analyses and determines the funding shortfall to be $77 billion for pavements and essential components. This does not include any expenditures from the additional regulatory requirements (e.g. NPDES, ADA and sign retroreflectivity), which was estimated to have a shortfall of $3.4 billion (see Table 2.6). However, those numbers were not included in Table 4.11 since only one third of the agencies had data, and most indicated that they were "informed estimates" or "guesses" at best.

Table 4.11 Summary of 10 Year Needs & Shortfall (2014 $ Billion)

	Needs ($B)				Funding ($B)	2014 Shortfall
Transportation Asset	2008	2010	2012	2014		
Pavement	$ 67.6	$ 70.5	$ 72.4	$ 72.7	$ 16.6	$ (56.1)
Essential Components	$ 32.1	$ 29.0	$ 30.5	$ 31.0	$ 10.1	$ (20.9)
Totals	$ 99.7	$ 99.5	$ 102.9	$ 103.7	$ 26.7	$ (77.0)

In the 2012 study, the funding shortfall identified was $80.9 billion, so this is a decrease of $3.9 billion, or approximately 4.8 percent.

The shortfall for local streets and roads is estimated at $77 billion!

4.6 Pavement Funding Scenarios

Since 2008, California, together with the rest of the nation, has faced severe economic challenges, with reductions in revenues, multi-billion deficits and a high unemployment rate. This has impacted transportation funding accordingly, with reductions in gas taxes, the loss of redevelopment funds and a general decrease in sales taxes as well as contributions from the General Fund. Although Proposition 30 (which passed in the November 2012 General Election) stabilized state funding, the funding outlook for local streets and roads continues to be grim. The preceding sections described a general declining trend in funding, yet the needs continue to increase.

Over the past six years, the results of the previous statewide needs studies have helped educate policy makers and prevented severe cuts to road funding. To further assist policy makers on how potential cuts will affect pavement conditions; this update includes the impacts from three different funding scenarios:

1. Existing funding, estimated at $1.657 billion/year;
2. Funding to maintain current pavement condition at PCI = 66; and
3. Funding to achieve best management practices (BMP) in ten years.

Scenario 1: Existing Funding ($1.657 billion/year)

In this scenario, the most cost-effective treatments are funded first, and these are typically preventive maintenance or preservation strategies, such as seals. This approach generally treats a larger percent of pavement network resulting in optimizing the use of limited funds. At the existing funding level of $1.657 billion/year, the pavement condition is expected to deteriorate to 55 by 2024, and the unfunded backlog will increase by more than 50 percent to $61 billion. Again, these are in constant 2014 dollars. Figure 4.4 graphically illustrates these two trends.

Scenario 2: Maintain PCI at 66 ($3.328 billion/year)

In order to maintain the pavement condition and unfunded backlog at existing conditions (i.e., PCI = 66) an annual funding level of $3.328 billion is required (see Figure 4.5). This funding level is twice the current funding level of $1.657 billion/year. The unfunded backlog is stabilized at around $40 billion.

Scenario 3: Reach Best Management Practices ($7.275 billion/year)

One of the objectives of this study was to determine what funding level would be required to reach a pavement condition where best management practices can be applied. This occurs when the PCI reaches an optimal level in the low to mid 80's, and the unfunded backlog has been eliminated.

For this scenario, $7.275 billion/year is required to achieve this level (see Figure 4.6). The PCI will reach 84 by 2024 and the unfunded backlog is eliminated. Once eliminated, the cost of maintenance thereafter is significantly lower, requiring approximately $2.4 billion a year.

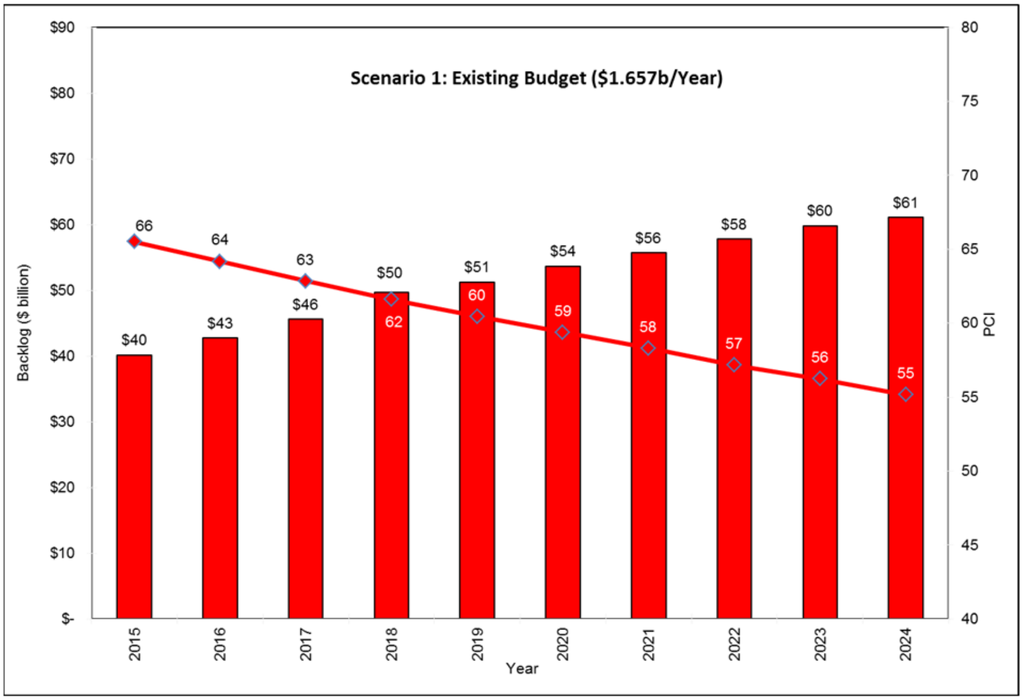


Figure 4.4 Results of Scenario 1: Existing Budget ($1.657 billion/year)

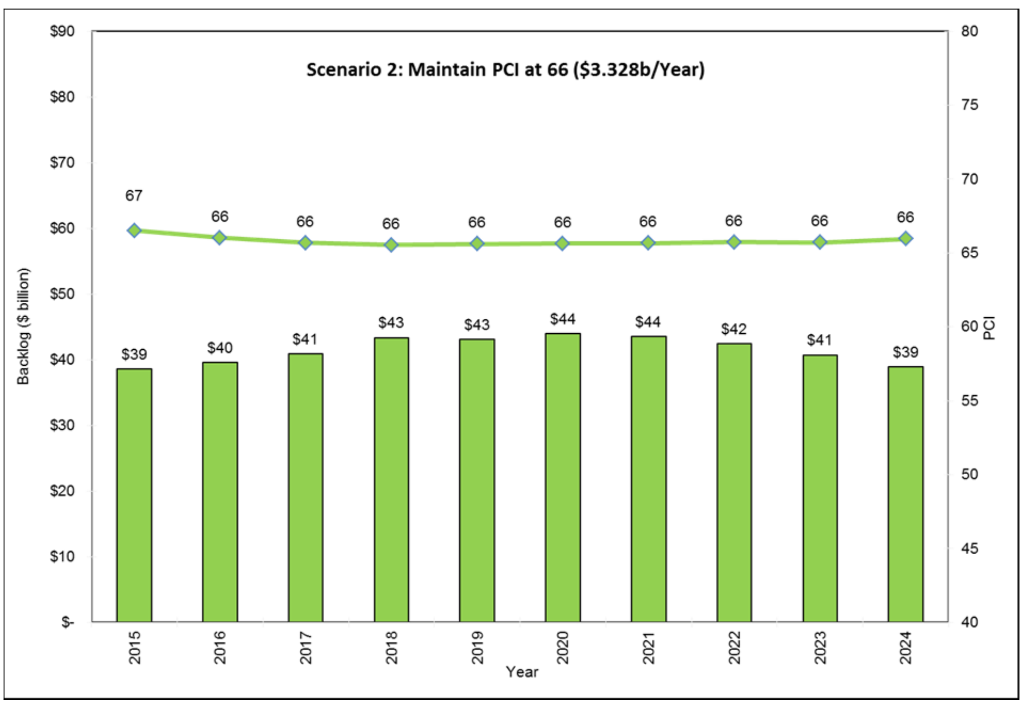


Figure 4.5 Results of Scenario 2 (Maintain PCI at 66; $3.328 billion/year)

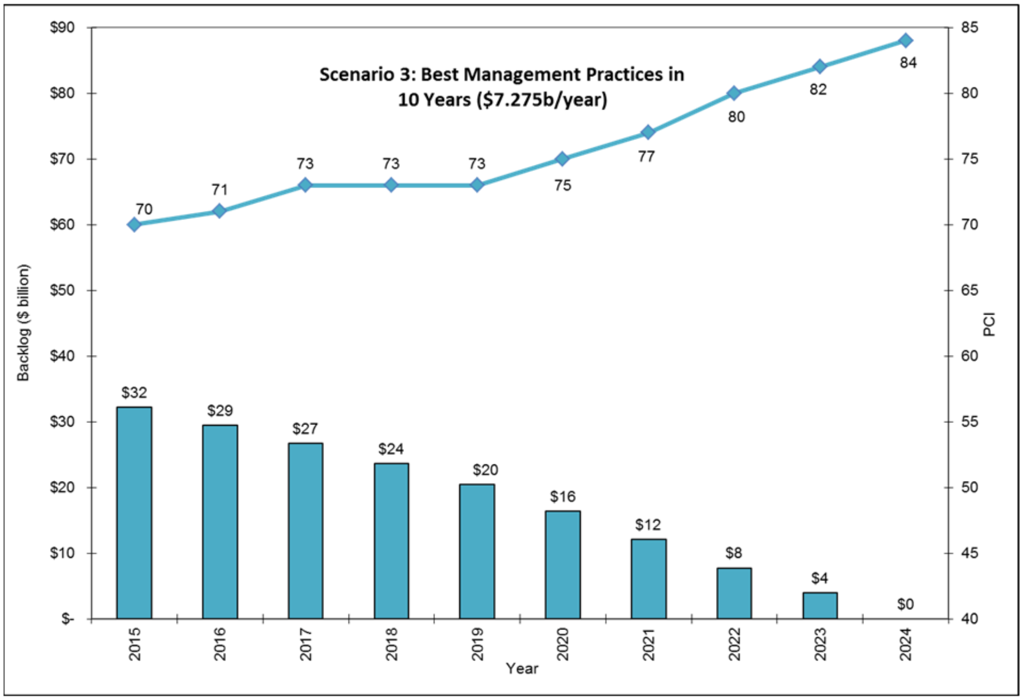


Figure 4.6 Results of Scenario 3 (BMP in 10 years = $7.275 billion/year)

4.7 Other Performance Measures

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

The biggest factor that jumps out is that the percentage of pavements in failed condition today is estimated to be approximately 6.2 percent; however, under Scenarios 1 and 2, this will grow to between 19.9 to 24.5 percent by 2024. Or to be blunt, a quarter of local streets and roads will be considered "failed" by 2024 under existing funding levels. Figure 4.6 show examples of "failed" local streets.

A quarter of California's streets will be in failed condition by 2024 under existing funding levels.

Another trend of note is that while Scenario 2 maintains the existing condition and unfunded backlog, there is still a significant growth in the percentage of pavements that are "failed" (from 6.6 percent to 19.9 percent). The good news is that the preservation strategies will also dramatically improve the percent of pavements in the "good to excellent" category from 56 percent to 77 percent.

Table 4.12 Percent of Area by Condition Category in 2024 for Each Scenario

Condition Category	Current Breakdown (2014)	Scenario 1 Existing Budget ($1.657b/yr)	Scenario 2 Maintain PCI at 66 ($3.328b/yr)	Scenario 3 BMP in 10 Years ($7.275b/yr)
PCI 70-100 (Good to Excellent)	56.5%	52.0%	77.3%	100.0%
PCI 50-69 (At Risk)	21.7%	12.2%	0.0%	0.0%
PCI 25-49 (Poor)	15.6%	11.3%	2.8%	0.0%
PCI 0-24 (Failed)	6.2%	24.5%	19.9%	0.0%
Totals	100.0%	100.0%	100.0%	100.0%

Figure 4.7 Examples of Failed Streets

Finally, a short note on the definitions of a "distressed highway." As was mentioned in Chapter 1, Caltrans has a goal of reducing the percentage of distressed highways from the current level of 25 percent to 10 percent. Distressed highways in this definition are those highways that require capital preventive maintenance and rehabilitation. When applied to a local street or road, this includes all the streets in the "At Risk" category and below. Applying the Caltrans definition would mean that currently, 44 percent of local streets and roads are "distressed". Clearly, the definitions used by Caltrans are applicable for highways but not for local streets and roads; this is only logical since the types of facilities are so different.

4.8 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. Yet the factors that have led us here can be quickly summarized as:

- The population of California was approximately 30 million in 1990; it is now approximately 38 million, an increase of almost 27 percent. Attendant with that increase in population are increases in traffic, housing and new roads.
- There are many new regulations which have increased the responsibilities of cities and counties, such as ADA, NPDES and new traffic sign retroreflectivity standards.
- Greenhouse gas reduction policies (AB 32) have also had an unexpected impact on streets and roads. One example is the use of heavy new buses that exceed the legal highway limits because they have been upgraded to reduce GHG and other particulate air emissions. These higher loads will inevitably result in a premature pavement failures and therefore higher maintenance costs.
- The public demands a higher quality of life e.g. complete streets or active transportation policies.
- Cities and counties need to consider, build and maintain a transportation system that has multiple transportation modes e.g. bicycles, pedestrians, and buses.
- The cost of road repairs and construction has steadily increased, at rates that are significantly higher than that for inflation. In the last 15 years, paving costs have increased more than eight-fold but revenues have not.
- The gas tax has not increased in over 20 years and yet it remains the single most important funding source for transportation. This means that cities and counties are relying on a diminishing revenue source for a transportation system that is aging and deteriorating rapidly, and which continues to shoulder additional demands from the public.

4.9 Summary

From the results of the surveys as well as the funding scenarios, it is apparent that:

- Total funding for pavements is projected at $1.657 billion annually over the next ten years. Of this, 59 percent will come from state funds (almost all gas tax), 10 percent from federal sources, and the remainder from local sources (mostly sales taxes).
- Total funding for essential components is projected to decrease to approximately $1 billion annually. The majority of the funding comes from local sources (58%) with the state contributing approximately 31%.
- Given the existing funding levels, the total funding shortfall for pavements and essential components is a staggering $77 billion over the next ten years!
- Under the existing funding for pavements ($1.657 billion/year), it is projected that the statewide PCI will decrease from 66 to 55 and the unfunded backlog will increase to $61 billion. In addition, a quarter of the pavement network will be in "failed' condition by 2024.

- In order to maintain the existing pavement condition (Scenario 2), it will require a funding level of $3.328 billion/year, twice the existing level. This would dramatically improve the percentage of pavements in the "good to excellent" category from 56 percent to 77 percent. Unfortunately, the percentage of pavements in the "failed" category also grows from 6.2 percent to 20 percent.
- The best management practice scenario would require approximately $7.275 billion annually to eliminate the backlog of work and raise the PCI to 84.

5. Bridge Needs and Funding Analysis

Bridges are an integral part of the transportation system, and therefore a study such as this one 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 four hours may be necessary.

For the 2012 update, both Quincy Engineering (QE) and Spy Pond Partners (SPP) collaborated to provide the analysis to determine both the ten year bridge needs and funding analysis, respectively. For this update, the analysis was not updated; rather, the results were extrapolated by an additional two years assuming the trends were the same. Therefore, much of the information presented here is similar to that shown in the 2012 study.

A total of 11,863 local agency bridges in California were inventoried in the 2012 National Bridge Inventory (NBI) Database. Local agency bridges are defined as bridges that are owned by local agencies such as counties and cities. Other owners such as the State, Bay Area Rapid Transit, private, railroad and federal bridges were not considered as local agency bridges for this study.

Figure 5.1 represents a breakdown of local bridge count by county. Most counties (including city bridges within the county) have a few hundred bridges, averaging about 200 bridges per county. In general, the larger populated counties have a significantly higher number of bridges than the lower populated counties. Los Angeles County has the most locally owned bridges, with over 1400 bridges.

Figure 5.2 illustrates the age distribution of all the statewide local bridges. The largest age group are bridges 40 years or older, followed by bridges that are 50 years or older. 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 those bridges to deteriorate at a faster rate and require replacement sooner. Figure 5.2 also shows that there are a significant number of bridges that are over 80 years old (most bridges are designed to last 50 years). Most of those bridges are at the end of their life and will require replacement soon.

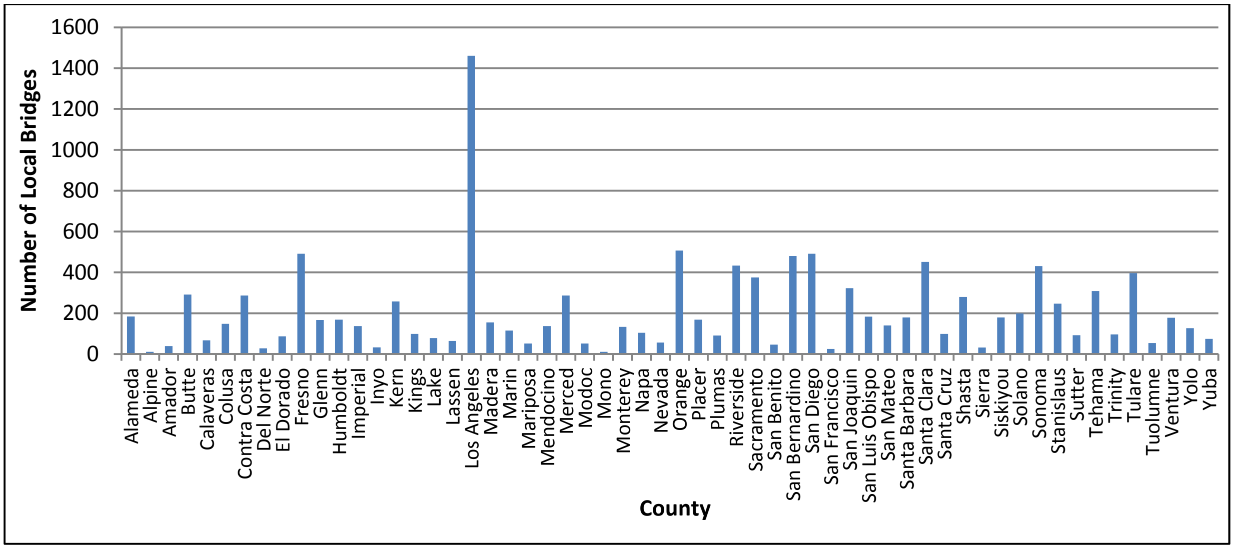


Figure 5.1 Number of Local Bridges by County (includes Cities within County)

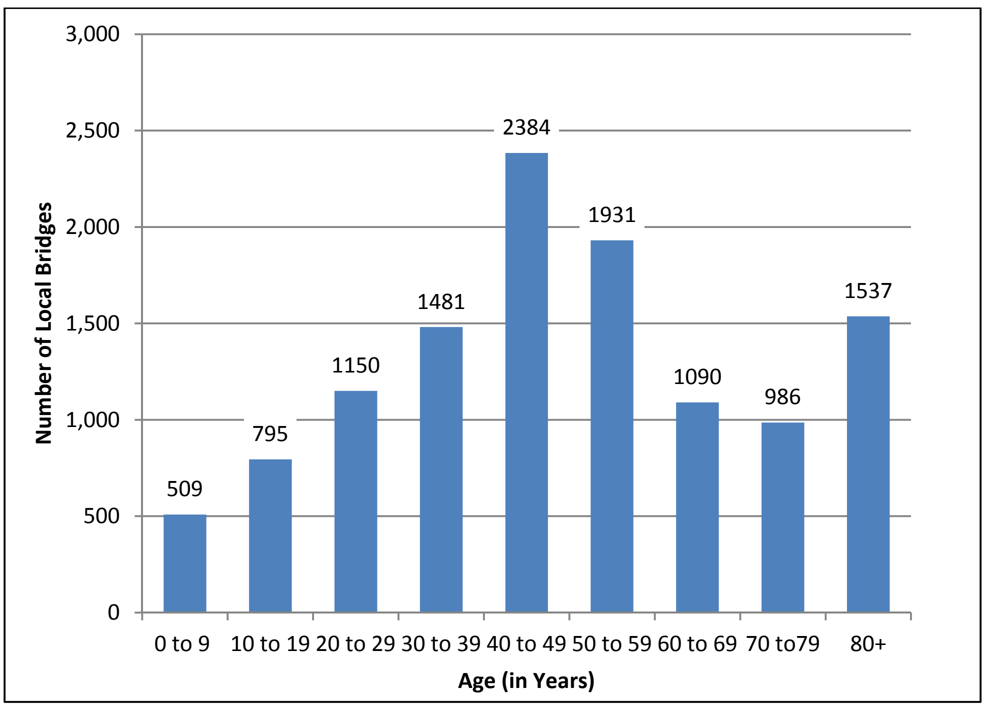


Figure 5.2 Age Distribution of Local Bridges

Of the 11,863 local agency bridges, 6,285 bridges are considered “on-system” and 5,584 are “off-system”. “On-system” bridges are listed in the National Highway System or are bridges with the following functional classifications:

- Urban Principal Arterial – Interstate
- Urban Principal Arterial – Other Freeways or Expressways
- Urban Other Principal Arterial

- Urban Minor Arterial
- Urban Collector
- Rural Principal Arterial – Interstate
- Rural Principal Arterial – Other
- Rural Major Arterial
- Rural Major Collector

Off-system bridges are bridges that are not on the National Highway System and have the following functional classifications:

- Urban Local
- Rural Minor Collector
- Rural Local

5.1 Survey Results (2012)

Since the cities and counties were not asked to provide bridge data in the 2014 survey, all results reported are from the 2012 survey. This showed that 49 of 58 counties (84%) responded, and 128 of 482 cities (27%) responded to the survey. While the percentage of cities participating was low, it should be noted that many small cities do not own and maintain their own bridges.

5.2 Needs Assessment

The needs assessment for bridges has three primary categories: Replacement, Rehabilitation, and Seismic Retrofit to follow the Federal Highway Administration Highway Bridge Replacement and Rehabilitation Program and the Caltrans Seismic Retrofit funding eligibilities. For the purpose of this study's terminology, rehabilitation is separated into three sub-categories:

- Bridge deck rehabilitation and deck replacement (deck improvement)
- Bridge strengthening
- Bridge widening

The bridge deck is the component that takes the most wear-and-tear from the impact of daily vehicular traffic, and is the most common bridge rehabilitation. Therefore, it contributes to the majority of bridge rehabilitation cost projects in California. Figure 5.3 below shows an example of deck rehabilitation with methacrylate resin treatment.

Figure 5.3 Bridge Deck Rehabilitation with Methacrylate Resin Treatment

The three sub-rehabilitation needs are estimated to capture all preservation needs such as deck joint replacement, bearing pad replacement, painting, etc. Preservation works are typically performed concurrently with a bridge rehabilitation job. For instance, painting is performed at the same time a steel structure is strengthened to minimize impact and save cost. Another example is when a bridge deck is replaced, bridge joints are replaced at the same time. Also, during a bridge widening, concrete barriers are replaced and updated to new standards. In this study, all preservation needs are accounted for in the bridge deck rehabilitation-and-replacement, bridge strengthening, and bridge widening needs category (the three rehabilitation categories).

5.2.1 Replacement and Rehabilitation Eligibility

The Federal Highway Administration Highway Bridge Replacement and Rehabilitation Program funding eligibility requirements (FHWA HBRRP 23 CFR 650.409) was used as the basis to determine which bridges have needs for replacement or rehabilitation.

According to FHWA, the National Bridge Inventory is used for preparing the selection list of bridges both on and off Federal-aid highways. Bridges that are considered structurally deficient or functionally obsolete and with a sufficiency rating of 80 or less are used for the selection list. Those bridges appearing on the list with a sufficiency rating of less than 50 are eligible for replacement while those with a sufficiency rating of 80 or less are eligible for rehabilitation. To be classified as structurally deficient, a bridge must have a length equal to or greater than 20 feet and not been constructed or had major reconstruction within the past 10 years. The definitions are listed below:

- A bridge is defined as eligible for replacement if the Sufficiency Rating is less than 50 *and* the bridge is structurally deficient or functionally obsolete (SR<50 & bridge is SD or FO).

- A bridge is defined as eligible for rehabilitation if the Sufficiency Rating is greater than or equal to 50 but less than or equal to 80 *and* the bridge is structurally deficient or functionally obsolete (50≤SR ≤ 80 & bridge is SD or FO).

In order to be considered for either the Structurally Deficient (SD) or Functionally Obsolete (FO) classification, a bridge must also meet the following guidelines:

1. Structurally Deficient (SD)
   a) Condition rating of 4 or less for deck, superstructures, substructures, culvert and retaining Walls, or
   b) Appraisal rating of 2 or less for structural condition or waterway adequacy.
2. Functionally Obsolete (FO)
   a) An appraisal rating of 3 or less for deck geometry, under-clearances or approach roadway alignment, or
   b) An appraisal rating of 3 for structural condition or waterway adequacy

Figures 5.4 to 5.7 illustrate examples of structurally deficient and functionally obsolete bridges.

Figure 5.4 Structurally Deficient – Low Deck & Superstructure Condition Rating

Figure 5.5 Structurally Deficient – Low Superstructure & Substructures Condition Rating

Figure 5.6 Structurally Deficient – Low Substructures Condition Rating & Low Waterway Adequacy

Figure 5.7 Functionally Obsolete – Low Approach Roadway Alignment Appraisal Rating

Of the 11,863 bridges, 1,887 bridges are Structurally Deficient (16%), and 1,796 bridges are Functionally Obsolete (15%). Of the total, 950 bridges are eligible for replacement (8%), and 1,891 bridges are eligible for rehabilitation (16%).

5.2.2 Bridge Replacement

Of the 950 bridges eligible for replacement, 33 were not included in the needs assessment because they already have secured funding in place or construction was imminent. Two large bridges were also excluded from this study.

1. *Golden Gate-San Francisco Bay Bridge (*Bridge #27 0052), is owned by a local toll authority and is not considered a local bridge.
2. *Los Angeles River Bridge on Sixth Street (*Bridge #53C1880), owned by the City of Los Angeles is already programmed and federally obligated for $229.5 million dollars for construction and $104.6 million dollars for right-of-way. Therefore, this bridge was removed from this assessment.

Figure 5.8 shows the average bridge replacement unit cost (dollars per square foot) of all the bridges that are assessed to require replacement. This cost is based on site characteristics and includes the new bridge and bridge removal costs. It does not include approach roadway and other bridge replacement project costs.

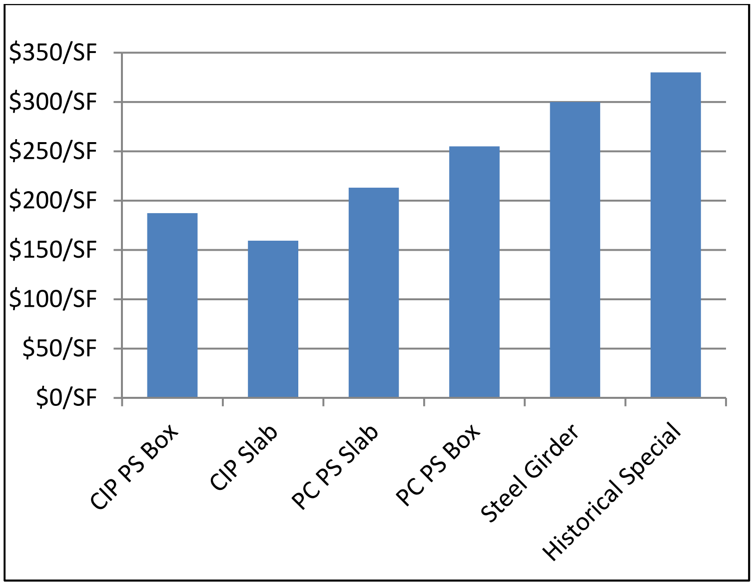


Figure 5.8 Average Bridge Replacement Unit Cost ($/SF)

Figure 5.9 below shows the different components of the bridge replacement associated cost. In addition to the cost of replacing the bridge, the other associated costs include costs for roadway approaches, right-of-way, design engineering and environmental, construction mobilization, construction contingency, and construction management. The cost of the bridge itself is only about 40% of the total bridge replacement project cost.

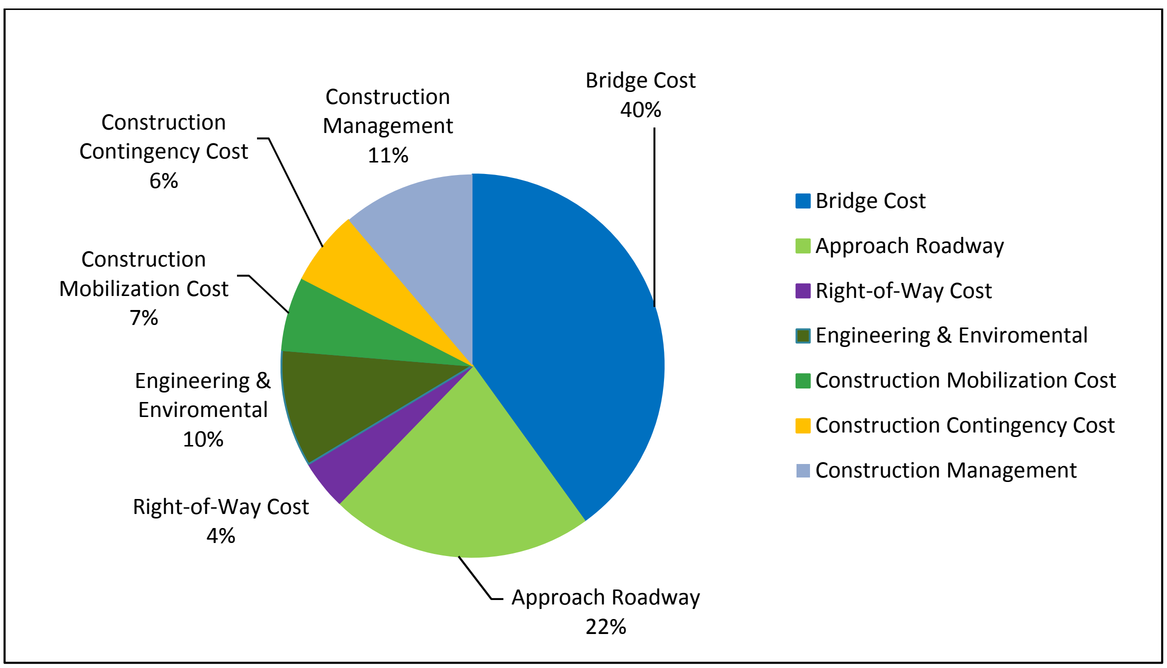


Figure 5.9 Total Bridge Replacement Associated Costs

5.2.3 Bridge Rehabilitation

As mentioned previously, rehabilitation is categorized into the following three categories:

1. Bridge deck rehabilitation and deck replacement (deck improvement)
2. Bridge strengthening, and
3. Bridge widening

Bridge deck rehabilitation is the most common bridge rehabilitation, and contributes to the majority of the bridge rehabilitation costs in California. Because it accounts for the majority of bridge rehabilitation cost, a refined assessment of the unit cost of bridge decks was required. A unit cost of $10/sf for deck rehabilitation and $100/sf for deck replacement was used. The unit prices are based on Caltrans and Quincy Engineering's historical design and construction support data. The unit cost is conservatively estimated to include common preservation needs such as rehabilitation of expansion joints and bridge bearings.

Of the 1,891 bridges eligible for rehabilitation, approximately 548 bridges require deck rehabilitation and 133 bridges require deck replacement.

Figure 5.10 is an example of a bridge deck that requires replacement. Figure 5.11 shows a bridge expansion bearing replacement during deck widening project.

Figure 5.10 Bridge Deck Requiring Replacement

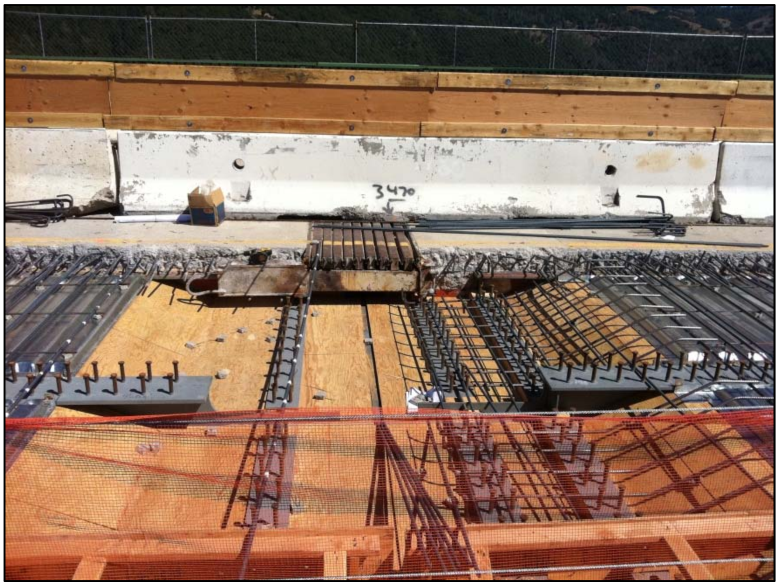


Figure 5.11 Bridge Expansion Bearing Replacement During Deck Widening

5.2.4 Bridge Strengthening

Bridge strengthening project costs vary widely depending on individual projects. For example, to strengthen an older steel bridge built before 1970, lead abatement and environmental mitigation will be required. Depending on the amount of work involved in bridge strengthening, the cost of lead abatement can vary from a local containment to a full bridge containment system which tends to be very costly.

The cost associated with bridge strengthening was obtained from bridge improvement data within the NBI database. To scale the improvement needs to 2012 dollars, a Construction Cost Index was used. This methodology was considered to be more accurate because local bridge inspectors and agencies have more site specific information on a project by project basis.

Using the rehabilitation criteria (50≤SR ≤ 80 & bridge is SD), it was estimated that approximately 495 bridges required bridge strengthening. The weighted average cost per area is $150/sf.

5.2.5 Bridge Widening

Similarly to bridge strengthening, bridge widening costs are highly dependent on specific project needs. Figure 5.12 illustrates the bridge widening cost distribution over all the local agency bridges. Most bridges that require widening are located in Los Angeles County. This is because the Average Daily Traffic (ADT) count is high in comparison to the traveling capacity of the existing bridge. The LA county bridges also have a higher project cost due to site specific variables such as higher right-of-way acquisition costs and construction limitations due to congested conditions. From the NBI data, there are approximately 154 bridges that require widening.

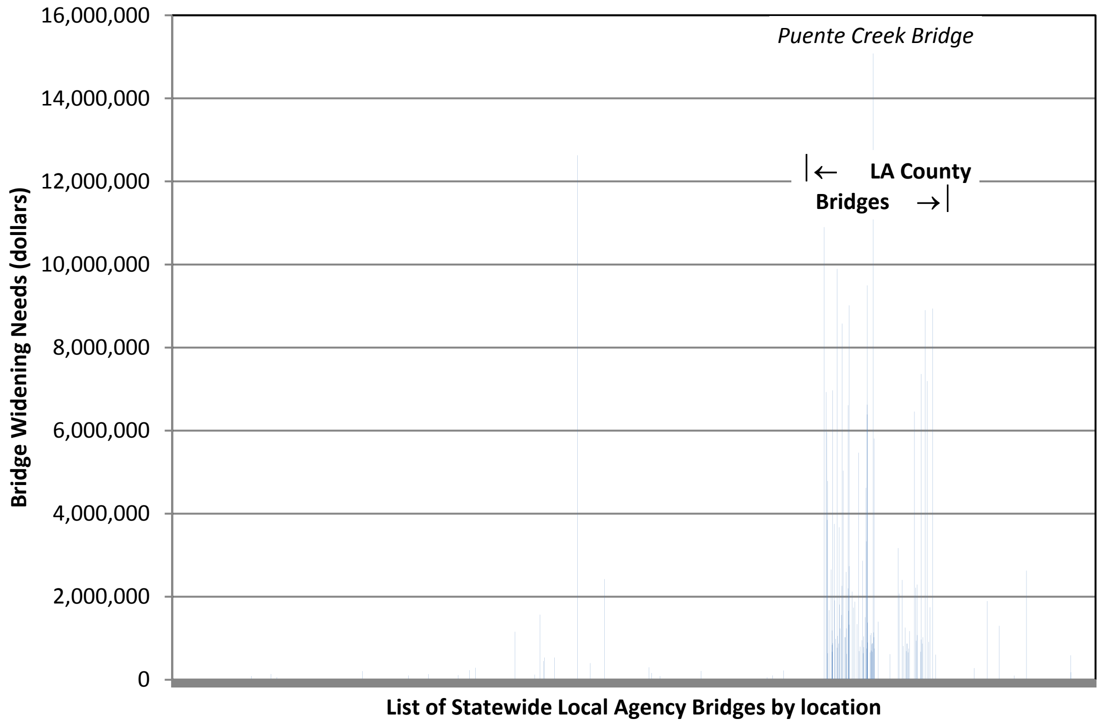


Figure 5.12 Distribution of Bridge Widening Projects

5.2.6 Bridge Seismic Retrofit

Seismic retrofit need is also project specific with costs varying greatly between individual projects. The Caltrans Local Bridge Seismic Retrofit Program (LBSRP) list provides remaining projects that are eligible for LBSRA Funds. The total seismic requested federal Highway Bridge Program (HBP) funds requested was used to determine the total seismic needs.

5.2.7 Non-NBI Bridges

Non-NBI Bridges are non-vehicular bridges or vehicular bridges less than 20 feet long. While a bridge maybe considered non-NBI due to its limited length or because of its pedestrian and/or bicycle designation, these bridges are still of significant importance to our communities. For instance, there are many local short vehicular bridges (less than 20 feet) that provide the only access for fire trucks in case of emergencies. The need for non-NBI bridges should not be neglected.

Unlike NBI bridges, non-NBI bridges do not have a state or national database that documents these bridges. Therefore, the survey information was the only source available. As was noted previously, 49 counties out of 58 counties (84%) responded to the survey, and 128 cities out of 482 cities (27%) responded to the survey. However, only 41 counties and 95 cities responded to questions about the non-NBI bridges.

Therefore, a method of approximation had to be developed to estimate the non-NBI bridge counts. Briefly, the methodology to estimate the missing or unknown county bridge data was to consider geography, adjacent county data, and population. For instance, based on the 2010 United States Census, Sutter County, Yuba County, and Nevada County have similar population size. Based on geography, the three counties have similar rivers characteristics. Since bridge survey data is available for Sutter and Nevada County, Yuba County's missing data can be estimated similar to that of Sutter and Nevada County's.

The method to estimate city non-NBI bridges was based on available data from adjacent cities. However, not all cities within a county are similar; some cities have larger population than smaller cities. This method assumes that cities within a county had a similar bridge to population ratio. Within a given county, the geographical characteristics of its land and rivers are assumed to be similar. Therefore, the number of bridges per population should be similar.

Based on the assumptions above, the total number of non-NBI bridges was estimated to be approximately 3,500. Of these, approximately 30 percent were assumed to be non-vehicular bridges (extrapolated survey data). The percentage of non-NBI bridges assumed to require rehabilitation or replacement were assumed to be similar to those for the NBI bridges. The unit costs for vehicular bridges were also assumed to be the same as for the NBI bridges, while those for non-vehicular bridges were $200/sf for replacement, and $10/sf for rehabilitation. With the assumptions above, the non-NBI bridge needs are estimated to range from $30 to $60 million.

5.2.8 Summary of Local Bridge Needs

The total statewide local agency bridge needs is estimated to be $4.3 billion over the next ten years. The breakdowns are as follows:

- Bridge replacement needs are approximately $2.6 billion.
- Bridge deck rehabilitation and deck replacement costs are approximately $420 million.
- Bridge structural strengthening requires approximately $530 million.
- Bridge widening requires approximately $420 million (widening projects are to bring bridges up to current width standards, and are not for adding capacity i.e. adding lanes)
- Bridge seismic retrofit needs are approximately $320 million.
- Non-NBI bridge needs are estimated at $30 to $60 million.

The total statewide local bridge needs are estimated at $4.3 billion over the next ten years.

Appendix D contains a summary of the bridge needs by County.

5.3 Funding Analysis

The funding analysis considered maintenance, repair, rehabilitation actions required to preserve existing structures. Also, it included needs to perform seismic retrofits, strengthen bridges, raise bridges to increase vertical clearance, and widen bridges (without adding lanes) to address clearance or safety issues. Bridge replacement was considered in the analysis when it was projected to be more cost effective than preservation or functional improvement, or when other actions were deemed to be infeasible. The analysis did not consider costs associated with adding lanes to existing structures to relieve congestion.

To develop the projections, the FHWA's National Bridge Investment Analysis System (NBIAS)[6] was used. FHWA uses NBIAS to develop its biannual Conditions and Performance Report[7]. NBIAS has a modeling approach similar to that of the AASHTO Pontis Bridge Management System (BMS) which is used by Caltrans for managing its bridges. However, NBIAS requires only publically-available NBI data to run, in contrast to Pontis, which requires detailed element data that are not part of the NBI. (Note that the 3500 non-NBI bridges were not therefore included in this analysis. However, their needs are less than 1.5% of the total, so was not considered to be significant.)

