

Save Our Survey Monuments

Help Preserve Our Survey Monuments!

The seriousness of the situation of damaged or lost survey monuments must be addressed today to safeguard California's civil infrastructure.

Photo: Philip Melcher



By **League of California Surveying Organizations (LCSO)** Monument Preservation Committee

Acknowledgments

David Bush

Surveyor, Orange County Public Works

Dana J. Caccamise II

National Geodetic Survey Pacific Southwest Regional Advisor

Joseph Dechellis

Deputy County Surveyor, County of Ventura

Kevin Hills

Orange County Surveyor, Orange County Public Works

Kevin C. Maxwell

Chief, GNSS & Geodetic Control, California Department of Transportation (Caltrans)

Caleb McCallister

Enterprise Data and Geospatial Governance Manager, California Department of Transportation (Caltrans)

David McMillan

County Surveyor & Servant Leader, Riverside County

Michael Mueller

Surveyor, Hogan Land Services

Dana Robie

Surveyor (Ret.), California Department of Transportation (Caltrans)

Bobbi Simmons

Graphic Design and Editing, Simmons + Associates Graphic Design



The LCSO Monument Preservation Committee stands as a stalwart defender of California's land survey markers' future. Comprising experienced land surveyors and academic experts, this dedicated assembly convenes monthly to confront the pressing challenges posed by the destruction of these crucial markers in our state and offer up solutions to these problems.



Executive Summary

Executive Summary

Survey monuments and bench marks are essential physical markers used in land surveying and mapping throughout our cities and counties. **Survey monuments (also called markers)** are typically made of durable materials like concrete or metal and are placed at strategic locations, such as property corners and intersections, to **establish precise property boundaries**. Similarly, **bench marks** are markers primarily used for determining **elevations and vertical measurements**. Both survey markers and bench marks are **crucial for accurate and reliable land surveying data**, and they serve as the **foundation for surveying, cartography, construction, engineering, and land-use planning activities**.

Despite their significance and our legal obligation to protect them, survey monuments and bench marks face a myriad of challenges that endanger their preservation and, consequently, **the accuracy and integrity of California's geographic information system's database**. Susceptibility to various **physical threats** can lead to their damage, displacement, or destruction. **Heavy machinery, digging, and ground vibrations** can dislodge or render survey monuments inaccurate, resulting in potential discrepancies in property boundaries and spatial data. **Natural disasters such as earthquakes, floods, and landslides can cause severe damage** to survey monuments, exacerbating their vulnerability.

Survey monuments are expensive to establish, but they are **significantly more expensive** to re-establish when they are destroyed. Addressing the issue of threats to survey markers and bench marks is paramount to maintaining the integrity of our state's geographic information system and preventing potential legal disputes that may arise from inaccurate survey data. The seriousness of the situation of damaged or lost survey monuments must be addressed today to safeguard California's civil infrastructure.

Monument preservation requires a **collaborative effort** from stakeholders, including public works decision makers, engineers, surveyors, and others. In this guide, we provide essential strategies for trade professionals to **preserve and safeguard civil infrastructure monumentation**. By utilizing **outreach strategies**, as well as accurate techniques for locating these marks, combined with efficient reporting and rigorous replacement strategies, we can safeguard California's survey monuments for current and future generations.



Photo: Brian Kong

What's Happening?

What's Happening?

Civil infrastructure monuments are critical components that define accurate land boundaries and spatial data. These markers are essential for construction efforts, and they support mapping and numerous other industries, including government and community services.

Other types of at-risk survey monuments include bench marks and geodetic control marks. Bench marks and geodetic control marks serve as reference points for determining elevations and positions at both the national and global level.

Lack of Awareness

One of the most significant challenges in survey monument preservation is the **lack of public awareness** concerning their importance. Lack of awareness can lead to accidental damage or disturbance during construction and other activities.

Inadequate Reporting Mechanisms

The absence of an efficient and user-friendly reporting system is another obstacle in survey monument preservation. Damaged or missing survey monuments must be reported in a timely manner to avoid unnecessary delays in their repair or replacement. **Lacking accessible reporting channels, citizens and professionals face challenges in notifying appropriate authorities,** leading to either a delayed response or leaving issues unreported altogether.

