BRIDGE STRATEGIC PLAN REPORT

City of Los Angeles, California
Bureau of Engineering
Bridge Improvement Division

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Table of Contents

List of Figures

List of Tables

Glossary

AA	Arellano Associates
AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ADT	Average Daily Trips
BCA	Benefit-Cost Analysis
BID	Bridge Improvement Division
BIR	Bridge Inspection Report
BSL	Bureau of Street Lighting
BOE	Bureau of Engineering
BPMP	Bridge Preventive Maintenance Program
BSP	Bridge Strategic Plan
CEQA	California Environmental Quality Act
CIP	Capital Improvement Project
City	City of Los Angeles
CTC	California Transportation Commission
DLAE	District Local Assistance Engineer
FHWA	Federal Highway Administration
ft	Feet
FY	Fiscal Year
HBP	Highway Bridge Program
LADOT	Los Angeles Department of Transportation
LASAN	Los Angeles Sanitation and Environment (Bureau of Sanitation)
M&N	Moffatt & Nichol
NBI	National Bridge Inventory
NBIS	National Bridge Inspection Standard
NEPA	National Environmental Policy Act
PCI	Paint Condition Index

PS&E	Plans, Specifications, and Estimates
RAP	City of Los Angeles Department of Recreation and Parks
ROM	Rough Order of Magnitude
RSP	Rock Slope Protection
SED	Structural Engineering Division
SLA	Structure Local Assistance
SNBI	Specifications for National Bridge Inventory
SR	Sufficiency Rating
STRAHYNET	Strategic Highway Corridor Network
StreetsLA	Bureau of Street Services
USDOT	U.S. Department of Transportation

Executive Summary

The Bridge Strategic Plan (BSP) outlines a proposal to address 51 priority bridge repair projects and secure $25 million in funding over five years. The funding would be allocated as follows:

- **$15 million** to repair 42 bridges and complete the design for 2 additional bridge projects.
- **$1.5 million annually** for non-routine bridge maintenance.
- **$500,000 annually** for consultant-provided design and technical support services through task order solicitations under Pre-Qualified On-Call Consultant contracts.

The BSP also recommends that the City of Los Angeles Bureau of Engineering (BOE), through its Bridge Improvement Division (BID), take the lead in implementing and managing the Bridge Asset Management System, in accordance with Mayor's Executive Directive No. 9.

Background

The City of Los Angeles (City) maintains one of the largest and most complex bridge infrastructure in the nation. With over 4 million residents and two of the largest port facilities in the Western Hemisphere, the City's transportation infrastructure is critical for economic prosperity, community connectivity and public safety. The BID is the lead division within BOE to deliver Capital Improvement Projects (CIP) to improve City's 516 bridges.

Challenges

Over 83% of the City's bridge are over 50 years old and 24% exceed their 75-year design lifespan. Many require seismic retrofits, rehabilitation or replacement to meet modern safety standards. Additionally, 8% have a "D" or "F" sufficiency rating, indicating critical structural deficiencies. Systemic preventive maintenance and strategic funding are essential to preserve these aging assets.

Bridge Strategic Plan

The BSP establishes a comprehensive and prioritized framework for bridge maintenance, rehabilitation, and replacement, ensuring structural resilience and public safety while maximizing funding opportunities at the federal, state and local level. The plan is structured around the following key objectives:

1. Inventory Assessment and Prioritization:
    - Identifies 51 priority bridges requiring repairs. Details are provided in Table 11.
    - Categorizes bridges based on condition, structural needs and funding eligibility to optimize resource allocation.
2. Funding Strategy and Federal Compliance:
    - Seek $15 million over five years to repair 42 bridges and complete the design for 2 additional bridge projects.
3. Non-Routine Maintenance and Long-Term Planning:
    - Establishes an annual baseline non-routine maintenance budget of $1.5 million.
4. Flexibility in Design and Technical Support:
    - Seek annual budget of $500,000 to provide urgent design and technical support services using Pre-Qualified On-Call (PQOC) Consultants contract.
5. Seismic Safety and Structural Resilience:
    - Identifies six (6) structurally vulnerable bridges needing urgent attention.
    - Within the next five years:
        - Seismic retrofitting of three (3) high-risk bridges
        - Design completion of one (1) structurally vulnerable bridge
        - Strategic planning for two (2) additional bridges.
6. Establish and Maintain Asset Management System:

- The Bureau of Engineering – Bridge Improvement Division (BOE-BID) will leverage existing platforms, including InspectX and an Asset Management System, to establish and maintain a comprehensive bridge asset management system. The specific implementation approach will be guided by factors such as licensing fees, implementation requirements, training needs, and technical support costs.

7. Clarify Maintenance Roles and Responsibilities:
    - BOE-BID (Bureau of Engineering - Bridge Improvement Division) – Manages bridge replacement, rehabilitation and non-routine maintenance projects, coordinates funding and contractor approvals, and maintains bridge asset management system.
    - BOE-SED (Bureau of Engineering - Structural Engineering Division) – Conducts bridge inspections, structural assessments and maintenance recommendations in collaboration with Caltrans, and maintains bridge inspection system.
    - StreetsLA (Bureau of Street Services) – Handles routine bridge-related roadway maintenance, pavement repairs and accessibility improvements.
    - BSL, LADOT, LASAN, RAP – Handles routine bridge maintenance for street lighting (BSL), traffic control devices (LADOT), storm drains (LASAN) and park infrastructure at RAP properties.

The City coordinates efforts across multiple departments, as shown in the figure below.

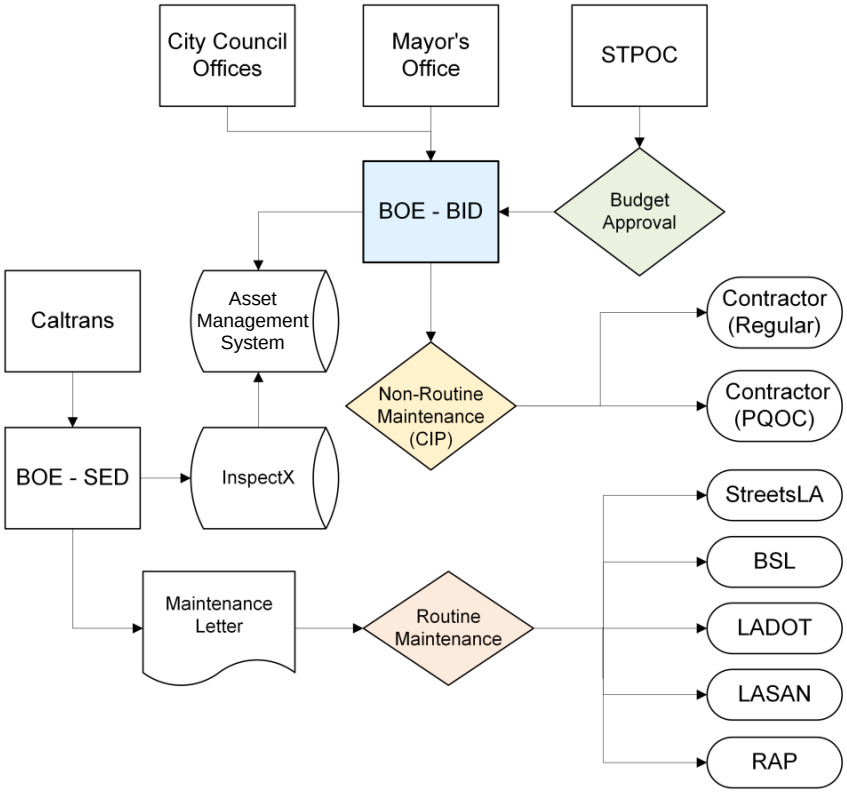


FIGURE 1: RECOMMENDED ROLES AND RESPONSIBILITIES ACROSS THE CITY DEPARTMENTS AND BUREAUS

8. Establish Bridge Emergency On-Call Contractors List
    - To ensure timely and cost-effective urgent and emergency repairs to bridges and transportation infrastructure, it is recommended that BID establishes a five-year contract to solicit construction services from pre-qualified contractors on the Bridge Emergency On-Call Contractors List.

Key Findings

1. Bridge Network Overview – The City manages 516 bridges, with 84% designed for vehicular traffic.
2. Structural Deficiencies – 42 bridges (8%) have failing sufficiency ratings, requiring urgent repairs.
3. Seismic Risks – 20 bridges over 100 years old are highly vulnerable to seismic events.
4. Funding Shortfall – The BSP prioritizes 51 bridges, but 465 remain unfunded and need ongoing assessment.

1. Bridge Strategic Plan

1.1. Background

The City of Los Angeles (City) is the second-largest U.S. city with over 4 million residents, plays a crucial role in Southern California's economy and transportation. Home to the Port of Los Angeles and Port of Long Beach, which handle over 40% of U.S. imports and exports, the city is a global hub for commerce and tourism. As a co-host of the 2026 FIFA World Cup and host of the 2028 Summer Olympics, maintaining a world-class transportation network is essential.

The City's transportation system includes roadways, vehicle and pedestrian bridges, bike paths, and tunnels, ensuring connectivity, economic growth, and equitable mobility. The Bureau of Engineering's Bridge Improvement Division (BOE-BID) oversees the maintenance, widening, replacement, and seismic upgrades of bridges to ensure safety and resilience.

1.2. City's Bridge and Tunnel Inventory

The BOE-BID manages 516 bridges and tunnels, as detailed in the 2022 inventory (Table 1). The majority (84% or 431 structures) are designed for vehicular traffic. According to the December 2022 Infrastructure Assessment Report, the City maintains 516 structures, including:

- 426 City-owned and maintained bridges/tunnels.
- 90 structures maintained by the City but owned by other entities.