Though NBIAS is populated with default costs, deterioration models, and other parameters, it is important to calibrate the system results so that they provide as realistic a projection as possible. The costs in NBIAS were calibrated using data provided by Quincy Engineers. Consequently, the calculation of initial needs corresponds to that developed independently by Quincy Engineers. Further, seismic retrofit needs, which are not modeled by NBIAS, were calculated by Quincy Engineers. The deterioration models used in the system were originally developed by Caltrans, and are included in NBIAS, along with models from other states. A set of calibration runs was performed in NBIAS to confirm the deterioration models, using 2001 data to compare results predicted for 2011 using different deterioration models with actual conditions observed in 2011 based on NBI data.

The results obtained from NBIAS provide a projection of bridge investment needs over time for different budget assumptions. Investment needs are funds that should be invested to minimize bridge costs over time and address economically-justified functional improvements. To the extent that projected funds are insufficient for addressing all needs, the system simulates what investments will occur with an objective of maximizing benefits given an available budget. The system also predicts what new needs may arise considering deterioration and traffic growth, and projects a range of different physical measures of bridge condition.

[6] Cambridge Systematics, Inc. *NBIAS 3.3 Technical Manual.* Technical Report prepared for FHWA. 2007.

[7] FHWA and FTA. *2010 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance*. Report to the United States Congress. 2012.

5.3.1 Projected Statewide Bridge Conditions and Needs

Table 5.1 presents the summary results for the statewide analysis. The table shows results for annual budgets from $0 to $600 million. For each budget level shown the table shows results by year for 10 years for the following measures:

- **Needs:** investment need as of the beginning of the year, shown in billions of dollars. The projections include costs for replacement, functional improvement, rehabilitation, minor preservation activities, and seismic retrofits.
- **Cumulative Work Done:** total spending over time, shown in billions of dollars. Typically this measure increases by the budgeted amount each year, but in some cases may increase by less than the budgeted amount if no needs remain to be met, or if during the program simulation the available budget was less than the cost of the next recommended action.
- **Average Health Index:** average calculated from predicted element conditions, where a value of 75 or less for an individual bridge generally indicates the bridge is in fair or poor condition (in need of rehabilitation) and a value of 90 or greater for an individual bridges indicates the bridge is in good condition.
- **Average Sufficiency Rating:** average rating calculated based on FHWA definitions unlike the Health Index Sufficiency Rating which includes adjustments for functional characteristics of a bridge.
- **Percent Structurally Deficient:** percent of bridges classified as Structurally Deficient based on FHWA definitions, weighted by deck area.

Note that the current level of spending is approximately $300 million/year. Figure 5.13 shows total bridge needs over time and Figures 5.14, 5.15 and 5.16 show the average Health Index, average Sufficiency Rating, and percent Structurally Deficient, respectively.

Table 5.1 Summary Bridge Funding Analysis (2014 to 2024)

Description	Value by Year Base	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Annual Budget: $0M												
Needs ($B)		4.9	5.6	6.1	6.6	7.3	8.0	8.9	10.0	11.2	12.5	13.7
Cumulative Work Done ($B)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Avg. Health Index	91.44	89.64	88.73	87.82	86.91	85.99	85.07	84.15	83.22	82.30	81.38	80.46
Avg. Sufficiency Rating	82.45	80.60	79.69	78.76	77.91	76.44	74.35	71.81	69.49	67.16	65.48	64.17
% Structurally Deficient	20.72	29.32	33.30	37.11	41.75	47.55	53.66	59.57	63.55	67.13	69.68	72.37
Annual Budget: $100M												
Needs ($B)		4.8	5.4	5.8	6.2	6.7	7.2	7.9	8.7	9.8	10.9	11.9
Cumulative Work Done ($B)		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
Avg. Health Index	91.44	89.72	88.88	88.03	87.21	86.38	85.57	84.74	83.97	83.17	82.39	81.64
Avg. Sufficiency Rating	82.45	80.76	79.99	79.18	78.47	77.21	75.36	73.07	70.98	68.89	67.46	66.38
% Structurally Deficient	20.72	28.98	32.68	36.20	40.38	45.57	51.14	56.58	60.32	63.64	65.93	68.08
Annual Budget: $200M												
Needs ($B)		4.7	5.1	5.4	5.7	6.1	6.4	6.7	7.2	7.9	8.6	9.2
Cumulative Work Done ($B)		0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
Avg. Health Index	91.44	89.83	89.08	88.36	87.75	87.18	86.64	86.05	85.47	84.94	84.42	84.01
Avg. Sufficiency Rating	82.45	80.99	80.32	79.70	79.20	78.21	76.83	74.93	73.15	71.33	70.27	69.75
% Structurally Deficient	20.72	28.71	31.81	34.54	37.82	41.49	44.98	48.95	52.20	54.55	56.02	56.42
Current Budget: $300M												
Needs ($B)		4.6	4.8	5.0	5.1	5.4	5.5	5.5	5.6	6.0	6.1	6.1
Cumulative Work Done ($B)		0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6
Avg. Health Index	91.44	89.98	89.40	88.88	88.52	88.22	88.17	87.98	88.06	88.23	88.77	89.48
Avg. Sufficiency Rating	82.45	81.20	80.73	80.29	79.96	79.40	78.64	77.27	76.32	75.62	75.89	76.61
% Structurally Deficient	20.72	28.18	30.34	32.17	33.00	34.46	35.76	37.42	37.30	37.19	34.56	32.93
Annual Budget: $400M												
Needs ($B)		4.5	4.6	4.6	4.7	4.5	4.5	4.3	4.1	3.9	3.8	3.5
Cumulative Work Done ($B)		0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8
Avg. Health Index	91.44	90.14	89.78	89.59	89.69	90.13	91.00	92.06	93.25	93.94	94.06	94.12
Avg. Sufficiency Rating	82.45	81.41	81.14	80.94	81.07	81.00	80.96	80.97	81.32	81.23	81.13	81.06
% Structurally Deficient	20.72	27.65	28.04	27.46	26.06	24.80	24.00	22.46	18.75	18.87	18.36	17.89
Annual Budget: $500M												
Needs ($B)		4.4	4.4	4.3	4.1	3.9	3.6	3.2	2.9	2.6	2.4	2.0
Cumulative Work Done ($B)		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Avg. Health Index	91.44	90.33	90.27	90.68	91.65	93.21	94.57	94.71	94.77	94.79	94.78	94.79
Avg. Sufficiency Rating	82.45	81.64	81.56	81.76	82.28	82.85	83.26	83.15	83.00	82.76	82.69	82.63
% Structurally Deficient	20.72	26.76	24.85	22.11	18.60	16.29	13.69	13.85	14.68	15.34	15.32	15.02
Annual Budget: $600M												
Needs ($B)		4.3	4.1	3.9	3.5	3.1	2.7	2.2	1.8	1.5	1.2	0.7
Cumulative Work Done ($B)		1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.0
Avg. Health Index	91.44	90.67	91.04	92.54	84.71	95.08	95.15	95.18	95.19	95.23	95.24	95.14
Avg. Sufficiency Rating	82.45	81.93	82.19	82.78	83.63	84.01	84.20	84.15	84.05	83.95	83.93	83.71
% Structurally Deficient	20.72	24.63	20.79	15.87	13.23	11.47	11.31	11.79	12.87	13.29	13.17	13.09

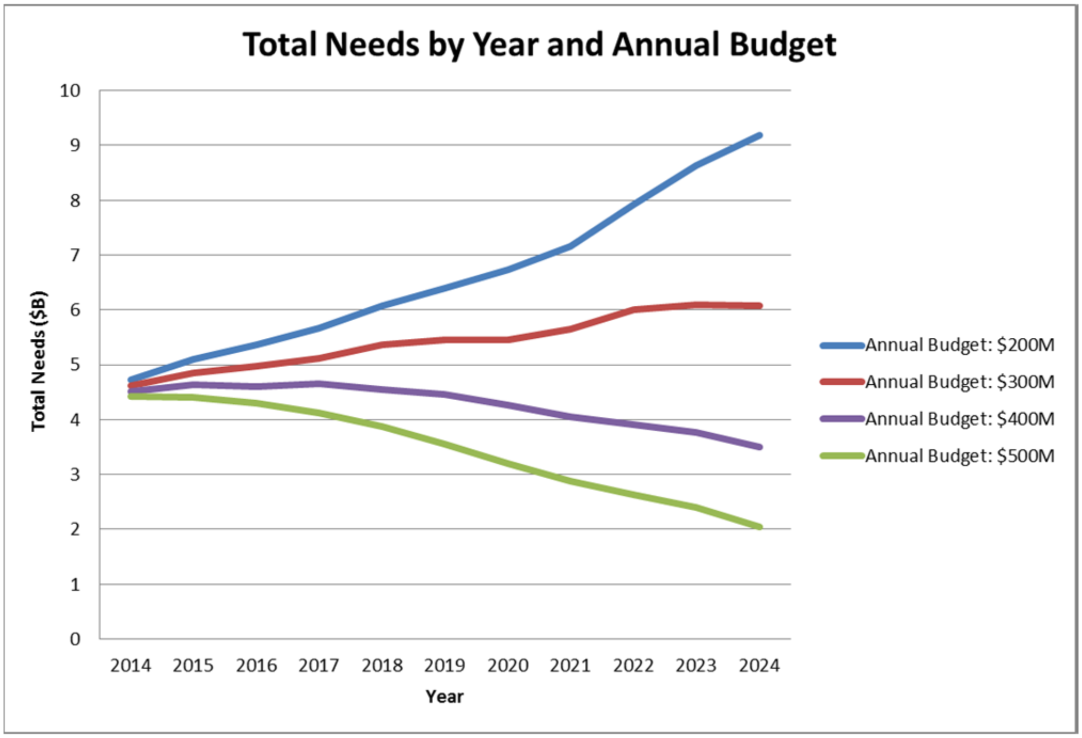


Figure 5.13 Projected Local Bridge Needs (2014-2024)

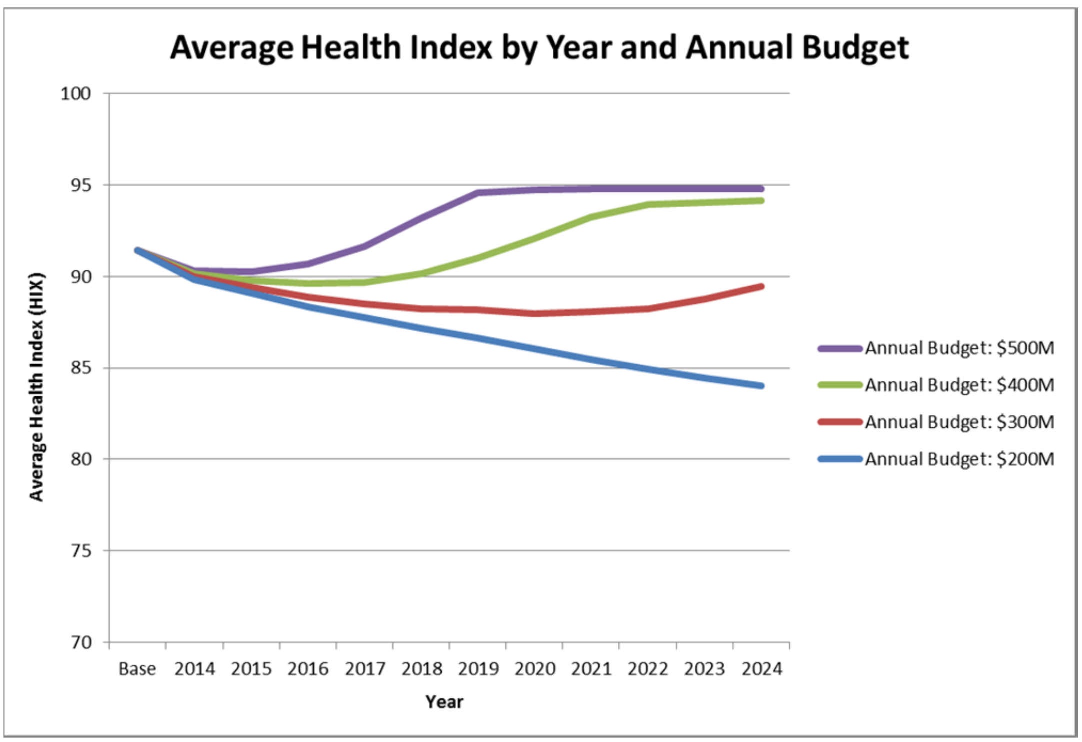


Figure 5.14 Projected Health Index (2014-2024)

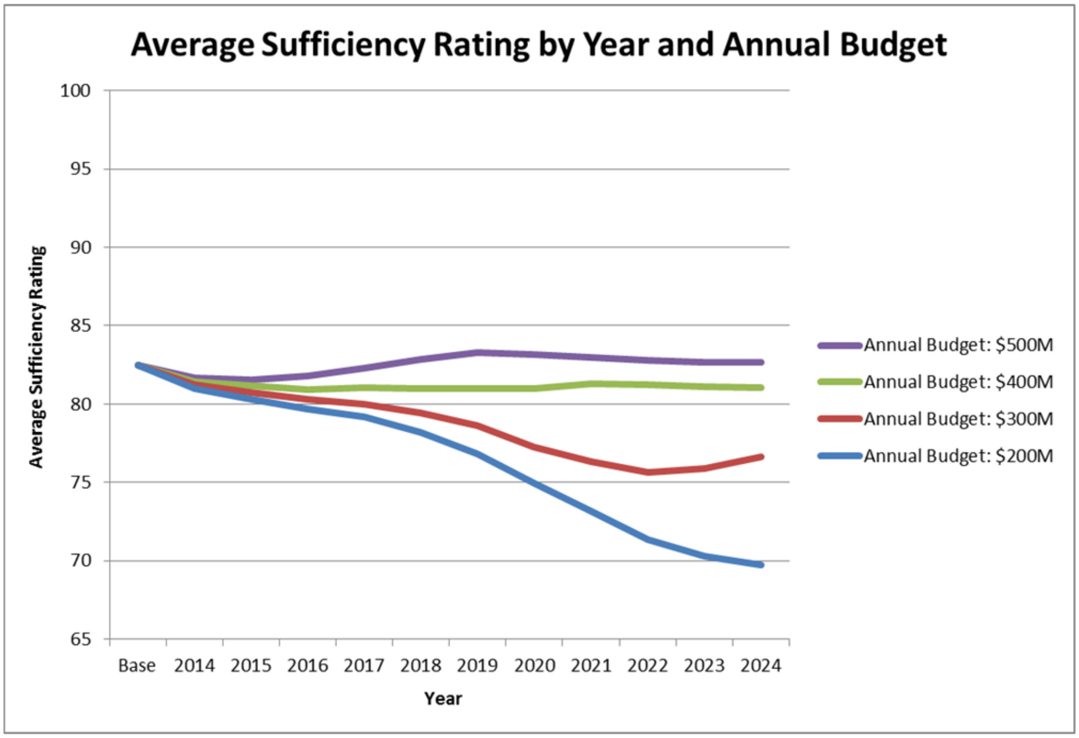


Figure 5.15 Projected Sufficiency Rating (2014-2024)

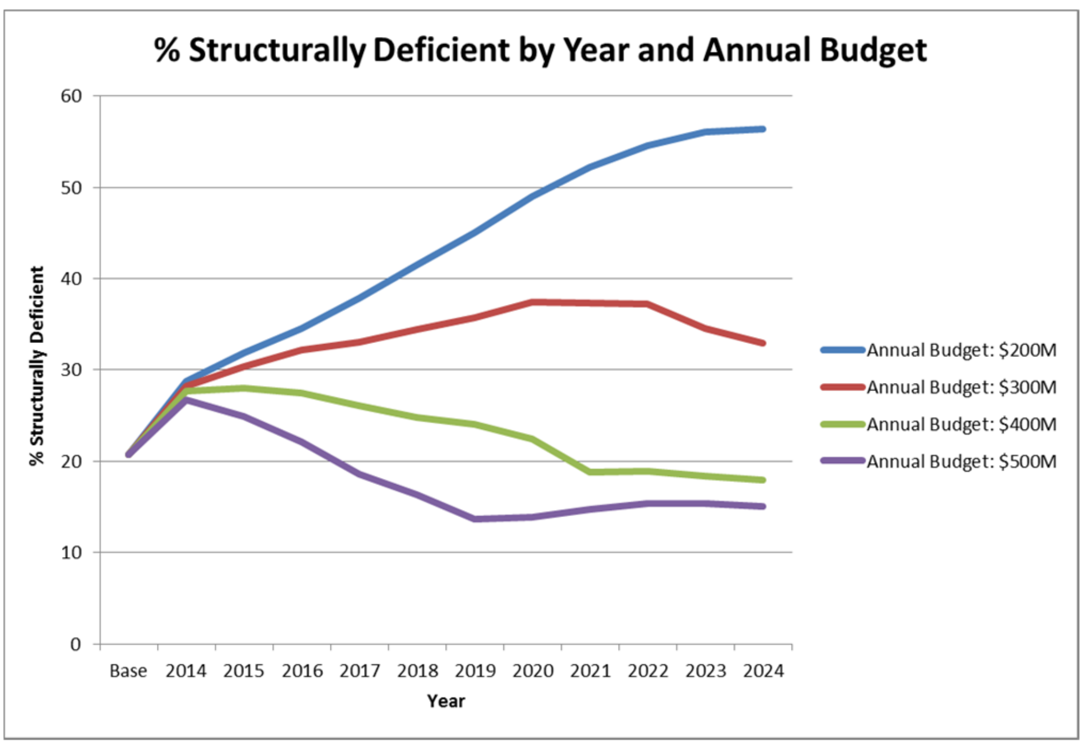


Figure 5.16 Projected Percent Structurally Deficient (2014-2024)

5.4 Summary

The total estimated needs for the local bridges is estimated to be $4.3 billion over the next ten years, which includes rehabilitation, replacement and seismic retrofit costs. Appendix E summarizes the bridge needs by county.

Currently, it is estimated that only $300 million a year is available for bridge repairs, or $3 billion over ten years.

The funding analysis shows that an annual budget of $377 million is required to maintain the level of investment needed over a 10-year period for California's local bridges. Somewhat less money would be required to maintain an average Health Index equal to the current value, while somewhat more would be required to maintain conditions measured using Sufficiency Rating. For percent of bridges classified as "Structurally Deficient", the analysis suggests that $390 million would be required annually to maintain conditions statewide.

An additional $90 million/year is needed to ensure that no more than 20% of the state's bridges are structurally deficient.

While the analysis shows the funds required to achieve a given target condition, it does not recommend a specific level of funding. Given that the investment needs in NBIAS are based on consideration of what work is economically justified, ideally a bridge owner would address all needs for their bridge inventory, rather than simply maintaining conditions. However, doing this in the short term would require a substantial increase in budget and is not practical in this case. Another approach to setting a target level of investment is to base the investment level on a specific target condition. There are several issues with this approach in the case of California's local bridges. First, it is difficult to summarize conditions using an average "Health Index" or "Sufficiency Rating", as an average may mask the extent of bridges in very poor condition requiring immediate attention. An average is a good measure for illustrating trends, but less useful for characterizing the distribution of conditions.

The percent of bridges classified as "Structurally Deficient" is a better measure than an average condition index for illustrating bridges in poor condition. However, some caution is needed in interpreting this measure. The calculation of the "Structurally Deficient" classification is based upon the condition ratings defined in NBI. In California, unlike other states, these ratings are not explicitly captured. Instead, they are calculated based on element-level data using an algorithm developed by FHWA. The impact of this approach is that counts of "Structurally Deficient" bridges for California tend to be high compared to other states, but this is based more upon the inspection approach than actual differences in condition[8].

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8 Spy Pond Partners, LLC and Arora and Associates, Inc. NCHRP 20-24(37)E: *Measuring Performance Among State DOTs, Sharing Best Practices - Comparative Analysis of Bridge Condition.* Technical report prepared for NCHRP Project 20-24-37(E). 2010.

In the absence of a better alternative, it is recommended that the level of investment needed be used as the best measure for use in establishing target investment levels for California's local bridges. Absent budget constraints, an organization seeking to maximize economic efficiency would address all investment needs. Considering budget constraints, a reasonable goal is to at least keep needs from increasing by addressing new investment needs as they arise, if not to lower the backlog of needs over time. Even with the goal of gradually lowering needs, however, one faces a situation in which needed work is being deferred, potentially increasing the work that must be performed on a given bridge.

6. Potential Solutions for Funding Gap

From the previous chapters, it is clear that there exists a significant funding gap between the existing funding available and what is needed to maintain the pavement conditions (additional $1.57 billion a year) or to improve the local streets and roads system to a state of good repair (additional $5.61 billion a year).

This chapter explores various options, or combination of options, that may be employed to fill in the gap. They include:

- Technological cost savings or efficiencies
- Increasing revenues by:
    - Indexing the gas tax to inflation
    - Increasing the gas tax
    - Additional fees/taxes, many of which have been discussed in various local, state and national forums, such as the vehicle license fee, sales taxes, cap and trade revenues, miles-based fees.

Each is briefly discussed in the paragraphs below.

6.1 Technological Efficiencies

As with many economic trends in the United States, productivity gains from new technologies are also applicable in the transportation sector. In the case of pavements, the most obvious is the reuse or recycling of existing materials in pavement rehabilitation. Section 2.3 discussed various sustainable pavement practices; more than 150 agencies indicated that they have employed one or more recycling techniques such as the use of RAP (reclaimed asphalt pavement), cold-in-place recycling and full depth reclamation. These techniques are reported to have cost savings ranging from 11 to 32 percent when compared to conventional mill and fill overlays, or reconstruction.

Full Depth Reclamation Process

Although not all streets and roads are good candidates for recycling (reasons include shallow utilities, inadequate pavement sections, geometric factors etc.), a conservative estimate indicates that agencies can potentially save as much as $912 million a year. This essentially stretches the existing paving budget of $1.657 billion to $2.569 billion, an increase of 55 percent.

6.2 Increasing Revenues

Much of the discussion in transportation policy forums, not just in California but also nationally, has been on the failing infrastructure and declining transportation revenues. For instance, the federal Highway Trust Fund was projected to be insolvent by August 2014[9] and this was only averted when the President signed a bill that transferred $10.8 billion from the General Fund in August. The last surface transportation authorization law, (Moving Ahead for Progress in the 21st Century or MAP-21), which was signed in 2012, also set spending levels significantly above revenues, resulting in a structural funding gap.

Price of Gas in Bishop, CA (October 2012)

Section 4.1 indicated that the state gas tax is the single largest funding source for cities and counties, and it is well worth recapitulating the history of this revenue source. The state gas tax is currently at 18 cents a gallon, and was first approved by voters in 1923. The last time it was increased to its current level was in 1994, exactly 20 years ago. The price of regular unleaded gasoline then was approximately $1.20 per gallon, compared to the average $3.60 per gallon in September 2014. In effect, gas prices have tripled, but the gas tax has stayed the same at 18 cents. Of course, during this 20 year period, gas prices have fluctuated considerably, reaching as high as $5.59 a gallon in Bishop, CA in October 2012.

Between 1994 and 2014, the buying power of the gas tax has also dropped significantly; from inflation as well as from the declining gas consumption due to vehicles with higher efficiency standards. Figure 6.1 illustrates what the 18-cent gas tax is worth today; it is essentially half the value it was in 1994.

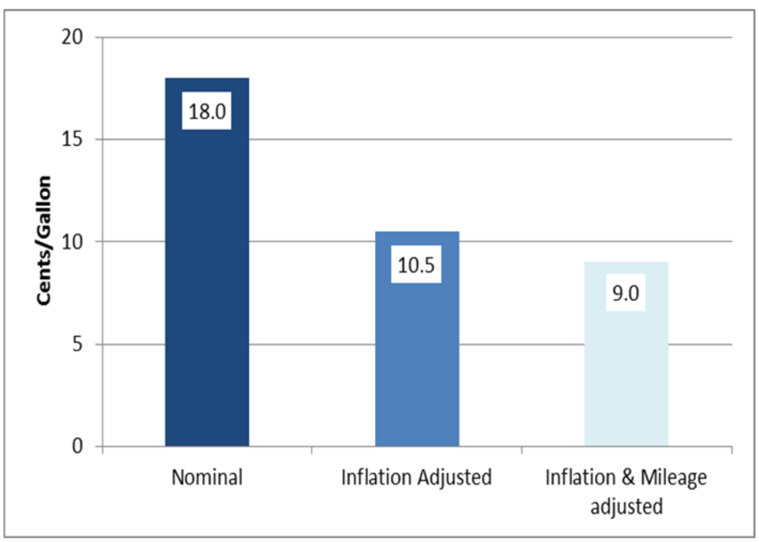

Figure 6.1 Value of 18-cent Gas Tax in 2014
(Source: Caltrans, Division of Budgets)

9 *http://www.dot.gov/highway-trust-fund-ticker*

6.2.1 Raising the Gas Tax

For the gas tax to continue to be a relevant source for transportation means that it has to be increased. If the gas tax is not increased, the projected value is expected to decline rapidly due to the improved fuel economy standards. The Caltrans Division of Budgets, in a presentation to the California Transportation Commission (CTC) in January 2014, projected a loss of as much as $16.1 billion by 2030 due to new fuel economy standards, while the annual vehicle miles travelled (VMT) will continue to grow.

Currently, the 18-cent state gas tax raises approximate $2.4 billion a year[10], which is allocated by formula to Caltrans, cities and counties. Raising the gas tax to 1994 levels could immediately increase the funding by an additional $1.7 billion a year (considering inflation only). This would be, of course, be distributed to Caltrans as well as cities and counties, if the allocation formula remained the same.

Finally, some regions in the state have the authority to go to the voters and increase the gas tax by as much as ten cents per gallon. If this increase were to occur, it would raise approximately $1.3 billion a year.

California's Gas Tax

Prior to 2010, California levied a constant rate 18-cent excise tax AND a sales tax on every gallon of gasoline.

The constant rate 18-cent excise tax stayed the same regardless of the price of gas at the pump. The sales tax increased or decreased based on the price of fuel.

However, in 2010, the sales tax was replaced with an additional increment of the excise tax. Intended to be revenue neutral, this "price based" excise tax is adjusted annually to generate what a sales tax would have otherwise generated and naturally keeps pace with inflation.

Figure 6.1 depicts the inflation adjusted value of the constant rate excise tax that was last increased in 1994.

Note that the federal excise tax is 18.4-cents per gallon, which is separate from the state's tax.

6.2.2 Indexing the Gas Tax

Indexing the gas tax in other states has proven to be a feasible and workable solution; the Governor of Nevada signed into law Assembly Bill 516 in October 2013, which resulted in Washoe County (Reno) fuel taxes being subject to the Consumer Price Index (CPI). The Regional Transportation Commission (RTC) – Washoe County staff report that with these revenues, they have been able to conduct an aggressive maintenance work plan, to the extent that currently, less than one percent of the eligible local street network need rehabilitation in 2014.

Indexing the gas tax to the CPI (assuming 2 percent a year)[11] will raise approximately $48 million a year. This is a modest increase, and will not have a significant impact on the current shortfall, but does at least partly mitigate future increases in construction costs.

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[10] *http:/www.lao.ca.gov/handouts/transportation/2014/Overview-of-Transportation-Funding-3-13-14.pdf*

[11] *http://www.bls.gov/news.release/pdf/cpi.pdf*

6.2.3 Returning Vehicle Weight Fees

In March 2010, the Governor signed a package of bills (AB X8 6 and AB X8 9) known as the Transportation Tax Swap. The Tax Swap eliminated the sales tax on gas (Prop. 42) and replaced it with a 17.3-cent excise tax on gasoline, indexed to keep pace with what the sales tax on gasoline would have generated in a given fiscal year to ensure revenue neutrality. The primary motivation was to help the state address its then-massive General Fund deficit. The gas tax swap provided approximately $1 billion annually in General Fund relief by funding debt service on transportation-related, general obligation bonds from new gas tax revenues. While no additional revenue was created, less money went to current transportation spending through the State Highway Account and instead went to the General Fund to pay debt service on transportation bonds.

With support from various transportation stakeholders, Senator Mark DeSaulnier introduced a measure (SB 1418, 2014) that would return vehicle weight fees back into the State Highway Account, rather than the Transportation Debt Service Fund, thereby providing an additional $1 billion annually to local streets and roads and to the state highway system. The measure was not successful as the General Fund would have had to service the transportation-related, general obligation bond debt of the state.

However, there remains significant interest among stakeholders and policy-makers for pushing this proposal in the future, especially as a way to provide some level of increased revenue in the short-term as the state and federal governments determine how to move forward with a long-term solution to bridging the transportation infrastructure gap.

6.2.4 Vehicle License Fees

Another option that has been proposed is a voters' initiative to raise the vehicle license fee. Transportation California has been researching the idea of a ballot initiative that if passed, is estimated to raise approximately $1 billion a year for local streets and roads.

6.2.5 Mile-Based Fee

Yet another option being discussed is a road user charge (SB 1077 - DeSaulnier; Road Usage Charge Pilot Program). This bill was passed by the California State Legislature and signed by the Governor in 2014, and sets up a pilot program to identify and evaluate issues related to the potential implementation of a statewide vehicle miles-traveled fee.

The pilot program must commence by January 1, 2016 and will be the first pilot program in California modelled after similar programs in Oregon and Washington. The intent is to charge a fee for all users of local roads and state highways, regardless of whether the vehicle is powered by gasoline, diesel, alternative fuels, or electricity. The pilot program will assess the road user charge as a replacement to the gas tax.

6.2.6 Sales Taxes

Currently, there are 19 so-called “Self-Help Counties” that have passed sales tax measures specifically for transportation. These counties include over 81% of California’s population, and the measures are estimated to fund over $95 billion of voter-approved transportation investments by 2050[12]. They include $23.9 billion for local streets and roads, and $1.3 billion for bicyclists and pedestrians.

There are an additional 17 “Aspiring Counties” who are either exploring similar sales tax measures, or who have failed to pass them, some very narrowly. It is estimated that if a sales tax measure were to pass in all of them, an estimated $316.9 million a year would be generated for transportation needs. Table 6.1 summarizes who the “Aspiring Counties” are and their revenue estimates.

Table 6.1 Aspiring Counties and Potential Revenue Estimates

Aspiring County	2014/15 Revenue Estimates ($M/year)
Butte	$ 13.7
El Dorado	$ 8.9
Humboldt	$ 8.9
Kern	$ 72.6
Kings	$ 7.0
Lake	$ 2.7
Merced	$ 12.7
Monterey	$ 25.0
Placer	$ 40.4
San Benito	$ 2.8
San Luis Obispo	$ 26.0
Santa Cruz	$ 15.5
Shasta	$ 13.2
Solano	$ 31.4
Stanislaus	$ 36.3
Ventura	$ 62.0
Totals	**$ 316.9**

Table 6.2 summarizes the potential solutions from all the options discussed above. Even assuming that all measures were to be pass, they still do not fill in the funding gap. Note too that some are statewide revenues, so only a portion will be allocated to local streets and roads under the existing distribution formulae.

[12] http://selfhelpcounties.org/Brochure_Self-HelpCounties_011813.pdf

Table 6.2 Estimate of Potential Revenues From Different Options

Potential Solutions	Potential Revenues ($M/year)
Technological Efficiencies	$ 912
Bring Gas Tax to 1994 Levels	$ 1,700
Raise Gas Tax 10-cents/gallon	$ 1,330
Index Gas Tax to CPI (2% annually)	$ 48
Return Weight Based Fees	$ 950
Vehicle License Fee	$ 1,000
Mile-Based Fee (SB 1077)	Unknown
Aspiring Counties Sales Tax Measures	$316.9
Totals	**$ 6,257**

6.3 Case Studies

Despite all the grim news, it is possible for California to climb out of what appears to be a downward spiral. The next few pages present case studies from three agencies that have been successfully pro-active in managing their road networks.

The first is the City of El Cerrito, a small city who was able to use the ballot initiative process to pass a ½ cent sales tax before the recession. When the measure was passed, the City was able to bond against the revenues, and coupled with an economic climate that resulted in low construction costs, they were able to improve the average PCI from 53 to 82 in an aggressive three year construction schedule.

The second is the City of Palo Alto, with 200 miles of roads in their network. The residents (through a blue ribbon panel) were especially concerned with the infrastructure needs and the City Council subsequently adopted a goal that the average PCI be 85 by 2021 (it was 72 in 2009.) General Funds were used to supplement the paving budget to achieve this goal.

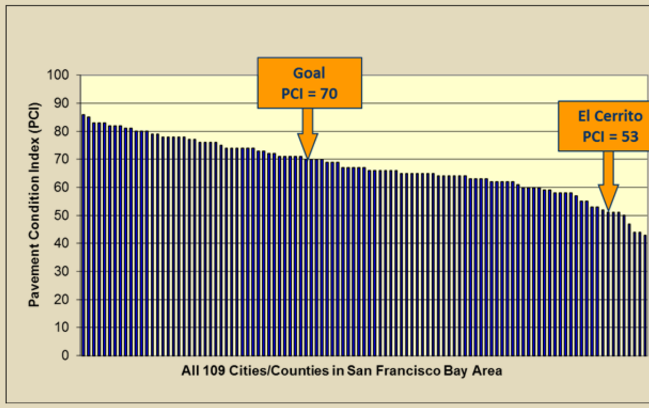
Lastly, the County of Los Angeles illustrates what an agency can do when it adopts both a preservation policy as well as sustainable pavement treatment strategies. With over 3,200 miles in its road network, the County adopted a three-pronged approach in 2009, which resulted in reducing energy use by 81%, greenhouse gases (GHG) by 87%, and construction costs by over $20 million. In addition, 600,000 tires were eliminated from landfills. The current PCI is 71, contrasted with the 66 that was projected if it had continued its old policies.

Source: www.el-cerrito.org

In 2006, the outlook was not optimistic. El Cerrito, a small city (population 24,000) in the San Francisco Bay Area had one of the worst street networks in the region. Their 68 mile street network had an average PCI of 53[13], and the City was in the bottom 10 when compared to the other 109 cities/counties in the region. Their unfunded backlog was over $21 million, and it required $1.7 million a year to maintain their PCI at 53. Yet their annual paving budget was only $250,000 a year.

In early 2007, polls showed that the residents rated the poor condition of the streets as the highest priority, and the City Council directed staff to develop a local sales tax that would require a two-thirds voter approval. The City developed a new ordinance, work plan, ballot language and launched a public information campaign to publicize the measure.

The ½ cent sales tax ballot measure promised that the City would improve street conditions (other elements such as sidewalks were peripheral improvements) so that the average PCI would be raised to 70; and to perform the bulk of the work over four years. Measure A was placed on the February 2008 ballot and it passed with 71 percent.

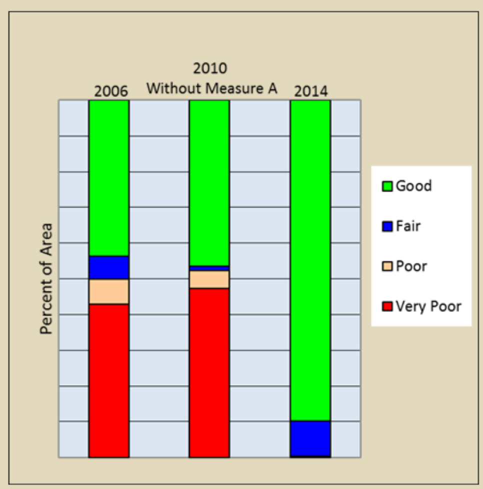


Courtesy: Jerry Bradshaw

Courtesy: Jerry Bradshaw

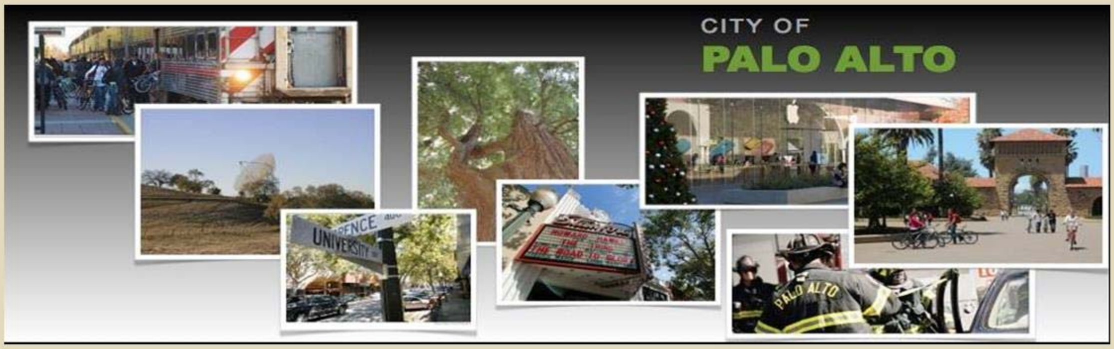
The aggressive work schedule was further compressed into three years, partly to take advantage of very competitive construction bids during the 2009-2010 recession. The work program was fast tracked, with asphalt rubber cape seals playing a large role to in the maintenance treatments.

A total of $14.4 million ($10.5 million from bond proceeds, $2.1 million from annual revenues and the remainder from grants) was spent.



The results were gratifying and exceeded expectations. As shown on the chart, the City's street network improved dramatically from 2006 (condition prior to Measure A) to today's conditions in 2014. Almost 90% of the street network is in good condition, with less than 2% in poor or very poor. The current PCI is 82.

[13] *El Cerrito Pothole Repair: A Street Success Story*, by Jerry Bradshaw, Director of Public Works, Street Talk, Metropolitan Transportation Commission, March 2011.



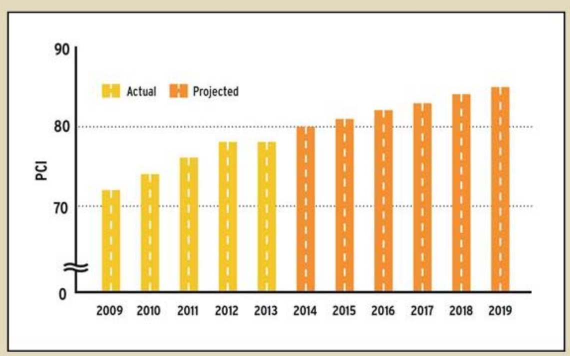
Located 35 miles south of San Francisco and 14 miles north of San Jose, Palo Alto is a community of approximately 61,200 residents. Part of the San Francisco Metropolitan Bay Area and Silicon Valley, Palo Alto is located within Santa Clara County and borders San Mateo County.

The City of Palo Alto Public Works Department maintains 200 miles of streets. The City has used its own Pavement Maintenance Management System (PMMS) since the mid 1970's. In 2009, Palo Alto successfully completed a correlation between PMMS and StreetSaver and calculated the City's first pavement maintenance score at 72. Since then, Palo Alto has been focused on improving pavement conditions across the City's 200 mile network.

In October 2010, the City Council appointed a 17-member Infrastructure Blue Ribbon Commission (IBRC) to examine the City's infrastructure and determine a plan to keep the existing infrastructure in good condition. By 2010, Palo Alto's average rating for streets was 73, placing it below many neighboring communities. The IBRC determined that nearly 20% of all Palo Alto's streets were rated under 60.

The IBRC recommended that, by 2021, no street should have a PCI rating below 60 and the City Council established a goal of achieving an average citywide PCI of 85 by 2021. Since 2009, Palo Alto's PCI score has gone from a 72 to a 78 (end of FY 2014) and we expect to reach a citywide average of 85 by 2019.

Annual funding has increased from $1.7M to $5.1M for street maintenance since FY 2009. In FY 2011, the City Council approved a $2 million annual increase in the paving budget an effort to step-up and address aging City streets. This resulted in an annual budget of $3.7M and in FY 2014, the street resurfacing program budget was increased again to $5.1M to accelerate the timeline for meeting the goal of a citywide PCI of 85 prior to 2021.

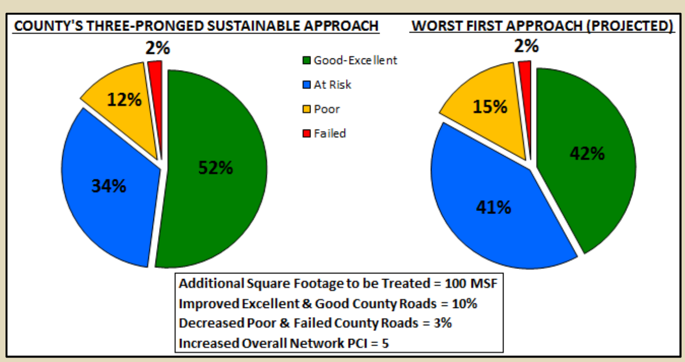


The County of Los Angeles Department of Public Works (DPW) maintains approximately 3,200 centerline miles (7,400 lane miles) of paved roads located within 114 communities that are spread over 4,800 square miles. The network is comprised of rural and urban roadways that have significant variations in geographical settings, climatic conditions, and traffic volumes. Historically, DPW practiced a "worst first approach" in treating their roads and utilized a rudimentary pavement evaluation methodology to track their condition. In 2008, DPW determined they needed to look for a better way to manage their road network and subsequently upgraded the pavement management system and began to embrace a pavement preservation approach to their road network.

