

**Nevada County Department of Public Works
County Roads: Take Me Home**

2021-2022 Nevada County Grand Jury

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Nevada County Department of Public Works County Roads: Take Me Home

Summary

Roads are a crucial contribution to economic development and growth and bring important social benefits. Maintenance of our Nevada County roads is an essential part of these contributions. Traveling Nevada County roads, first and foremost, must be safe for the traveler. Roads maintained in good condition are safe to travel, increase property values, improve the overall quality of life, and provide evacuation paths in times of emergency. Nevada County maintains approximately 560 miles of roads, roughly 61% are paved (317 miles).

The Nevada County Grand Jury received a complaint requesting it investigate a claim of substandard roadwork by Nevada County Public Works Division. The Nevada County Grand Jury found the complainants' concerns were brought to the attention of the district supervisor. Eventually, several Nevada County employees, including the Nevada County Counsel, were involved in responding to the complainant. The complainant was not satisfied with Nevada County's response.

The Nevada County Grand Jury initially focused on quality standards, inspection records, road crew training, equipment usage, etc. of the Road Maintenance Division. The Nevada County Grand Jury found insufficient inspections records, aging equipment in need of costly repairs and training to be "on the job."

The Nevada County Grand Jury expanded the scope of the investigation to include the condition of all equipment maintained by the Fleet Services Division but owned by the Road Maintenance Division.

The Nevada County Grand Jury recommends Nevada County Public Works Department develop robust processes for capturing all related costs associated with road repairs, and equipment. The Jury recommends the use of industry best practices when deciding between preservation or replacement.

Glossary

BoS – Board of Supervisors

CIP – Capital Improvement Plan

County – Nevada County

Engineering – Nevada County Public Works Department, Engineering Division

F - Fahrenheit

Fleet – Fleet Services Division

ISF – Internal Service Fund

Jury – 2021-2022 Nevada County Grand Jury (Grand Jury)

PCI – Pavement Condition Index

Public Works – Nevada County Department of Public Works

RES – Resolution

Road Maintenance – Nevada County Public Works Department, Road Maintenance Division

RPI – Replacement Priority Index

SB – Senate Bill

SHC – Streets and Highway Code

Background

The Nevada County (County) Grand Jury (Jury) received a complaint requesting an inquiry into a claim of substandard roadwork by Nevada County Department of Public Works (Public Works).

The State of California recognizes the road infrastructure in the state is aging. In 2017, the California State Senate passed Senate Bill (SB) 1: “The Road Repair and Accountability Act of 2017”.¹ SB 1 increased several taxes and fees to raise \$5 billion annually. SB 1 prioritizes funding towards maintenance, rehabilitation, and safety improvements. Nevada County is recipient of approximately \$3 million per year in SB 1 Funds. In addition to SB 1 funds, funding for road maintenance and capital improvements comes from a mix of General Fund, taxes, state, and federal revenue.

County Public Works comprises several different divisions of which the Engineering Division (Engineering), Road Maintenance Division (Road Maintenance) and Fleet Services Division (Fleet) are the primary focus of this report:

- Engineering provides a variety of technical services, support, and planning, including “Project Design, Inspection, Contract Preparation, Traffic Analysis, Special Districts, Encroachment Permits, and Reviews/Inspections.”²
- Road Maintenance is responsible to protect, repair and maintain the County's road system infrastructure, including and not limited to snow removal, storm damage response, vegetation management, drainage and shoulder maintenance, bridge maintenance, and surface preservation.³
- Fleet is responsible for the acquisition, utilization, repair and replacement of County owned vehicles and equipment.