Insufficient Funding and Resources

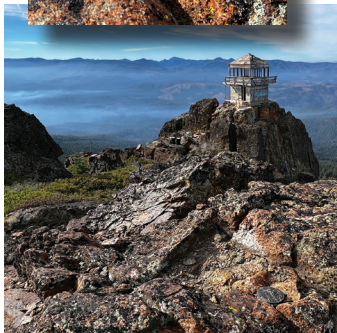
Preserving survey monuments requires dedicated funding and resources, however budget constraints and competing priorities may result in inadequate attention and financial support for this critical issue. A lack of financial resources can hinder preservation efforts, thus contributing to the deterioration of survey markers and the potential loss of valuable data and time.

Discrepancies in Record-Keeping

Accurate record-keeping is vital for maintaining a comprehensive inventory of survey monuments and their historical data. **Discrepancies in record-keeping practices can lead to incomplete or outdated information** regarding existing survey markers. Without a precise and up-to-date registry, surveyors face challenges in identifying and locating survey monuments.



Photo: Philip Melcher



Photos: Philip Melcher



Photo: Steve Martin

Fragmented Responsibilities

Survey monument preservation requires multiple stakeholders, including government agencies, local authorities, private landowners, and construction companies, and it is a legal obligation (Reference: [CA Bus & Prof Code § 8771 \[2022\]](#)). Fragmented responsibility can lead to challenges in coordinating preservation efforts and raising awareness across all relevant parties.

Impact on Land Surveys and Legal Disputes

When survey monuments are damaged, disturbed, or lost, inaccuracies in land surveys can negatively affect property boundaries and legal descriptions. These inaccuracies can **trigger legal disputes** between property owners, businesses, and government entities. **Resolving such disputes can be time-consuming and expensive**, underscoring the importance of proactively preserving survey monuments.

Addressing the challenges facing survey monument preservation in California is crucial to uphold the accuracy, reliability, and continuity of the state's geographic information system. Ensuring the proper functioning of this geospatial

What Can We Do?

What Can We Do?

data infrastructure is not only essential for land surveyors and cartographers, but also impacts urban planning, transportation infrastructure, environmental management, emergency response, property ownership, and more.

Through a comprehensive and coordinated approach to these challenges, California can pave the way for a more robust survey monument preservation framework, bolstering our state's land surveying infrastructure and contributing to sustainable growth and development for years to come.

A comprehensive and coordinated approach is needed to address the challenges of survey monument preservation in California. The following strategies encompass a **multi-faceted solution** involving outreach, accurate locating techniques, efficient reporting mechanisms, and systematic preservation procedures. By combining these efforts, public works managers, engineers, and surveyors can effectively safeguard survey monuments, save millions of dollars in unnecessary litigation and replacement costs, and ensure the accuracy and integrity of California's geospatial data infrastructure.

Outreach

Promoting awareness regarding the significance of survey monuments is a crucial first step in their preservation. By conducting targeted outreach initiatives to various stakeholders, including the general public, local officials, community organizations, and construction companies, we can foster a sense of shared responsibility towards preserving these essential markers.

Educational campaigns at local schools, community centers, and public events can introduce the importance of survey monuments and their role in land ownership, land surveying, and mapping.

Conducting community workshops with local civic organizations, homeowners' associations (HOAs), and chambers of commerce can address the significance of survey monument preservation.

Public awareness materials such as informational brochures, posters, and online resources that explain the significance of survey monuments and the potential consequences of their



Photo: Brian Kong

Save Our Survey Monuments

damage or loss can be distributed through public libraries, city halls, and online platforms.

Media engagement with local media outlets will elevate public awareness and reinforce the importance of preserving these markers.



Photo: Steve Martin

Locate

Accurate and up-to-date knowledge of the **locations of survey monuments** is clearly an essential ingredient in effective preservation efforts. By leveraging modern technologies, such as the Global Positioning System (GPS) and geographic information system (GIS), the accuracy and efficiency in locating survey markers can be significantly improved. This strategy should be executed by, or under the direction of, licensed land surveyors.

Comprehensive surveys conducted across regions will identify and record the locations of existing survey monuments.



Photo: Brian Kong

GPS and GIS integration methods used to precisely map the coordinates of survey monuments will facilitate real-time tracking, monitoring, and analysis of the condition of the markers, thus ensuring proactive maintenance.