In 2009, DPW performed several pilot pavement preservation projects on County roads to evaluate their performance and cost effectiveness. The early successes of these treatments and their cost effectiveness led to consideration of implementing other sustainable treatments. Legislation to reduce greenhouse gas (GHG) emissions was a key element in the development of a three-pronged sustainable approach which focused on the following principles: 1) First, take care of roads that are in good condition; 2) include recycled materials in the treatment selections; and 3) reutilize and modify the existing in-place materials by recycling the pavement and/or strengthening the subgrade beneath the pavement. The objectives of using sustainable treatments were to reduce energy use, GHG emissions, impacts to our landfills and communities, and costs.

In the last five years, 30 percent of the County's projects used a sustainable treatment, and the results have been very positive. DPW was able to reduce energy use by 81%, GHG's by 87%, and costs by over $20 million (which was reinvested back into the road network). In addition, 600,000 tires were eliminated from landfills. DPW's goal is to increase the sustainable treatments to 50 percent of all pavement projects over the next five years.

DPW estimates that implementing the three-pronged approach has resulted in treating an additional 100 million square feet of pavement. As a result, the amount of roads rated excellent/good increased by 10% and the number of poor/failed roads decreased by 3%. The County's current Pavement Condition Index (PCI) is 71; it would have been 66 if DPW had not adopted sustainable pavement practices in 2009.



7. Summary and Conclusions

The results of this study continue to be sobering. It is clear that California's local streets and roads network are not just at risk; they are on the edge of a cliff with an average PCI of 66. With this pavement condition and the existing funding climate, there is a clear downward trend projected for the next ten years.

By 2024, with the current funding of $1.657 billion/year, the pavement condition index will continue to deteriorate to 55. Even more critically, the backlog will increase from $40 billion to $61 billion. This is assuming that construction costs do not outstrip the anticipated revenues. Further, it is estimated that almost a quarter of California's local streets and roads will be in "failed" condition.

Table 7.1 summarizes the results from Chapters 3, 4 and 5. The total funding needs over the next 10 years is $108 billion, and the resulting shortfall is $56.1 billion for pavements, $20.9 billion for essential components and $1.3 billion for bridges. The total shortfall is $78.3 billion over the next 10 years.

Table 7.1 Summary of 10-Year Needs and Shortfall Calculations (2014 $ Billion)

	Needs ($B)			2014		
Transportation Asset	**2008**	**2010**	**2012**	**Needs**	**Funding**	**Shortfall**
Pavement	$ 67.6	$70.5	$72.4	$ 72.7	$ 16.6	$ (56.1)
Essential Components	$32.1	$29.0	$ 30.5	$31.0	$ 10.1	$(20.9)
Bridges	-	$ 3.3	$ 4.3	$ 4.3	$ 3.0	$ (1.3)
Totals	$ 99.7	$102.8	$107.2	$ 108.0	$ 29.7	$ (78.3)

The conclusions drawn from this study are inescapable. Given existing funding levels, California's local streets and roads can be expected to deteriorate rapidly within the next 10 years. In addition, the costs of any deferred maintenance will only continue to grow. The additional funding scenarios analyzed only serve to emphasize this point.

To bring the transportation network to a level where best management practices can occur will require more than four times the existing level of funding. For pavements, that will require an increase of at least $56.1 billion. However, once this has been achieved, it will only require $2.4 billion/year after that to maintain the pavement network.

For essential components, it will require an additional $20.9 billion to address the ten year needs, and for bridges, it will require an additional $1.3 billion for a total of $78.3 billion.

To just maintain the existing pavement condition at 66 will require $3.328 billion/year, approximately double the existing funding level of $1.657 billion.

To put the shortfall in perspective, $78.3 billion over 10 years translates to an additional 54 cents per gallon per year at the pump (based on an estimated 14.4 billion gallons of fuel purchased in California in

2013)[14]. For the average driver (10,000 miles a year driving a 20 mpg vehicle), this translates to an average of 74 cents a day.

Another perspective is to compare what motorists pay at the pump with basic day to day amenities. Or, as Caltrans so succinctly indicates in Figure 6.1 below, the annual costs of cable television, cell phone, coffee or internet access far outstrip the current prices paid for gas by the typical consumer.

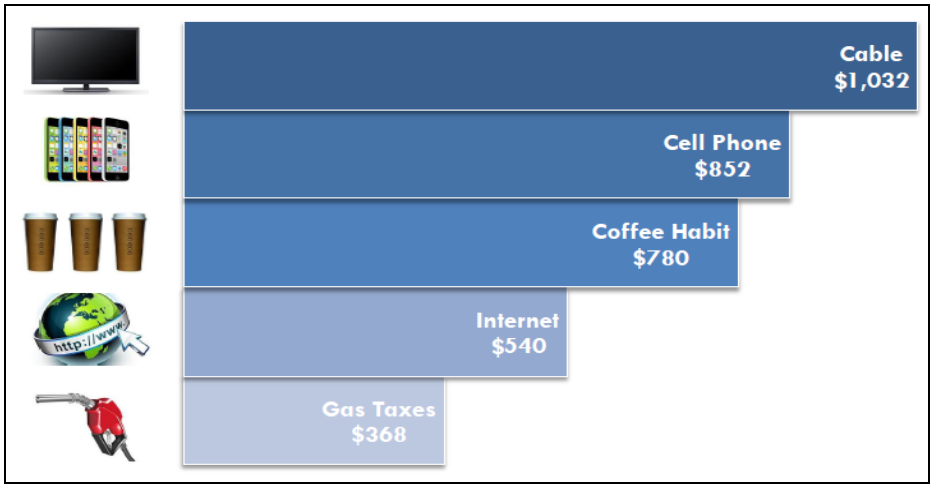


Figure 7.1 Average Annual Cost of Select Items (Source: Caltrans Division of Budgets)

[14] http://www.boe.ca.gov/sptaxprog/spftrpts.htm

APPENDIX A

List of Fiscal Sponsors

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

FISCAL SPONSORS CITIES		
Adelanto	Burbank	Delano
Agoura Hills	Burlingame	Dinuba
Alameda	Calabasas	Downey
Alhambra	Calexico	Duarte
Aliso Viejo	California City	Dublin
Alturas	Calimesa	Dunsmuir
Angels Camp	Calistoga	East Palo Alto
Antioch	Capitola	Eastvale
Arcadia	Carlsbad	El Cajon
Arcata	Carmel-by-the-Sea	El Centro
Arroyo Grande	Carson	El Cerrito
Artesia	Cathedral City	El Monte
Atascadero	Ceres	El Segundo
Atwater	Cerritos	Elk Grove
Auburn	Chico	Emeryville
Avalon	Chino Hills	Encinitas
Avenal	Chowchilla	Escalon
Azusa	Chula Vista	Etna
Bakersfield	Claremont	Eureka
Banning	Clayton	Exeter
Barstow	Clovis	Fairfax
Beaumont	Colfax	Fairfield
Bell	Colma	Farmersville
Bell Gardens	Colusa	Fillmore
Bellflower	Commerce	Firebaugh
Belmont	Compton	Folsom
Belvedere	Concord	Fontana
Benicia	Corcoran	Fortuna
Berkeley	Corning	Foster City
Beverly Hills	Corona	Fowler
Big Bear Lake	Coronado	Fremont
Biggs	Corte Madera	Fresno
Bishop	Cotati	Fullerton
Blythe	Covina	Galt
Brawley	Cudahy	Gardena
Brea	Culver City	Gilroy
Brentwood	Cupertino	Glendale
Brisbane	Dana Point	Glendora
Buena Park	Del Mar	Goleta

FISCAL SPONSORS CITIES		
Gonzales	Lake Forest	Moreno Valley
Grand Terrace	Lakeport	Morgan Hill
Greenfield	Lakewood	Morro Bay
Gridley	Lancaster	Mountain View
Half Moon Bay	Larkspur	National City
Hanford	Lathrop	Newark
Hawaiian Gardens	Lemon Grove	Newman
Hawthorne	Lemoore	Newport Beach
Hayward	Lincoln	Norwalk
Healdsburg	Lindsay	Novato
Hemet	Live Oak	Oakland
Hercules	Livermore	Oakley
Hermosa Beach	Livingston	Ontario
Highland	Lodi	Orinda
Hillsborough	Lompoc	Orland
Hughson	Loomis	Oroville
Huntington Beach	Los Altos	Oxnard
Huron	Los Banos	Pacific Grove
Imperial	Los Gatos	Palm Springs
Imperial Beach	Lynwood	Palmdale
Indian Wells	Madera	Palo Alto
Industry	Malibu	Paramount
Inglewood	Manhattan Beach	Pasadena
Ione	Manteca	Paso Robles
Irwindale	Marina	Patterson
Kerman	Martinez	Petaluma
King City	Maywood	Pico Rivera
La Canada Flintridge	Menifee	Piedmont
La Habra	Menlo Park	Pinole
La Habra Heights	Millbrae	Pismo Beach
La Mesa	Milpitas	Pittsburg
La Mirada	Mission Viejo	Placerville
La Puente	Modesto	Pleasant Hill
La Quinta	Montclair	Pleasanton
La Verne	Montebello	Plymouth
Lafayette	Monterey	Point Arena
Laguna Beach	Monterey Park	Pomona
Laguna Hills	Moorpark	Port Hueneme
Lake Elsinore	Moraga	Portola

FISCAL SPONSORS CITIES		
Portola Valley	Santa Ana	Tulelake
Poway	Santa Barbara	Turlock
Rancho Cordova	Santa Clara	Ukiah
Rancho Cucamonga	Santa Clarita	Union City
Rancho Mirage	Santa Cruz	Upland
Rancho Palos Verdes	Santa Fe Springs	Vacaville
Red Bluff	Santa Maria	Ventura
Reedley	Santa Monica	Vernon
Richmond	Santa Rosa	Victorville
Rio Dell	Santee	Visalia
Rio Vista	Saratoga	Walnut Creek
Riverbank	Sausalito	Wasco
Riverside	Selma	Weed
Rolling Hills Estates	Shafter	West Covina
Rosemead	Shasta Lake	West Hollywood
Roseville	Signal Hill	West Sacramento
Ross	Simi Valley	Westlake Village
Sacramento	Solana Beach	Westminster
Salinas	Soledad	Westmorland
San Anselmo	Solvang	Wheatland
San Bruno	Sonoma	Whittier
San Carlos	South El Monte	Wildomar
San Clemente	South Gate	Williams
San Dimas	South Pasadena	Willows
San Fernando	South San Francisco	Windsor
San Gabriel	St. Helena	Winters
San Jacinto	Stockton	Woodlake
San Joaquin	Suisun City	Woodland
San Jose	Sunnyvale	Yountville
San Leandro	Sutter Creek	Yreka
San Luis Obispo	Taft	Yucaipa
San Marcos	Tehachapi	
San Marino	Tehama	
San Mateo	Temple City	
San Pablo	Thousand Oaks	
San Rafael	Tiburon	
San Ramon	Torrance	
Sand City	Tracy	
Sanger	Truckee	

FISCAL SPONSORS REGIONAL TRANSPORTATION PLANNING AGENCIES (RTPA)	
Alpine Co. Local Transportation Commission	Orange Co. Transportation Authority
Amador Co. Transportation Commission	Placer Co. Transportation Planning Agency
Butte Co. Association of Gov'ts	Plumas Co. Transportation Commission
Calaveras Council of Gov'ts	Riverside Co. Transportation Commission
Del Norte Co. Local Transportation Commission	Sacramento Area Council of Gov'ts
El Dorado Co. Transportation Commission	San Benito Co. Local Transportation Authority
Glenn Co. Local Transportation Commission	San Bernardino Associated Gov'ts
Humboldt Co. Association of Gov'ts	San Diego Association of Gov'ts
Inyo Co. Local Transportation Commission	San Joaquin Council of Gov'ts
Kern Council of Gov'ts	San Luis Obispo Council of Gov'ts
Kings Co. Association of Gov'ts	Santa Barbara Co. Association of Gov'ts
Lake Co./City Area Planning Council	Santa Cruz Co. Regional Transportation Commission
Lassen Co. Transportation Commission	Sierra Co. Transportation Commission
Los Angeles Co. Metropolitan Transportation Authority	Siskiyou Co. Transportation Commission
Madera Co. Transportation Commission	Tahoe Metropolitan Planning Organization
Mariposa Co. Local Transportation Commission	Tehama Co. Transportation Commission
Mendocino Council of Gov'ts	Transportation Association for Monterey Co.
Merced Co. Association of Gov'ts	Trinity Co. Transportation Commission
Metropolitan Transportation Commission	Tulare Co. Association of Gov'ts
Modoc Co. Transportation Commission	Tuolomne Co. Transportation Council
Mono Co. Local Transportation Commission	Ventura Co. Transportation Commission
Nevada Co. Transportation Commission	

APPENDIX B

Data Collection

This appendix describes in detail the data collection efforts for this update. The goal was to ensure participation by all 58 Counties and 480 Cities.

B.1 Outreach Efforts

As with the previous studies, significant efforts were made to reach all 540 agencies in January-April 2014. 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 2012, the memberships of both CSAC and the League, the email listserv for the Regional Transportation Agencies (RTPA) and NCE's 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-January 2014 (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 March 31st, 2014, but this was later extended to April 7, 2014, as there were numerous requests from agencies for more time to respond. NCE made calls and emailed all local agencies (approximately 198) in the Southern California Association of Governments (SCAG) region. MTC also sent numerous emails to its 102 member agencies. The League and CSAC/CEAC use their email listservs to spread the word, and made a special point of publicizing the survey at the annual Public Works Institute conference in late March 2014.

B.2 Project Website

The website at www.SaveCaliforniaStreets.org (see Figure B.1) was originally designed and developed for the 2008 study. This was subsequently modified to accommodate the 2014 survey. The intent of this website was to act as both an information resource on this study 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. The Metropolitan Transportation Commission (MTC) currently hosts the website.

B.3 Online Survey Questionnaire

A survey questionnaire was prepared and finalized in early December 2013, and a blank example included in Exhibit B-1. Briefly, it included a request for the following information (bridge data were not requested in this update):

1. Contact name and information for both pavements and financial data
2. Streets and pavements data
3. Safety, traffic, and regulatory components data
4. Additional Regulatory Requirements
5. Funding and expenditure data

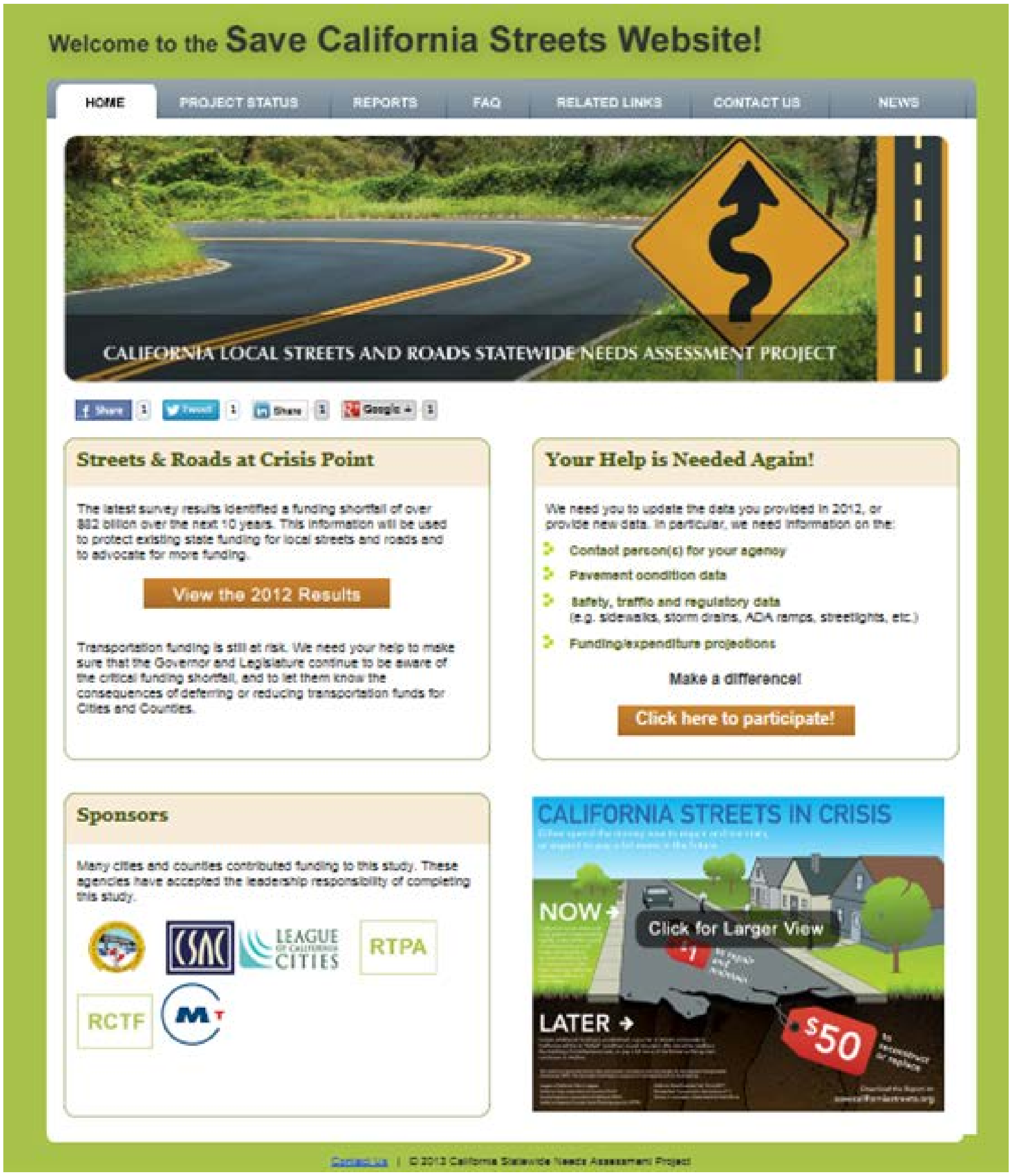


Figure B.1 Home Page of www.SaveCaliforniaStreets.org Website

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 previously designed and developed in 2012 was updated for 2014.

B.4 Results of Data Collection

Data from 99% of the state's local streets and roads are included in this study.

A total of 399 agencies (74 percent) responded to the survey, which was an increase from the 361 agencies in 2012. When these were added to the agencies who responded in 2008, 2010 and 2012, this represented 99 percent of the total centerline miles of local streets and roads in the state (see Figure B.2). It also represented 98 percent of the state's population.

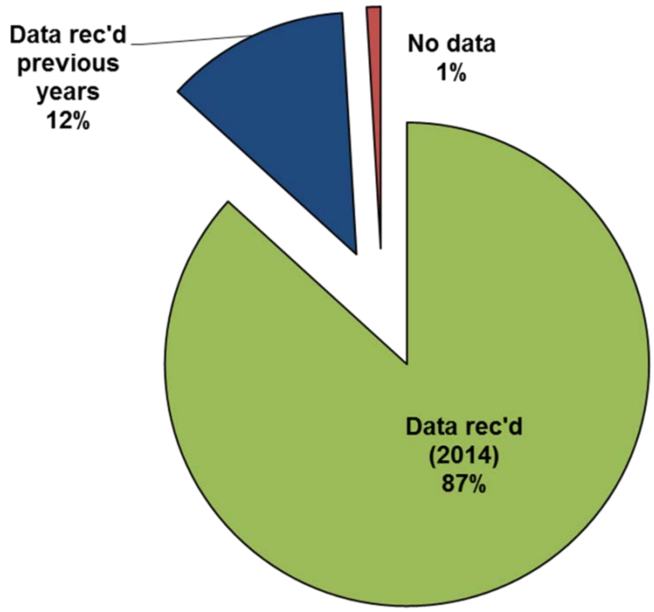


Figure B.2 Responses to Survey (% centerline miles)

Only 24 agencies have not responded to this or any previous survey; of these, 22 have less than 100 centerline miles, and 21 have populations less than 50,000. Many had limited resources in terms of staff time to respond to the survey. Table B.1 illustrates the survey responses by type of data. The pavement data had the most responses (371), but the remaining data elements were able to maintain their past response rate.

Table B.1 Number of Agencies Responding by Data Type

Data Type	2008	2010	2012	2014
Pavement data	314	344	273	371
Unit costs	50	260	211	177
Sustainable practices	-	-	280	269
Complete streets	-	-	269	250
Safety, Traffic & Regulatory	188	296	341	352
Bridges	-	-	177	-
Additional Regulatory Reqts	-	-	220	199
Financial	137	300	238	276

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 2014 (green), those who responded in 2008/2010/2012 but not 2014 (blue) 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 240 responses in this category, so our confidence in the responses were validated.

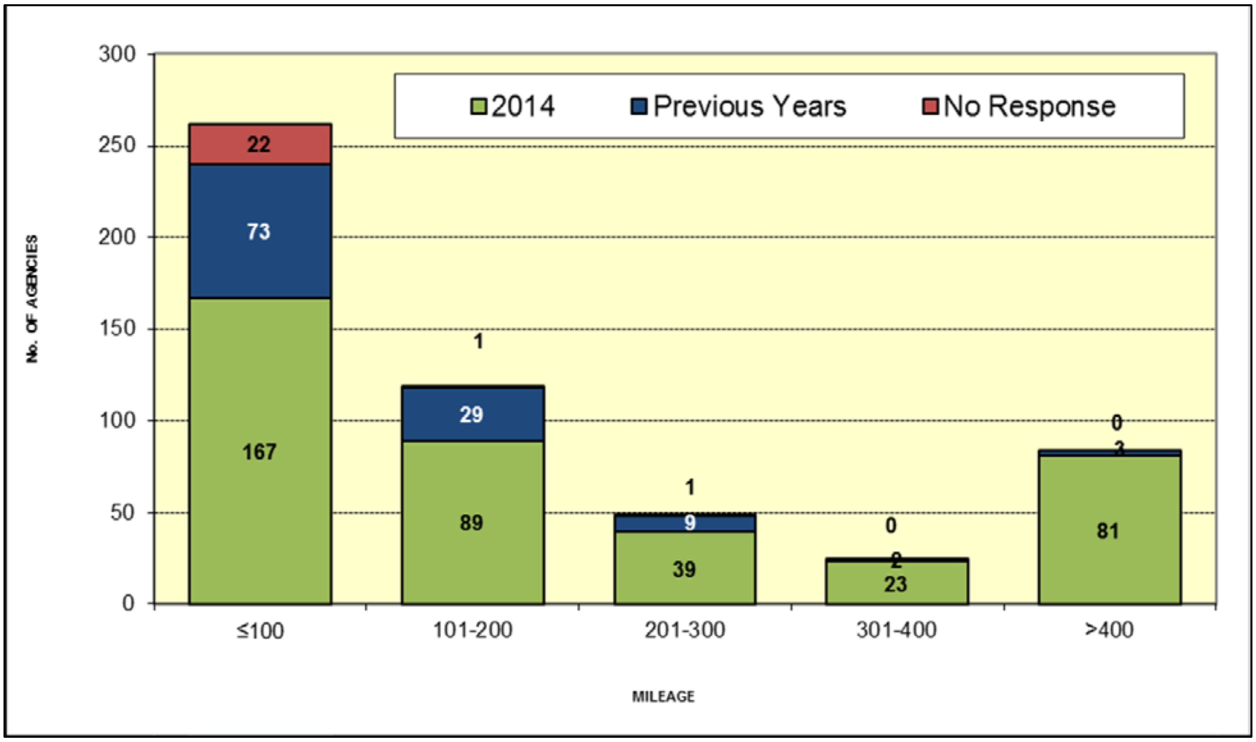


Figure B.3 Distribution of Agency Responses by Network Size (centerline miles)

An important point to note too is that small agencies account for a very small percentage of the state's pavement network. There are 262 cities with less than 100 centerline miles of streets, and 159 cities with less than 50 centerline miles of streets. However, they comprise only 8.2 percent and 2.9 percent of the total miles in the state, respectively. Their impact on the statewide needs is consequently minimal.

B.4.2 PMS Software

The survey responses showed that 85 percent of the responding agencies had a pavement management system (PMS) in place (see Figure B.4). The StreetSaver® (42%) and MicroPAVER (24%) software programs are the two main ones in the state, not

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.

surprising given their roots in the public domain and reasonable costs. StreetSaver® was developed and supported by the Metropolitan Transportation Commission (MTC) and MicroPAVER supported by the American Public Works Association (APWA).

What is more important is that approximately 94% of the total miles in the state are included in a pavement management system, which lead to a high confidence in the data submitted.

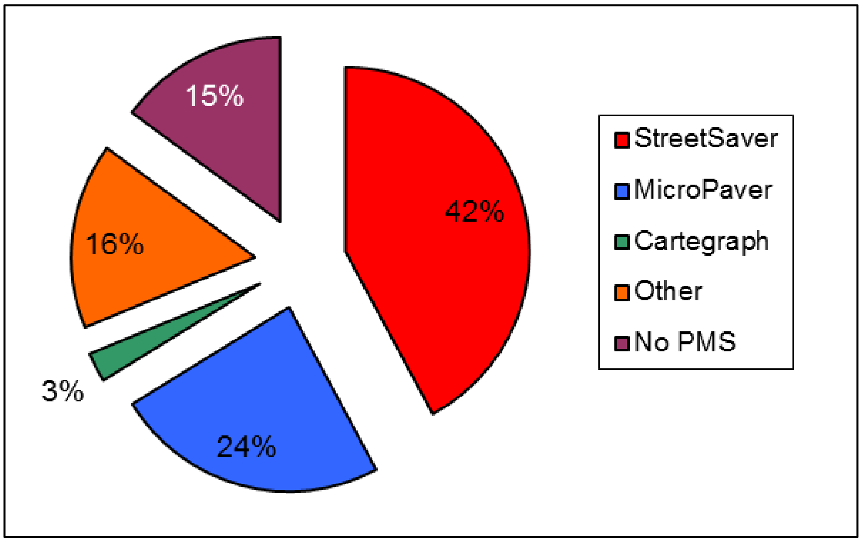


Figure B.4 PMS Software Used from Survey Responses

B.5 Summary

Overall, the number and quality of the survey responses received again exceeded expectations and more than met the needs of this study. To obtain data on 99 percent of the state's local streets and roads network was a remarkable achievement. That 85 percent of agencies that responded also had some 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, Fact Sheet & Survey Questionnaire

APPENDIX C

Pavement Condition* & Needs by County

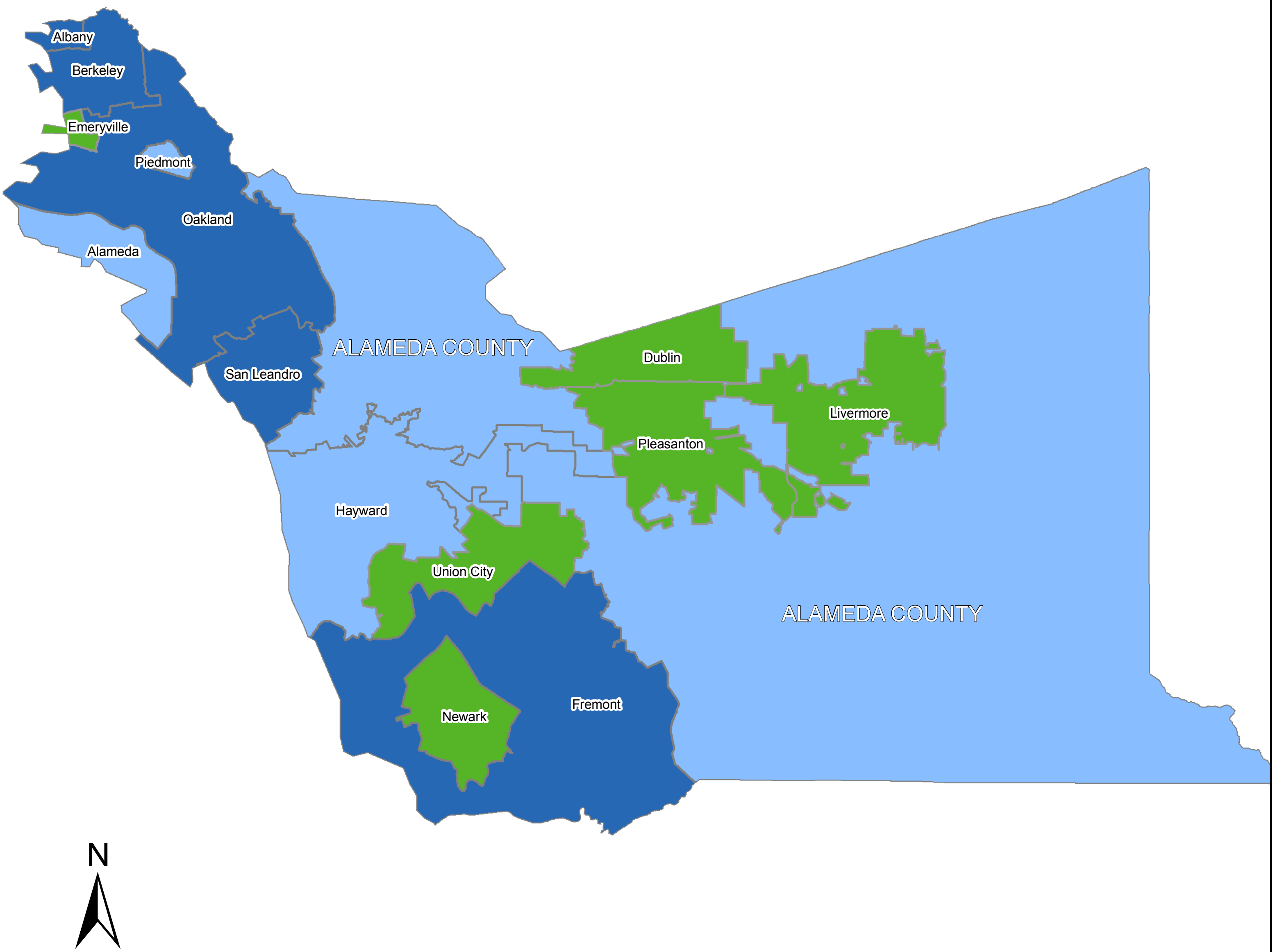
*Pavement condition data for the MTC region provided by MTC in April 2014.

Table C.1 Pavement Needs by County* (2014 $)

County (Cities included)	Center Line Miles	Lane Miles	Area (sq. yd.)	2014 PCI	10 Year Needs (2014 $M)
Alameda County	3,538.15	7,999.12	82,401,946	66	$2,305
Alpine County	135.00	270.00	1,900,800	44	$48
Amador County	477.96	958.12	6,485,201	33	$383
Butte County	1,800.07	3,675.85	26,771,323	66	$658
Calaveras County	716.98	1,332.66	8,937,332	51	$374
Colusa County	986.70	1,523.51	12,503,304	62	$317
Contra Costa County	3,376.49	7,047.81	63,500,917	68	$1,577
Del Norte County	323.88	643.80	5,334,695	63	$129
El Dorado County	1,252.70	2,508.40	21,671,673	63	$635
Fresno County	6,195.51	12,679.92	106,057,018	69	$2,572
Glenn County	910.42	1,821.73	13,917,626	68	$354
Humboldt County	1,470.96	2,933.21	24,234,864	64	$683
Imperial County	2,999.96	6,086.66	45,427,410	57	$1,236
Inyo County	1,134.80	1,802.50	13,700,999	62	$308
Kern County	5,026.42	11,648.11	103,132,477	64	$2,927
Kings County	1,328.00	2,795.72	20,026,009	62	$598
Lake County	752.70	1,494.45	9,997,345	40	$436
Lassen County	431.41	878.80	6,282,324	66	$186
Los Angeles County	21,329.61	57,629.56	459,830,656	66	$12,971
Madera County	1,822.44	3,680.41	23,490,290	47	$1,019
Marin County	1,021.14	2,055.14	17,166,574	63	$488
Mariposa County	1,122.00	561.00	3,949,440	44	$150
Mendocino County	1,124.43	2,255.81	16,004,034	35	$625
Merced County	2,330.00	4,954.00	37,182,870	58	$1,224
Modoc County	1,491.48	2,982.97	17,545,534	46	$566
Mono County	727.38	1,453.39	10,071,369	67	$147
Monterey County	1,779.28	3,725.79	33,599,361	50	$1,389
Napa County	725.80	1,507.56	12,896,309	59	$429
Nevada County	802.04	1,616.70	10,370,868	71	$234
Orange County	6,600.63	16,808.28	150,276,239	77	$2,725
Placer County	1,986.35	4,194.49	34,182,680	69	$799
Plumas County	703.90	1,408.60	11,409,902	64	$225
Riverside County	7,560.55	16,834.63	149,403,177	70	$3,551
Sacramento County	5,053.22	11,284.73	95,918,441	62	$2,939
San Benito County	452.32	916.23	5,951,814	48	$261
San Bernardino County	9,106.58	22,249.14	181,002,241	71	$ 4,103
San Diego County	7,813.98	18,596.42	170,696,012	66	$5,016

County (Cities included)	Center Line Miles	Lane Miles	Area (sq. yd.)	2014 PCI	10 Year Needs (2014 $M)
San Francisco County	989.00	2,135.00	17,758,676	66	$473
San Joaquin County	3,287.78	6,806.76	60,571,515	73	$1,245
San Luis Obispo County	1,965.93	4,078.93	32,385,537	64	$887
San Mateo County	1,864.70	3,904.15	33,272,016	70	$769
Santa Barbara County	1,587.32	3,375.52	30,610,681	66	$852
Santa Clara County	4,172.80	9,431.15	92,436,719	68	$2,314
Santa Cruz County	873.65	1,790.15	14,190,207	57	$480
Shasta County	1,686.97	3,479.08	26,243,076	60	$799
Sierra County	398.20	798.65	3,669,765	45	$116
Siskiyou County	1,519.15	3,049.62	20,519,624	57	$604
Solano County	1,699.55	3,582.19	27,706,938	65	$744
Sonoma County	2,371.17	4,922.58	39,557,359	52	$1,540
Stanislaus County	2,916.30	6,031.63	53,459,748	55	$2,044
Sutter County	981.51	2,010.93	15,199,498	65	$385
Tehama County	1,197.49	2,400.88	15,834,143	62	$437
Trinity County	692.97	1,113.86	11,757,354	60	$352
Tulare County	3,937.17	8,132.39	60,195,390	68	$1,482
Tuolumne County	552.70	1,115.65	8,200,702	47	$369
Ventura County	2,512.86	5,530.08	50,382,156	70	$1,211
Yolo County	1,328.40	2,457.72	21,290,870	60	$655
Yuba County	724.40	1,504.26	12,862,583	60	$404
California	**143,671**	**320,466**	**2,661,335,629**	**66**	**$72,746**
* Includes Cities within County					

Alameda County

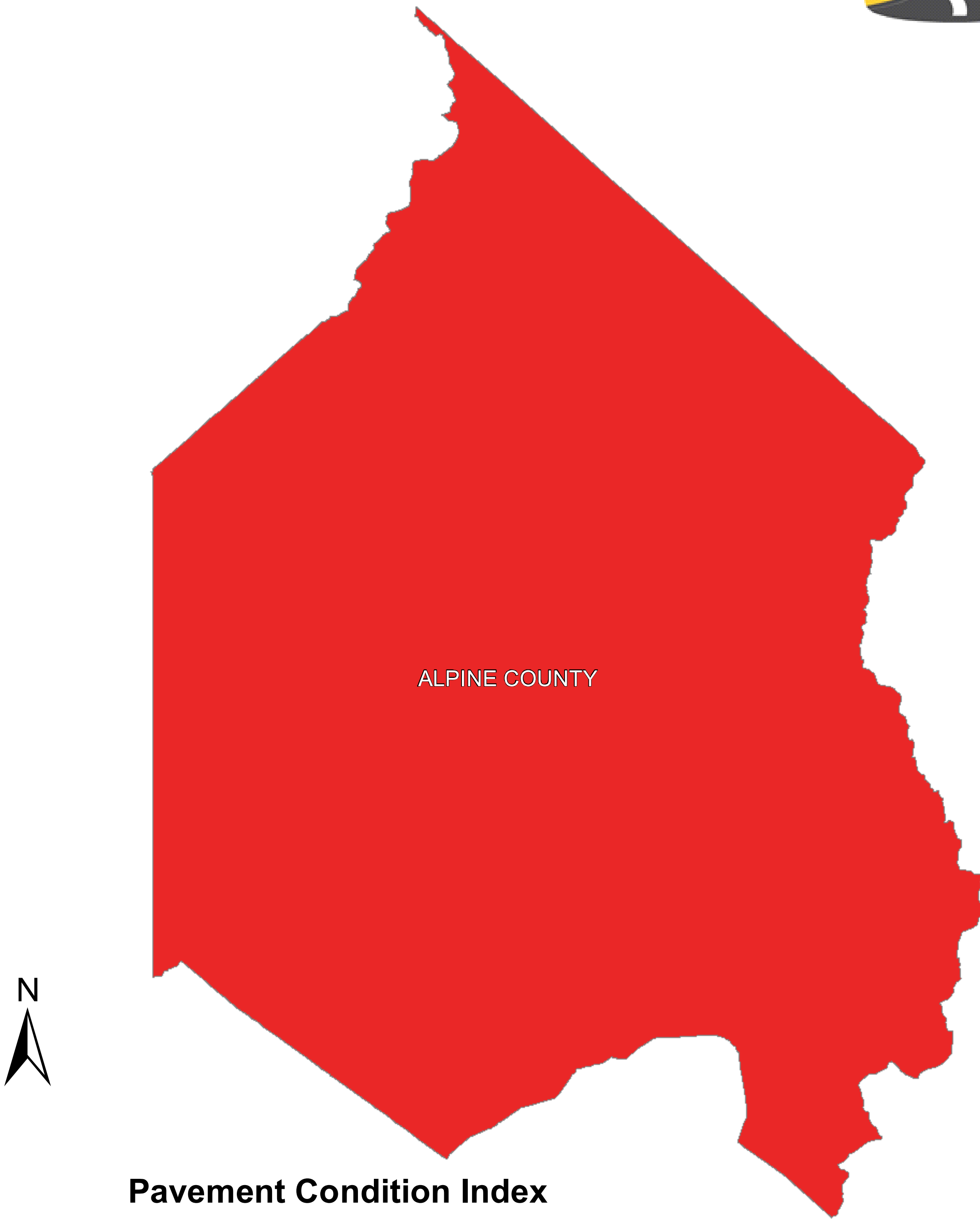


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Alpine County



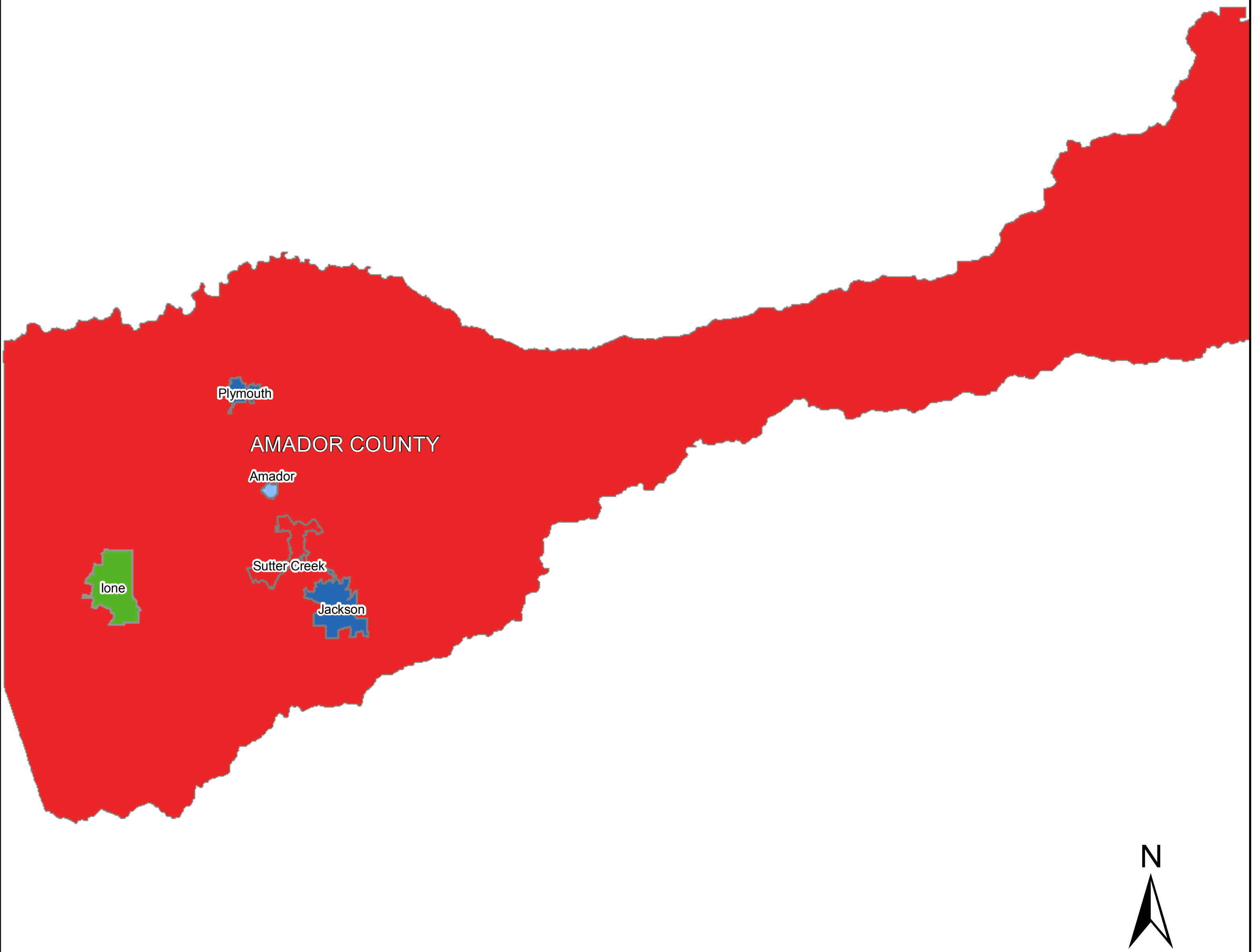
Pavement Condition Index

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)