Of these, Caltrans inspects and provides Sufficiency Ratings for 366 structures with State No. 53Cxxxx, as listed in the GASB 34 Inventory (Appendix A). These bridges meet National Bridge Inventory (NBI) criteria, having a span length of at least 20 feet, with several designated as part of the Strategic Highway Corridor Network (STRAHNET). The remaining 150 bridges and tunnels that do not meet NBI criteria are inspected and assessed by the Bureau of Engineering Structural Engineering Division (BOE-SED) to ensure structural integrity and safety.

TABLE 1: SUMMARY OF TYPES OF CITY BRIDGES & TUNNELS (YEAR 2022)

Bridges / Tunnels Type	Number
Vehicular Bridges	425
Pedestrian Bridges	75
Bikeway Bridges	3
Vehicular Tunnels	6
Pedestrian Tunnels	2
Equestrian Tunnels	8
Total Number of City-Owned Bridges & Tunnels Inspected	516

Note: This inventory does not include most bridges above highways or a small number of bridges owned by other public or private entities. The City does share bridge responsibility with Caltrans on a small number of bridges.

1.3. Condition of Bridges and Tunnel Inventory

A 2022 City review[1] that 42 bridges (8%) had a sufficiency rating (SR) of "D (50-69)" or "F (<50)". The federal rating system, in place since 1995, evaluates structural condition, serviceability and essentiality of use, considering factors like traffic volume, bridge capacity and access to public safety services.

The SR ranges from 0 to 100% based on four components:

1. **Structural Adequacy (S_1 = 55%)** – Evaluates superstructure, substructure and load capacity.
2. **Serviceability and Functional Obsolescence (S_2 = 30%)** – Assesses traffic volume, bridge alignment, width, clearances, and approach geometry.
3. **Essentiality for Public Use (S_3 = 15%)** – Measures emergency access, detour lengths, and public safety importance.
4. **Special Reductions (S_4 = 13%)** – Adjusts for detour impacts, safety features, and structure type.

The SR formula: SR = S1 + S2 + S3 - S4.

A new federal rating system, emphasizing structural, physical, and safety conditions, will replace the 1995 system by 2026. Until then, the 2022 City study remains the most comprehensive assessment of the City's bridge and tunnel inventory (Table 2).

TABLE 2: CITY 2022 SUMMARY OF GRADE COUNTS

Grade (Sufficiency Rating)	Number
A (90-100)	183
B (80-89)	183
C (70-79)	108
D (50-69)	38
F (<50)	4
Total Number of Bridges	516
Percentage of Bridges Graded "B" or Better	70.9%
Percentage of Bridges Graded "C" or Better	91.8%

The City's 2022 infrastructure evaluation estimates the value of its 516 bridges and tunnels at nearly $1 billion. However, with current investment levels, significant deterioration is expected in the coming decades. To mitigate this, the City is developing a systematic Bridge Strategic Plan (BSP) to guide long-term improvements.

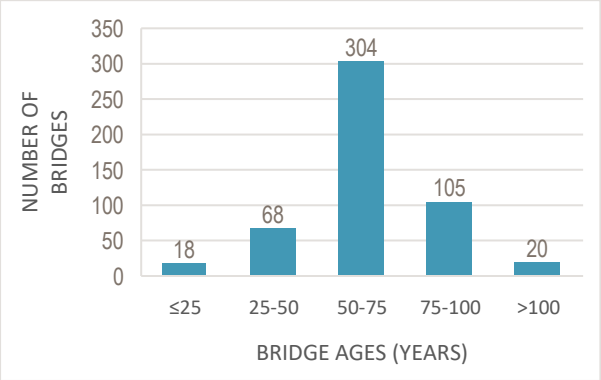
The upcoming federal bridge rating system will emphasize structural, physical, and safety conditions, potentially reclassifying many bridges. For example, some bridges currently rated as "C" may be reassessed as "Good" or "Fair". Since federal funding prioritizes bridges classified as "Poor", this shift could impact the City's ability to secure funding.

The City's aging bridge and tunnel inventory remains a critical risk factor for long-term maintenance and safety.

1.4. The Aging Bridge and Tunnel Inventory

Of the City's 516 bridges, 429 (83%) are over 50 years old, and 125 (24%) have exceeded 75 years, surpassing their original design lifespan. Additionally, 20 bridges are more than 100 years old, highlighting the aging infrastructure challenge.

While seismic retrofits, rigorous inspections, and Southern California's climate have helped preserve the bridge inventory, aging effects are inevitable. Addressing these risks requires proactive planning and strategic investment to ensure long-term structural integrity and public safety.



Note: There is 1 bridge (Bridge #000600 – Dresden Dr. Bridge) with unknown built year in City's inventory

FIGURE 2: CITY OF LOS ANGELES - BRIDGE INVENTORY

Between 2019 and 2022, the number of "F" rated bridges increased from 1 to 4 (Figure 3), signaling the need for costly replacements or major rehabilitations. While aging infrastructure cannot be stopped, it can be managed through strategic investments.

Preventive maintenance for "B" and "C" rated bridges must not be overlooked due to the high costs of replacing or rehabilitating "D" and "F" bridges. Although the new federal rating system will adjust classifications, the principle remains the same: proactive maintenance is a cost-effective, long-term strategy for infrastructure preservation.

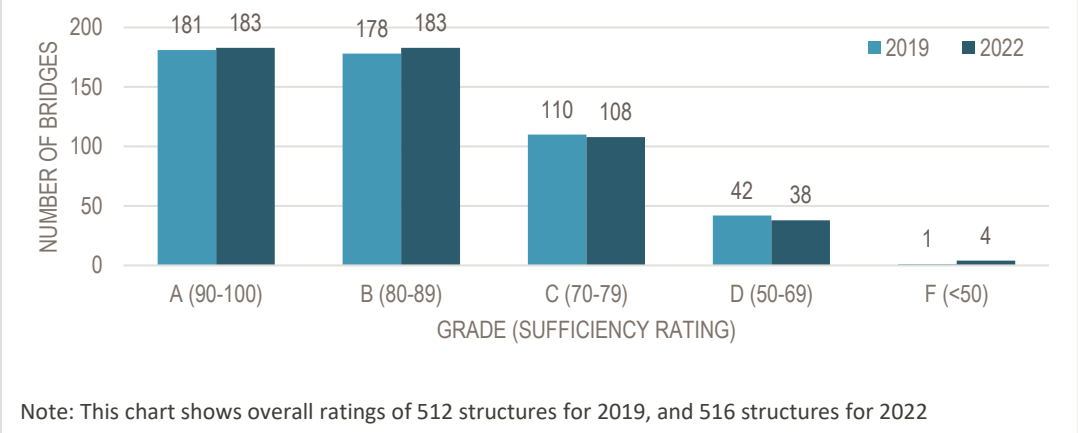


FIGURE 3: COMPARISON OF GRADE RATINGS

1.5. Planning and Funding Bridge Preventive Maintenance, Rehabilitation, and Replacement

The Bridge Strategic Plan (BSP) aligns with Caltrans guidelines, City input, and community needs, providing an overview of the City's bridge inventory and strategies for maintenance and repairs to extend service life. Tunnel maintenance and replacement are not included in this BSP.

Key actions include inspections, repair planning, project prioritization, and funding alignment. Bridges will be categorized based on condition:

- Well-maintained bridges requiring cost-effective preservation and rehabilitation.
- Distressed bridges needing major repairs, retrofits, or scour mitigation.

While the BSP focuses on 51 priority bridges, its framework can be scaled over time to achieve a state of good repair for all 516 City bridges.

1.6. Evaluating Bridge Conditions Based on 1995 Sufficiency Ratings

The City's bridge inventory is prioritized using sufficiency ratings, focusing on preventive maintenance to extend bridge lifespan (Figure 4). Effective prioritization must align with local, regional, state, and federal funding to mitigate further deterioration.

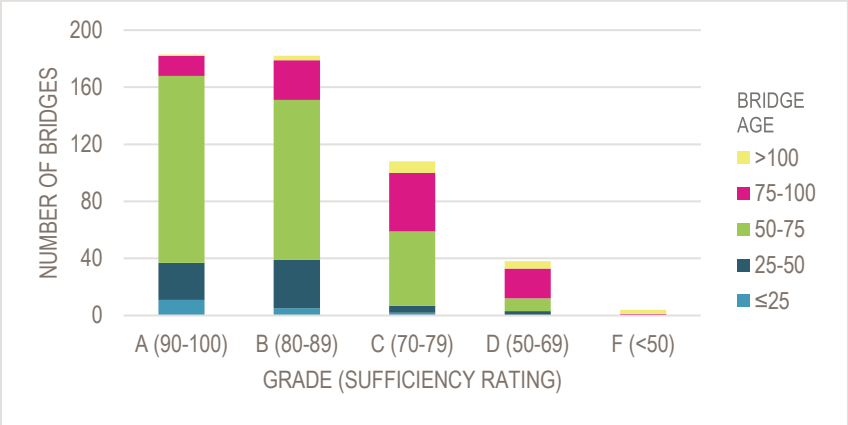


FIGURE 4: BRIDGE INVENTORY SUFFICIENCY RATING COMPARED TO BRIDGE AGE

Aging Bridge Infrastructure and Sufficiency Ratings

Strategic investment is critical, as 125 bridges (24%) are over 75 years old, and 20 exceed 100 years. Bridges were originally designed for a 75-year service life, making preventive maintenance essential. The 2022 City database categorizes bridges by sufficiency rating (0-100), which evaluates:

- Structural Safety and Adequacy (55%)
- Serviceability (30%)
- Essentiality for Public Use (15%)

While the rating does not determine maintenance eligibility, it provides a general condition assessment:

- SR 81-100 (Good Condition) – Most require little to no preventive maintenance.
- SR 51-80 (Moderate Condition) – Preventive maintenance is beneficial, and some may require rehabilitation.
- SR 0-50 (Poor Condition) – Only two bridges fall into this category, likely requiring replacement rather than repair.