Approach

¹ https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1

² [Engineering | Nevada County, CA \(nevadacountyca.gov\)](https://www.nevadacountyca.gov/Engineering)

³ [Road Maintenance | Nevada County, CA \(nevadacountyca.gov\)](https://www.nevadacountyca.gov/RoadMaintenance)

During the investigation, the Jury interviewed:

- A member from the County Board of Supervisors (BoS)
- Employees of Public Works
- Private paving contractor

The Jury reviewed the following documents:

- Email correspondence between County employees and the complainant
- Email correspondence between various County employees
- Fleet maintenance records (June 30, 2020, to July 1, 2021)
- Roads Equipment List with Replacement Priority Index (RPI)
- BoS meeting minutes and packets
- Private Contractor Assessment
- BoS Resolution (RES) 20-072
- 2020 Road Rehabilitation Project County Contract No. 450006
- Engineering 2020 Road Rehab Quantities worksheet
- California Statewide Local Streets and Roads Needs Assessment, Final Report August 2021
- Photographs before and after the repair
- Public Works, Capital Improvement Plan (CIP) 2021 Annual Update⁴
- Road Maintenance Daily Diary
- California Streets and Highways Code (SHC), The County Road Systems {Sections 2004.5-2010}
- 2021-2022 Nevada County Adopted Budget

Discussion

The Jury received a complaint alleging substandard road repair, completed by the County at a residential cul-de-sac. This repair work was done by Road Maintenance.

The Jury learned the complainant's cul-de-sac was originally included in Engineering's 2020 Roads Rehab Quantities List as needing "milling and pulverizing." Mill and pulverize is a full-depth reclamation process, in which all the pavement and some of the underlying material is pulverized and treated with an additive to produce an improved stabilized road base. This process is a full road asphalt depth replacement.⁵ The repair cost for the cul-de-sac was estimated by Engineering to be \$35,591.

Road repair priority is based on road safety, road conditions and average daily trips. Heavily traveled roads in need of repair move toward the top of the repair list. Less traveled cul-de-sacs in need of maintenance will move toward the bottom of the list due to fewer average daily trips.

⁴ <https://www.nevadacountyca.gov/DocumentCenter/View/26478/Annual-Capital-Improvement-Plan?bidId=>

⁵ www.teamelmers.com

There are six other cul-de-sacs in the same geographical area on the quantities list. The estimated repair costs for each of these cul-de-sacs ranged from \$1,938 to \$9,884. These six cul-de-sacs were included in the 2020 Road Rehabilitation Project County Contract No. 450006; however, even though the complainant's cul-de-sac was on the Quantities list it was designated to be saved for 2021 "mill and pulverize" work, and not included in the contract. The six cul-de-sacs were repaired in 2020 by a private company under contract to the County.

The decision was made by the County to use Road Maintenance for repair of the cul-de-sac rather than through the above-mentioned contract. This entailed digging up tree roots and patching with asphalt. Once completed and visually compared to the other six cul-de-sacs in the area there was a noticeable difference in the quality of the surface.

Prior to the work, there was no communication between the County and the residents of the cul-de-sac of what work was planned, when the work would be scheduled, and what to expect of the completed work.

Over the course of the following months, at the insistence of the complainant, County Engineers, Department Heads, Directors, BoS, and County Counsel reviewed the work. All concluded the road to be operational with no need for additional work. The County suggested to the complainant that the residents of the cul-de-sac could form a Private Road District (PRD) if they wanted more work completed. Funding would come from an additional tax collected with their property tax. These funds would accumulate over time and be used to maintain the cul-de-sac.

The Jury learned, from Public Works internal emails and interviews, the work performed in November 2020 was considered "late in the season," meaning there was a potential risk to the project. Materials used to patch the pavement require heat to adhere to existing subsurface asphalt. The work was done on Nov 3, 2020. Temperatures on this day ranged from low to mid 70s Fahrenheit (F) during the day to mid-40s F at night. The temperature grew increasingly colder dropping 25° F by Nov 6th with rain and lows to mid-30s F at night.⁶ The ideal temperature for doing this work is a consistent, above 70° F. Temperatures dropping to 40° F at night requires the pavement to warm up prior to repairing. In November, this warming of the roadway may not have been possible. Road Maintenance kept no records of materials used, temperatures of tack oil and pavement, or daily environmental conditions. Sources informed the Jury that Engineering requires contractors to record this information daily. Road Maintenance does not have this requirement. The Jury was told the road crew would place their hand on the "hot box" and if hot to the touch, then the work could proceed, if not the crew would take the material back. The Jury learned hot mix asphalt temperature should be between 270° – 325° F when applied, while "hot to the touch" is closer to 140° F. This method of testing temperature could lead to cooler materials than required for adherence to the subsurface asphalt. The testing by this "touch" method may pose a safety risk and/or injury to staff.