NCE

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Amador County

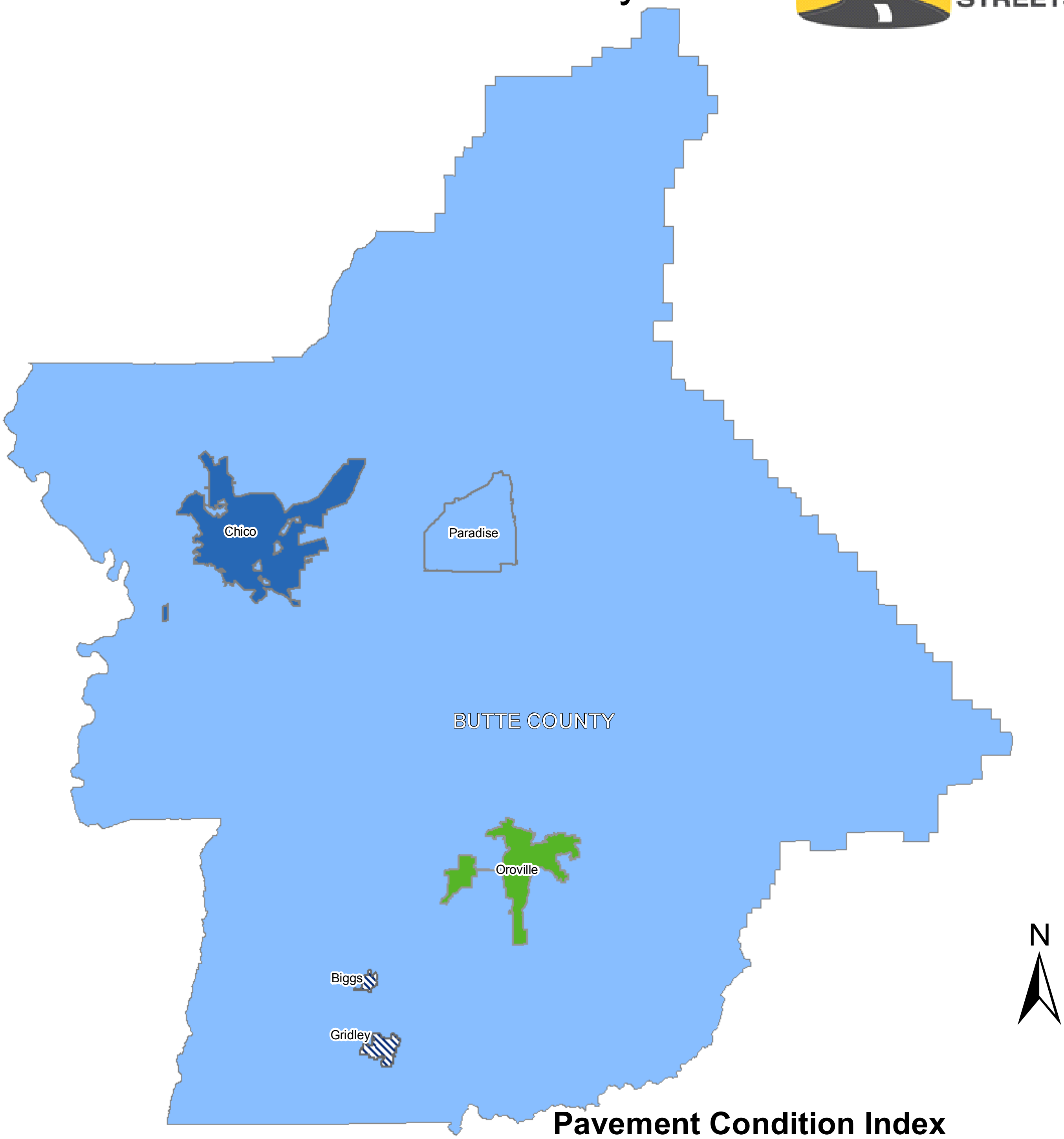


Pavement Condition Index

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)

Butte County

SAVE CALIFORNIA STREETS



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)

NCE

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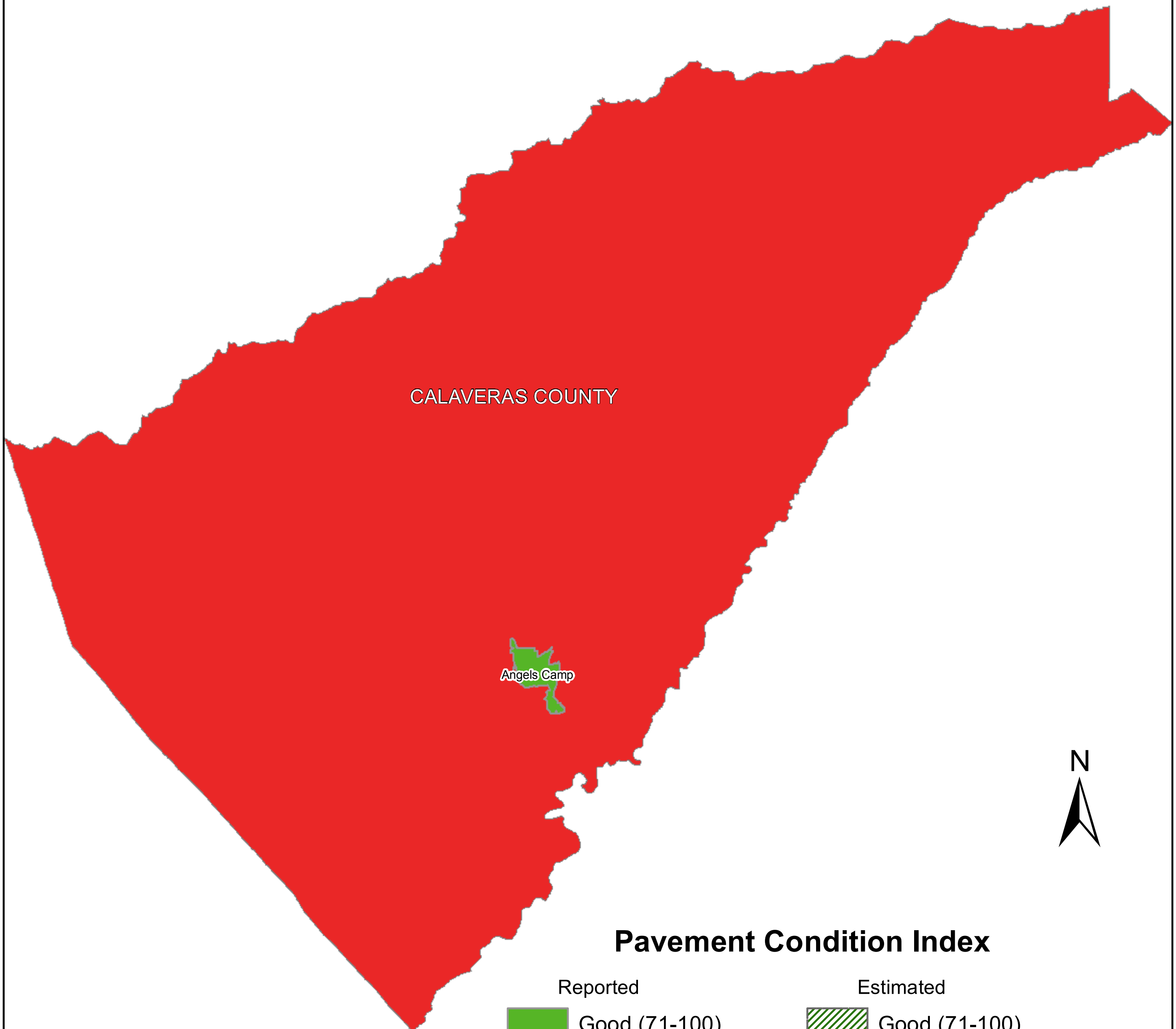
Calaveras County

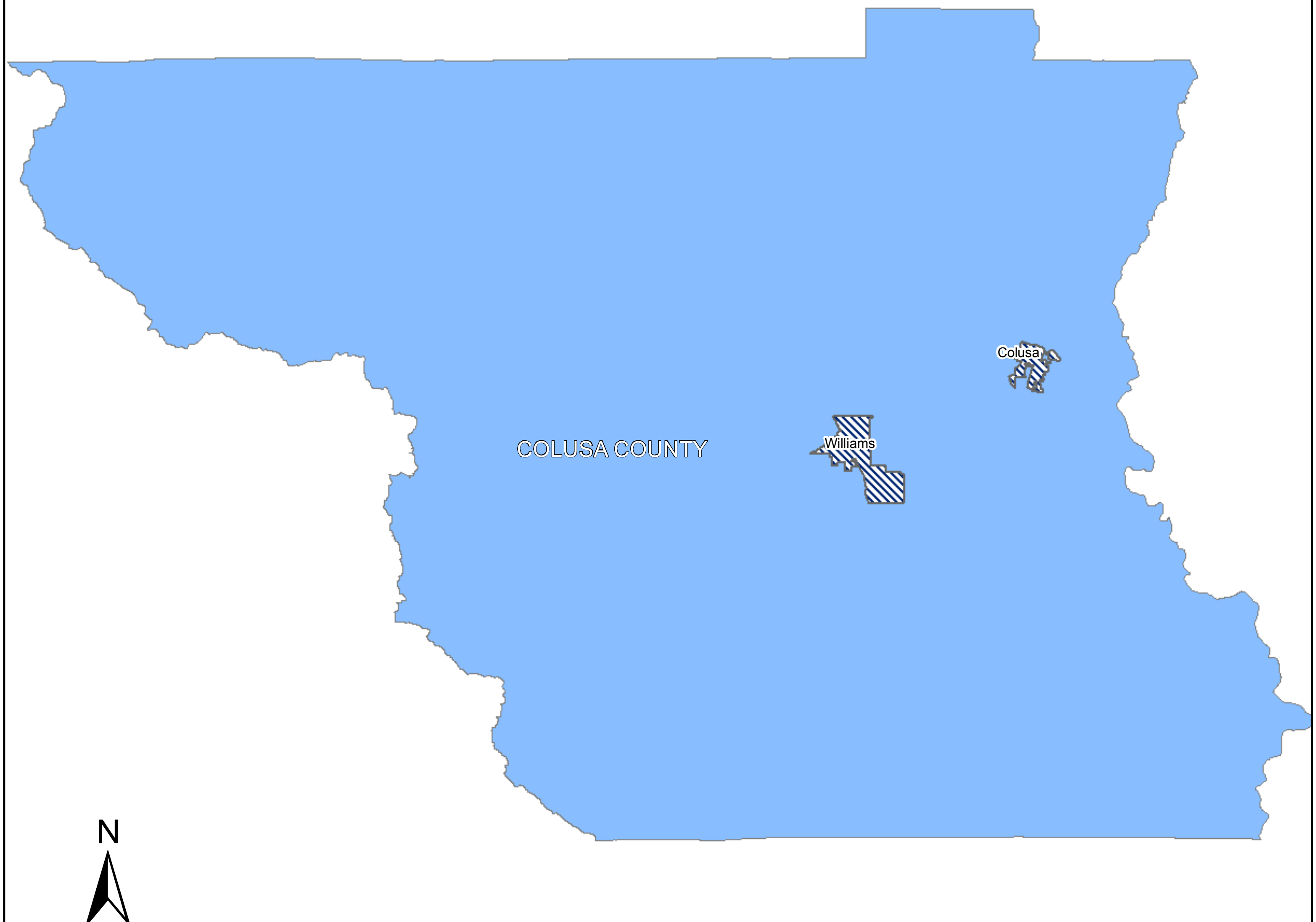


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Colusa County

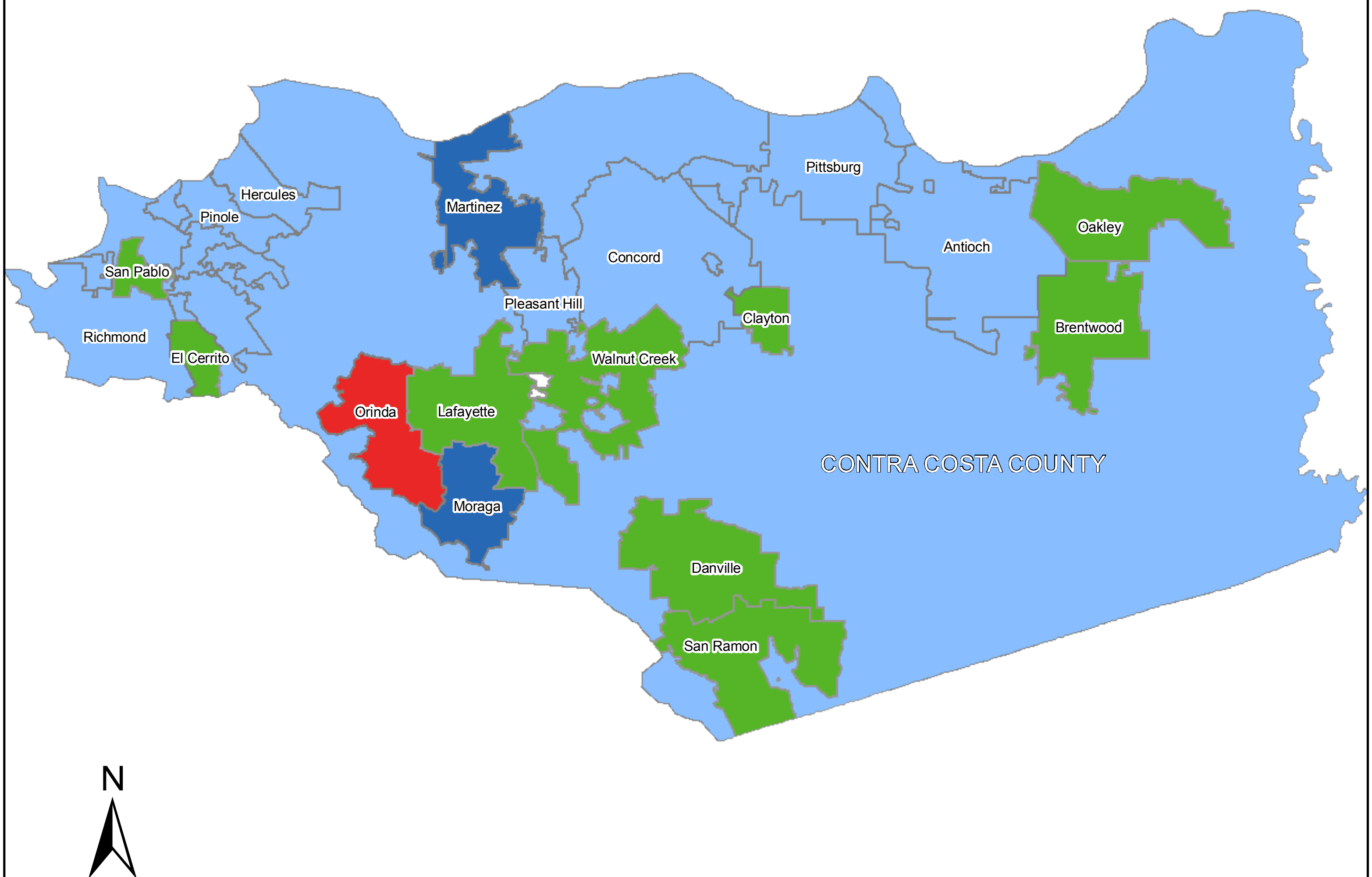


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

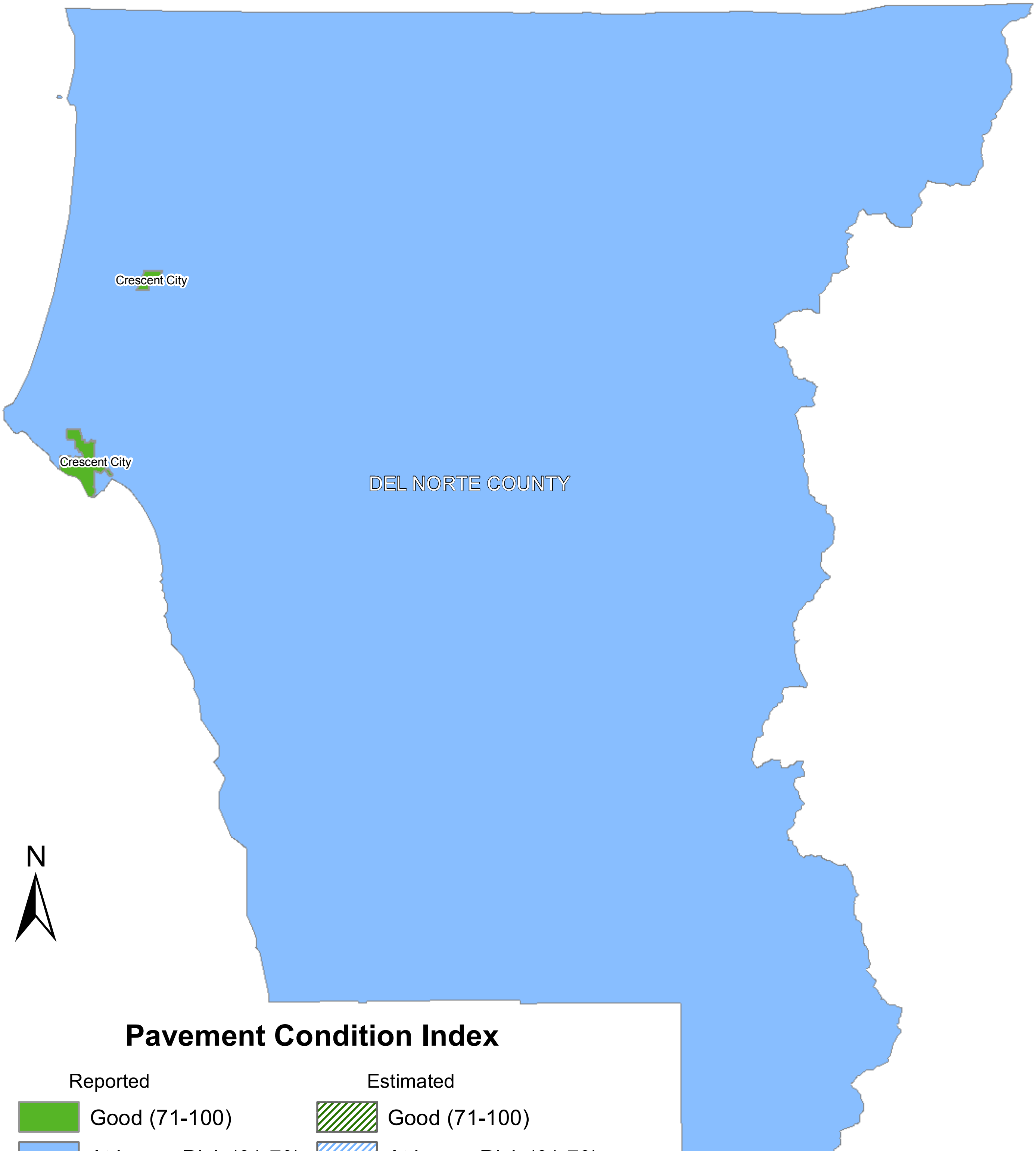
Contra Costa County



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

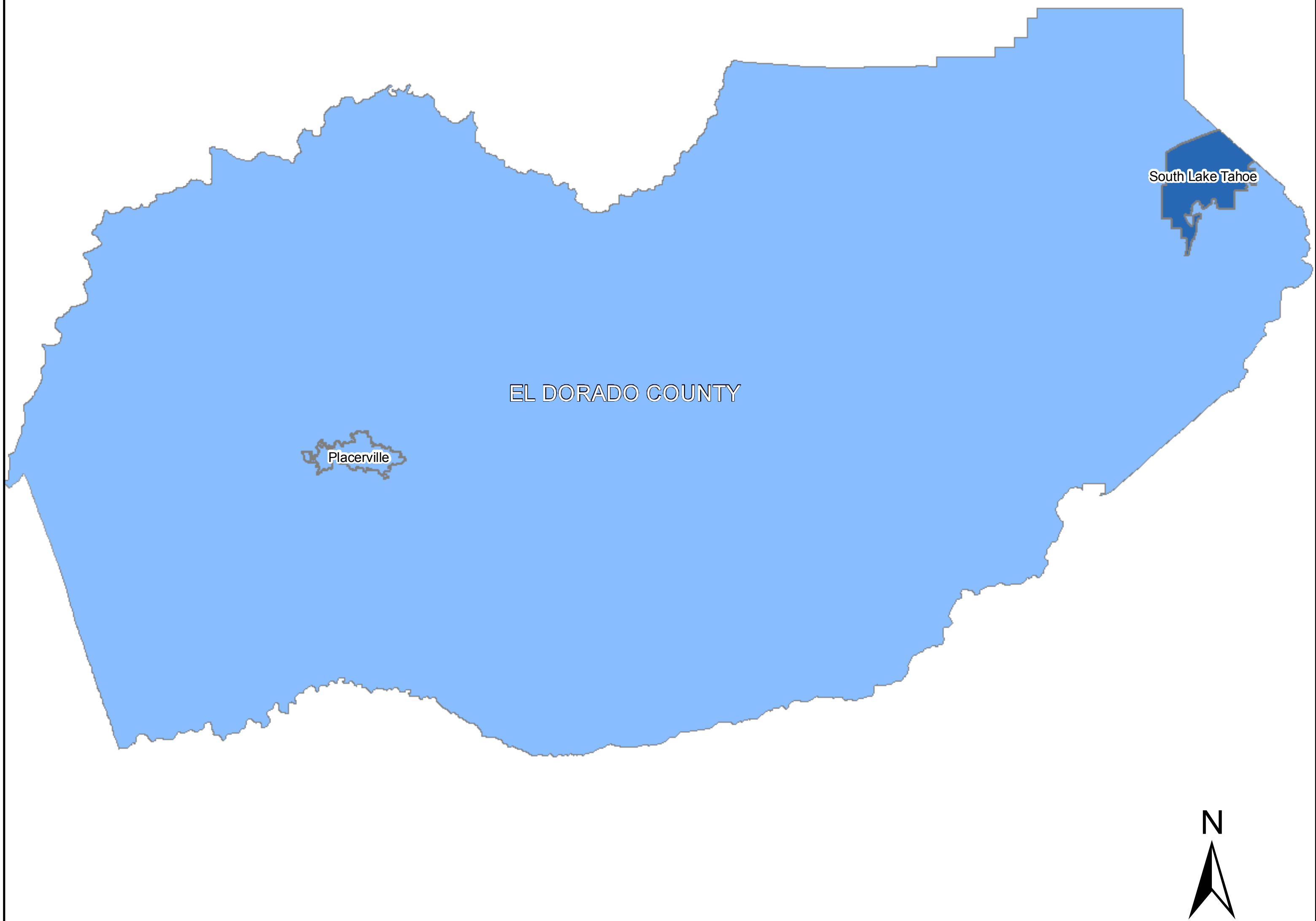


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

El Dorado County



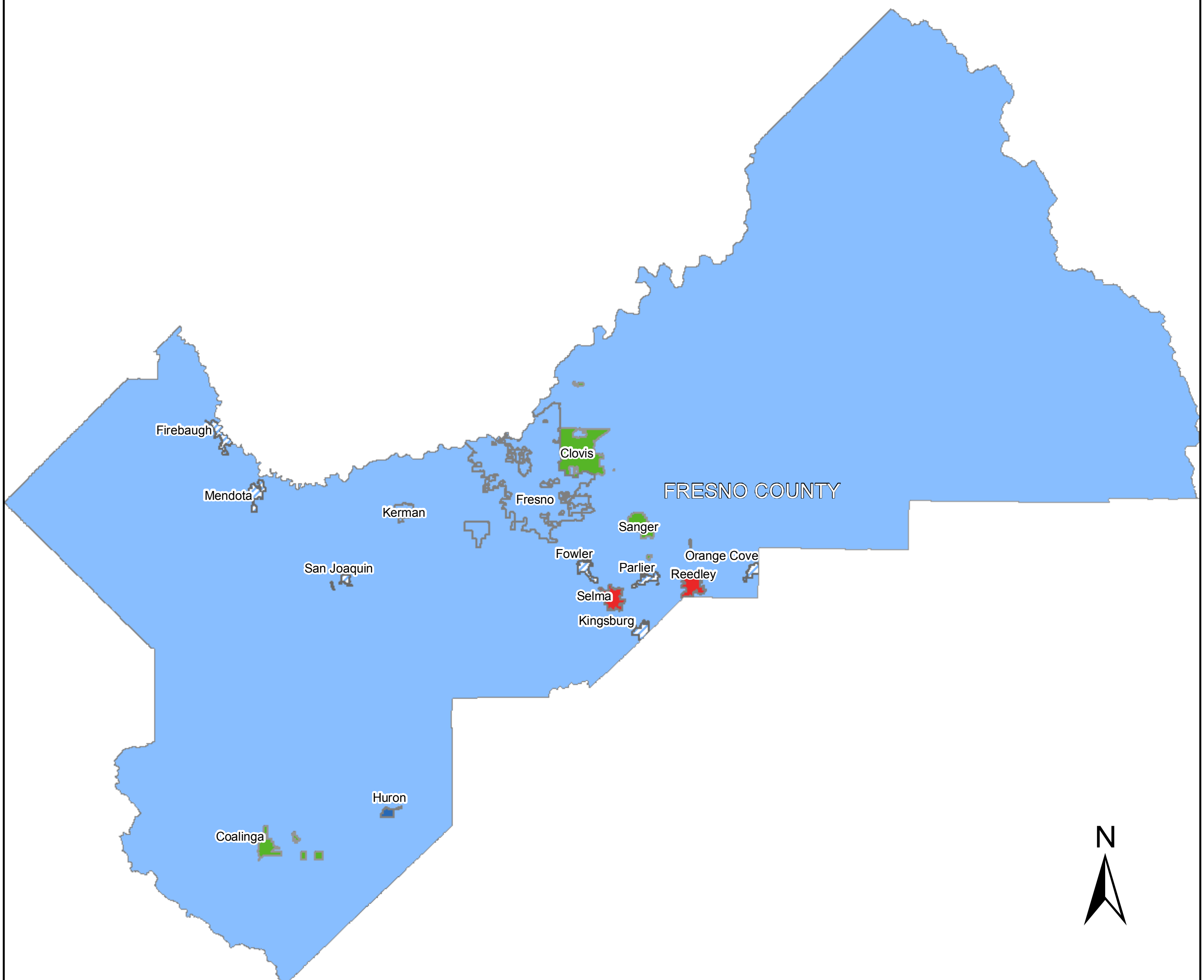
Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Fresno County

SAVE CALIFORNIA STREETS



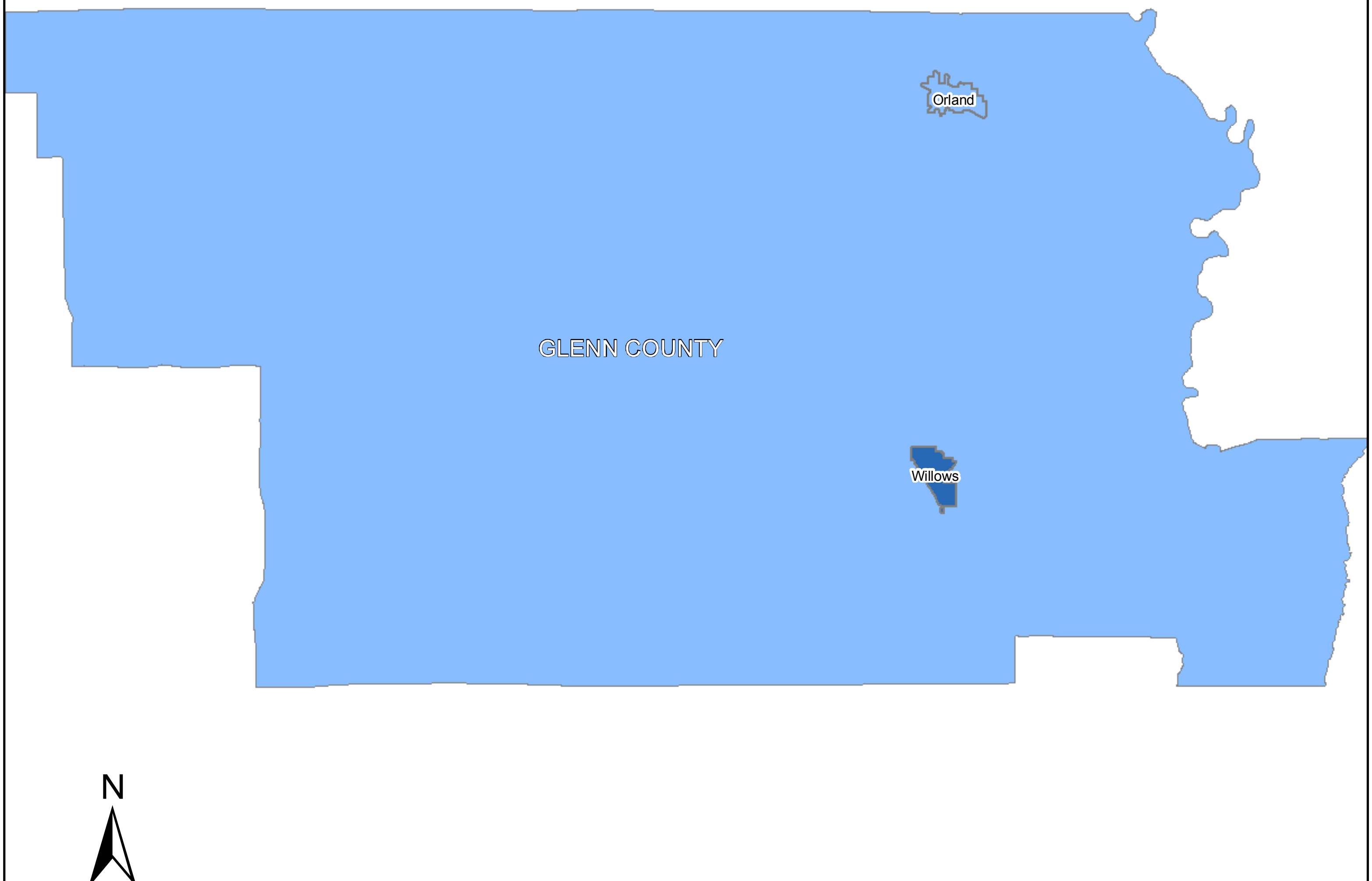
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Glenn County



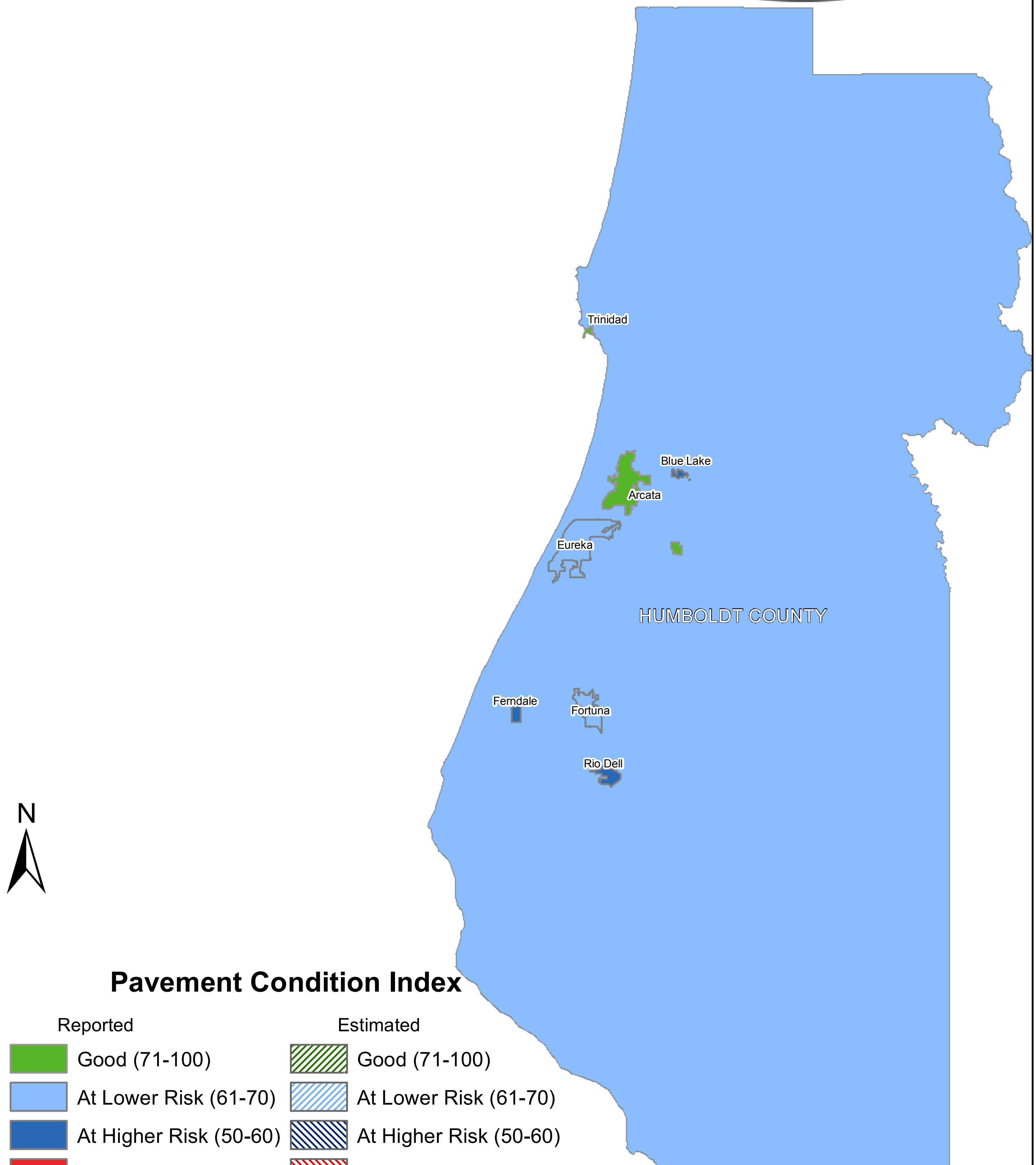
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

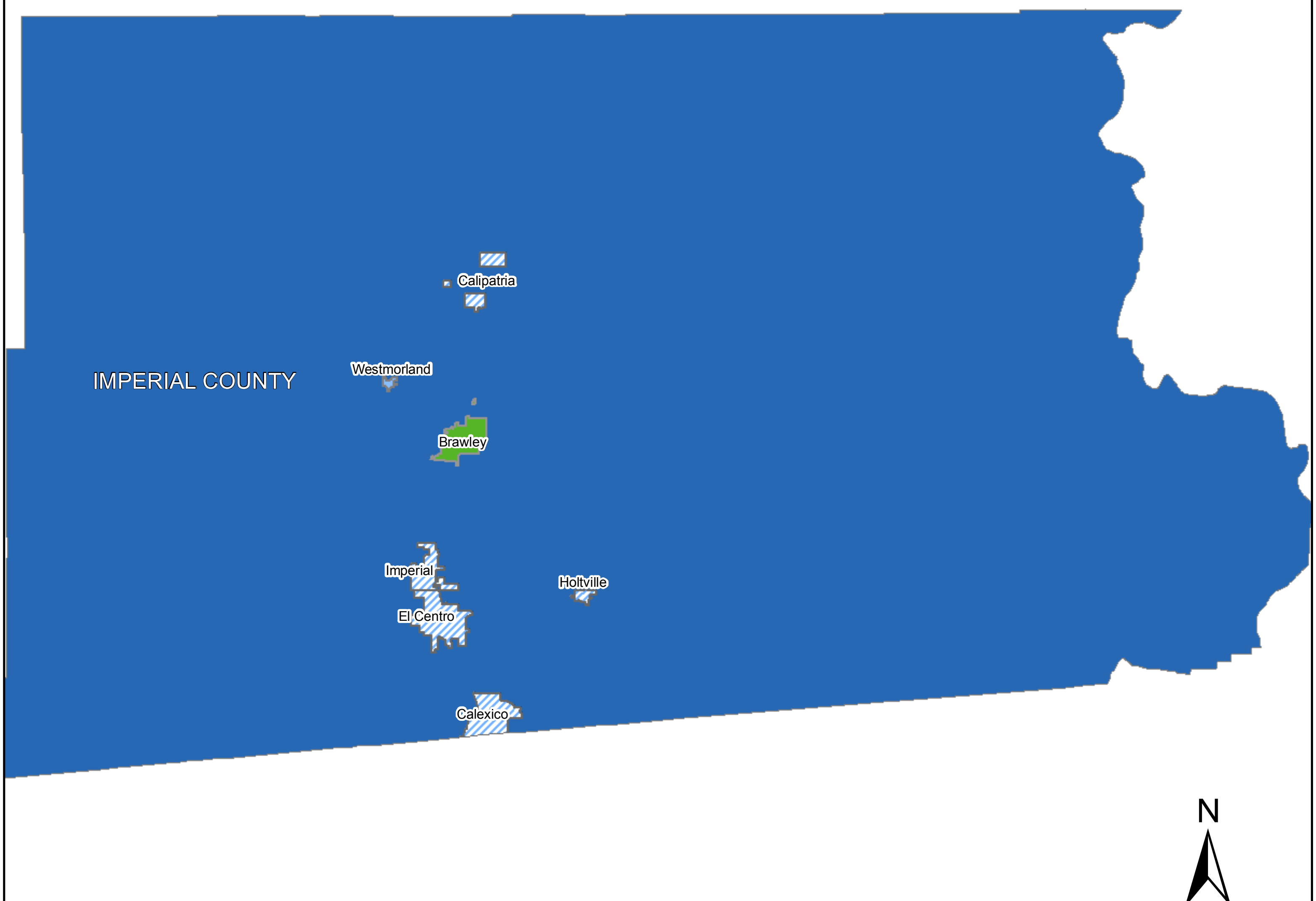
Humboldt County



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)

Imperial County



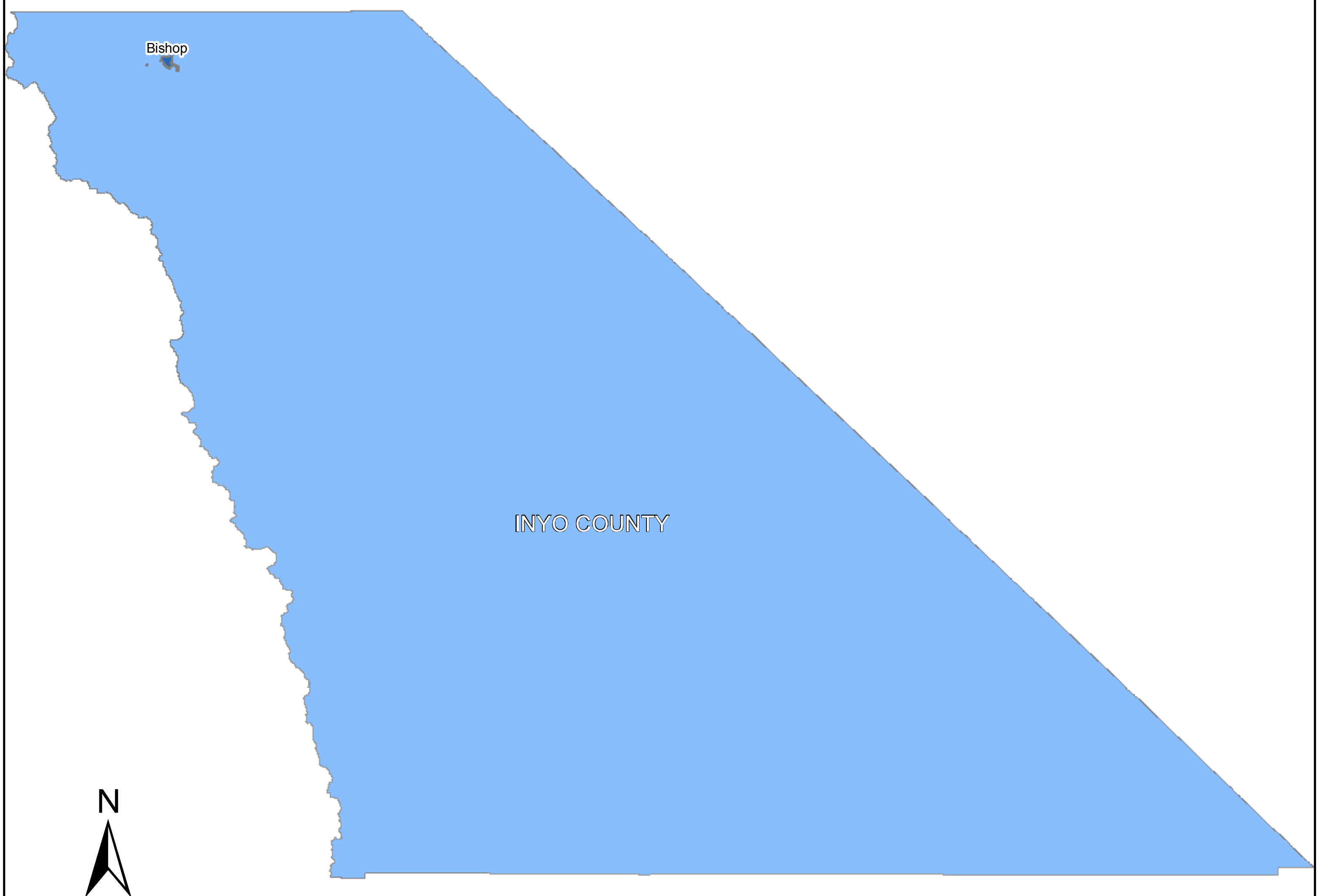
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