Seismic Vulnerability and Retrofit Needs

The City's aging infrastructure is at higher risk due to seismic activity. Seismic design has evolved significantly since California's 1933 Long Beach Earthquake, which led to the Field Act and early bridge seismic design regulations.

- In 1937, bridges like Lincoln Boulevard Bridge over Ballona Creek were designed to withstand seismic forces of 8% of vertical loads.
- After the 1971 San Fernando Earthquake, Caltrans introduced response spectrum analysis and the first Seismic Design Criteria (1973).
- By 2009, probabilistic seismic response spectra accounted for larger earthquakes over extended periods.

Figure 5 on the next page compares 1930s seismic load estimates to the current 975-year return period seismic design spectrum for Los Angeles. For a concrete bridge with a 50-ft span, the spectral acceleration is approximately 0.7g, significantly higher than the 0.08g estimated in the early 1900s.

Given these seismic risks, retrofit programs are a top priority within the BSP to ensure long-term structural resilience and public safety.

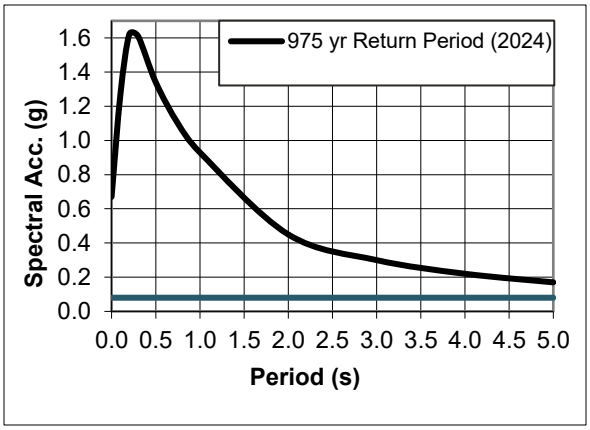


FIGURE 5: COMPARISON OF DESIGN SEISMIC LOAD IN 1930S AND 975-YEAR RETURN PERIOD DESIGN RESPONSE SPECTRUM (2024) IN LOS ANGELES AREA

1.7. Evaluating Bridge Conditions Based on 2026 Specifications for National Bridge Inventory (SNBI)

While the current sufficiency rating system provides a reliable foundation for the City's BSP, the transition to the 2026 federal standards will require adjustments. Although individual bridge rankings may change, the City's overall approach and programmatic needs will remain unchanged.

The USDOT Federal Highway Administration (FHWA) issued a Final Rule on May 6, 2022, updating the National Bridge Inspection Standards (NBIS). By March 2026, the 1995 Coding Guide will be replaced with the SNBI, which evaluates bridges using a Good (G), Fair (F), and Poor (P) rating at both component (deck, superstructure, substructure, culvert) and element levels. The City must update its bridge inventory accordingly to align with these changes.

Bridge Prioritization and Funding Strategy

The City will categorize bridges based on work type and appropriate funding sources, as defined by the FHWA bridge maintenance categories (Table 3). Each category will undergo further environmental assessments and field verifications to identify priority projects. A prioritization matrix, developed with local stakeholders, will help align projects with community needs and City objectives (Appendix E).

TABLE 3: FHWA BRIDGE MAINTENANCE CATEGORIES

Maintenance/Repair Category	Description
Routine Maintenance	Short-term operational work in response to events or seasonal needs, requiring **recurring attention** but no preservation value.
Bridge Preservation	Activities that **prevent, delay, or reduce deterioration**, restoring function and extending bridge lifespan.
Bridge Rehabilitation	Major work needed to **restore integrity and correct significant safety defects**.
Bridge Replacement	Complete **replacement of an existing bridge** in the same general corridor.

The 51 priority bridges identified in the BSP include those previously assessed by BOE-SED and structures with low sufficiency ratings in poor or fair condition.

Funding Needs and Responsibilities

- Routine Maintenance:
  - Typically a City responsibility, involving multiple agencies (streets, utilities, traffic, etc.).
  - Requires multi-year funding commitments.
  - Estimated baseline $1 million annually starting in FY26-27, with adjustments for inflation.
- Bridge Preservation:
  - Funded primarily by the City or in partnership with the State.
  - Preservation investments significantly outweigh long-term rehabilitation or replacement costs.
  - No dedicated state or federal grant programs currently exist for municipal bridge preservation.
  - Estimated funding need: $2 million annually in FY26-27, with escalation for inflation.
  - Advocacy opportunities: Explore Caltrans Bridge Preservation and Maintenance Program (BPMP) and other regional/state/federal funding options.
- Bridge Rehabilitation:
  - Typically funded through local, state, and federal sources.
  - The City lacks dedicated resources for large-scale rehabilitation projects.
  - Example: The City is seeking FHWA/Caltrans Highway Bridge Program (HBP) funding for San Fernando Bridge rehabilitation.
  - Rehabilitation projects require state or federal grants, allocations, or appropriations.
- Bridge Replacement:
  - Requires a combination of local, state, and federal funding.
  - The City lacks dedicated funds for bridge replacements.
  - Example: The Sixth Street Bridge replacement utilized local, state, and federal funds.
  - Funding sources include FHWA/Caltrans HBP and other grant opportunities.
  - Additional funding details are discussed in Section 1.7.1.

The transition to the SNBI system will help refine the City's bridge assessment process while maintaining its long-term strategy of preventive maintenance, rehabilitation, and replacement investments.

1.7.1. Grants, Allocations, and Appropriations

External grants, allocations, and appropriations are best utilized for priority bridge replacement or rehabilitation projects. The prioritization process is collaborative, with a spreadsheet provided to support decision-making (Appendix E).

Federal Construction Grants

The strongest federal discretionary grant applications are those prioritized by their locality, region, or state and typically include:

- Bridge rated as "Poor" or "Fair" with potential to become "Poor".
- 30% Preliminary Engineering (PE) and escalated cost estimate.
- NEPA completed or in progress.
- Network traffic study accompanying NEPA.
- Benefit-Cost Analysis (BCA) above 1.4.

- 20-50% matching funds, depending on the program.
- Ability to meet aggressive bridge obligation timelines (may require alternative delivery).

Meeting these requirements can cost up to 10% of total bridge construction costs (e.g., PA-ED, NEPA/CEQA, traffic analysis, and outreach). Writing a federal construction grant for a major bridge typically costs $40,000 to $60,000 if PE, NEPA, and traffic studies are complete.

Relevant federal discretionary construction grant programs for City bridges:

- RAISE – Supports bridge projects with strong transit, bike, and pedestrian components: https://www.transportation.gov/RAISEgrants/about
- Bridge Investment Program (BIP) – Covers bridges under and over $100 million: https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program

Federal Planning Grants

Some federal planning grants help advance bridge projects but do not fund 30% PE, NEPA, or traffic studies. Writing a federal planning grant typically costs $20,000 to $30,000.

Relevant federal discretionary planning grants:

- Bridge Investment Planning Grants – Funds feasibility, funding strategies, and community studies: https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program
- PROTECT Planning Grants – Focus on resiliency issues, such as sea level rise or climate-related scour events.

State Construction Grants

The Caltrans Highway Bridge Program (HBP) receives $575 million annually through the Bipartisan Infrastructure Law. Currently, HBP funding is limited to bridges rated "Poor". The San Fernando Bridge is the only City bridge in the queue for HBP rehabilitation funding. If found seismically vulnerable, its chances of funding will improve.

State and Federal Allocations and Earmarks

Additional funding may be possible through legislative allocations and earmarks, requiring City-led advocacy and organizational efforts.

1.8. Conclusion

This section outlines key components of the BSP. The following sections provide further details on implementation, presenting a roadmap for achieving long-term bridge sustainability and resilience.

2. Bridge Prioritization Plan

The Bridge Prioritization Plan is a key strategy in the City of Los Angeles' asset management practices, designed to establish procedures and methodologies for identifying bridges that require routine maintenance, preservation, rehabilitation, or replacement.

The plan is based on:

- Caltrans Bridge Inspection Reports (BIRs)
- Federal Highway Administration (FHWA) guidance and tools
- Supplemental local bridge inspections

A prioritization matrix will be developed, listing projects and their corresponding fiscal year commitments, ensuring a structured and transparent approach to bridge maintenance.

Funding and Implementation Strategy

The City has relied on the Caltrans BPMP for its basic bridge maintenance needs. The following sections outline a proactive approach to identifying critical bridge maintenance and improvement needs. This approach includes consolidating projects into funding categories to secure resources through Caltrans' HBP and other federal, regional, and local sources.

This report identifies 51 bridges for capital improvement and preventive maintenance initiatives (Appendix E). These bridges were selected based on low sufficiency ratings, prioritizing those in "poor" or "fair" condition. The list also defines the proposed scope of work, determined through a preliminary review of Caltrans BIRs and Google Street View assessments.

2.1. Capital Improvement Project Prioritization List

The goal of prioritizing capital improvement projects is to reduce the number of bridges in poor condition and prevent fair-condition bridges from deteriorating further.

A preliminary analysis of 51 bridges identified 7 priority bridges for capital improvement:

- 5 bridges require full replacement ("Remove and Replace").
- 2 bridges require soffit repairs due to potential utility leakage.