⁶ <https://weatherspark.com/h/d/1188/2020/11/3/Historical-Weather-on-Tuesday-November-3-2020-in-Nevada-City-California-United-States#Figures-ColorTemperature>

The substandard work on the cul-de-sac is described as excessive loose asphalt, asphalt chunks unraveling from the substrate and a raised lip resulting in a tripping hazard. In response, the County sent a street sweeper twice to remove the loose debris. Road Maintenance also returned to eliminate the tripping hazard.

The work on the cul-de-sac was reviewed by a private contractor. The contractor approached by the residents, working pro-bono, stated in his written assessment report “it is unequivocally the worst asphalt paving job I have ever seen in my 32 years in this business.” The County continued to maintain the road was operational.

The complainant's cul-de-sac is not scheduled for additional work until 2025 per the CIP where it is listed under Brushing, Shoulder, General Maintenance Project.

To quote the *California Statewide 2020 Local Streets and Roads Needs Assessment*⁷:

To use taxpayer money wisely, it makes more sense to preserve and maintain roads in good condition than to wait and repair or replace them when they deteriorate or fail. For example, it costs as much as fourteen times more to reconstruct a pavement than to preserve it when it is in good condition.

The *California Statewide 2020 Local Streets and Roads Needs Assessment*, prepared by Nichols Consulting Engineers is a comprehensive statewide study of California’s local street and road systems. The assessment uses a scale of 0 (Failed) to 100 (excellent) to categorize the pavement condition. The scale is referred to as the Pavement Condition Index (PCI).⁸ The scale 0 to 100 is divided into ranges classified as follows:

- 86-100 (Excellent)
- 71-85 (Good)
- 50-70 (At Risk)
- 0-49 (Poor)

According to the *County of Nevada Annual Comprehensive Financial Report* for fiscal year ended June 30, 2021, the County set a goal of average PCI for County maintained roads at a rating of 62 “At Risk.” This same assessment indicates Nevada County roads had a PCI rating of 72, “Good” in 2008 and by 2020 had fallen to a rating of 67, “At Risk.”

Equipment

Road Maintenance owns and operates approximately one hundred (100) pieces of equipment. The equipment ranges from trailers and pickups to road graders and street sweepers. All equipment is managed and maintained by Fleet.

⁷ <https://www.savecaliforniastreet.org/wp-content/uploads/2021/08/Statewide-2020-Local-Streets-and-Roads-Needs-Assessment-Final-8-4-21.pdf>

⁸ [Pavement condition index - Wikipedia](#)

Fleet mechanics do most of the routine maintenance and repairs as needed. There are times when some specialty equipment must be outsourced for repairs or servicing, if under warranty. Fleet maintains a record of all maintenance and repairs for each piece of equipment.

The Fleet Manager calculates a Replacement Priority Index (RPI) and documents this value for all equipment. This list and associated RPI is provided to the Road Maintenance Manager for prioritizing capital expenditures. The formula for RPI considers the age, mileage or hours, annual usage, depreciation, and current value. Equipment with an RPI of less than 1.0 is not considered for replacement. However, if RPI is over 1.0, then equipment is considered for replacement.

All equipment has a calculated RPI. For example, the Road Maintenance equipment RPI ranges from .01 for a 2020 Ford 350 Pickup (does not need replacement) to a 1990 Ford Elgin Street Sweeper index of 21,877. (This is not a mistake: 21,877 needs replacement.) Over 80 of the 100 pieces of equipment owned by the Road Maintenance Division currently have an RPI greater than 1.0.