Geodetic control networks consisting of high-precision reference points used in land surveying must be strengthened, expanded, and recorded.



Photos: Steve Martin

Report

It is imperative that we establish a user-friendly and accessible reporting system to encourage timely reporting of damaged, disturbed, or missing survey monuments.

Online portals and hotlines can be designed for citizens, surveyors, and contractors to quickly and easily report incidents related to survey monuments. These platforms must be simple to navigate and available 24/7 to ensure efficient and prompt responses.

The development of mobile applications can provide responsible citizens with an easy and convenient way to report survey monument incidents, thus empowering them to be proactive in these preservation efforts.

By publicizing reporting channels via signage at construction sites, information boards at public parks, and in community newsletters, we can raise awareness of reporting options and encourage necessary community engagement.

We can collaborate with surveying professionals, organizations, and associations to disseminate information concerning reporting mechanisms within the industry. This partnership can facilitate a seamless flow of information and accelerate response times.

Replace

When survey monuments are either lost or damaged beyond repair, **timely and accurate replacement** is essential to maintain the integrity of surveying data.

Qualified surveyors must assess damaged survey monuments to determine appropriate replacement procedures. These qualified professionals will ensure replacement efforts meet the necessary standards for accuracy and longevity.

High-quality materials for survey monuments ensure their resilience to environmental factors and human activities. Stainless steel, concrete, or brass markers are common materials used for longevity, and a professional land surveyor has the knowledge to assess the best material for any given situation.

Standardized replacement procedures for perpetuating and replacing survey monuments ensures consistency and accuracy and streamlines the process.

Historical documentation related to survey monuments must be stored as well, so the pedigree, significance, and continuity is available for future use.

Benefits

By implementing these strategies, California will build a robust framework to protect our land, resources, and essential infrastructure framework. The implementation of these strategies will yield numerous benefits for California's communities and industries.

Preserving survey monuments ensures **property boundaries and legal descriptions remain accurate**, reducing the likelihood of costly legal disputes over land use and ownership.

Accurate survey data contributes to intelligent land-use planning, infrastructure development, and environmental management, resulting in **sustainable, cost-effective urban development**.



Photo: Kevin C. Maxwell

Conclusions

Conclusions

Reliable geographic data **assists emergency responders** to quickly and efficiently reach critical locations during natural disasters and other emergency situations.

Precise surveying data is essential for **environmental conservation efforts**, including land preservation, wildlife habitat mapping, coastal resilience and resource management.

Accurate surveying **supports vital economic activities**, such as real estate development, construction projects, and transportation planning, to promote emerging technologies and ensure economic growth.

Outreach efforts can bring a **sense of pride** to the community by preserving local landmarks and historical survey monuments.

Preserving survey monuments is truly a **collective responsibility** that impacts the accuracy, reliability, and sustainability of California's geographic information system. By addressing these challenges and implementing our proposed solutions, public works managers, engineers, and surveyors can fortify the state's survey monument preservation efforts.

Through proactive outreach initiatives, **communities can be empowered** to value and protect these vital markers and their historical and geographic significance. By leveraging modern **technologies** for accurate locating and real-time monitoring, surveyors can ensure these reference points are resilient and reliable within the dynamic nature of urban development.

The development of **efficient reporting channels** will improve incident response times, prevent further damage, and ensure timely maintenance and replacement efforts. Through community collaboration and standardization procedures, stakeholders can work cohesively to sustain the integrity of California's foundation for land ownership.

Preserving survey monuments yields far-reaching benefits, from **legal certainty** and **disaster response** to **sustainable development** and **economic growth**. Emphasizing the importance of these markers instills a sense of community pride and stewardship, fostering a deeper connection to the land they inhabit.

Save Our Survey Monuments

With continued commitment to survey monument preservation, California can pave the way for informed decision-making, accurate land surveys, and responsible urban planning. By upholding the integrity of these foundational markers, our state ensures a sustainable and prosperous future for our citizens, while honoring the legacy of those who meticulously mapped its landscapes throughout history.

Find out more:

<https://www.californiasurveyors.org/MonumentPreservation.aspx>

Find Out
More!

CLSA

CALIFORNIA LAND SURVEYORS ASSOCIATION



Photos: Philip Melcher