Table 4 outlines the bridges prioritized for capital improvements based on their structural condition and maintenance needs.

TABLE 4: CITY OF LOS ANGELES BRIDGES IDENTIFIED FOR CAPITAL IMPROVEMENT

Bridge No.	Bridge Title	Bridge Built	Condition Rating	Work Recommendation
53C0300	Tujunga Wash (San Fernando Rd)	1935	Poor	Remove and Replace
53C0183	Sierra Highway OH	1911	Fair	Remove and Replace
53C0151	First Street OC	1940	Poor	Remove and Replace
000718	Lighthouse St Pedestrian Bridge	1907	Poor	Remove and Replace
000625	Pacific Ave Bridge over Ballona Creek	1940	Fair	Remove and Replace
53C0351	Ave of the Stars over Olympic Blvd	1963	Poor	Soffit Repair
53C2048	Haines Canyon Channel (Haines Canyon Ave)	1937	Fair	Soffit Repair

2.1.1. Environmental Resources Evaluation

The environmental and social impacts of proposed bridge improvements were assessed based on the type of work recommended and the projects' competitiveness for funding. A desktop environmental analysis was conducted for the 51 prioritized bridges (Appendix E).

Environmental and Social Impact Assessment

The evaluation process began with project-specific data collection, including:

- Bridge Inspection Reports to assess structural conditions.
- Urban planning considerations, including equity, pedestrian and bicycle access, regional connectivity, and accessibility.
- Environmental factors, such as biological, cultural, and hazardous material concerns.

The desktop environmental evaluation incorporated the following measures:

- Community Impact Score: Generated using CalEnviroScreen, which includes environmental, health, and socioeconomic data.
- Disadvantaged Communities Identification: Used Senate Bill (SB) 535 Disadvantaged Communities Map from CalEPA to determine if the bridge is in a historically underserved area (Appendix E includes a mapped exhibit).
- Metro Equity Focus Communities: Assessed bridge locations within LA Metro Equity Focused Communities, with mapped data in Appendix E.
- Bicycle Facility Assessment: Used the LA County Bikeways Map to determine if bridge widening is required to meet National Association of City Transportation Officials (NACTO) bike lane standards.
- Waterway Diversion Needs: Evaluated potential impacts of bridge work on nearby waterways.
- Historical Significance Assessment: Determined eligibility for the National Register of Historic Places (Listed, Eligible, or Not Eligible).
- Right-of-Way, Excavation, and Alignment Impacts: Justified potential land use and construction impacts based on bridge work recommendations.
- Railroad Impact Analysis: Identified any rail-related constraints or issues affecting project feasibility.

CEQA and NEPA Documentation Requirements

After compiling this information, bridges were assessed to determine the appropriate level of environmental documentation required under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

To streamline funding applications, bridges were grouped based on:

- Scope of work.
- California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation requirements.
- Potential funding eligibility.

This systematic approach ensures that projects are environmentally compliant while maximizing funding opportunities for bridge improvements.

2.1.2. Seismic Vulnerability Assessment

Among the identified bridges, some are historically significant, while one is over 100 years old. Table 5 lists the bridges selected for seismic retrofit, including their condition rating, historical significance eligibility, and year built.

Since the Caltrans inspection process does not assess seismic vulnerability, the City must conduct a self-funded seismic vulnerability assessment for each bridge. This evaluation will determine whether a bridge is eligible for retrofit funding under the Highway Bridge Program (HBP) or other funding sources.

To qualify for funding:

1. The seismic vulnerability assessment must confirm that the bridge is at risk of collapse during a maximum credible earthquake.
2. Caltrans must validate the analysis results before funding approval.

If deemed eligible, seismic retrofit projects receive top funding priority under the HBP.

Seismic Retrofit vs. Bridge Replacement

The seismic vulnerability study should identify specific retrofit measures to be implemented. Additionally, a life cycle analysis should be performed to determine if retrofitting is the most cost-effective long-term solution.

Considering future maintenance, repair costs, project support, and remaining service life, bridge replacement may sometimes be the more viable alternative.

TABLE 5: CITY OF LOS ANGELES BRIDGES IDENTIFIED FOR SEISMIC RETROFIT

City of Los Angeles Bridges Identified for Seismic Retrofit				
Bridge No.	**Bridge Title**	**Year Built**	**Historical Significance**	**Condition Rating**
53C0958	Pacoima Wash (Foothill Blvd)	1923	Not Eligible	Fair
53C1686	Arroyo Canyon (Westridge Rd)	1928	Eligible	Fair
53C1380	West Blvd Separation (Venice Blvd)	1933	Eligible	Fair
53C0044	Fourth St over City Sts, RR, LA River	1930	Eligible	Good
53C1874	Arroyo Seco Channel (York Blvd)	1912	Eligible	Fair
53C0130	Los Angeles River (Cesar E Chavez Ave)	1926	Eligible	Fair

2.1.3. HBP and Funding Opportunities

The HBP is a State of California funding program that provides pass-through federal funding for bridge maintenance, rehabilitation, and replacement. The City has the opportunity to apply for and secure HBP funding to support its bridge inventory improvements.

A flowchart outlining the HBP process, including resource and regulatory agency involvement in Caltrans' project development process, is provided in Appendix C. This flowchart, sourced from Caltrans, illustrates the typical project approval process.

Additionally, other regional and federal funding opportunities are available. Section 3 of this document provides a detailed overview of specific funding programs.

Bridge Prioritization and Funding Strategy

In Section 3.5, the top 51 prioritized bridges are categorized based on Section 2.5 criteria. This section also details:

- Funding requirements

- Maintenance schedules
- Systematic strategies to address bridge deficiencies efficiently

By consolidating projects into funding-eligible categories, the City can maximize available state, regional, and federal resources to enhance bridge infrastructure longevity and safety.

2.2. Caltrans Bridge Preventive Maintenance Program (BPMP)

BPMP is a Caltrans program to maintain the existing inventory of bridges in good or fair condition rating, making it a suitable funding source for bridge preservation maintenance[1]. Caltrans provides inspection services for eligible bridges in California. Inspection reports are provided to local agencies to use (along with their own evaluations) to schedule repairs or to identify more complex repairs that will be performed by an outside contractor using engineered plans as funding is made available. The Caltrans Bridge Preventive Maintenance Program (BPMP) is a component of the Highway Bridge Program (HBP) to help local public agencies extend the life of their bridges by performing preventive maintenance activities. According to LAPG Chapter 6, only bridges rated in poor condition are eligible candidates for rehabilitation or replacement under HBP funds. The local public agencies should consider BPMP for bridge preservation activities to keep their bridges in good condition. BPMP funding requires that a bridge does not apply for another HBP or BPMP project in the next 10 years upon completion of a preventive maintenance project.

Based on the most recent Caltrans BPMP Guidelines for Local Agencies published in April 2024 (https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hbp/2024/bpmp-guidelines-april2024.pdf), there are two types of BPMP projects, a BPMP Plan Development project and a BPMP Bridge List project.

1. The BPMP Plan Development project allows local agencies to evaluate the complete local bridge inventory and assess the needs for each structure. The HBP will fund the initial effort to assess the entire bridge inventory. After the initial effort, local agencies are expected to keep the bridge list up to date using local funds. Caltrans could argue that the City has already been reimbursed for this initial effort, since there is a bridge list on file for the City.
2. A BPMP Bridge List project is a group of bridges applying for BPMP funds:
   a) Bridges should be grouped together based on similar work items.
   b) Separate applications must be submitted for each Bridge List.
   c) Once a Bridge List project has been accepted into the HBP, additional bridges cannot be added to the same list.
   d) BPMP Bridge List applications are subject to the HBP project prioritization process and schedule, meaning the applications can be submitted anytime, but they must be submitted before November 30 of odd years for prioritization consideration in the following funding cycle.

2.2.1. Eligible Work Preventive Maintenance Activities

Work recommendations documented in the BIR are eligible for reimbursement under the BPMP. In addition, work recommendations not documented in the BIR may be eligible if there is adequate justification.

The following are specific work items eligible for HBP reimbursement under the BPMP Guidelines:

1. Expansion joint reconstruction or replacement. Bridge joint elements in condition states 2, 3 or 4, as shown in the BIR, are eligible.
2. Deck Work
   a. Seal Concrete Deck. Deck cracking defect in condition states 2, 3 or 4, as shown in the BIR, are eligible. Sealing bridge deck is usually done by using methacrylate. If polyester overlay is requested and not stated in the BIR, Structure Local Assistance (SLA) should be contacted for concurrence.

[1] Preservation maintenance is one of the bridge maintenance categories defined by the FHWA. Refer to Section 2.5 for details.

b. Concrete deck overlays or similar protective deck overlays. Concrete decks should be field assessed for reinforcing bar cover depths, spalling, delamination, and severe cracking. Deck restoration as required, includes removal of asphalt concrete (AC) and unsound concrete. Full concrete deck replacement is not eligible as a PM activity and may be funded through the general bridge rehabilitation program in Chapter 6 of the LAPG.

c. Deck Asphalt Concrete removal. Wearing surfaces in condition state 3 or 4, as shown in the BIR, are eligible. If the BIR indicates significant signs of AC deterioration and includes a work recommendation for replacement, it is recommended that the AC is removed, and a deck sealant or polyester concrete overlay be considered. Placing AC onto bridge decks is not eligible.

d. If the deck overlay alters the bridge deck elevation, the participating approach roadway work (adding or removing approach pavement) to tie into the new elevation must be kept to a minimum and must not exceed 50 feet. Any additional roadway work exceeding 50 feet is non-HBP-participating and is the fiscal obligation of the local agency. The intent of the BPMP is to correct structural deficiencies, not to correct roadway profiles.

e. When deck work alters deck elevations, consideration should be taken to taper the overlay so as not to alter the bridge rail height.