Equipment maintenance expenditures for fiscal year 2020-2021 were \$893,995. According to maintenance records there were 72 road calls which required a mobile repair unit. The cost of lost productivity for those employees who rely on equipment to do their job should be added to the direct maintenance cost. Downtime is not recorded and thus the aggregate cost of equipment failures is not known. The Jury learned there is always a plan “B” in place because equipment failures are common.

Equipment failures, while in use, could result in a safety and/or injury risk. For example, there are several road calls involving leaking hydraulic lines. Hydraulic fluid is under pressure and is hot enough to burn flesh. None of the interviewees or records reviewed mentioned any workplace injuries.

According to 2021-2022 Adopted Budget⁹, Fleet has established a new Road Equipment Internal Service Fund (ISF) to secure replacement funds for purchase of new, up-to-date equipment compliant with California emissions standards.

Every county in California has a Road Commissioner appointed by the BoS, according to the Street and Highways Code (SHC, section 2006).¹⁰ In Nevada County, the appointed individual is the Director of Public Works. SHC, section 2007 states,¹¹

The Road Commissioner shall each year prepare a tentative road budget covering all proposed expenditures for the ensuing fiscal year for county road purposes. The road commissioner shall submit the budget to the BoS in accordance with Chapter 1 (commencing with Section 29000) of Division 3 of Title 3 of the Government Code and in the form and manner prescribed by the Controller and at the same time as other county

⁹ [FY-2021-2022-Nevada-County-Adopted-Budget \(nevadacountyca.gov\)](https://leginfo.ca.gov/pub/21_2021/budget_fiscal_year/2021_2022/2021_2022_nevada_county_adopted_budget.html)

¹⁰ https://leginfo.ca.gov/faces/codes_displaySection.xhtml?sectionNum=2006.&lawCode=SHC

¹¹ https://leginfo.ca.gov/faces/codes_displaySection.xhtml?sectionNum=2007.&lawCode=SHC

departments submit their recommended budgets. The BoS shall hold public hearings on the proposed road budget at the same time as the general County budget is considered.

The Jury found no evidence of a proposed budget, as required in SHC, section 2007, presented to the BoS for approval. The CIP is submitted for approval per the requirements of SB 1. The CIP does not cover all proposed expenditures.

The SHC section 2010¹² states:

In order that the provisions of this chapter may be effectively carried out, the members of the board of supervisors of their respective counties shall make reasonable inspection from time to time of the roads within their counties maintained from funds supplied by this chapter.

Conclusion

The Jury, first, focused on quality standards, inspection records, road crew training, equipment usage, etc. of Road Maintenance. The question remained as to why the Engineering assessment of work, which the cul-de-sac needed, was not postponed, and included in the next budget cycle. The County made the decision to repair the road with an asphalt patch instead of the Engineering assessment of the road needing more substantial work as defined by “mill and pulverize.”

The County has a dedicated road inspector who inspects incremental progress of contract work. Each Road Crew Supervisor serves as inspector for their own crew. This may lead to less than objective and varying quality acceptances.

Engineering provides assessment and decisions to either use contractors or the Road Maintenance Division for repairs. The decision to use Road Maintenance was a temporary fix. The work was scheduled late in the season, risking the effect of cold weather on the quality of the sealing process. Since the work was done in sub-optimal temperatures, this area of road will require additional work with additional cost. Engineering is the appropriate department to analyze and evaluate the short and long-term costs.

Fleet maintains all equipment used by Road Maintenance. Fleet utilizes the Replacement Priority Index (RPI) for all vehicles and equipment owned by Road Maintenance. This data is used to prioritize the replacement of equipment. Currently, 80% of Road Maintenance equipment and vehicles should be replaced based on this Replacement Priority Index value. Public Works has not prioritized and provided the BoS with equipment replacement cost estimates for budget allocation.

¹² https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=2010.&lawCode=SHC

The Road Maintenance Division is designed as reactive and not necessarily proactive. This division is the go-to division when something is needed immediately. Safety issues such as missing stop signs, downed trees, or “axle buster” potholes are examples of immediate needs. This division has six crews. Each crew is assigned a specific zone or area within the County. Crews may from time-to-time work outside their assigned zone or area to cover all 560 miles of Nevada County roads. The Road Maintenance crews do not have the type of equipment which may be available to an independent contractor.