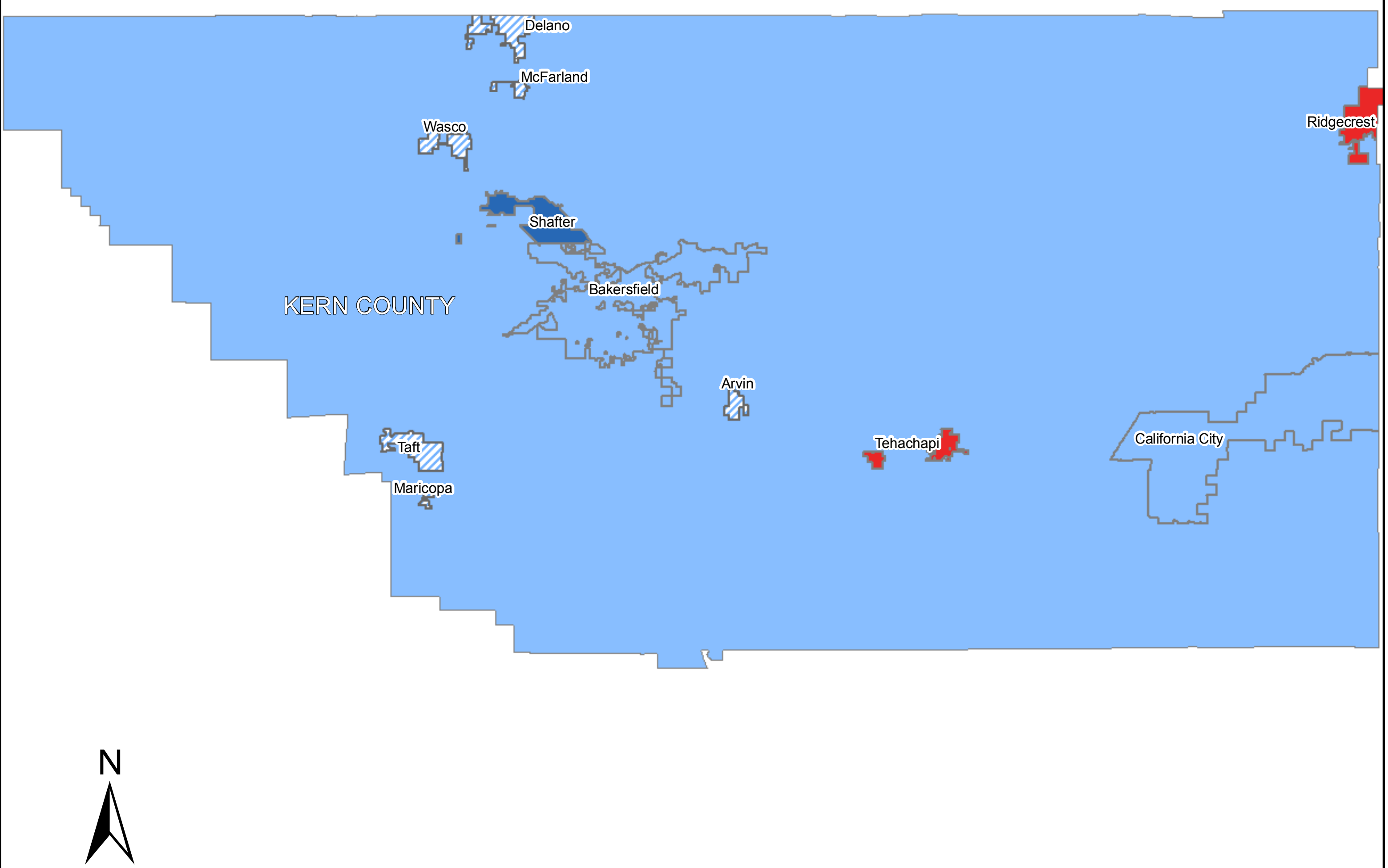
Inyo County



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



Pavement Condition Index

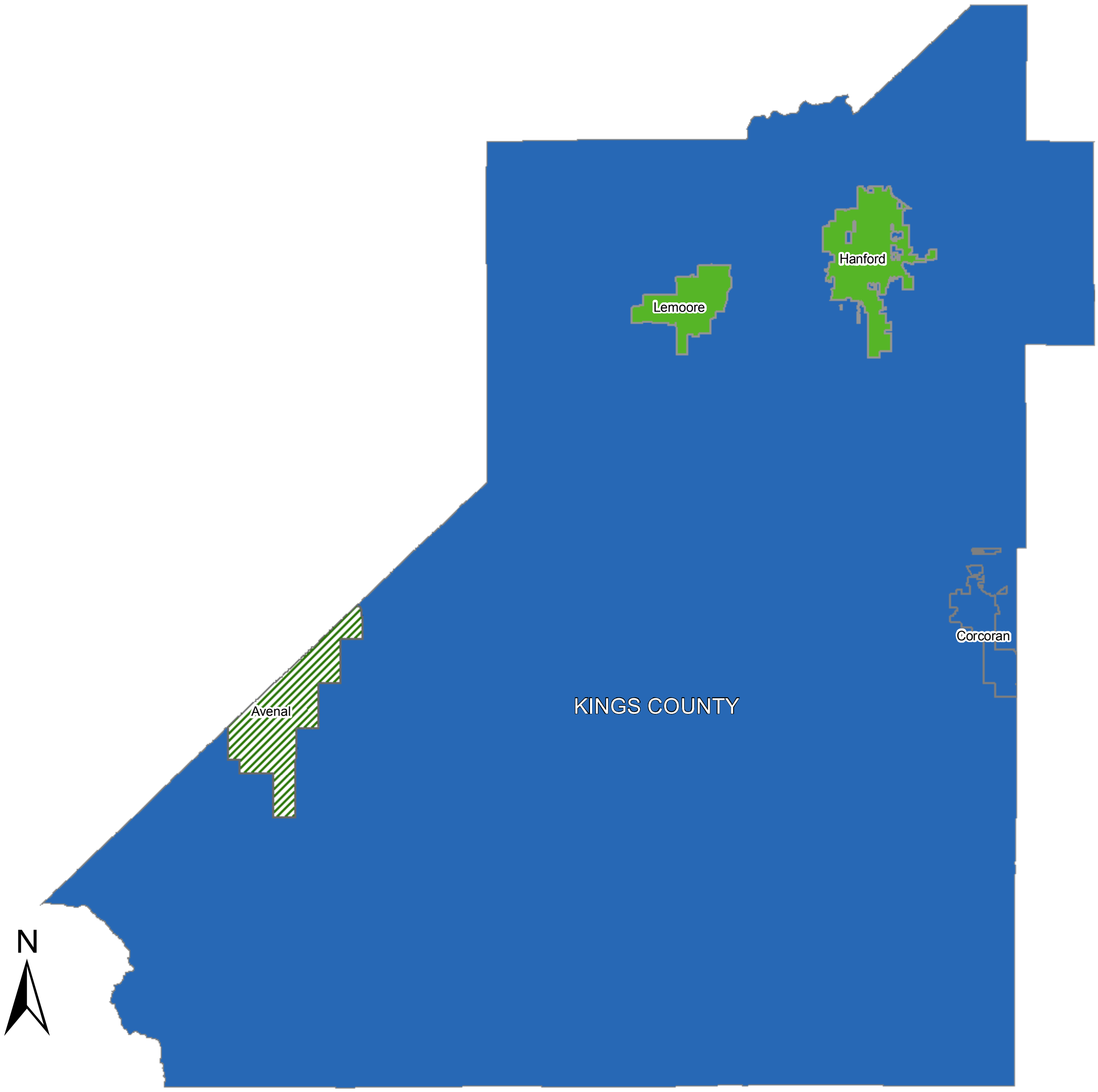
Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Kings County

SAVE CALIFORNIA STREETS



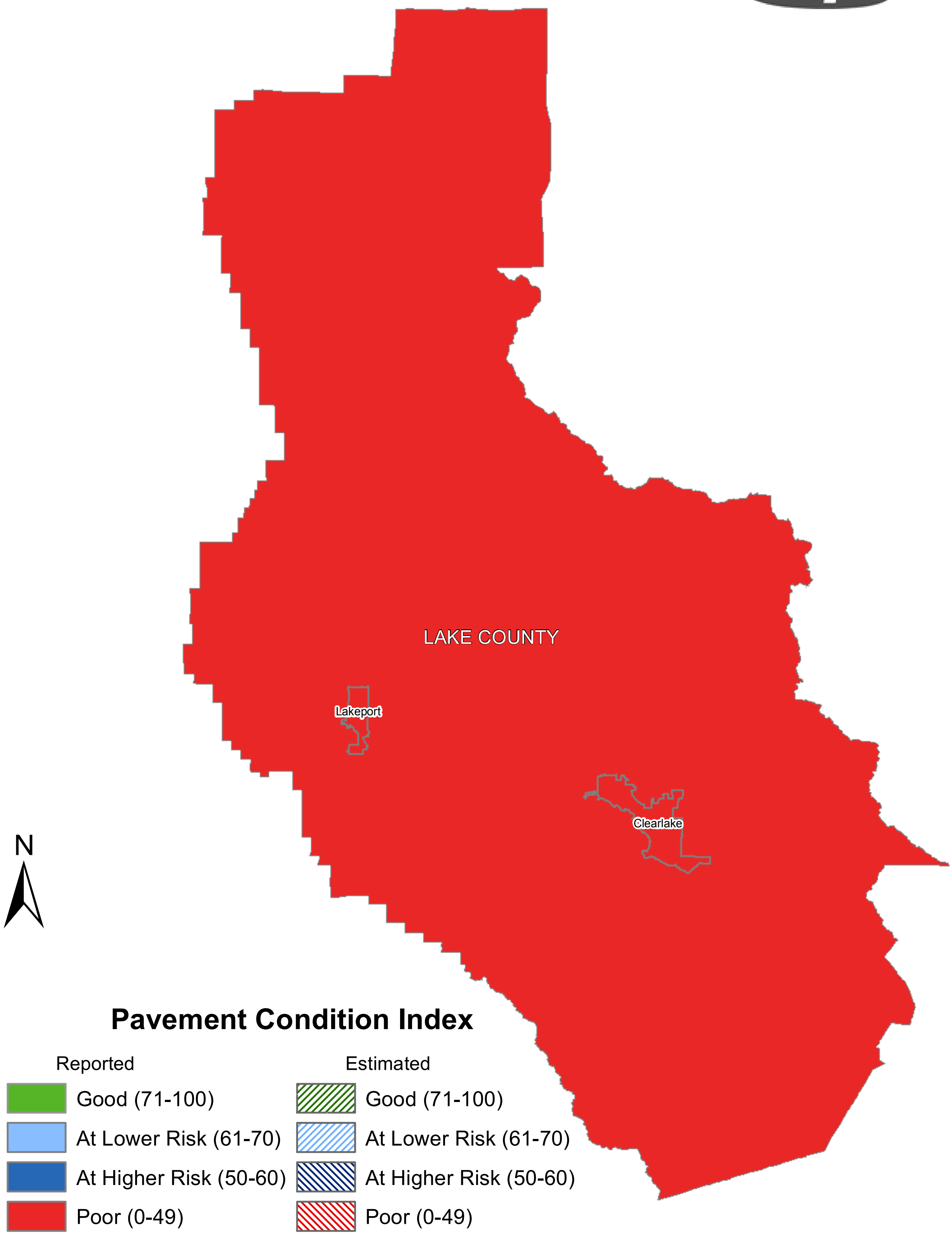
Pavement Condition Index

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)

NCE

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

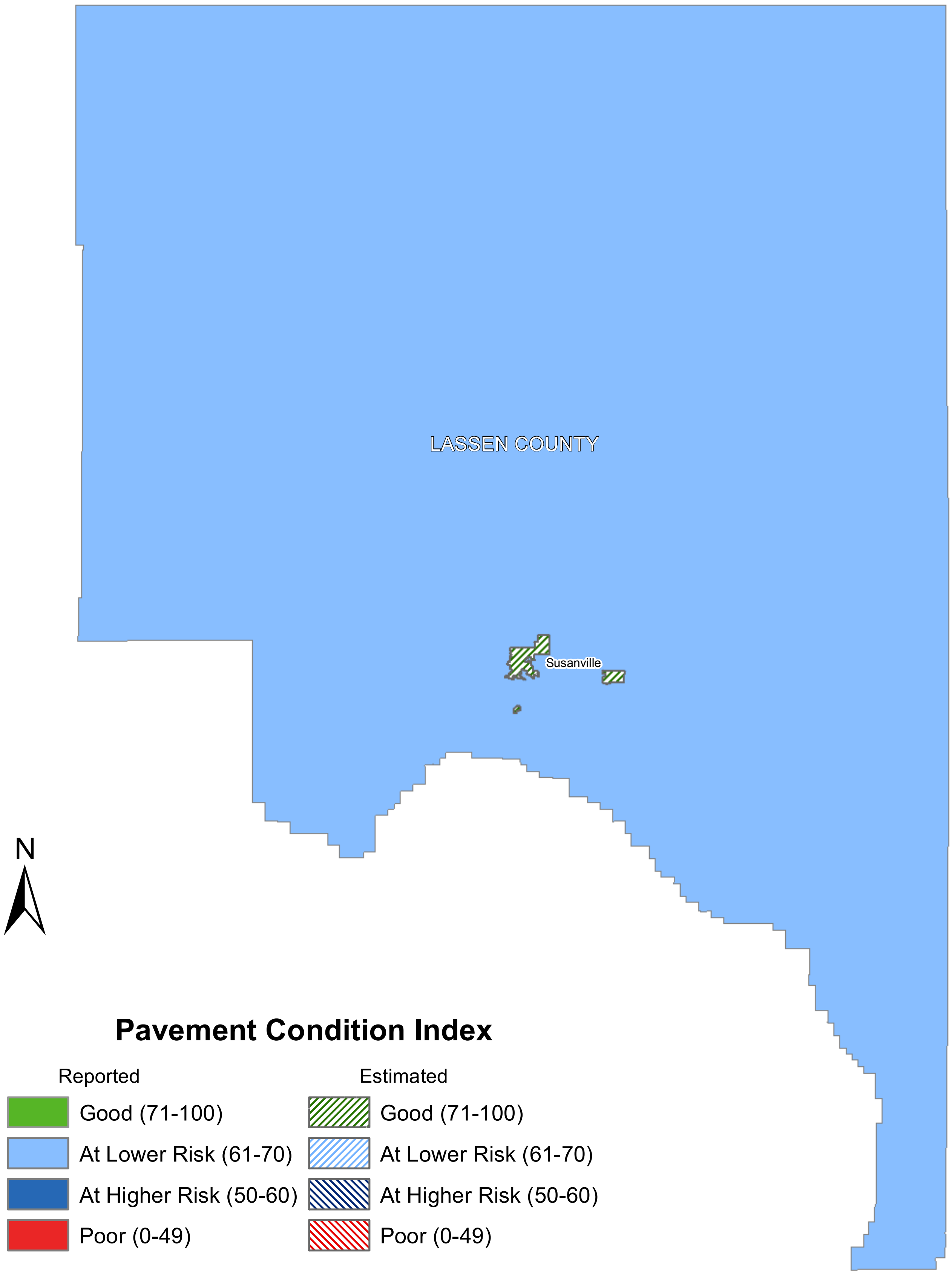
Lake County



NCE

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Lassen County



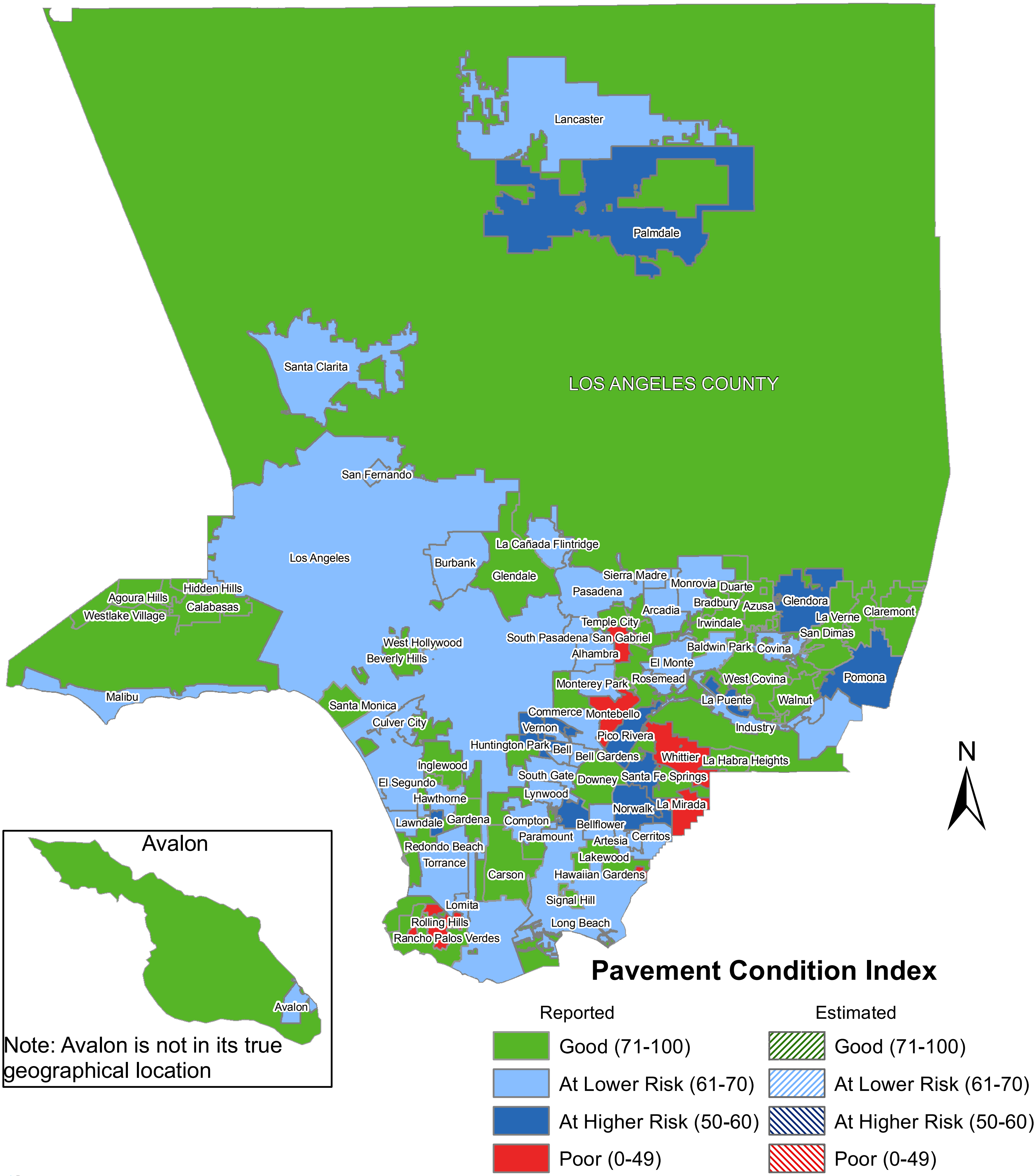
Pavement Condition Index

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)

NCE

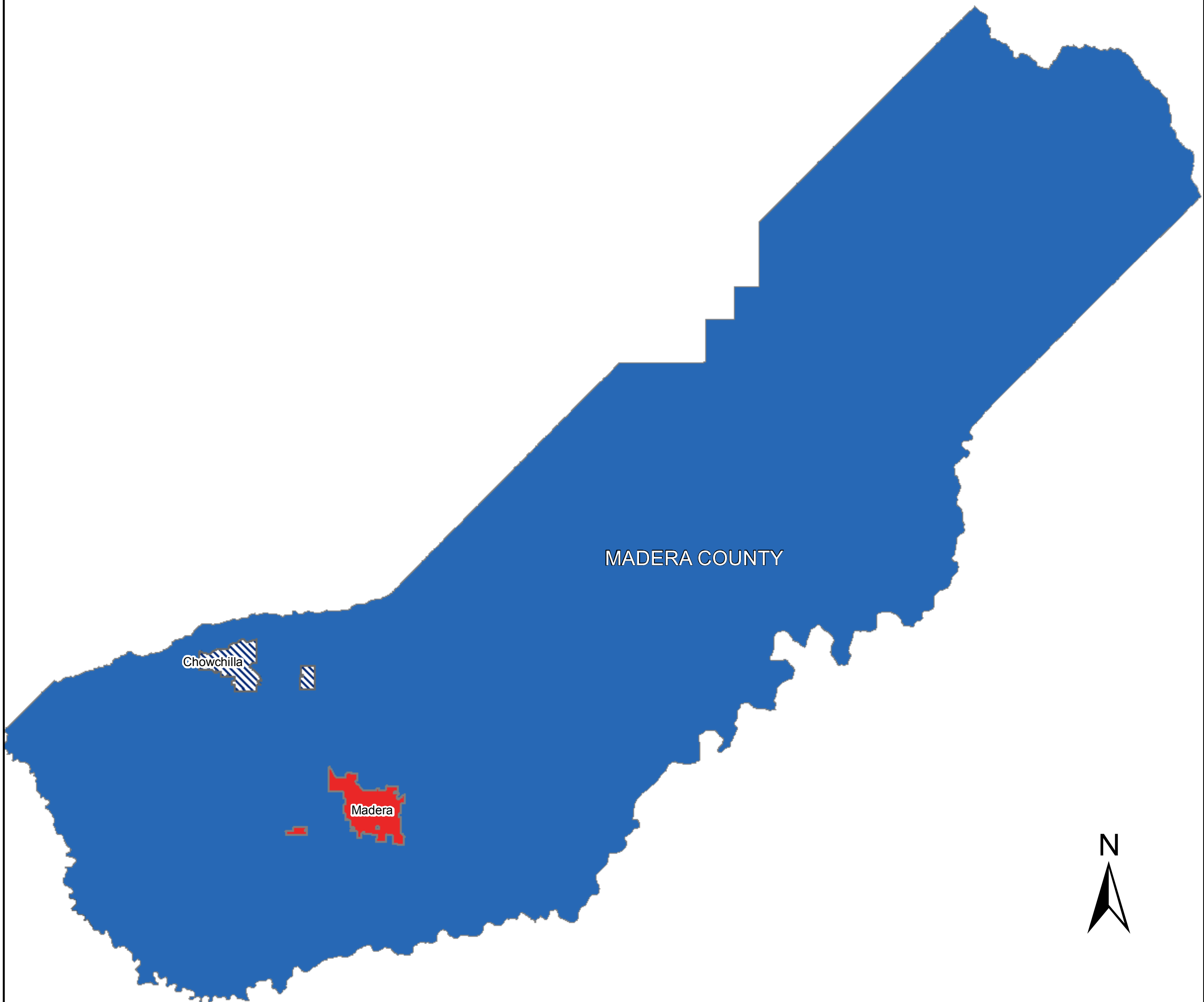
 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Los Angeles County



 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Madera County

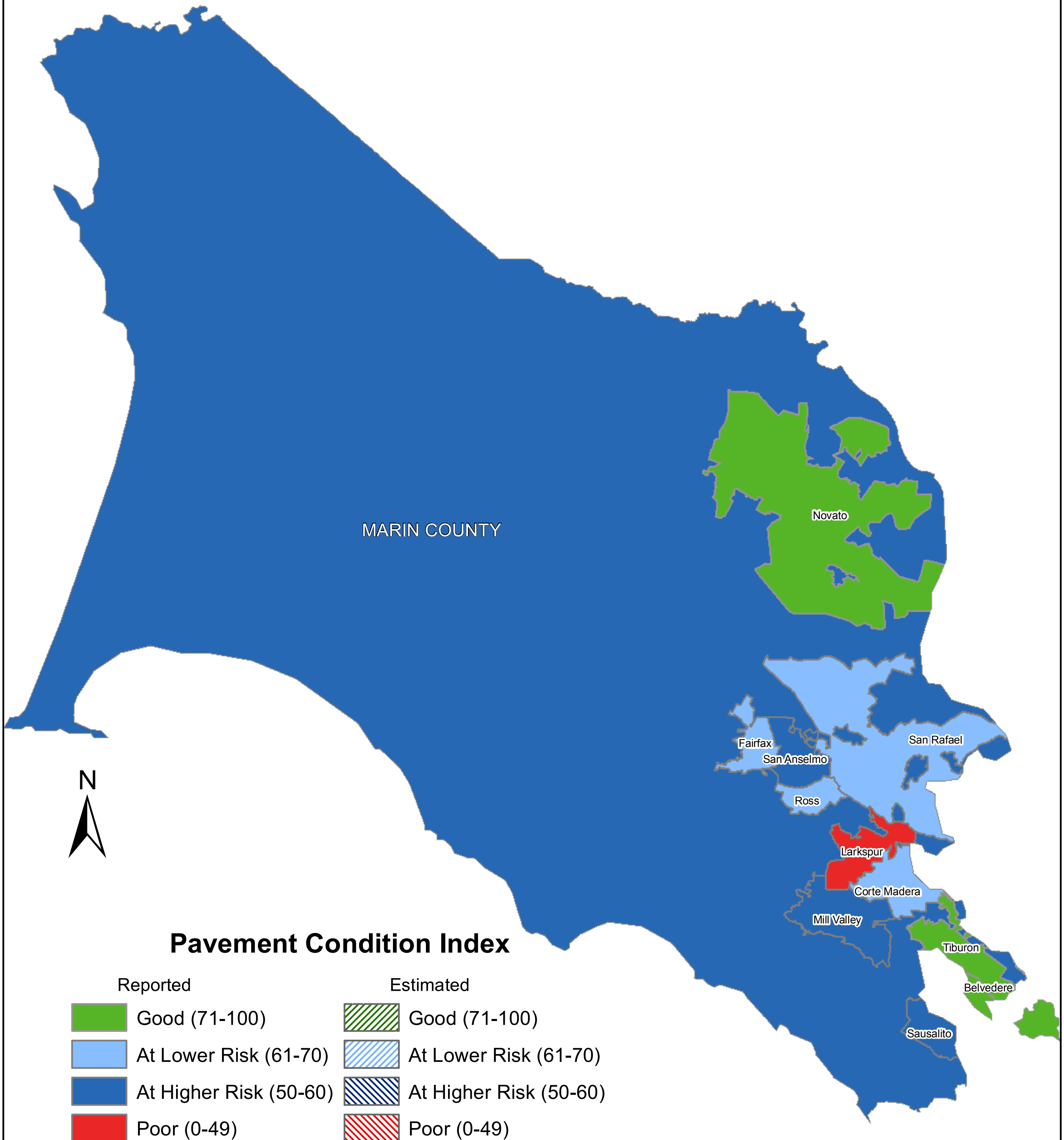


Pavement Condition Index

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)

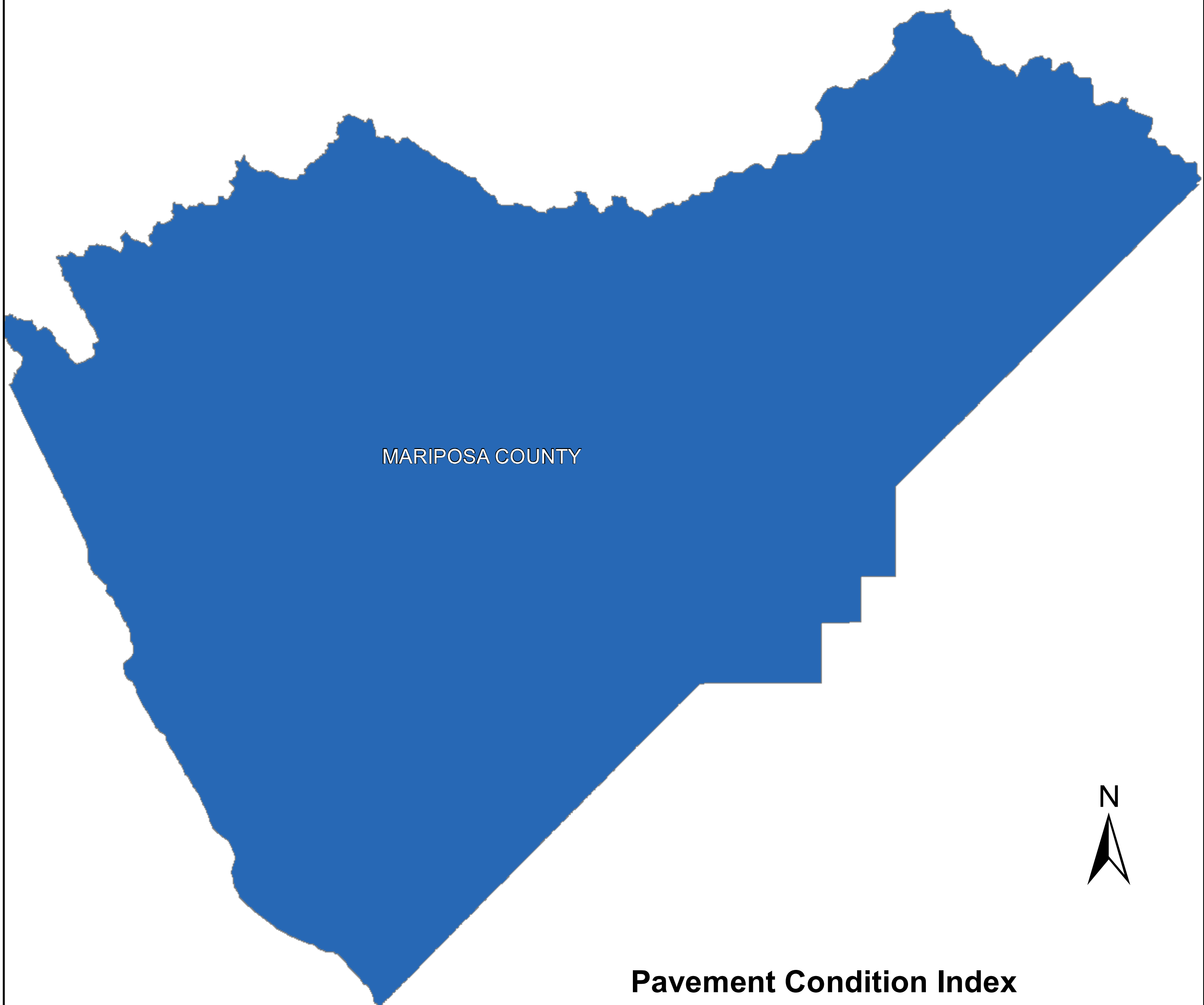
 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Marin County



 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

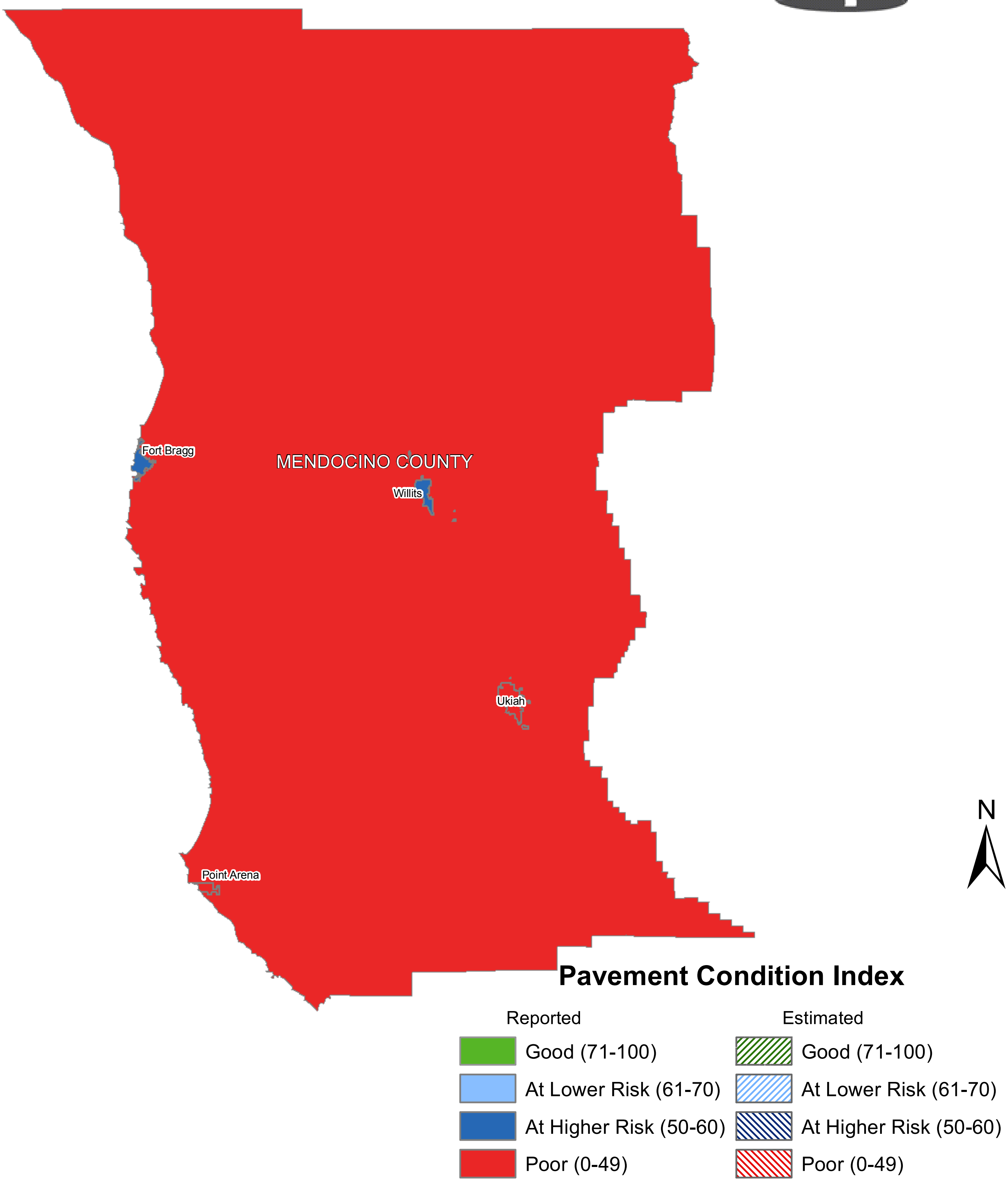
Mariposa County



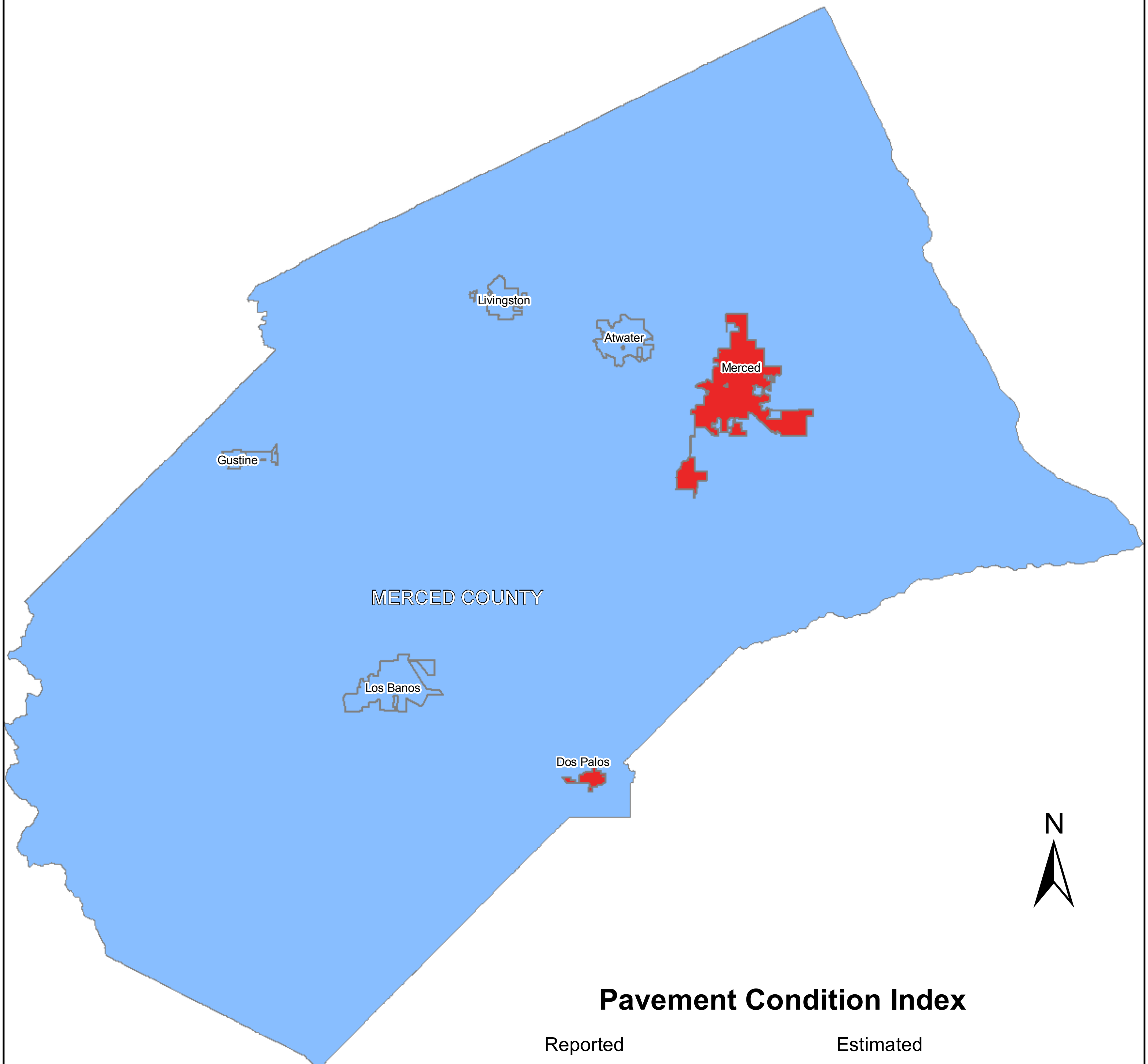
Pavement Condition Index

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)