3. Bridge bearings and supports. Restore or replace the existing bearings to make them functional and repair or rehabilitate bearing supports. Bearings in condition state 3 or 4, as shown in the BIR, are eligible.
4. Steel Components. Repair, restoration, and strengthening of major structural elements such as beams, piers, and end caps. Bridge strengthening is to eliminate the need for posting, mitigate further fatigue damage, increase fatigue life, and/or replace or strengthen main load carrying members.
5. Concrete Components. Repair of significant concrete spalls that have structural impacts on the longevity of the bridge. If the BIR indicates significant concrete spalls and includes a work recommendation for repair, then it is eligible.
6. Timber Components. Replacement, or supplementation of timber structural elements, timber deck runners, timber piles are eligible. Repair, replacement, or supplementation of timber railings are not eligible as it is considered routine maintenance.
7. Movable bridge mechanical/electrical components that relate to the structural and mechanical operation that are damaged or worn out may be repaired or replaced. Moveable bridge eligibility must be reviewed by the SLA.
8. Spot painting of structural steel elements, where the Paint Condition Index (PCI) is greater than 70. If the PCI is less than or equal to 70 (major painting effort), the project will be processed under HBP procedures in Chapter 6 of the LAPG. PM painting cannot be justified for solely aesthetic reasons. A work recommendation for paint must be identified in the BIR to be eligible under BPMP.
9. Existing Scour Countermeasure. Preventive maintenance work of restoring existing Rock Slope Protection (RSP) may be eligible. The construction work must be engineered using current Hydraulic Engineering Circular (HEC-23) methods and must be able to change the NBI 113 code to 4 or greater.
10. Caltrans, on a case-by-case basis, can review other scopes of work not documented in the BIR. Examples may include Alkali-silica-reactive aggregate mitigation, corrosion management systems, and fracture critical element replacement/rehabilitation. These items will be subject to Structures Maintenance and Investigations and/or SLA recommendations and HBP manager approval. Local agencies must contact their DLAE for assistance.
11. First time development of BPMP plans. See BPMP Plan Development section for more details.

2.2.2. Ineligible Preventive Maintenance Activities

Ineligible work applies to short bridges/culverts, bridge railing upgrades, and routine maintenance. Per the BPMP and certain federal guidelines, bridges with less than or equal to a 20-foot span are excluded from this program. Additionally, bridges in Poor condition may not be eligible for preventive maintenance funds

because replacement or rehabilitation may be more appropriate. Bridges currently programmed for rehabilitation or replacement generally are not eligible for funding.

Routine maintenance remains the responsibility of the local agency and is not eligible for HBP or other Federal-aid Highway Program funding. Routine bridge maintenance is defined as regularly scheduled activities to preserve the bridge components in their present or intended condition and generally includes minor work that is normally done by in-house bridge maintenance crews.

The following are specific work items not eligible for HBP reimbursement under the BPMP Guidelines:

1. Repair, replacement, painting, or new construction of the following:
    a. Bridge barrier, railing, fence, or sidewalk as it does not extend the service life of the bridge.
    b. Damaged bridge railing due to collisions
    c. Transition railing, approach guardrails, end crash cushion systems
    d. Timber railing
    e. Metal beam guard rail systems
    f. Warning signs and object markers
    g. Modifications to bridge rails needed due to bridge deck work
2. Painting over graffiti, graffiti removal, placement of anti-graffiti coating.
3. Repair or replacement of bridge components due to damage from fires, vehicles, or humans.
4. Work associated with the repair of bridge components, installation of preventive measures, or debris removal due to homeless-related activities.
5. Clearing of brush and vegetation overgrowth.
6. Bearing lubrication.
7. Minor concrete repairs (such as minor concrete spalls that have insignificant structural impacts on the longevity of the bridge or culvert). Generally, epoxy injecting into cracks is not eligible. There may be rare cases where epoxy injecting into substructure cracks in marine environments may be eligible. Generally, crack repair in culverts is not eligible except for culvert roofs that are also the riding surface.
8. Temporary shoring of bridges for load carrying capacity deficiencies.
9. Cleaning and flushing deck drains and cleaning/clearing debris from: a. Deck surfaces. b. Bridge sidewalks and curbs. c. Debris removal from channel waterway d. Bearing seats, pier caps, and other structural elements. e. Deck joints.
10. Removing deck asphalt concrete without other PM deck measures.
11. Correcting roadway approaches at the abutments that have settled or dipped.
12. Correcting roadway embankment erosion due to water run-off from the bridge deck or roadway.
13. Work on existing or constructing new weirs, dikes, fish ladders, and drop structures are not eligible.
14. New installations of structure approach slabs are not eligible.
15. Installation of new scour countermeasures are not eligible for BPMP. Refer to LAPG Chapter 6 for eligible scope regarding implementation of new scour countermeasures.
16. Development of subsequent BPMP plans after the initial BPMP development project.

2.2.3. Current City Of Los Angeles BPMP Inventory

As of August 2024, the City has 40 bridges programmed for preventive maintenance work under the BPMP. The complete bridge listing under BPMP is shown in Table 6 below. The 40 bridges were separated into three phases of work. Package 1 includes 13 bridges (1-1 through 1-13) for which construction-ready documents have been prepared. As a top priority for the City, the bid set for Package 1 bridges 1 should be advertised for construction. Next, the City should prepare construction documents for outstanding Package 2 (2-1 through 2-14) and Package 3 (3-1 through 3-13) BPMP bridges.

TABLE 6: CITY OF LOS ANGELES BPMP LISTING

Package	City No.	CT No.	Bridge Name	Condition Rating	Type of Work in BPMP
Package 1					
1-1	001433	53C1885	Balboa Blvd over Metrolink, UPRR, San Fernando	Fair	Methacrylate Deck Coating
1-2	001340	53C1756	Prairie St over Limekiln Canyon Wash	Fair	Deck Joint Seal Replacement
1-3	001340	53C1756	Prairie St over Limekiln Canyon Wash	Fair	Methacrylate Deck Coating
1-4	000947	53C0525	Vanowen St over S Fork Bell Creek	Fair	Methacrylate Deck Coating
1-5	000580	53C1216	Kester Ave over Los Angeles River	Fair	Deck Joint Seal Replacement
1-6	000580	53C1216	Kester Ave over Los Angeles River	Fair	Methacrylate Deck Coating
1-7	001391	53C1822	Devonshire St over Bull Canyon Creek	Fair	Methacrylate Deck Coating
1-8	000948	53C1365	Victory Blvd over Bell Creek (S Fork)	Good	Methacrylate Deck Coating
1-9	000860	53C1386	Wilbur Ave over Los Angeles River	Good	Deck Joint Seal Replacement
1-10	001341	53C1755	Nordhoff Place over Limekiln Creek Channel	Fair	Deck Joint Seal Replacement
1-11	000949	53C1287	Platt Ave over Bell Creek (S Fork)	Fair	Methacrylate Deck Coating
1-12	000552	53C1150	De Soto Ave over Browns Canyon Wash	Fair	Deck Joint Seal Replacement
1-13	000552	53C1150	De Soto Ave over Browns Canyon Wash	Fair	Methacrylate Deck Coating
Package 2					
2-1	000619	53C0545	North Broadway over La River, Bnsf, UPRR, Metro	Fair	Methacrylate Deck Coating
2-2	001271	53C1660	Mission Rd over UPRR, Amtrack, Eastlake Ave	Fair	Deck Joint Seal Replacement
2-3	001271	53C1660	Mission Rd over UPRR, Amtrack, Eastlake Ave	Fair	Methacrylate Deck Coating
2-4	001486	53C2100	Sante Fe Ave over 23Rd St,Washington Blvd, Bnsf	Fair	Methacrylate Deck Coating
2-5	000766	53C0052	Avenue 52 over Arroyo Seco Channel	Good	Deck Joint Seal Replacement
2-6	000574	53C0053	Via Marisol Ave over Arroyo Seco Channel	Good	Deck Joint Seal Replacement
2-7	001254	53C1662	Paxton St over Pacoima Wash	Good	Deck Joint Seal Replacement
2-8	000819	53C0572	Osborne St over Pacoima Diversion Channel	Good	Deck Joint Seal Replacement
2-9	000821	53C0530	Terra Bella St over Pacoima Diversion Channel	Good	Deck Joint Seal Replacement
2-10	001277	53C1661	Griffin Ave over UPRR, Amtrack, Alhambra Ave	Good	Deck Joint Seal Replacement
2-11	000983	53C0038	Daly St over UPRR, Amtrak, Alhambra Blvd	Good	Deck Joint Seal Replacement
2-12	000484	53C1172	4th St Ramp 'C' over Flower St	Fair	Deck Joint Seal Replacement
2-13	001491	53C2106	Henry Ford Ave over Dominguez Channel	Fair	Methacrylate Deck Coating
2-14	000482	53C1171	4th St Ramp 'B'	Good	Deck Joint Seal Replacement
Package 3					