Findings

- F1. The County has no policy, procedure, or protocol for notifying residents of dates for road repairs.
- F2. The County responses to customer complaints resulted in unsatisfactory resolution to the complaints.
- F3. Repairs made in substandard conditions (below 70° F) resulted in substandard repairs.
- F4. Road Maintenance does not document temperatures of material used, roadway surface, and/or outside weather conditions.
- F5. The road crew supervisor is inspecting his own crew's work and therefore may lose objectivity.
- F6. The repair was not completed as a “mill and pulverize” project as needed according to Engineering, but as a “grind and patch” project by Road Maintenance.
- F7. The County indicates an average PCI of 62 “At Risk” for county roads to be acceptable.
- F8. RPI is not used by the County to decide funding priorities for equipment replacement.
- F9. A full accounting of maintenance and repair costs of equipment is not utilized for present and proposed budget purchases.
- F10. There are no records of labor downtime during the “Plan B” transitions due to equipment failures. Adding these costs to the cost of equipment maintenance provides a full accounting of expenses.
- F11. The Internal Service Funds budget is currently inadequate for equipment replacement.
- F12. The Road Commissioner is required to submit a road budget request annually to the BoS legislated by state statute SHC, section 2007. The Jury found no evidence of compliance with section 2007

- F13. Road Maintenance does not keep the same vital inspection records during road repairs, which are required by County contractors.
- F14. Per SHC, section 2010, members of the BoS are to make reasonable inspection from time to time of the roads within their counties maintained from funds supplied by “Chapter 1. The County Road System” of the SHC. The Jury did not find a public record indicating compliance with section 2010
- F15. There are no records found of a presentation made to the BoS regarding equipment replacement.

Recommendations

- R1. Develop and implement procedures to notify residents affected by road work prior to starting, especially in closed neighborhoods such as cul-de-sacs.
- R2. Develop and implement a policy and procedure to inspect work done by Road Maintenance in line with what is required of private contractors.
- R3. Develop and implement a daily inspection report for all Road Maintenance jobs, including downtime caused by equipment failure.
- R4. Residential cul-de-sacs have a low daily trip value compared to through streets and therefore have a lower budgetary priority. Recommend the Public Works include in CIP, low daily trip County streets, based on road condition need.
- R5. The Jury recommends the County revise their stated goal of average PCI 62 in the CIP to an average PCI of 71 or better.
- R6. Recommend the RPI list, with estimated replacement costs, be presented to the BoS annually, requesting funding for equipment and/or funding for ISF at the same time as the annual budget request.
- R7. Recommend adequately funding the ISF for equipment replacement, and clearly define fund balances in the budget.
- R8. Recommend Road Commissioner present to BoS tentative road budget covering all proposed expenditures for the ensuing fiscal year for County Road purposes.

- R9. Recommend the BoS, per SHC, section 2010, make reasonable inspection from time to time of the roads within their district and submit a report at a public board meeting outlining their inspection.

Responses Required

Pursuant to Penal Code section 933.05, the following responses are required:

- The Director of the Nevada County Department of Public Works; respond to R1–R8 within **60** days of receipt of this report.
- The Nevada County Board of Supervisors respond to R6-R9 within **90** days of receipt of this report.

Pursuant to Penal Code section 933.05. the following responses are requested:

- The Road Maintenance Division Manager of the Nevada County Department of Public Works respond to R1–R3 and R6 within **60** days of receipt of this report.
- The Engineering Division Manager of the Nevada County Department of Public Works respond to R2, R4, R5 within **60** days of receipt of this report.
- The Fleet Services Division Manager of the Nevada County Department of Public Works respond to R6 and R7 within **60** days of receipt of this report.

Responses are to be submitted to the Presiding Judge of the Nevada County Superior Court in accordance with the provisions of California Penal Code Section 933.05. Responses must include the information required by Section 933.05