Mendocino County



Merced County

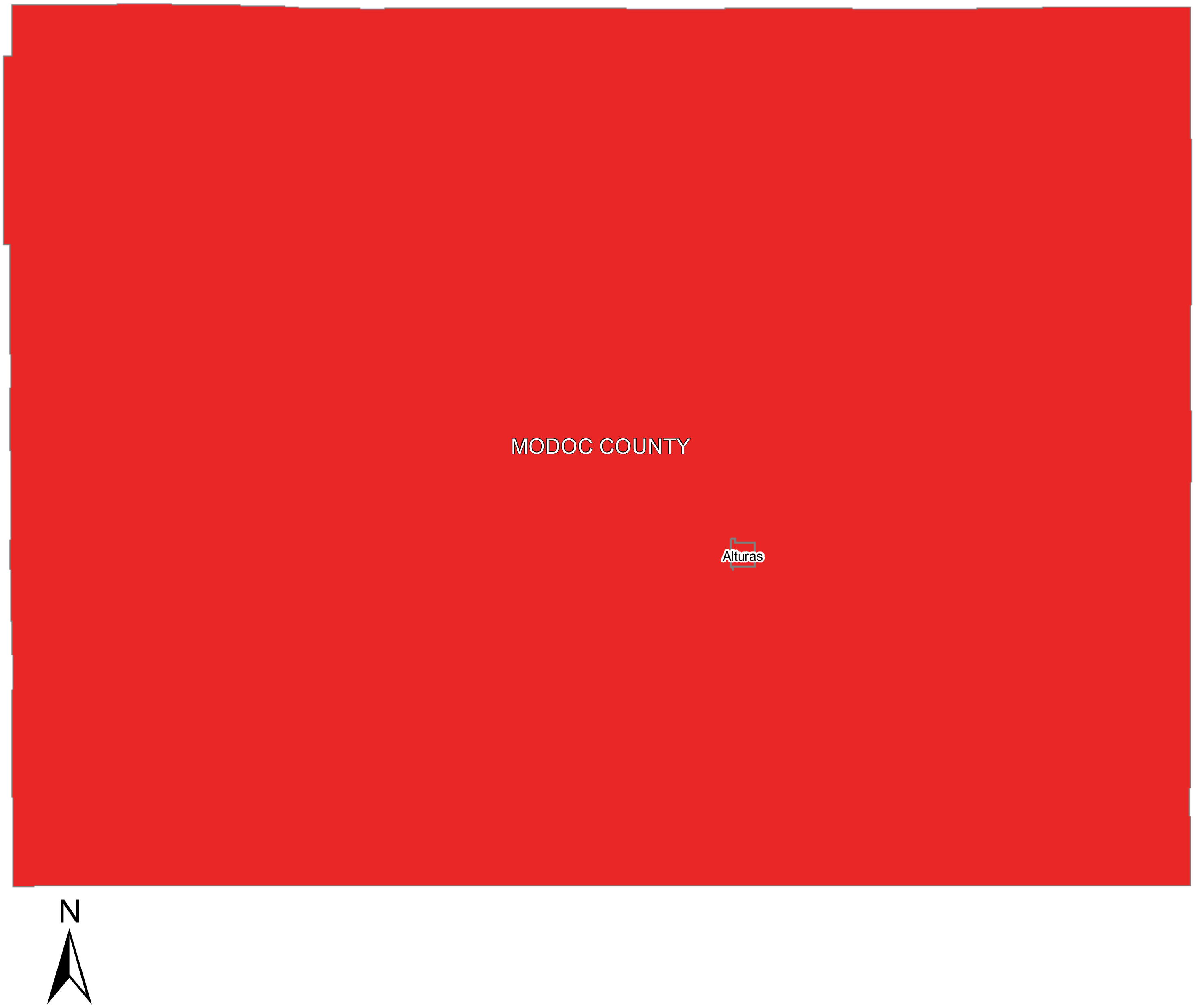


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Modoc County



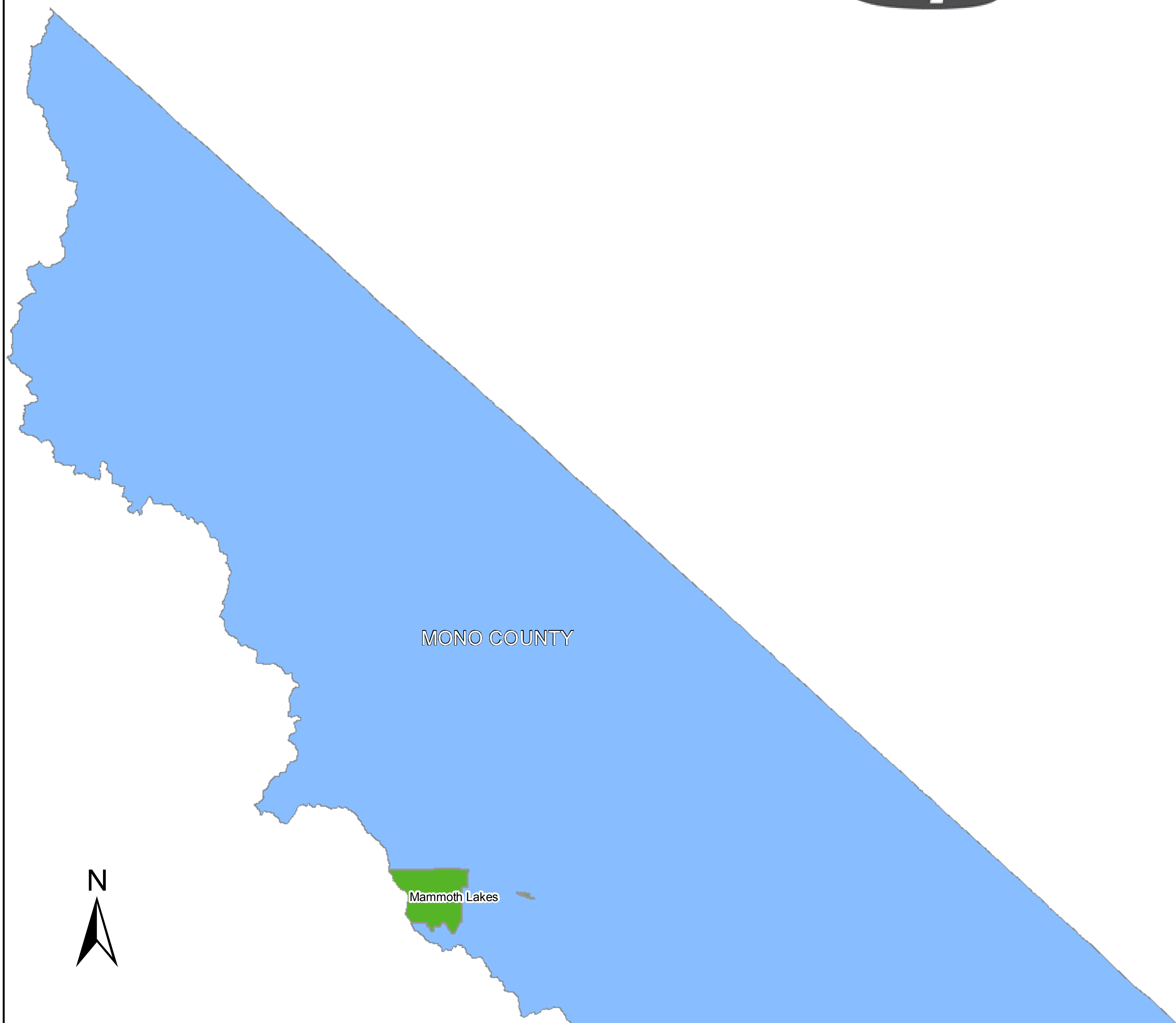
Pavement Condition Index

Reported		Estimated	
[green]	Good (71-100)	[green hatched]	Good (71-100)
[light blue]	At Lower Risk (61-70)	[light blue hatched]	At Lower Risk (61-70)
[dark blue]	At Higher Risk (50-60)	[dark blue hatched]	At Higher Risk (50-60)
[red]	Poor (0-49)	[red hatched]	Poor (0-49)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Mono County

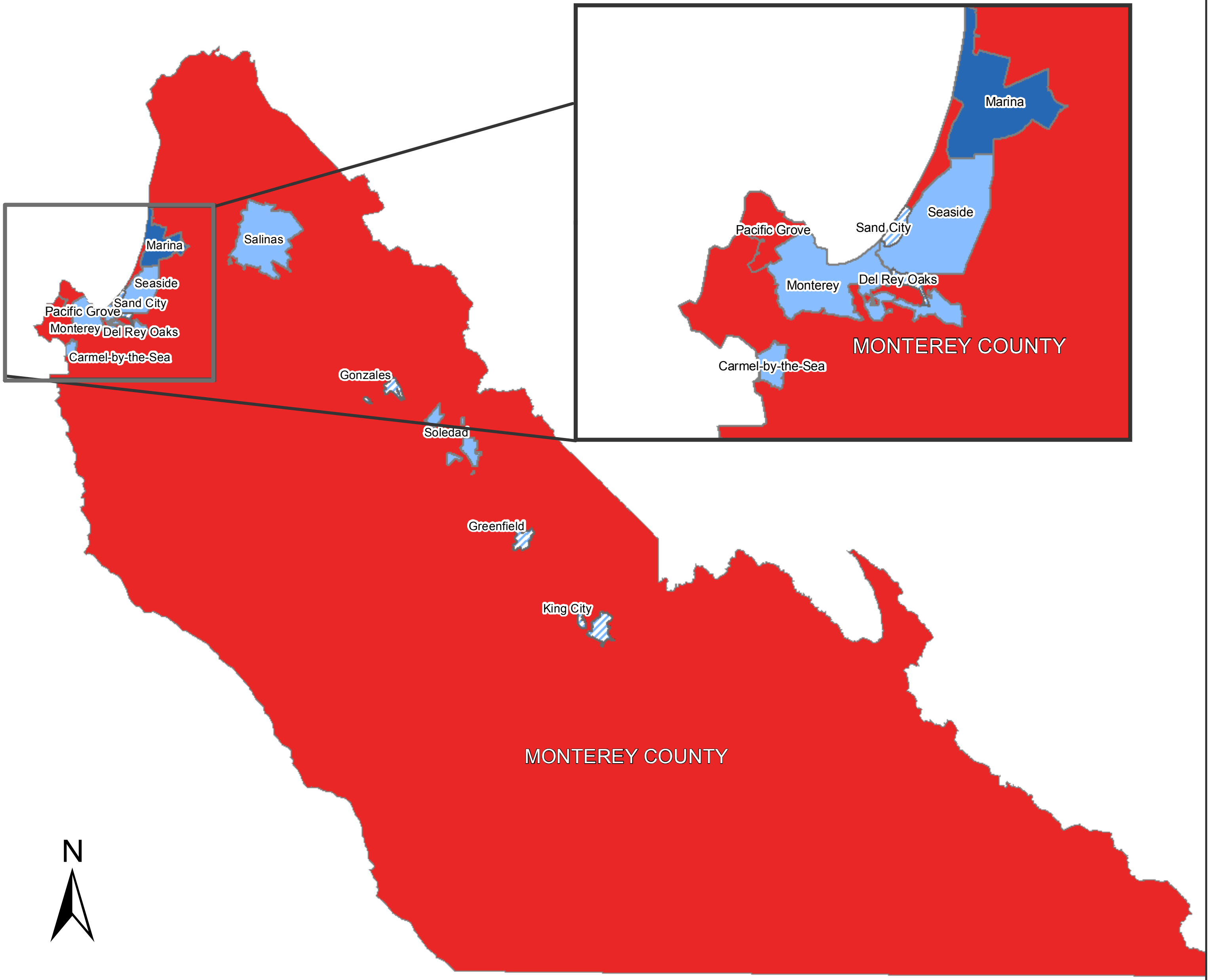


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Monterey County

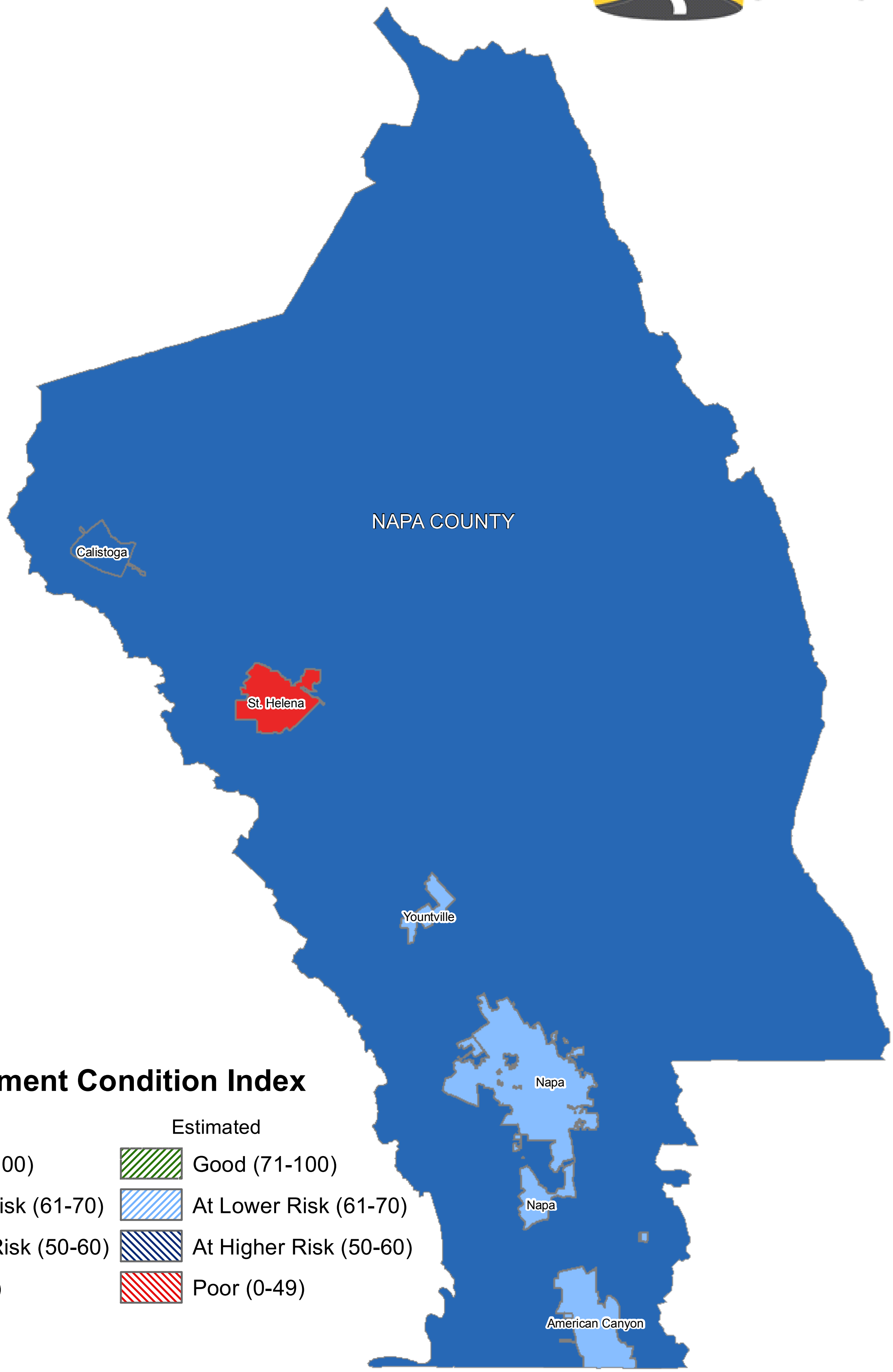


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

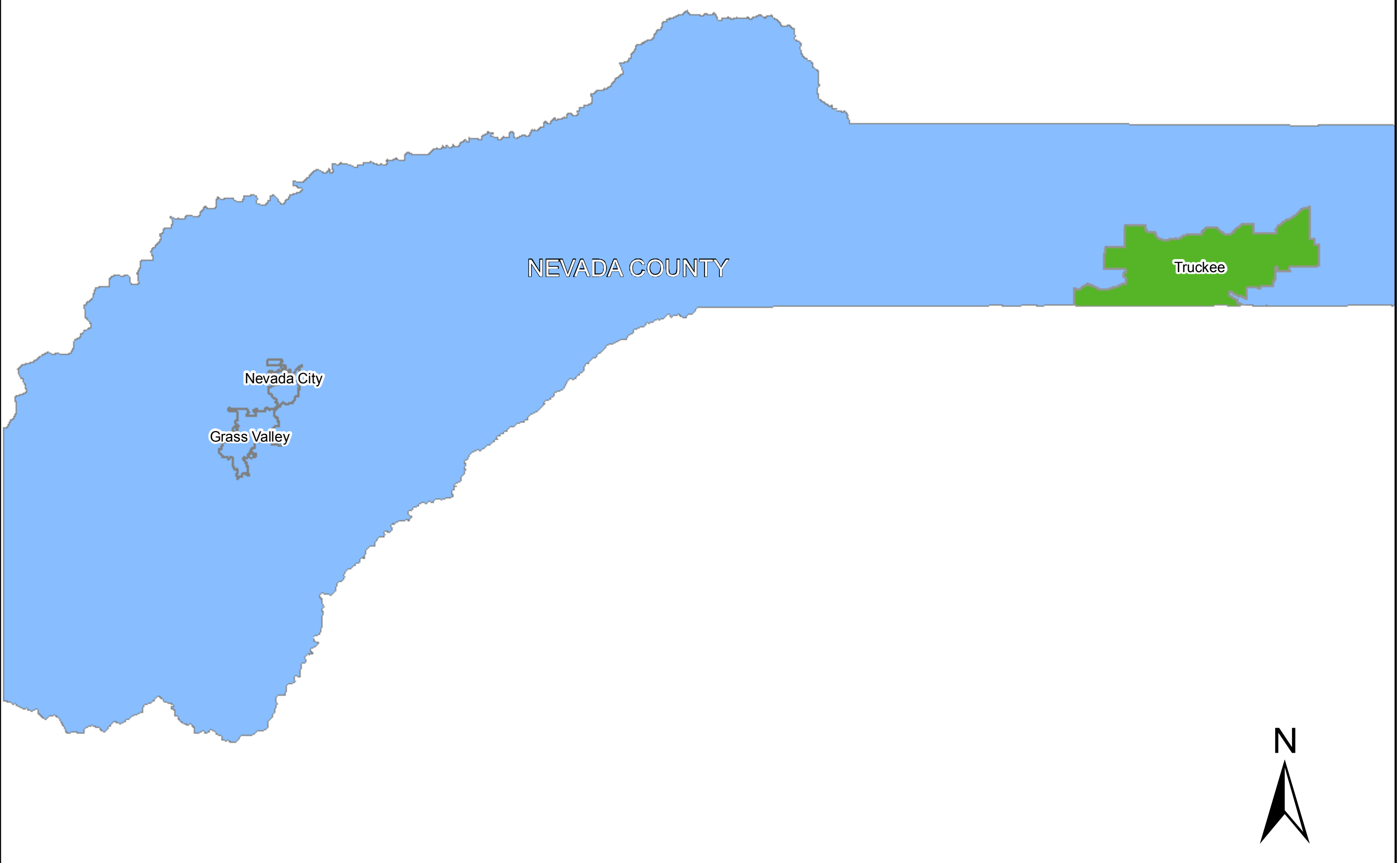
Napa County



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)

Nevada County

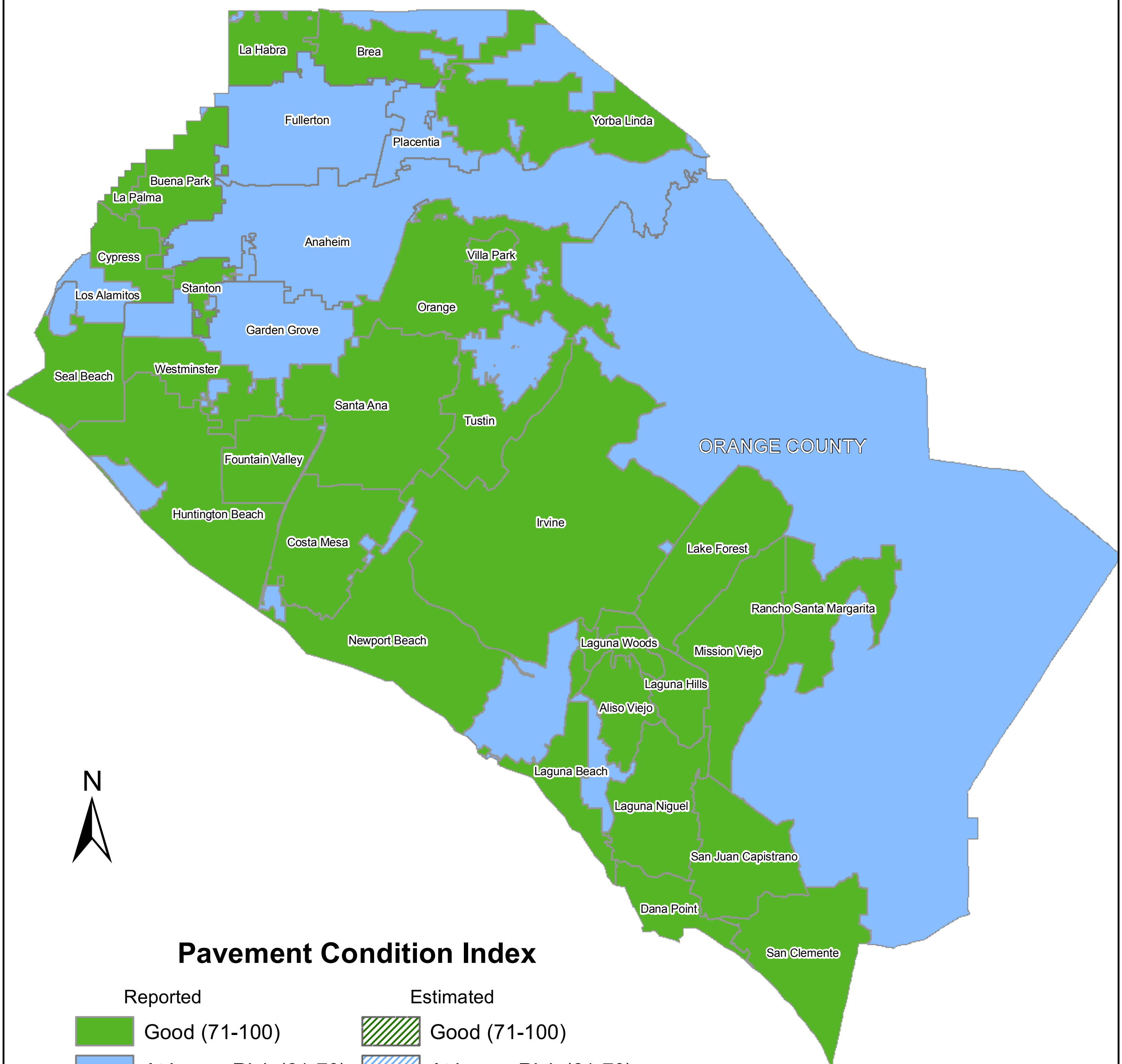


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Orange County



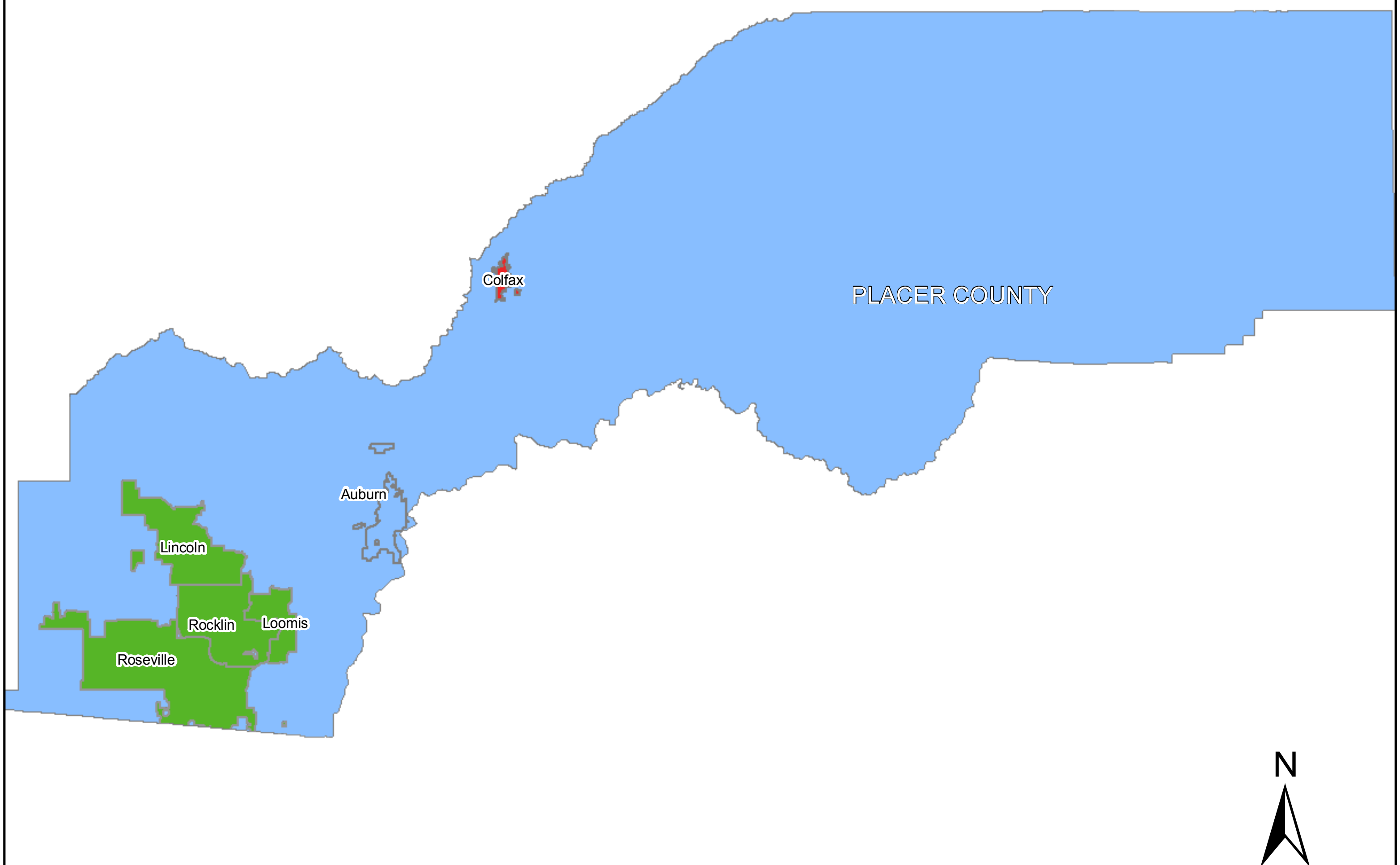
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Placer County



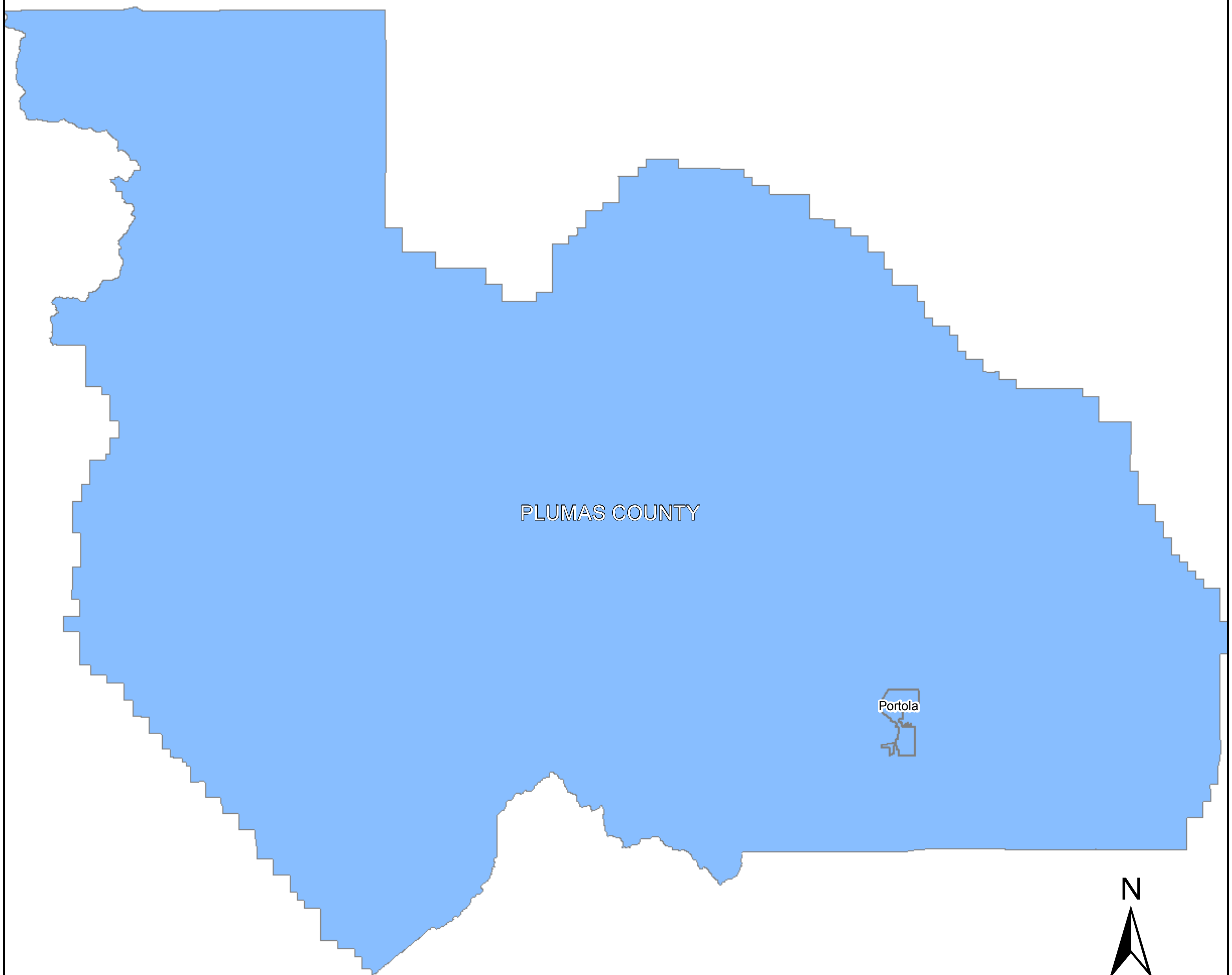
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Plumas County

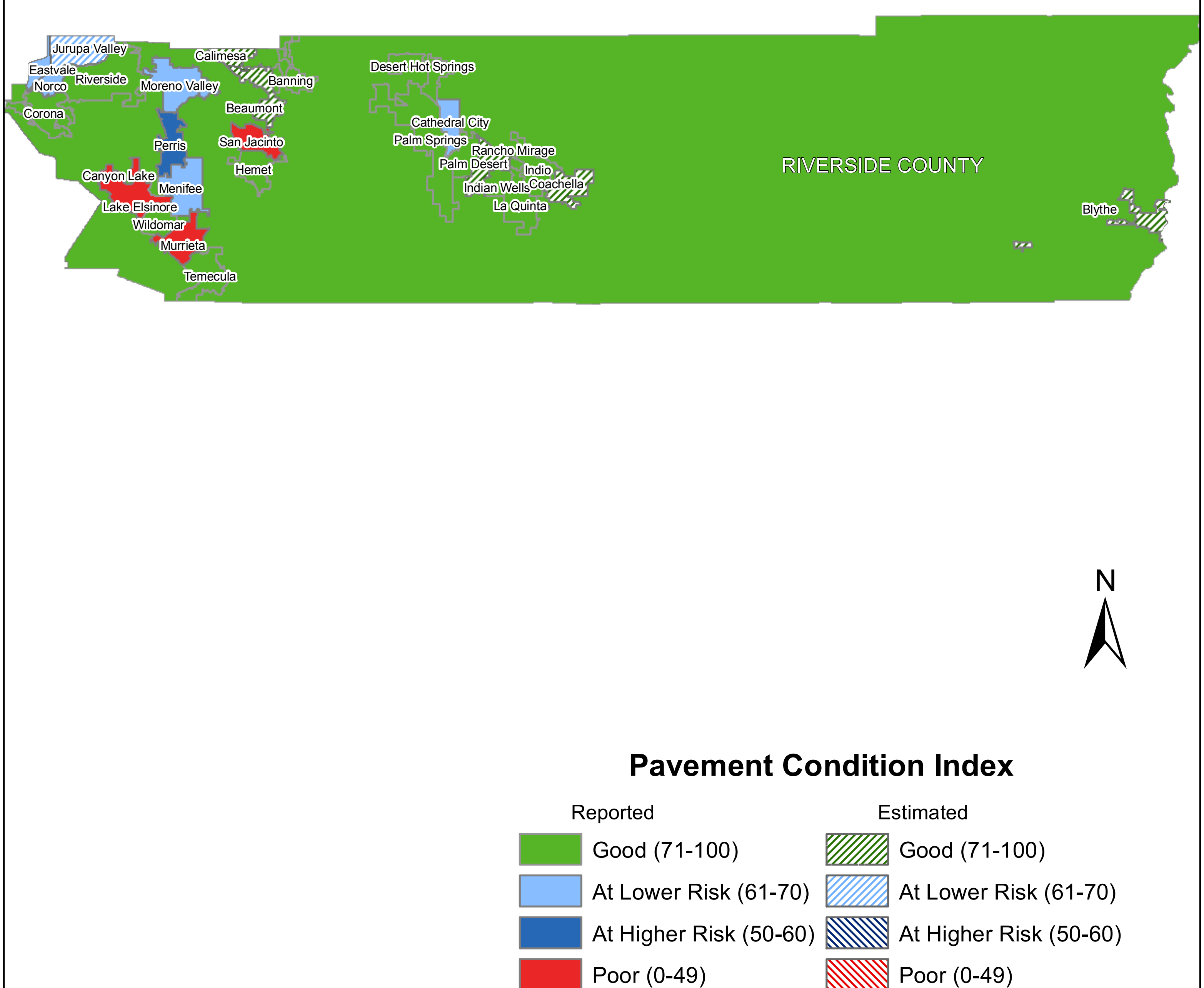


Pavement Condition Index

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)

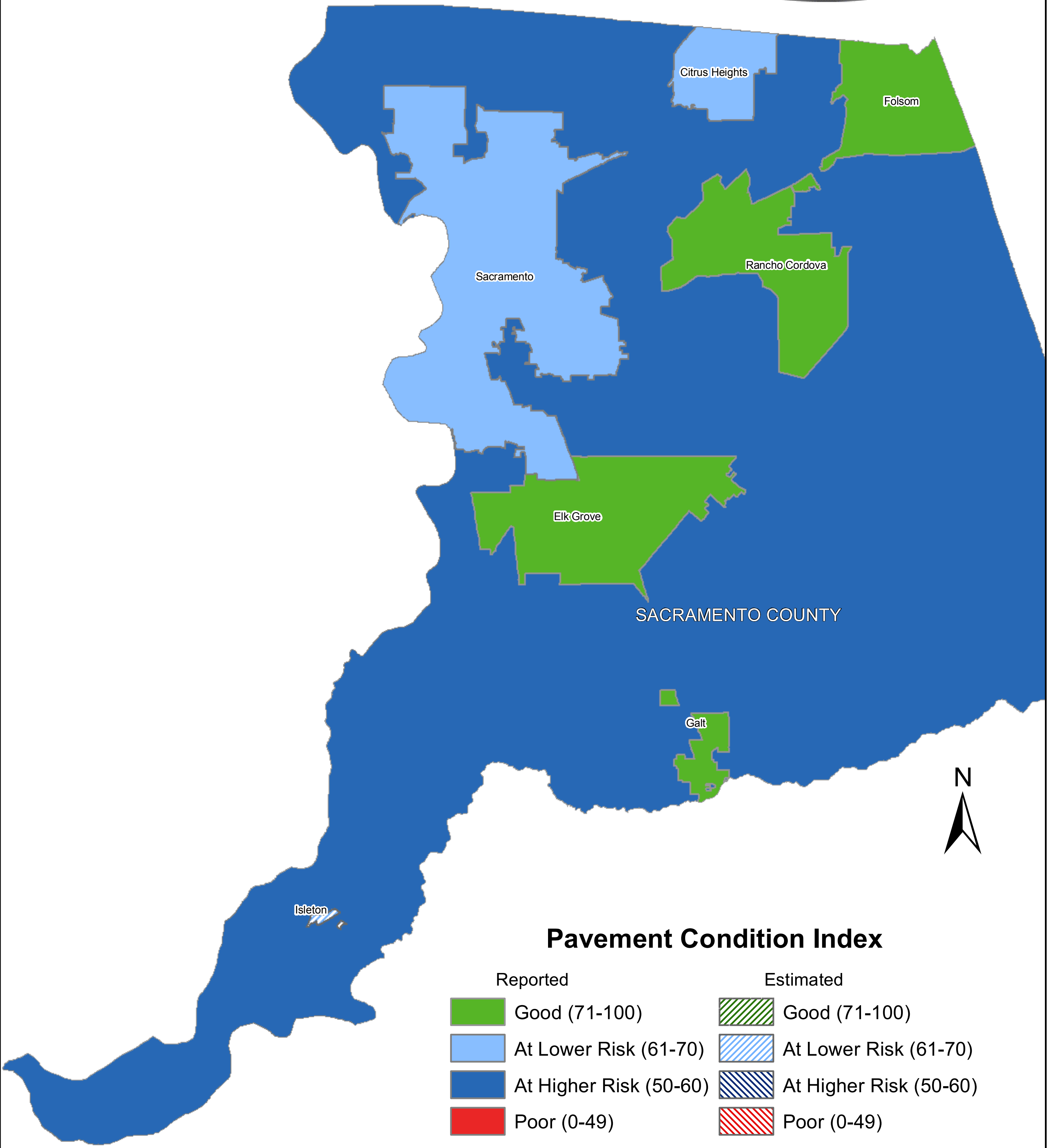
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Riverside County



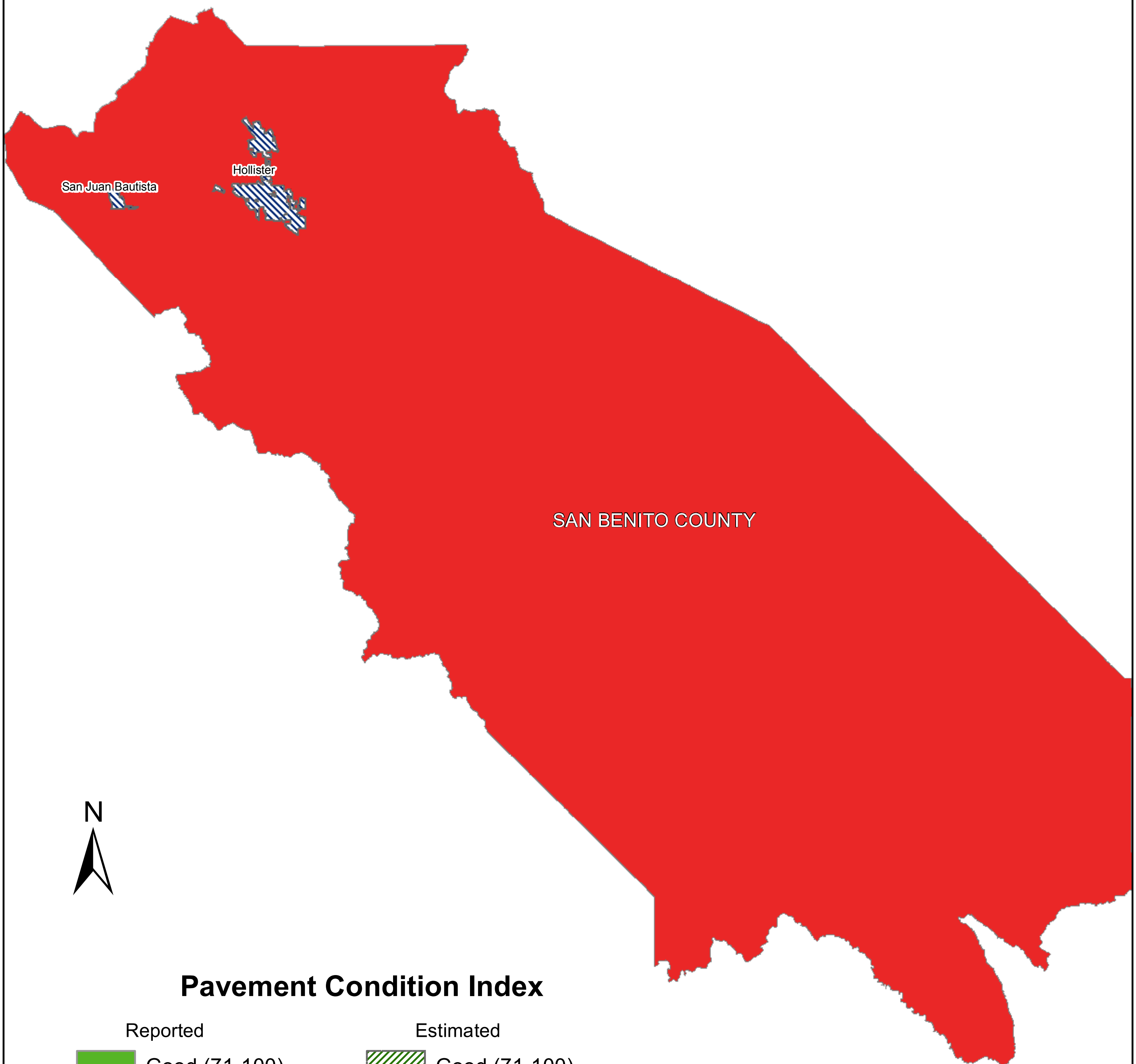
 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Sacramento County