Package	City No.	CT No.	Bridge Name	Condition Rating	Type of Work in BPMP
3-1	001234	53C1047	Burbank Blvd (WB) over Los Angeles River	Fair	Methacrylate Deck Coating
3-2	001234	53C1047	Burbank Blvd (WB) over Los Angeles River	Fair	Deck Joint Seal Replacement
3-3	001235	53C1109	Burbank Blvd (EB) over Los Angeles River	Fair	Replace the Approach Slabs
3-4	000516	53C1098	Barham Blvd over Los Angeles River	Fair	Deck Joint Seal Replacement
3-5	000506	53C0269	Sepulveda Blvd over Los Angeles River	Good	Deck Joint Seal Replacement
3-6	000647	53C1299	Riverside Dr over Tujunga Wash	Fair	Deck Joint Seal Replacement
3-7	000740	53C1374	Vineland Ave over Los Angeles River	Good	Deck Joint Seal Replacement
3-8	000993	53C0280	Sepulveda Blvd over Ballona Creek	Fair	Methacrylate Deck Coating
3-9	000632	53C1261	182nd Street over Dominguez Channel	Good	Rehab bearing pads at the west end of the bridge
3-10	000816	53C1107	Branford Street over Pacoima Wash Div Channel	Fair	Replace bearing pads at all exterior girders and at girder #2
3-11	000882	53C1061	Miller Drive over Hillside	Fair	Replace Cracked Approach Slab
3-12	000579	53C1213	Inglewood Blvd over Ballona Creek	Good	Exp. Joint Assembly Replacement
3-13	000654	53C1184	Grand Ave over 4th S, Kosciuszko Way	Fair	Exp. Joint Assembly Replacement

2.2.4. Future City of Los Angeles BPMP List

The City submitted its forty BPMP projects for federal fiscal year 2014/2015 (Table 6) and should submit an updated and prioritized BPMP project list as soon as possible, and every two years thereafter. Additional work is needed to create a master list of BPMP bridges, assuming the list in Table 6 does not encompass every eligible bridge in the City.

Caltrans Bridge Inspection Reports (BIRs) are issued every two years. When updated BIRs are received, the City should update the log of recorded deficiencies, condition states, and work recommendations as needed. Based on LAPG Chapter 6 and BPMP Guidelines for Local Agencies published by Caltrans in April 2024, it is recommended that the City follows the steps outlined below to implement a BPMP bridge List Project **every two years**:

1. Perform a detailed review of their bridge inventory and official BIRs to determine if there are preventive maintenance work recommendations, based on these BPMP Guidelines. Identify eligible preventive maintenance work.
2. Consider and determine how to group the bridges with preventive maintenance needs into distinct BPMP Bridge List project applications. For new BPMP Bridge List applications, each submitted application may only consist of bridges with a similar scope such that the work for all bridges can be administered and completed under 1 contract (PE and CON). Separate applications must be submitted for each list that is to be administered separately by contract.
3. Local agencies must consider all necessary preventive maintenance measures for each bridge at the time of developing BPMP Bridge List projects to leverage economical efficiencies. For example, joint seal replacements should be done at the same time as deck methacrylate. It is the Caltrans expectation that a bridge may not apply for another HBP or BPMP project in the next 10 years upon completion of a preventive maintenance project.

4. Clear accounting and expenditure records must be maintained for each individual bridge when managing a BPMP project list with multiple bridges. This includes funds used for any phase of work on each bridge in the list.
5. The total cost of a BPMP Bridge List must exceed $200,000.

2.2.4.1. Prioritization Procedure

To comply with the BPMP guidelines, local agencies must develop an objective procedure to prioritize their maintenance projects. This ranking procedure must be kept in the City's project file for future audits. Additionally, the highest priority projects should include scour countermeasures and the repair, restoration, and strengthening of structural elements. The following factors shall be taken into consideration when the City develops the ranking procedure:

- **Usage (Average Daily Trips).** This criterion considers the relative importance of the bridge to the traveling public. To be cost effective, preventive maintenance should be concentrated on bridges with higher ADT. The goal of this criterion is to improve overall connectivity and reliability of the City's more heavily used transportation assets.
- **Project Cost.** This criterion considers project costs. The benefit of considering project costs is that it may be more prudent to use available funding to complete several smaller and less expensive projects than to spend it all on a single larger one.
- **Structural Serviceability and Preservation/Maintenance Type.** The projects with items critical to the bridge's structural safety or that have a high potential to maximize service life shall be prioritized. These work items trend towards scour countermeasures and the repair, restoration, and strengthening of structural elements.
- **Project Grouping.** It is important to consider project grouping because it helps make efficient use of limited resources. Economy of scale plays an important role here as it generally becomes less expensive to perform a certain repair task as the quantity of work increases.

2.3. Routine Maintenance (Maintenance Letters)

Maintenance letters are the primary method the city uses to document and carry out routine bridge maintenance tasks. Bridge maintenance items described in Caltrans BIR work recommendation section are reviewed by Bureau of Engineering (BOE) Structural Engineering Division (SED). Maintenance letters are then created and sent to Bureau of Street Services Engineering Services Division or Street Maintenance Division to perform the field activities. Besides the Caltrans BIR work recommendations, SED also collects expedited maintenance requests and creates maintenance letters on a daily basis. When there is an incident happening on the bridge, SED will perform a field visit, identify the deficiencies. Some of the expedited maintenance requests also come from council offices or other agencies. Some of the bridges identified in these maintenance letters are bridges over the state highway owned by Caltrans and are not included in the City bridge inventory as described in Section 2.1.

Currently, all the bridge routine maintenance items are expected to be performed by City services. The City has outstanding maintenance letters on 56 bridges. Some of the maintenance letters were returned by Bureau of Street Services since they were beyond the bureau's in-house capability. Bureau of Street Services can only perform the routine maintenance work on bridges. Structural repairs are beyond the routine maintenance capabilities which will need to be bid out. Some of those maintenance improvements include:

- Expansion joint removal and replacement,
- Structural concrete crack seal, concrete spall repairs below the bridge decks (e.g. arch ribs),
- Any repair work above railroad tracks,
- Repairs that would require freeway lane closures and concrete bridge deck crack repairs with methacrylate.

In the future, considering the large inventory of bridges for City to maintain, a mix of city services and on-call list of contractors is recommended to deliver the bridge routine maintenance instead of using only in-

house city services. A recommended plan of roles and responsibility across the city bureaus is provided in Section 5.1.

To address the outstanding 56 maintenance letters, M&N:

- Obtained City's outstanding maintenance letters and reviewed all deficiencies and work recommendations identified in the letters.
- Conducted field reviews for bridges listed in the letters.
- Verified previously identified maintenance work and documented findings during M&N field review.
- Revised Rough Order of Magnitude (ROM) costs for identified maintenance work.
- Grouped the bridges by similar types of bridge maintenance work to bid out.

The findings are summarized in Appendix D and can be replicated in the future. A single design package for the entire group helps make efficient use of limited resources. Economy of scale plays an important role, as it generally becomes less expensive to perform certain repair tasks as the quantity of work increases. The process described above is a methodology that can be repeated as needed to address outstanding maintenance letters in the future.

2.4. Off-System Bridges

The local bridge inventory includes short span bridges (clear opening of 20-ft or less) and pedestrian crossing bridges. Caltrans does not conduct inspections of these bridges, and they are not listed in the Local Agency Bridge List. Furthermore, bridges 20-ft and under that carry vehicular traffic are rarely load rated, so their condition state and safe load carrying capacity area often unknown. Since these bridges are locally owned and maintained, a comprehensive BSP should include them for prioritized maintenance funding.

The following steps should be taken to complete the local bridge inventory assessment by conducting an inspection and evaluation of off-system bridges:

- Identify bridges for which inspection reports have not been prepared and load ratings have not been documented.
- Conduct routine inspections of the bridges and prepare BIRs following the same Caltrans process for NBI bridges.
- For vehicular bridges, conduct load ratings to determine whether legal loads can safely use the bridges.
- Recommend safe load postings when it is found that a bridge should be load restricted for legal vehicles.

2.5. Consolidate Projects into Broad Improvement Categories:

All bridges shall be grouped into work categories based on the type of work and appropriate funding source(s). The work identified under this Bridge Strategic Plan is expected to fall into one of four categories listed below, as defined by the Federal Highway Administration. Within each of these categories, additional assessments and field verifications will identify top projects for funding.

TABLE 7: LIST OF BRIDGE MAINTENANCE CATEGORIES INCLUDING FUNDING ELIGIBILITY

Maintenance/Repair Category	Description	Eligible for Federal Funds
Routine Maintenance	Work that is performed in reaction to an event, season, or activities that are done for short-term operational need that do not have preservation value. This work requires regular reoccurring attention.	No
Bridge Preservation	Activities that prevent, delay, or reduce deterioration of bridges or bridge elements, restore function, and keep bridges in good condition and extend their life.	Yes, with HBP limits
Bridge Rehabilitation	Major work required to restore the integrity of the bridge, as well as work necessary to correct major safety defects.	Yes, with HBP limits
Bridge Replacement	Total replacement of an existing bridge with a new facility constructed in the same general traffic corridor.	Yes, for discretionary grants

2.5.1. Routine Maintenance

Routine maintenance remains the responsibility of the local agency and is not eligible for HBP or other Federal-aid Highway Program funding. Routine bridge maintenance is defined as regularly scheduled activities to preserve the bridge components in their present or intended condition and generally includes minor work that is normally done by in-house bridge maintenance crews. These are examples of routine maintenance activities not eligible for federal funds:

- Trash, litter and dead animal removal
- Graffiti removal
- Hazardous material removal
- Asphalt patch with no membrane on concrete deck
- Accident damage to bridge and its appurtenances

2.5.2. Bridge Preservation

According to FHWA Bridge Preservation Guide, effective bridge preservation actions are intended to delay the need for costly rehabilitation or replacement while bridges are still in good or fair condition and before the onset of serious deterioration. Bridges classified as structurally deficient or in poor condition may not be eligible for preventive maintenance funds because replacement or rehabilitation may be more appropriate. Preservation actions may be cyclic or condition-driven, as illustrated in Figure 6. Examples are listed in Table 8 and Table 9.