 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

San Benito County

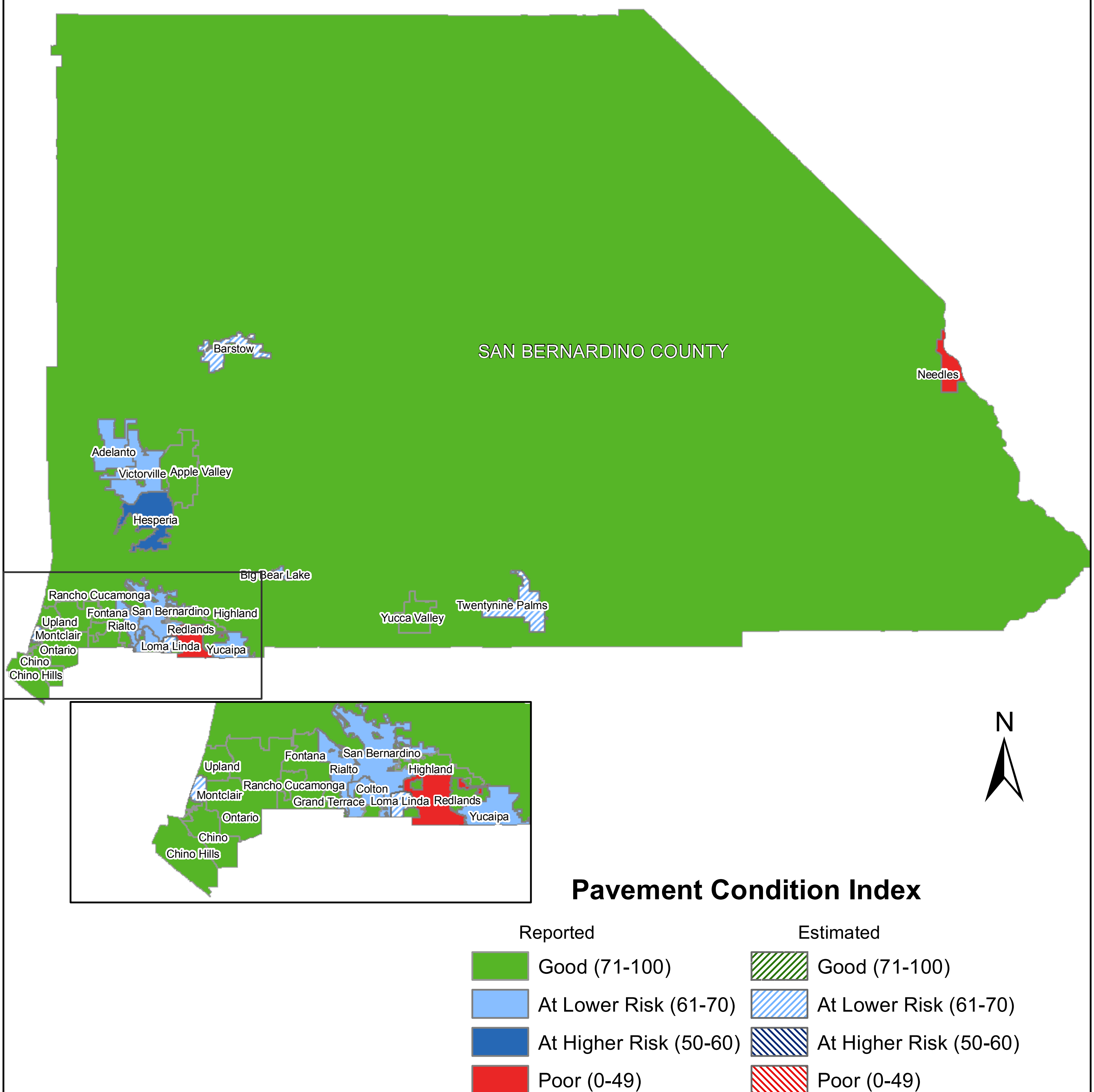


Pavement Condition Index

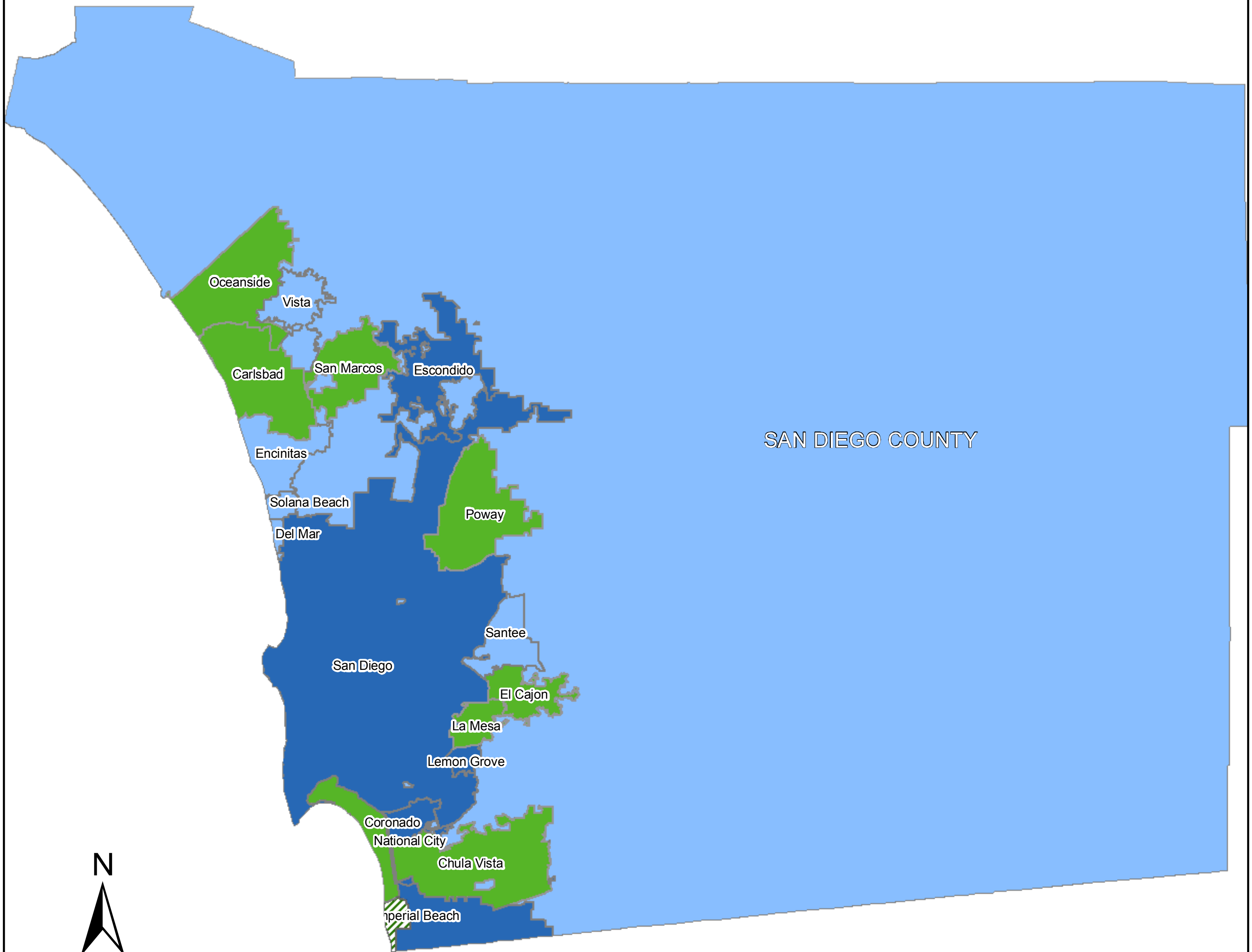
Reported	Estimated
Good (71-100)	Good (71-100)
At Lower Risk (61-70)	At Lower Risk (61-70)
At Higher Risk (50-60)	At Higher Risk (50-60)
Poor (0-49)	Poor (0-49)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

San Bernardino County



San Diego County



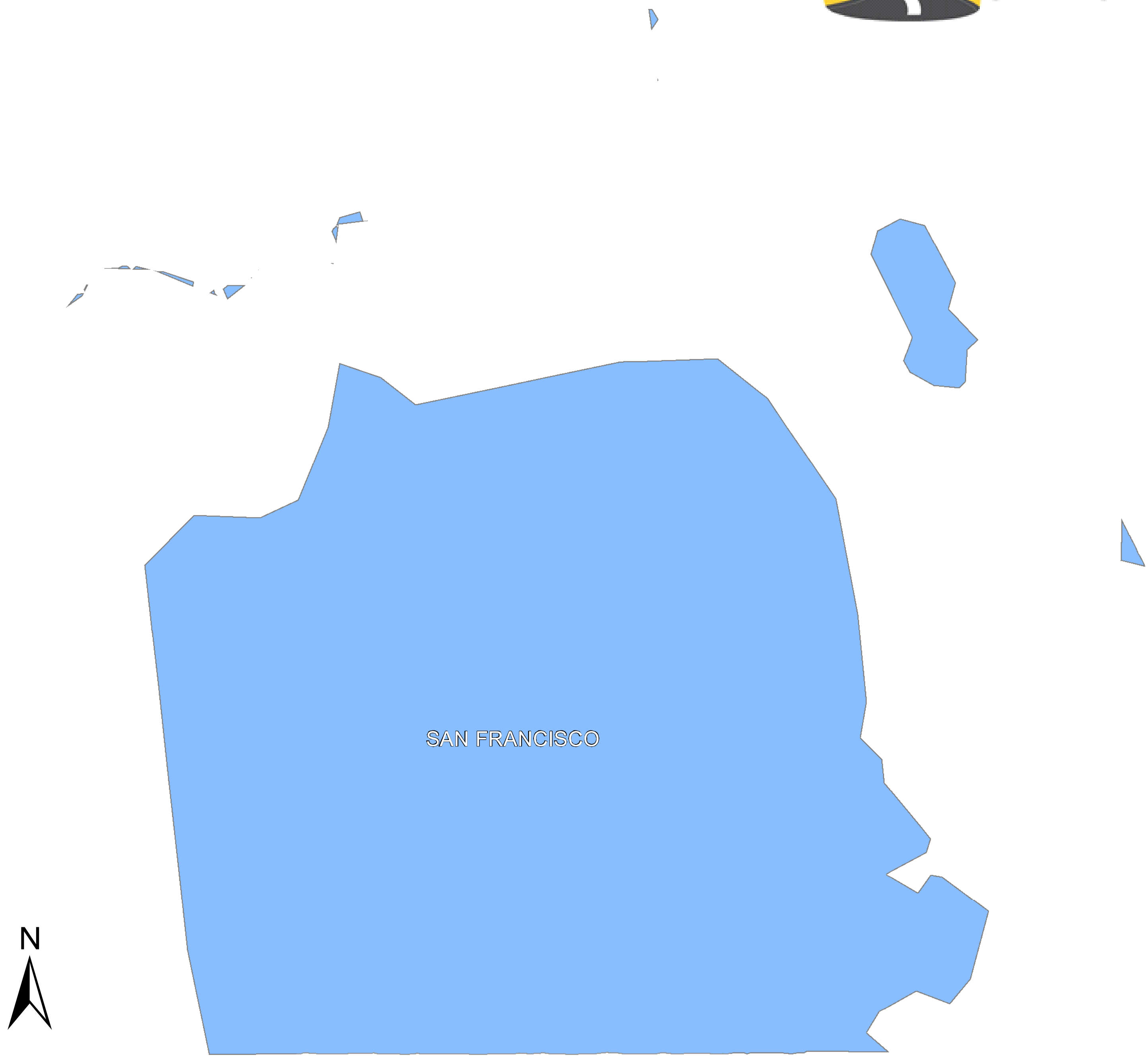
Pavement Condition Index

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)

NCE

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

San Francisco County



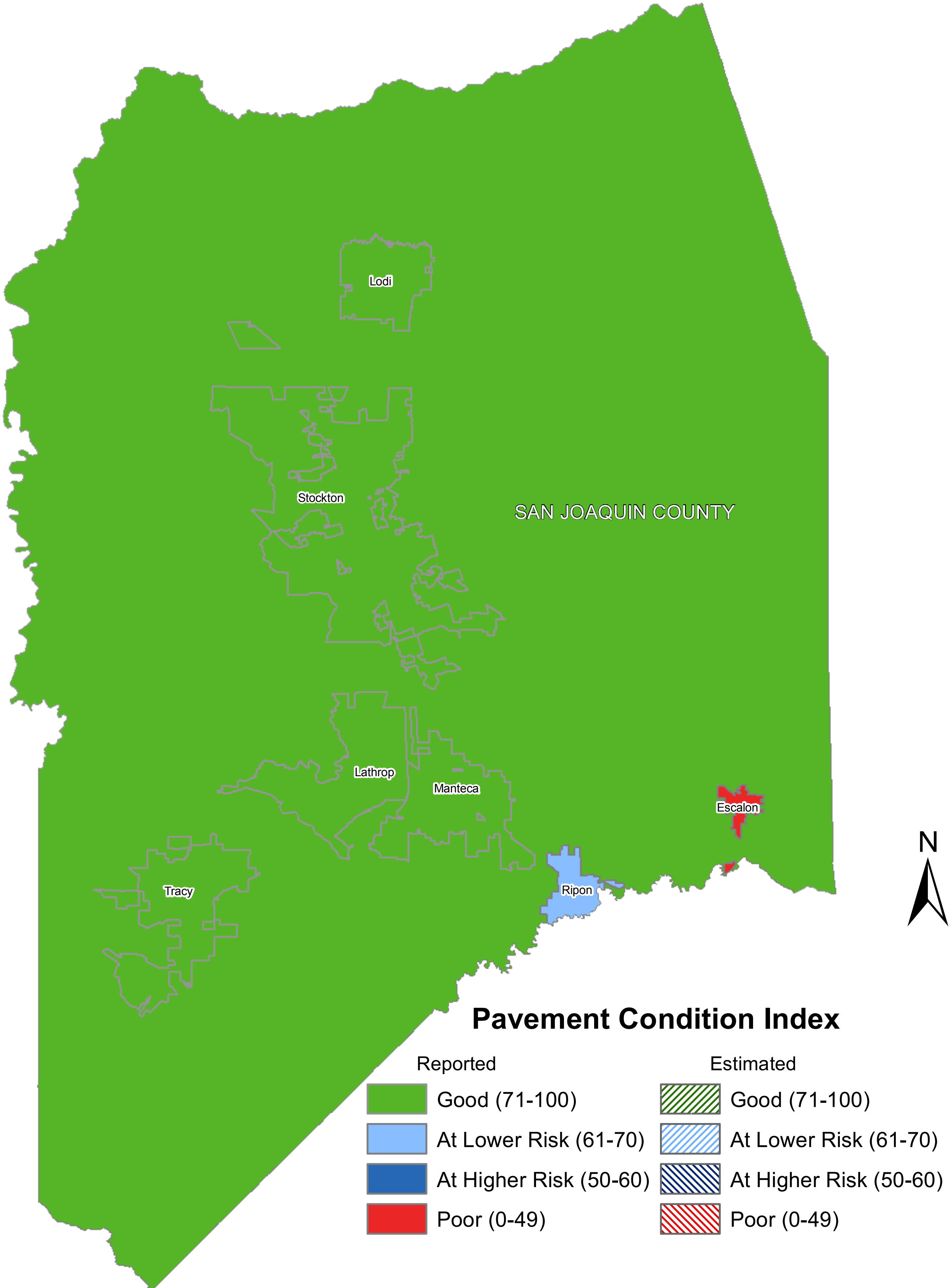
Pavement Condition Index

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)

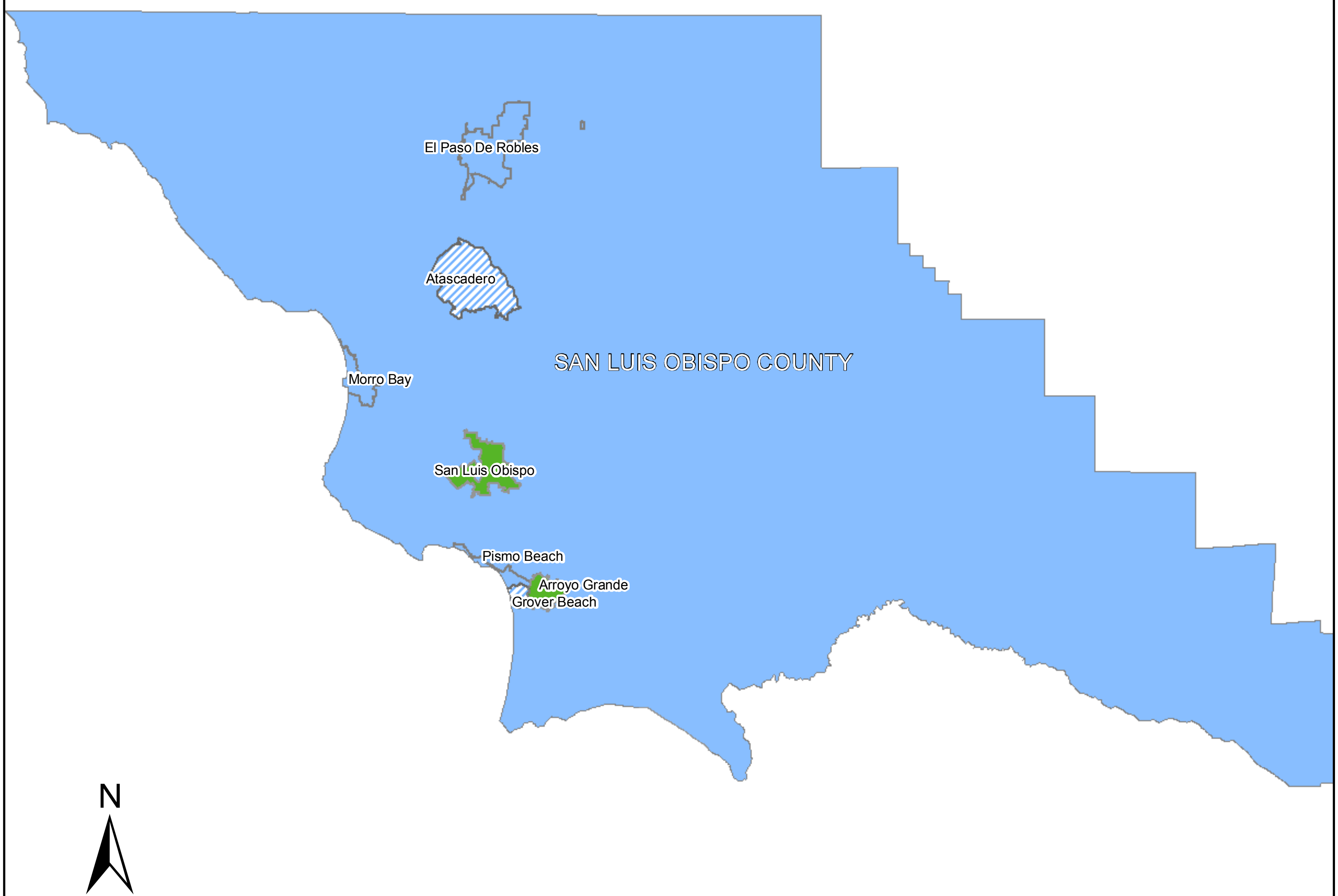
NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

San Joaquin County



San Luis Obispo County

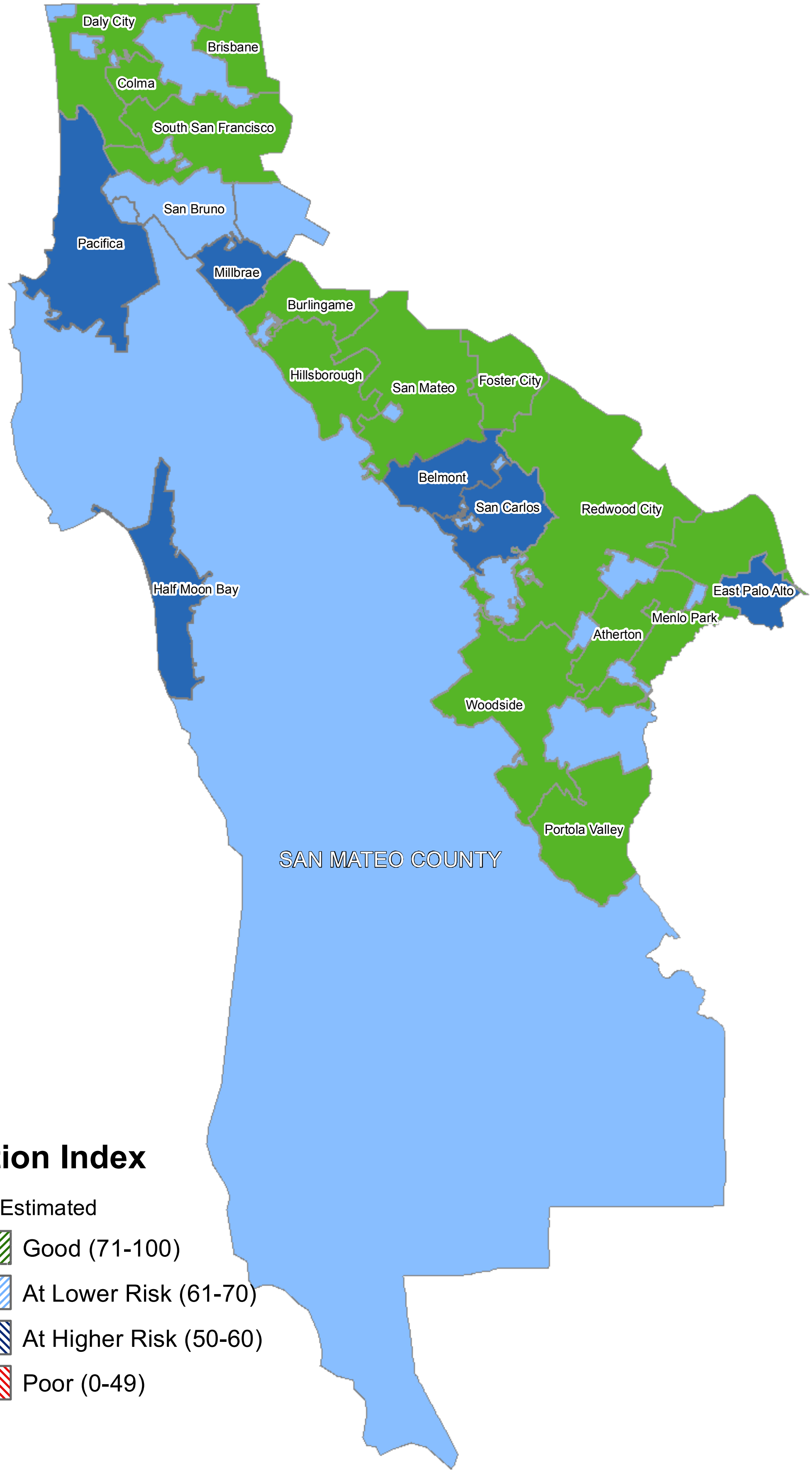


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

San Mateo County



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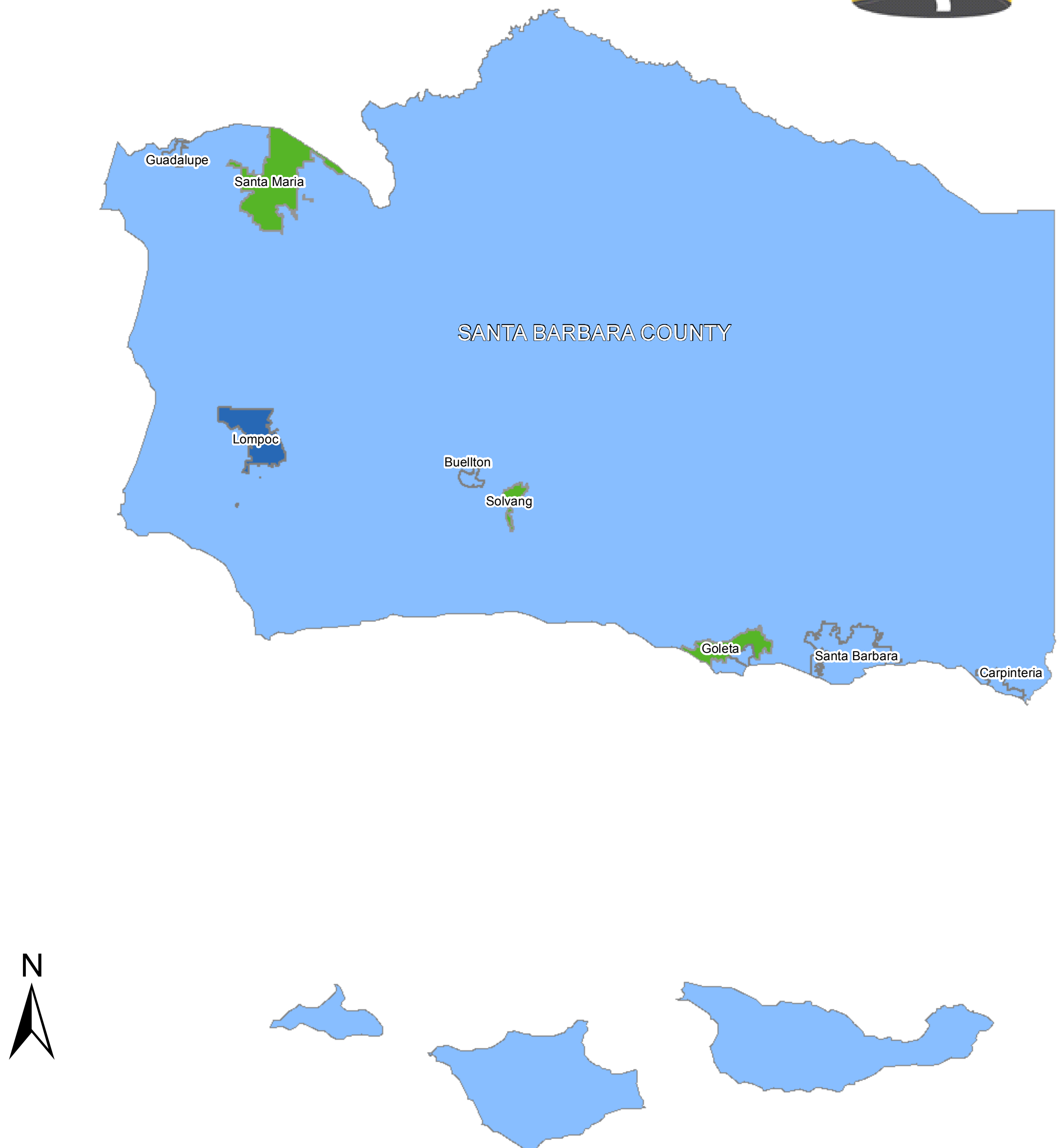
Pavement Condition Index

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)

NCE

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Santa Barbara 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)

Santa Clara County

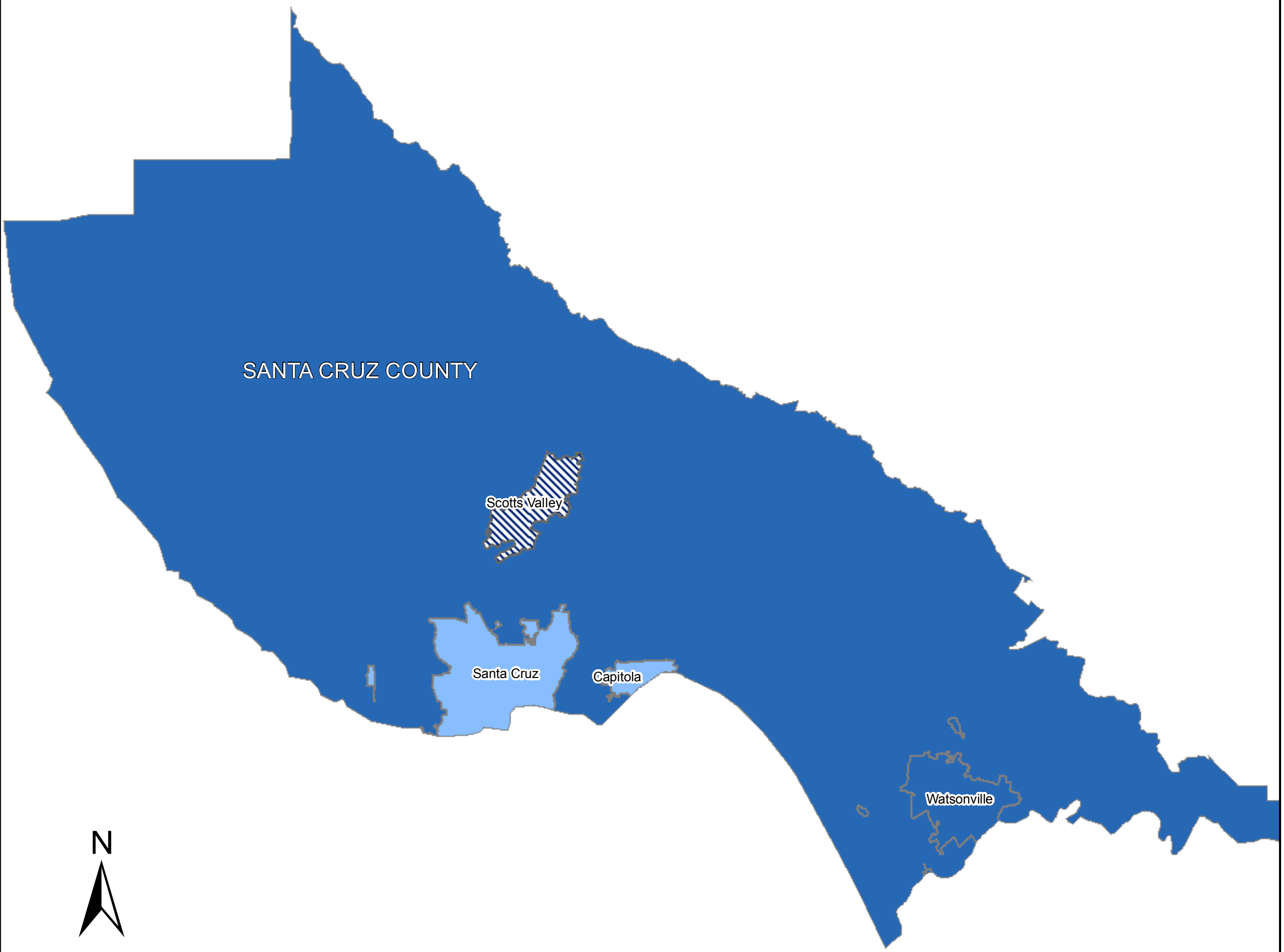
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

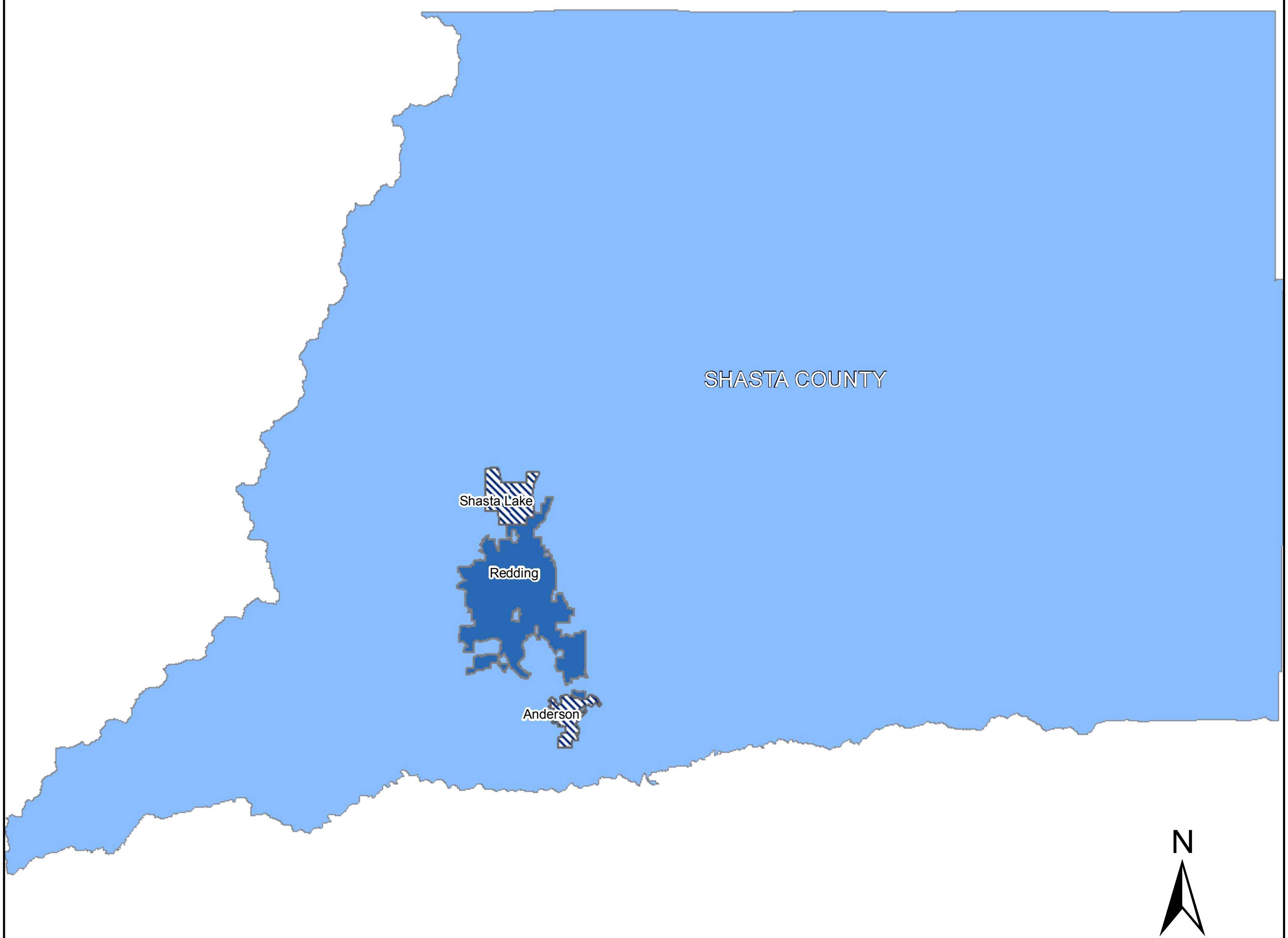
Santa Cruz County



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)

Shasta 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)

NCE

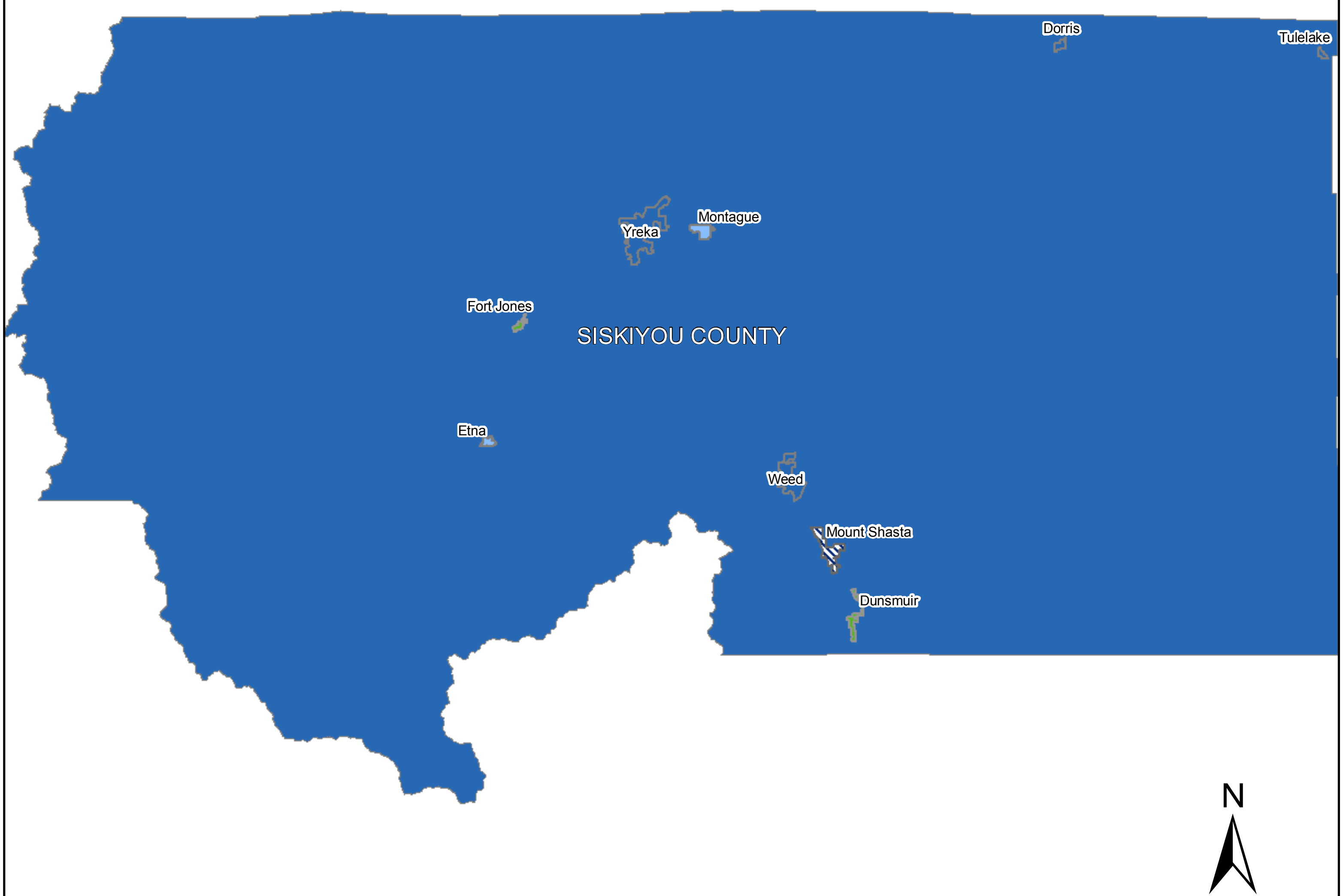
 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Sierra 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)

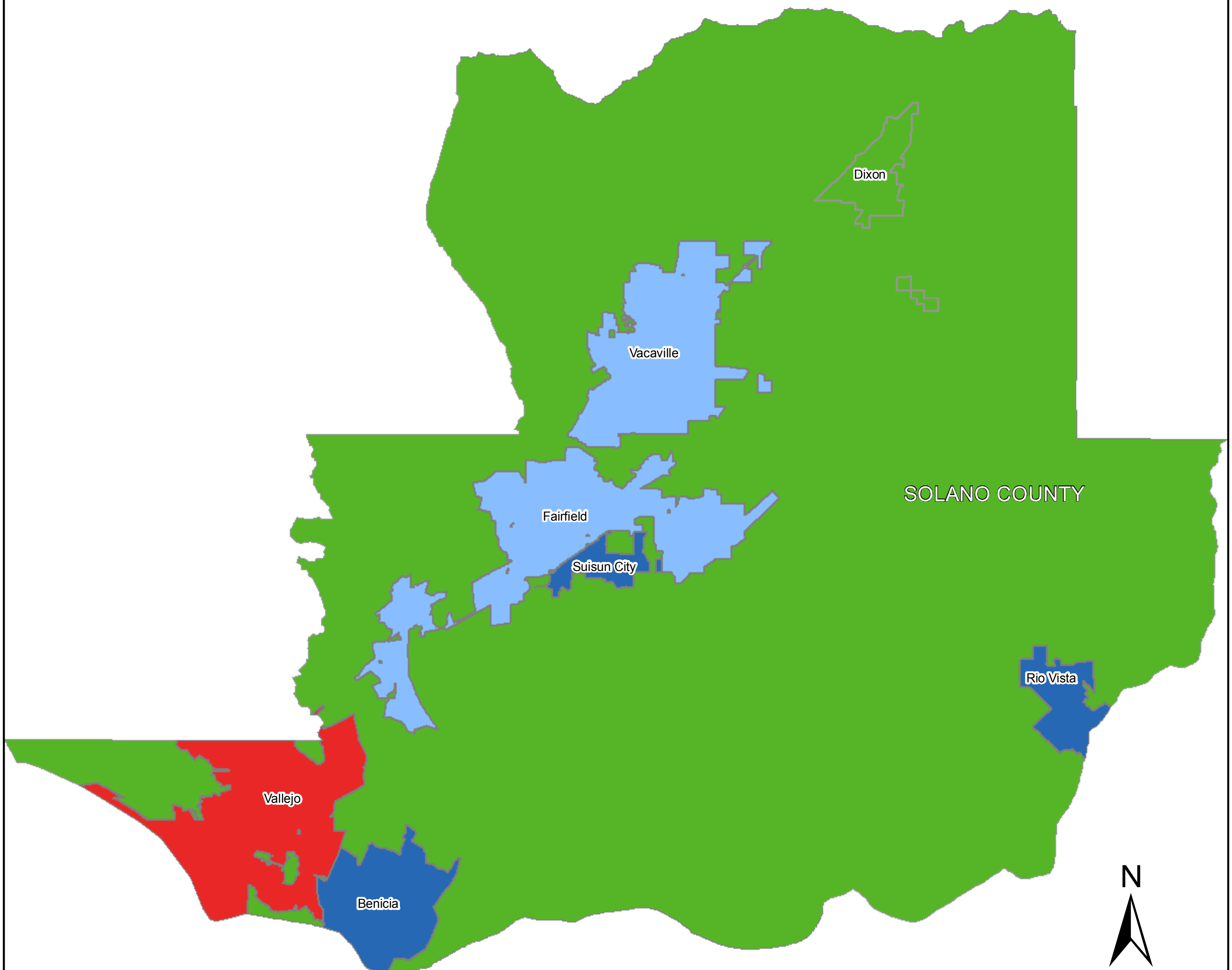
Siskiyou County



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



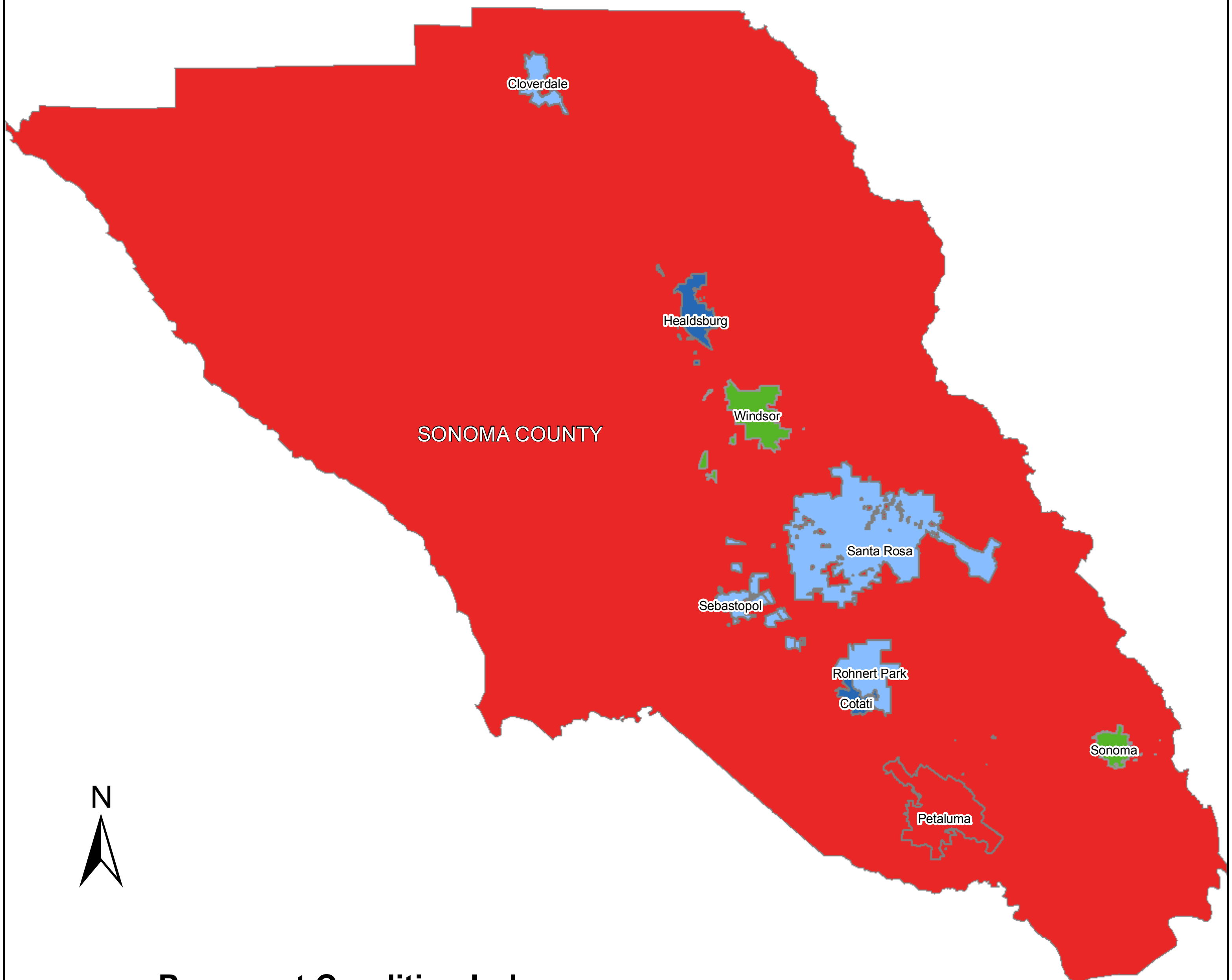
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Sonoma County

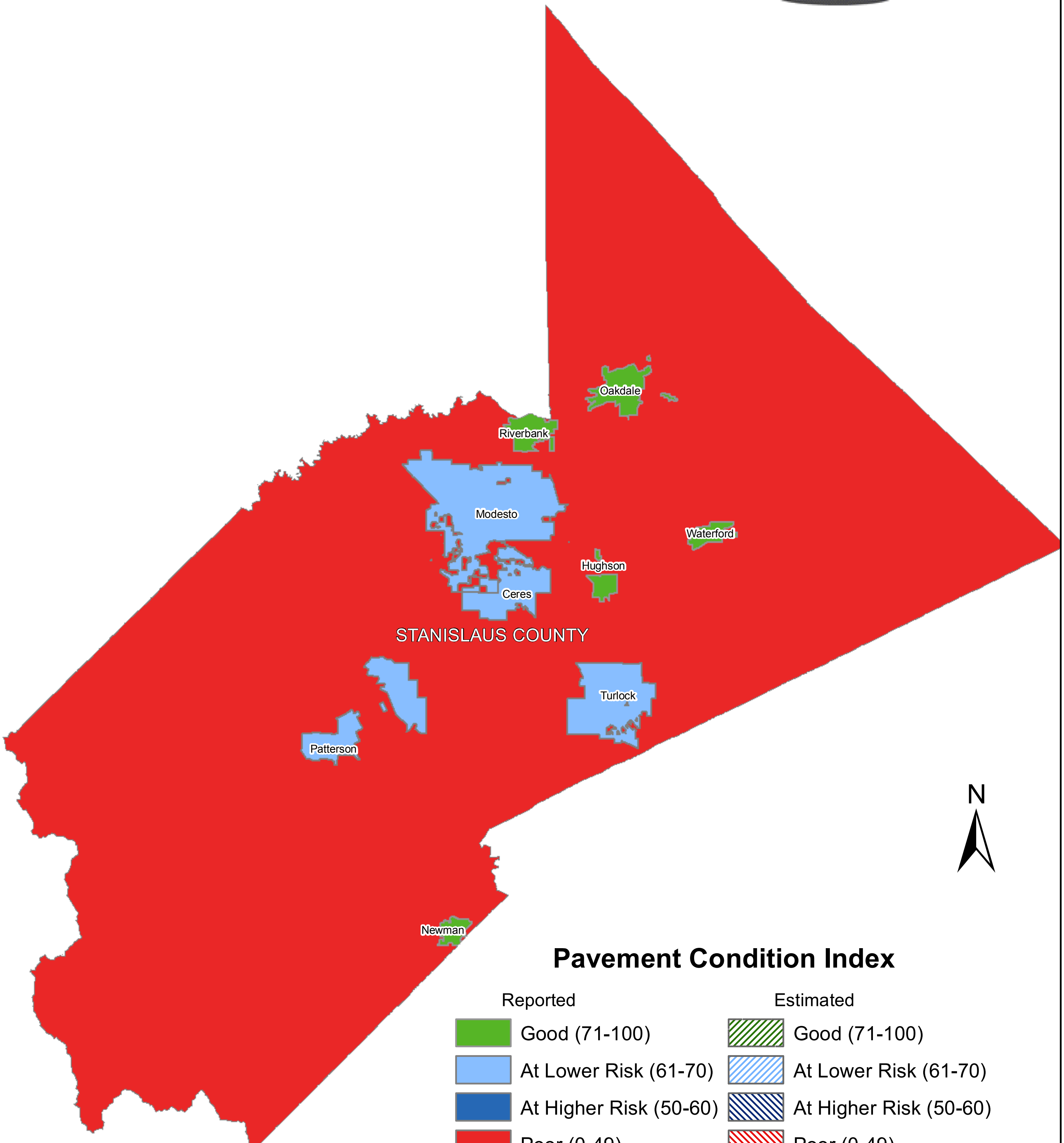


Pavement Condition Index

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

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Stanislaus County

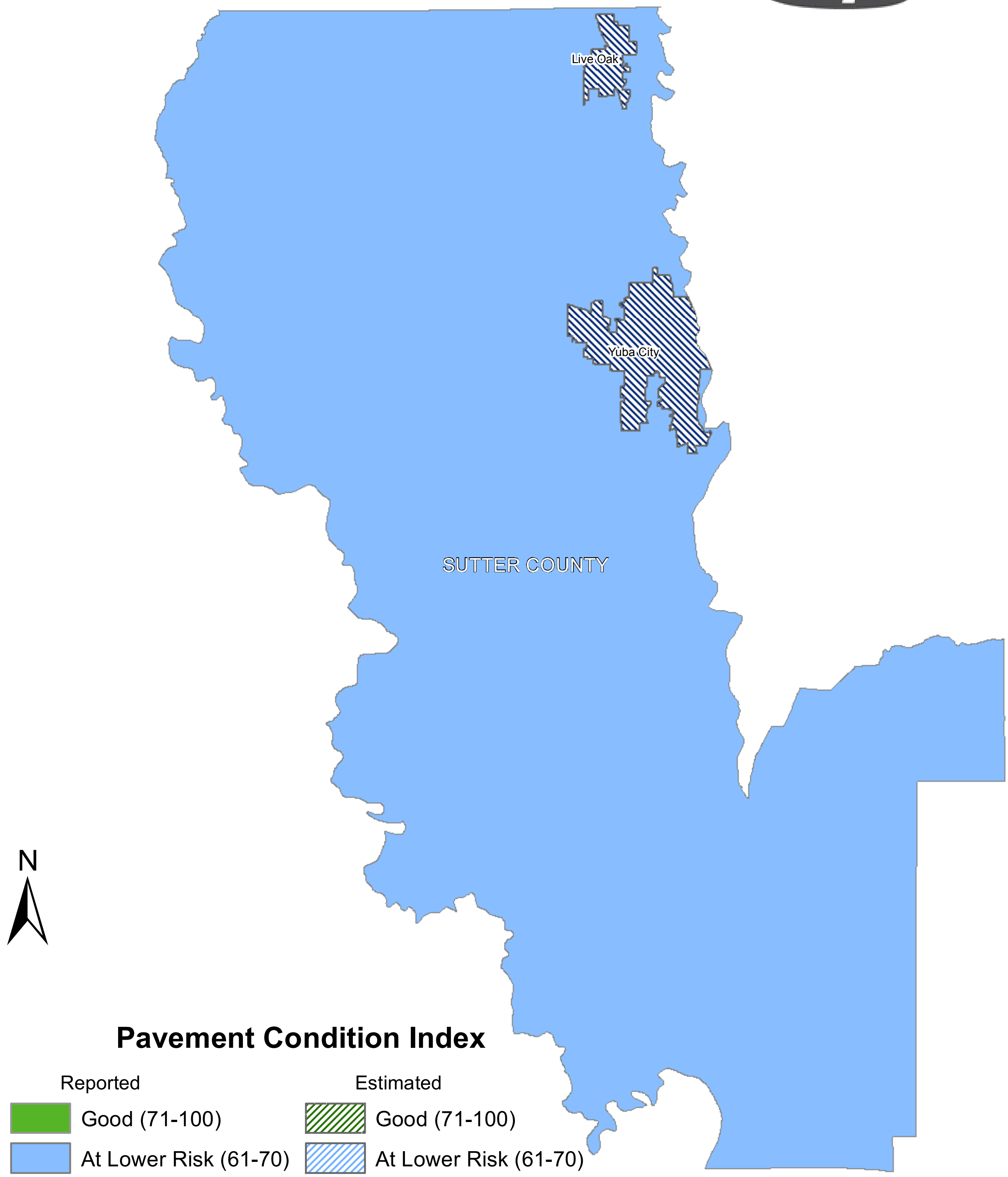


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Sutter County

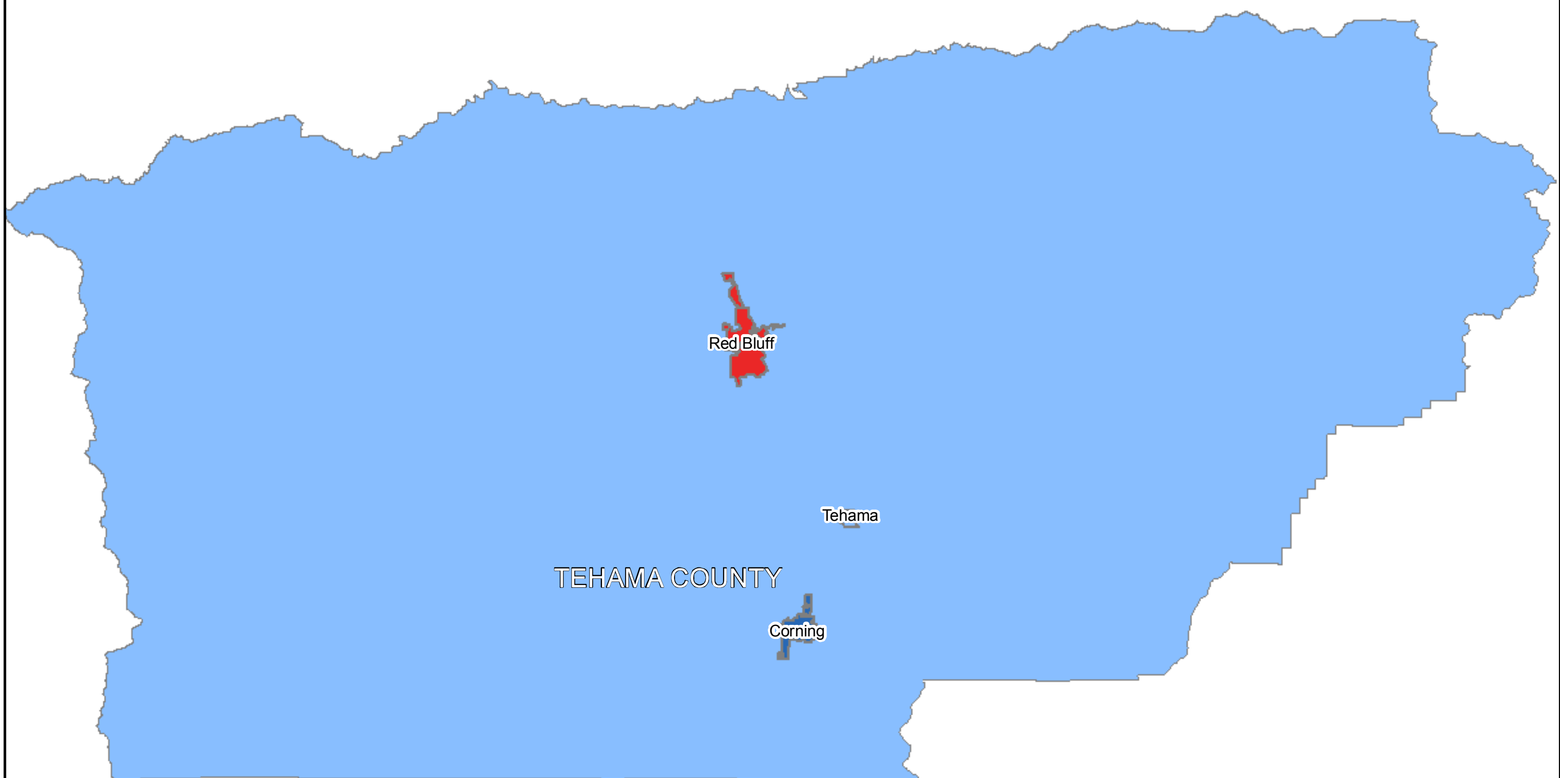


Pavement Condition Index

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)

Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Tehama County



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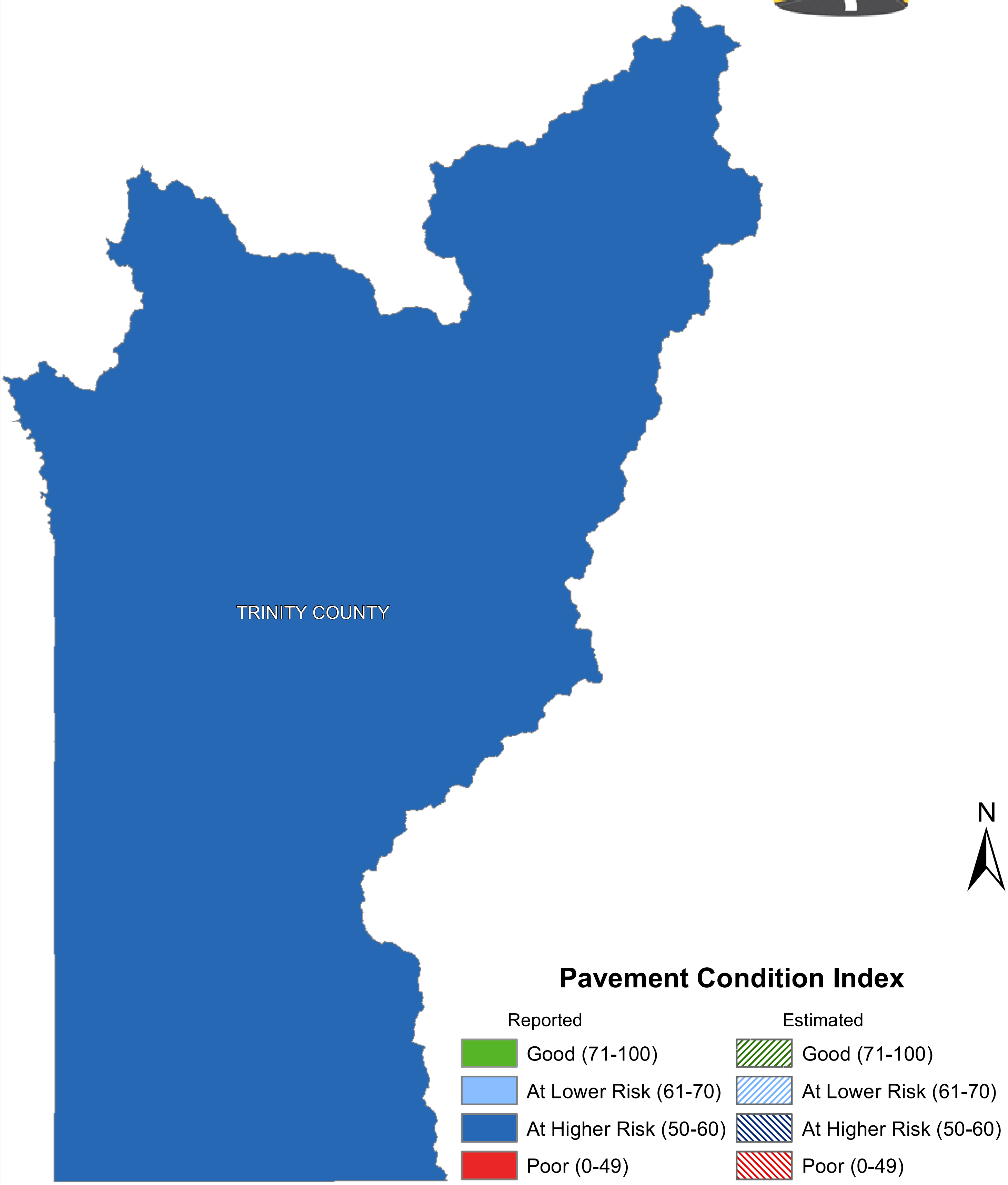
Pavement Condition Index

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)

Trinity County

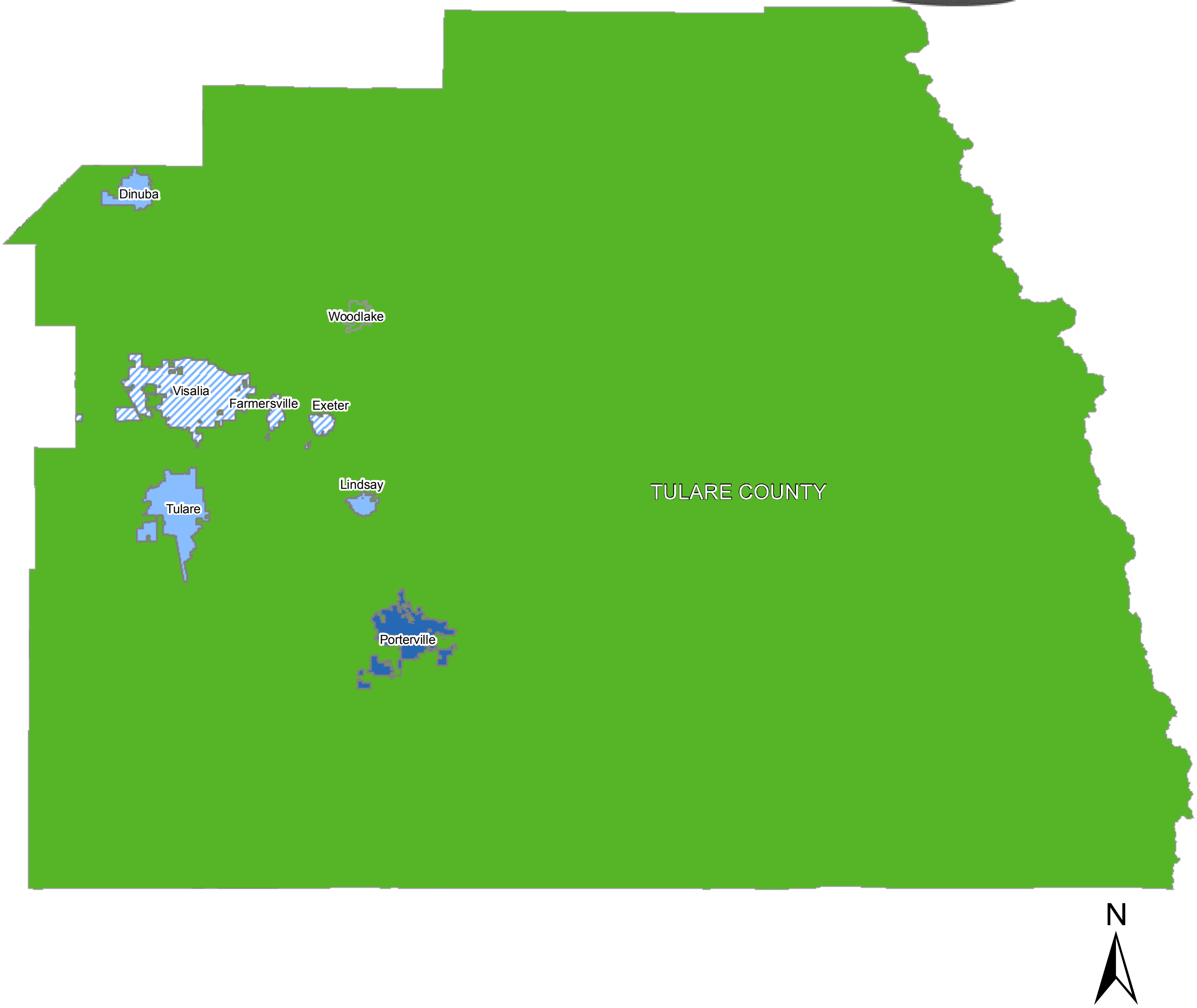


Pavement Condition Index

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)

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Tulare County

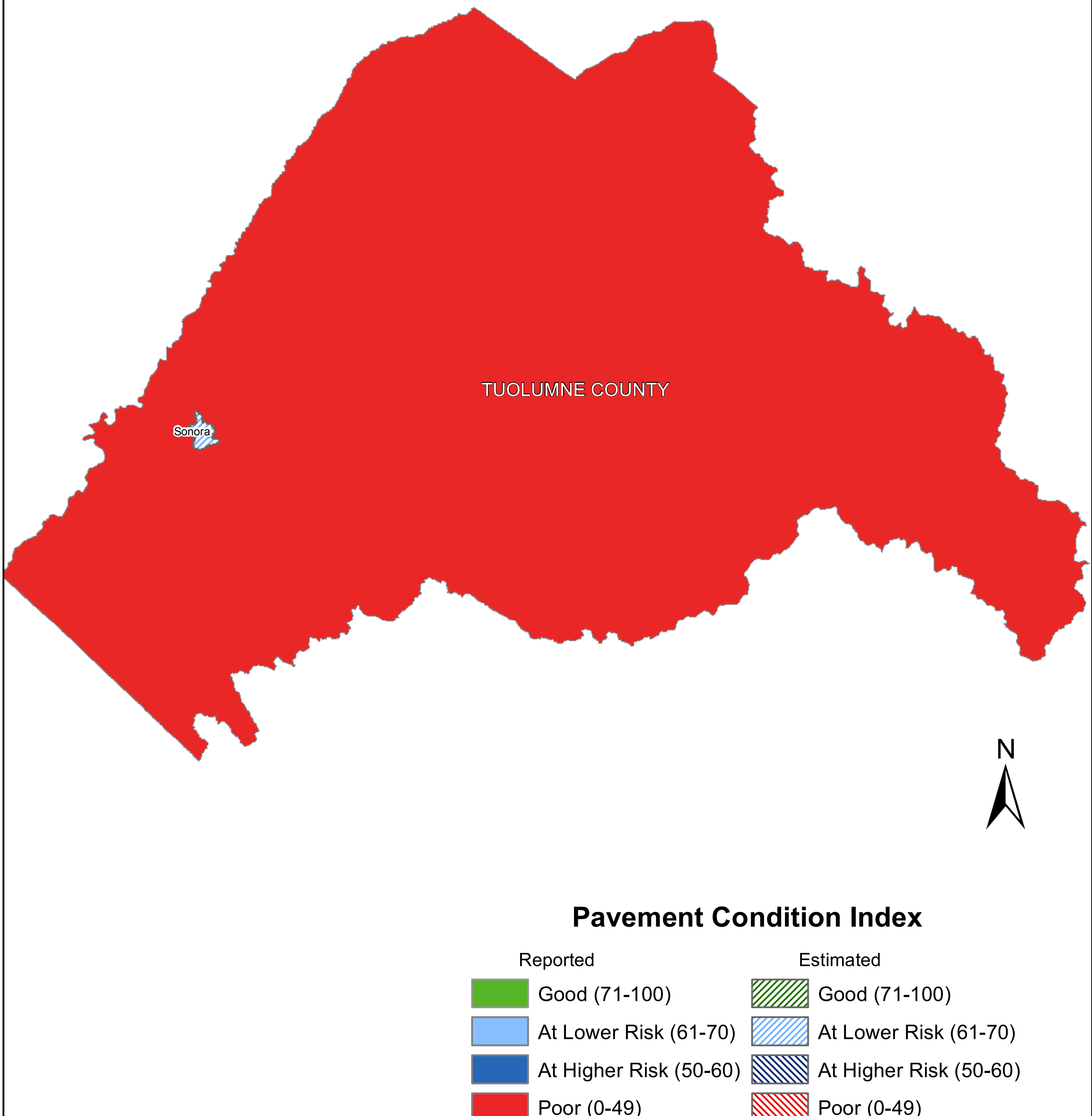


Pavement Condition Index

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)

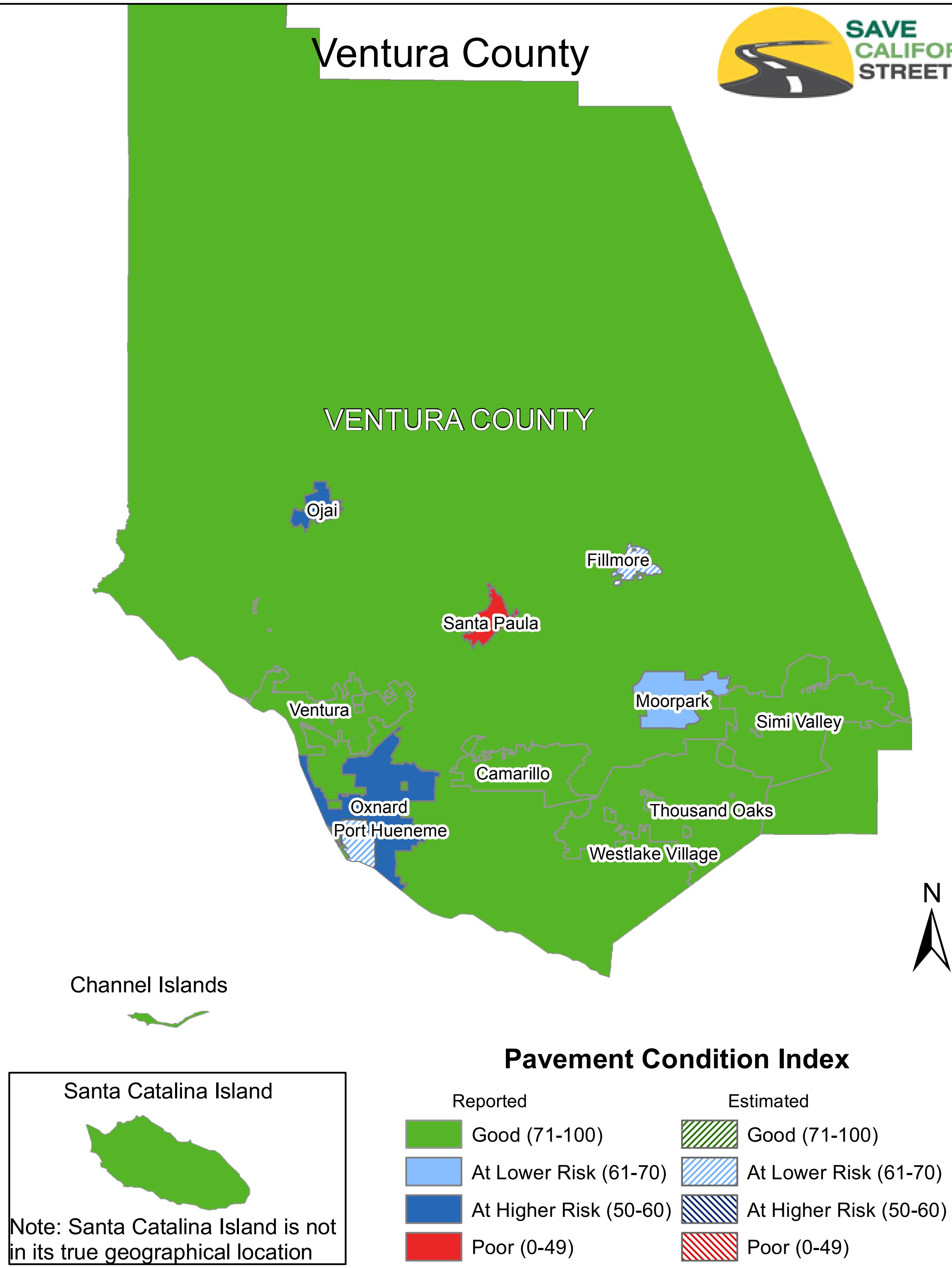
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Tuolumne County

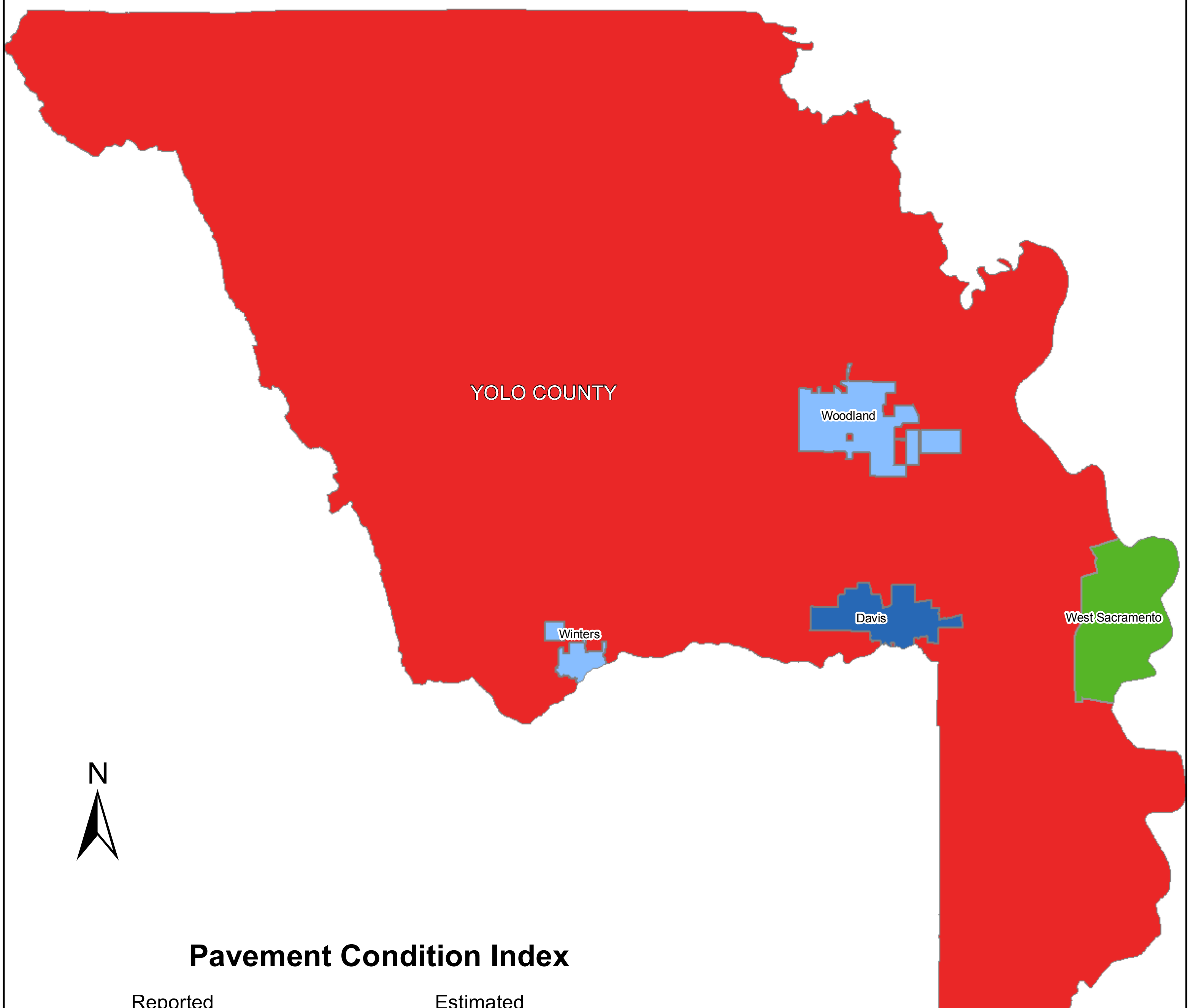


 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Ventura County



Yolo County



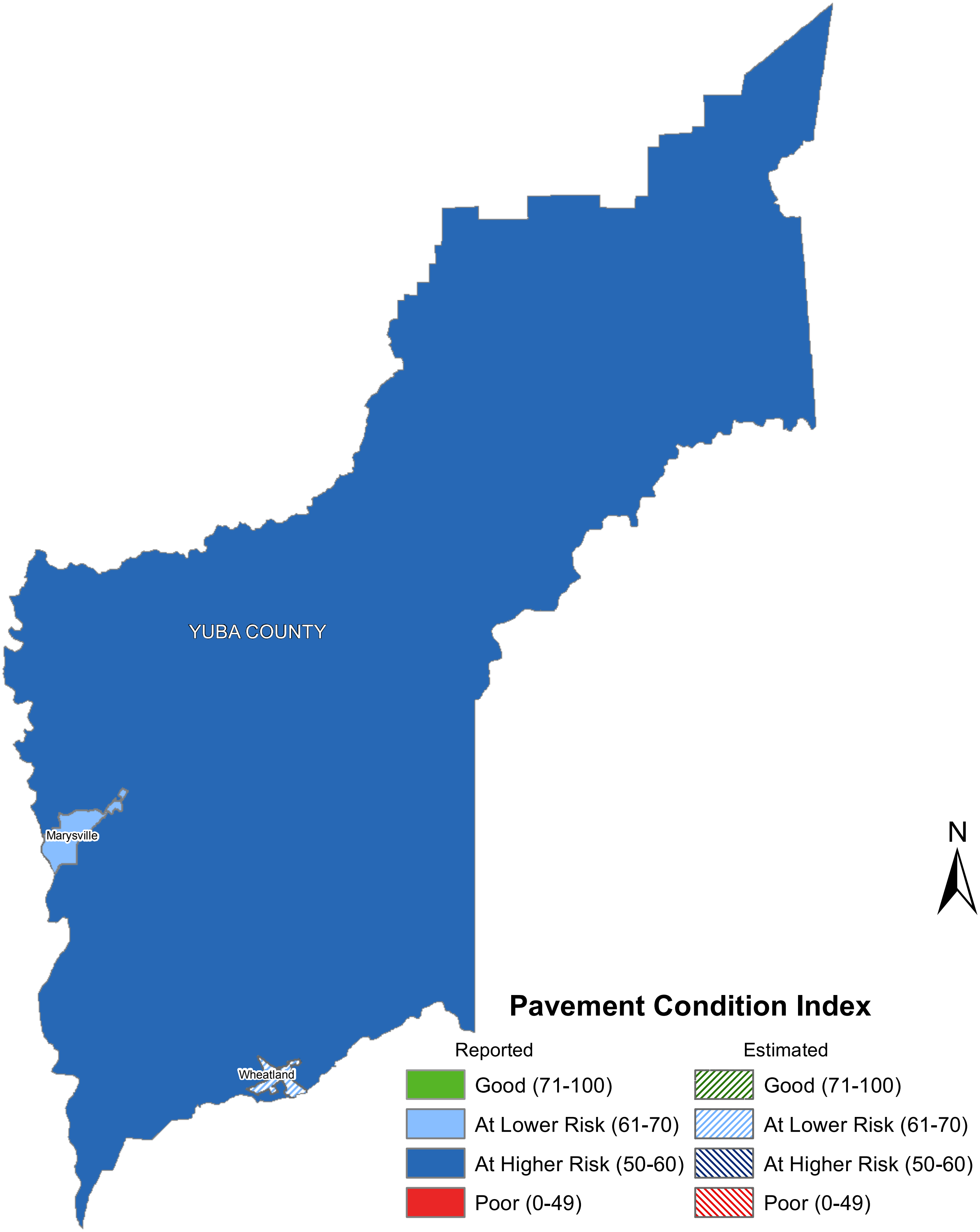
Pavement Condition Index

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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014.
Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

Yuba 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)

NCE

 GIS mapping data are from US Census Bureau TIGER Cartographic Boundary Shapefiles (https://www.census.gov/geo/maps-data/data/tiger.html), accessed October 2014. Boundaries represent incorporated city limits from U.S. Census data and are approximate in shape/area.

APPENDIX D

Essential Component Needs by County

Table D.1 Summary of Essential Component Needs By County

County	10 year Needs ($M)	County	10 year Needs ($M)
Alameda	$2,570	Orange	$2,060
Alpine	$4	Placer	$421
Amador	$5	Plumas	$31
Butte	$120	Riverside	$1,582
Calaveras	$7	Sacramento	$1,680
Colusa	$21	San Benito	$8
Contra Costa	$1,370	San Bernardino	$1,788
Del Norte	$34	San Diego	$2,097
El Dorado	$60	San Francisco	$2,358
Fresno	$244	San Joaquin	$728
Glenn	$24	San Luis Obispo	$213
Humboldt	$186	San Mateo	$776
Imperial	$107	Santa Barbara	$297
Inyo	$8	Santa Clara	$1,623
Kern	$561	Santa Cruz	$140
Kings	$109	Shasta	$203
Lake	$33	Sierra	$11
Lassen	$14	Siskiyou	$25
Los Angeles	$4,837	Solano	$553
Madera	$108	Sonoma	$853
Marin	$323	Stanislaus	$479
Mariposa	$6	Sutter	$114
Mendocino	$109	Tehama	$11
Merced	$127	Trinity	$10
Modoc	$4	Tulare	$301
Mono	$14	Tuolumne	$59
Monterey	$457	Ventura	$630
Napa	$184	Yolo	$239
Nevada	$27	Yuba	$25
Totals			**$30,989**

* Includes cities within County

APPENDIX E

Local Bridge Needs Assessment

Table E.1 Bridge Needs by County* (2012 $)

County Name	Number of Bridges	Average Sufficiency Rating, SR	Structures with SR ≤ 80	Structures with SR ≤ 50	Total Bridge Need
	EA		EA	EA	$ Million
Alameda	183	83	55	9	$120 M
Alpine	11	75	5	1	$1 M
Amador	39	66	19	9	$7 M
Butte	291	74	97	46	$82 M
Calaveras	67	76	27	9	$11 M
Colusa	148	86	27	11	$11 M
Contra Costa	287	83	83	15	$118 M
Del Norte	28	78	11	3	$12 M
El Dorado	87	66	45	17	$39 M
Fresno	491	81	156	34	$72 M
Glenn	167	76	58	22	$56 M
Humboldt	168	71	64	31	$119 M
Imperial	137	77	49	16	$18 M
Inyo	33	78	12	2	$3 M
Kern	258	87	57	4	$19 M
Kings	99	89	22	1	$4 M
Lake	78	73	28	13	$19 M
Lassen	64	78	24	6	$8 M
Los Angeles	1,456	85	451	28	$1,239 M
Madera	155	84	30	16	$38 M
Marin	112	74	44	16	$31 M
Mariposa	52	68	24	11	$16 M
Mendocino	137	74	55	20	$58 M
Merced	287	80	109	19	$27 M
Modoc	50	86	9	2	$1 M
Mono	11	80	3	1	$1 M
Monterey	133	69	52	31	$175 M
Napa	104	72	37	19	$35 M
Nevada	56	72	14	13	$26 M
Orange	507	84	179	13	$71 M
Placer	168	77	51	25	$29 M
Plumas	91	70	41	16	$34 M
Riverside	429	86	119	10	$71 M
Sacramento	375	84	86	21	$168 M
San Benito	46	76	14	7	$7 M
San Bernardino	480	76	109	91	$243 M

County Name	Number of Bridges	Average Sufficiency Rating, SR	Structures with SR ≤ 80	Structures with SR ≤ 50	Total Bridge Need
	EA		EA	EA	$ Million
San Diego	491	87	106	12	$95 M
San Francisco	23	73	12	3	$23 M
San Joaquin	323	85	78	14	$75 M
San Luis Obispo	183	76	83	17	$37 M
San Mateo	140	78	62	12	$36 M
Santa Barbara	178	80	47	21	$54 M
Santa Clara	447	78	118	64	$204 M
Santa Cruz	99	68	40	23	$57 M
Shasta	280	80	97	22	$66 M
Sierra	32	72	11	7	$13 M
Siskiyou	179	82	31	18	$32 M
Solano	199	87	41	7	$24 M
Sonoma	431	77	154	52	$150 M
Stanislaus	247	78	116	14	$81 M
Sutter	92	81	41	3	$3 M
Tehama	309	74	91	56	$136 M
Trinity	96	77	32	12	$24 M
Tulare	396	83	133	9	$29 M
Tuolumne	54	67	25	11	$10 M
Ventura	178	82	58	10	$81 M
Yolo	127	76	41	20	$27 M
Yuba	74	70	24	17	$30 M