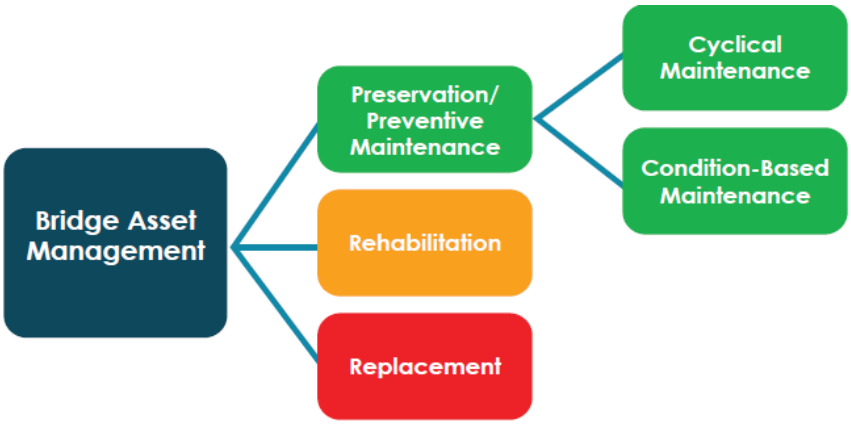


FIGURE 6: BRIDGE ACTION CATEGORIES (SOURCE - FHWA BRIDGE PRESERVATION GUIDE)

2.5.2.1. Cyclical Maintenance Activities

Cyclical maintenance activities are performed at pre-determined intervals that aim to preserve and delay deterioration of bridge elements or component conditions. The frequency of cyclical PM activities can change because of environmental or condition changes. For example, superstructure cleaning that was occurring at 3-year intervals based on past accumulation of debris buildup could change if pigeons start routinely nesting on superstructure elements. Examples of cyclical PM activities on good and fair condition bridges and components are shown in Table 8.

TABLE 8: EXAMPLES OF CYCLICAL MAINTENANCE ACTIVITIES

Cyclical Maintenance Activity	Bridge Component	Recommended Maintenance Frequency
Clean/Wash Bridge	Deck and/or Super/Substructure	Every 1 Year
Clean and Flush Drains	Deck	Every 1 Year
Clean Joints	Deck	Every 1 Year
Deck/Parapet/Rail Sealing	Deck	Every 5 Years

Source: AASHTO Guide to Bridge Preservation Actions, First Edition 2021

2.5.2.2. Condition-based Maintenance Activities

Condition-based maintenance activities are performed on bridge components or elements in response to known defects. Condition-based maintenance improves the condition of that portion of the element but may or may not result in an increase in the component condition rating. Examples of condition-based maintenance activities that may be considered on fair condition bridges and components are shown in Table 9. Although the listed maintenance activities are determined on an as-needed basis and the service life of bridge components depends heavily on factors such as traffic volume, roadway drainage and other environmental factors, Table 10 provides examples of typical maintenance cycles for various bridge component.

TABLE 9: EXAMPLES OF CONDITION-BASED MAINTENANCE ACTIVITIES

Examples of Condition-Based Maintenance Activity	Bridge Component
Drains, Repair/Replace	Deck
Joint Seal Replacement	Deck
Joint Repair/Replace/Elimination	Deck
Electrochemical Extraction (ECE)/Cathodic Protection (CP)	Deck
Concrete Deck Repair in Conjunction with Overlays, CP Systems or ECE Treatment	Deck
Deck Overlays (thin polymer epoxy, asphalt with waterproof membrane, rigid overlays)	Deck
Repair/Replace Approach Slabs	Approach
Seal/Patch/Repair Superstructure Concrete	Superstructure
Protective Coat Concrete/Steel Elements	Superstructure
Spot/Zone/Full Painting Steel Elements	Superstructure
Steel Member Repair	Superstructure
Fatigue Crack Mitigation (pin-and-hanger replacement, retrofit fracture critical members)	Superstructure
Bearing Restoration (cleaning, lubrication, resetting, replacement)	Superstructure
Movable Bridge Machinery Cleaning/Lubrication/Repair	Superstructure
Patch/Repair Substructure Concrete	Substructure/Culvert
Protective Coat/Concrete/Steel Substructure	Substructure/Culvert
ECE/CP	Substructure/Culvert
Spot/Zone/Full Painting Steel Substructure	Substructure
Pile Preservation (jackets/wraps/CP)	Substructure
Channel Cleaning / Debris Removal	Channel
Scour Countermeasure (installation/repair)	Channel

Source: USDOT FHWA Bridge Preservation Guide, Spring 2018

TABLE 10: EXAMPLES OF BRIDGE COMPONENT MAINTENANCE CYCLE

Examples of Condition-Based Maintenance Activity	Recommended Maintenance Cycle (years)
Deck Overlay (Asphalt)	20
Deck Overlay (Polymer Epoxy)	15
Deck Overlay (Concrete)	20
Replace Pourable Joint Seal	10
Replace Strip Seal Joints and Steel Joints	20
Structural Steel Spot Painting	10
Structural Steel Full Painting	40
Concrete Bridge Spall Repair	30
Bearing Cleaning and Recoating	4

Source: AASHTO Guide to Bridge Preservation Actions, First Edition 2021

2.5.2.3. Flow Chart to Determine Bridge Preservation Actions for Major Components

The flow chart shown in Figure 7 on next page was developed by M&N and is aimed to further help the City justify the eligibility of bridge preservation action if it is not listed in Table 8 and Table 9.

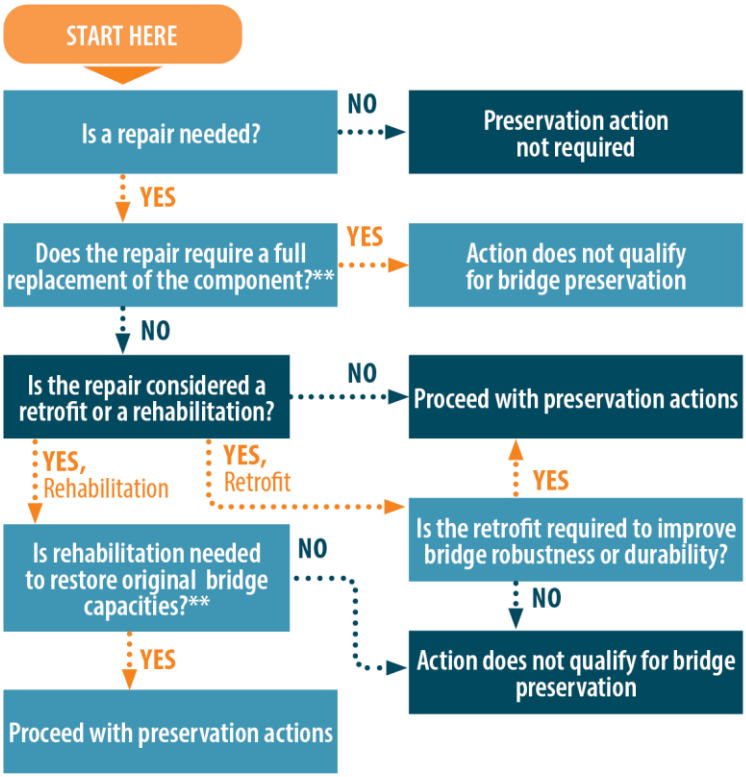


FIGURE 7: FLOW CHART TO DETERMINE BRIDGE PRESERVATION ACTIONS FOR MAJOR COMPONENTS

2.5.3. Bridge Rehabilitation

Rehabilitation involves major work required to restore the structural integrity of a bridge, as well as work necessary to correct major safety defects. Rehabilitation work can be done on one or multiple elements and/or components of a structure. These projects require significant engineering resources for design, a lengthy completion schedule, and considerable costs. Examples of bridge rehabilitation include, but are not limited to:

- Partial or complete deck replacement
- Superstructure replacement
- Substructure/culvert strengthening or partial/full replacement
- Incidental widening is often associated with some of these activities which include protected bike lanes that the City may require. Associated widening costs may or may not be eligible for reimbursement

Seismic retrofitting, which involves strengthening a bridge to better withstand earthquakes, is typically considered a form of rehabilitation because it improves the bridge's ability to resist seismic forces, thus enhancing its overall structural capacity.

2.5.4. Bridge Replacement

Similar to bridge rehabilitation, bridge replacement projects require engineering resources for design, a substantial and complex completion schedule, and considerable costs. A life cycle analysis may be performed to determine the economic viability of rehabilitation versus replacement. The life cycle analysis will take immediate and long-term cost factors into account, such as continual repairs and maintenance over the bridge's service life and will justify the preferred project strategy.

3. Bridge Project Funding Requirements and Opportunities

As an overall approach, the bridge strategic plan outlines a variety of grants and other funding sources and must follow a multitude of requirements at the federal, state and local levels. These requirements are specific for bridge condition, funding, community input and prioritization. This Section provides recommended City guidelines for the bridge project funding requirements and lists funding opportunities at federal, state and local levels. Local coordination and preference for projects is considered as a key element of the overall bridge strategic plan, including project outreach plans more fully described in Section 4.

3.1. Prerequisite for Obtaining Local, State and Federal Funding

There are four basic types of funding sources to support this Bridge Strategic Plan: 1) local funds for routine maintenance; 2) local, regional, state and pass-through federal funds for preventive maintenance; 3.) competitive regional, state and federal discretionary grants or allocations for bridge rehabilitation and replacement; and 4) set asides established by legislation (e.g. earmarks).

3.1.1. Routine Bridge Maintenance

Routine bridge maintenance is in most cases a City responsibility, generally requiring either City General Funds or dedicated City funds. Including routine bridge maintenance costs in a City's multi-year Capital Improvement Plan is considered a best management practice.

3.1.2. Preventive Bridge Maintenance

As previously noted, preventative bridge maintenance provides a significant return on investment. The Caltrans Bridge Preventive Maintenance Program (BPMP) is a major source of preventive funding for "on-system" bridges (i.e. vehicular bridges longer than 20 feet). "Off System" bridges (e.g. pedestrian bridges or bridges less than 20 feet long) are not included in BPMP eligibility. The City should consider tracking preventive funding shortfalls from the BPMP allocations and identifying preventive funding needs for "off-system" bridges in the City (i.e. pedestrian bridges and bridges less than 20 feet long). Including preventive funding shortfalls from the BPMP allocations and off-system preventive funding needs in a City's multi-year Capital Improvement Plan is considered a best management practice.

As the City Bridge Strategic Plan evolves from 51 bridges to 516 bridges, the City should track its preventive maintenance needs and the local or BPMP funds necessary to meet those needs.

3.1.3. Bridge Rehabilitation and Replacement

Bridge rehabilitation and replacement is an expensive undertaking, generally requiring state or federal discretionary grants or allocations. Relevant grants are listed in Appendix F. Regional funding sources such as CMAQ and RSTP can be used to rehabilitate most pedestrian bridges and some "short" bridges (less than 20 feet in length). As described in Section 1.7.1 above, a competitive grant application requires a good deal of engineering, environmental, and outreach. Including these grant preparation costs in a City's multi-year Capital Improvement Plan is considered a best management practice.

3.1.4. Bridge Funding

Funding set asides for critical bridge projects are not uncommon. Thoughtful federal earmarks can advance a critical project. California state project earmarks are relatively rare but could address programmatic deficiencies in the Caltrans Highway Bridge Program (HBP), such as the mandate for local seismic evaluations or the eligibility of bridges rated "Fair" and in danger of falling to "Poor". For example, local seismic evaluations are required and can be costly—approximately $1 million for the San Fernando Bridge alone—though actual expenses vary depending on the complexity of each bridge structure.

3.2. Federal and State Bridge Funding Opportunities

The most appropriate use of external grants, allocations or appropriations is for a priority bridge replacement or rehabilitation project. The prioritization process is necessarily collaborative, and a draft spread sheet is attached to provide information and data to support that process (Appendix E).

3.2.1. State Design and Construction Grants and Allocations.

The pass-through federal funds in the Caltrans Highway Bridge Program (HBP) have provided significant design and construction funding for the Sixth Street and the Hyperion Bridge projects. This longstanding program has grown into the conduit for the federal Bipartisan Infrastructure Law allocation of $575 million annually for bridge rehabilitation and replacement. Caltrans and the CTC have limited HBP to focusing exclusively on bridges rated "Poor." The San Fernando Bridge is currently the only City bridge queuing for HBP rehabilitation funding. Should the bridge be determined to be seismically vulnerable, its chances of grant funding will increase.

Securing additional and future HBP will require several City actions:

- Concerted efforts and resourcing for the construction of the Hyperion Bridge. Additional HBP funds are unlikely to be programmed until that project advances into construction.
- Identification of potential bridge rehabilitation and replacement projects based advanced material analysis and detailed seismic vulnerability analyses, possibly including one or more of the following:
    - Lincoln Bridge
    - Fourth Street Viaduct over LA River
    - Seventh Street Viaduct over Railroads
    - One or more of the six, seismically vulnerable City bridges on Table 5 of this report
- Advocacy for the use of state or pass-through federal funds to fully evaluate the seismic vulnerability of the six City bridges on Table 5—with each study costing in excess of $200,000, external funding or earmarks are needed from Regional Surface Transportation funds, Highway Bridge Program funds, federal Bridge Formula Funds, federal Bridge planning grants, or other grant programs.
- Advocacy for City representation on the BHBP Advisory Committee (https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hbp/hbp-advisory-committee-roster-20240109.pdf)

3.2.2. Other Grants and Allocation Opportunities

- Advocacy for regional pass-through federal funding, including Surface Transportation Block Grants (RSTP) and Congestion Mitigation and Air Quality (CMAQ) funding
- Off System HBP and CMAQ funding for pedestrian bridges

3.2.3. Federal Construction Grants.

For construction purposes, the strongest bridge grant application for a discretionary federal grant is one that is the priority of its owner – a locality, region, or state, along with the following:

- A bridge rating of "Poor" or a rating of "Fair" with the potential to become "Poor"
- 30% PE and escalated cost estimate
- NEPA completed or well underway
- Network traffic study accompanying NEPA
- Positive BCA, preferably above 1.4
- 20-50% matching funds depending on the program
- Ability to meet aggressive bridge obligation timelines (may require alternative delivery)

Excluding matching funds, the cost of meeting the above criteria can easily reach 10% of the bridge construction costs (e.g. PA-ED, NEPA/CEQA, traffic and outreach). These are significant costs that will

largely be borne by the City. The cost of writing a discretionary federal construction grant for a major bridge will typically range from $40,000 to $60,000, provided the PE, NEPA, and traffic work is complete. For City bridges, the most relevant discretionary construction grant programs include:

- RAISE for bridge projects with strong transit, bike and pedestrian usage https://www.transportation.gov/RAISEgrants/about
- Bridge Investment Program (BIP) for bridges less than $100 million and bridges greater than $100 million https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program
- INFRA and Mega multi-year grants for bridges greater than $100 million with *national* transportation benefits

3.2.3.1. Benefit-Cost Analysis (BCA)

Benefit-Cost Analysis (BCA) is a widely accepted method for making public sector investments, and USDOT has a well-developed set of standards to determine and compare project costs over time against project benefits over time. Project benefits typically include things like crash reduction, reduced maintenance, reduced air emissions, travel time savings, lower operating costs, etc. For all USDOT construction grants, it is a statutory requirement that project benefits MUST exceed project costs (the BCA ratio must be greater than 1.0). For most USDOT grant programs, the higher the BCA ratio, the more competitive an individual grant is. For example, if there are two $1 million bridge projects, but one project only has $1 million in benefits (a BCA of 1.0) while another has $1.5 million in benefits (a BCA of 1.5), the second bridge will be scored higher and is more competitive. The BCA ratio is one of several evaluation metrics used by USDOT. In highly competitive grant processes, USDOT places greater emphasis on BCA ratios due to their standardized calculation and comparability.

The FHWA bridge program has its own and very prescriptive BCA methodology and scoring system. Unfortunately, its user manual has been taken off the USDOT website, likely in order to address the new Administration's policy guidance. However, Section E.1.c of the outstanding Notice of Funding Opportunity (NOFO) for the Bridge Improvement Program gives very clear guidance on acceptable BCA ratios:

Rating	Description
High	The project's benefits will exceed its costs with a benefit-cost ration of at least 1.5

For the Bridge Improvement Program, a successful application should be rated "High" in all evaluation categories, including the BCA ratio. It is theoretically possible for a successful bridge grant request with a BCA less than 1.5, but that grant application would need a BCA ratio very close to 1.5 and a "High" ranking on all other criteria. A BCA ratio below 1.4 is likely to negatively impact a grant request, even if other evaluation criteria receive "High" ratings. Although a BCA ratio of 1.5 is the recommended target, achieving at least 1.4 is considered the minimum threshold for competitiveness in the Bridge Improvement Program.

3.2.4. Federal Planning Grants.

Some federal bridge planning grants can help advance bridge projects through certain levels of feasibility and general planning, but not for the 30% PE, NEPA, and traffic study required above. The cost of writing a discretionary federal planning grant will typically range from $20,000 to $30,000. For City bridges, the most relevant discretionary planning grants include:

- Bridge Investment Planning grants that can only be used for feasibility, funding, and community studies. https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program
- PROTECT planning grants where resiliency issues such as sea level rise or unusual scour due to climate change have occurred

3.3. State Construction Grants.

The longstanding Caltrans Highway Bridge Program (HBP) has grown into the conduit for the federal Bipartisan Infrastructure Law allocation of $575 million annually. Caltrans and the CTC have limited HBP

to focusing exclusively on bridges rated “Poor.” The San Fernando Bridge is currently the only City bridge queuing for HBP rehabilitation funding. Should the bridge be determined to be seismically vulnerable, then its chances of grant funding will increase.

4. State and Federal Allocations and Earmarks.

Other pathways for bridge funding are possible but will require concerted organizational and advocacy efforts by the City. Appendix F provides a complete listing of potential grants and fundings from federal, state, and local levels the City may consider to apply for implementing the bridge maintenance program.

Note that the authorization of most of those federal grant programs and most of the funding in those programs are attributable to the Bipartisan Infrastructure Law (BIL), the legislation for which expires at the end of Federal Fiscal Year 2026.

4.1. Filter Bridges Based on Local Prioritization and Funding Availability

The recommendations of this Bridge Strategic Plan can form the basis a sustainable bridge maintenance and replacement program by including and funding the following elements in the multi-year capital improvement plan:

- Adequate City funding for routine maintenance
- Adequate City, State, and pass-through Federal funding for preventive maintenance, with provisions to address any funding shortfalls from the Caltrans Bridge Preventive Maintenance Program (BPMP)
- Identification of bridge replacement and rehabilitation candidates; State and Federal funding options for each candidate; schedule and budget for planning, preliminary engineering, and environmental documentation required for a competitive grant application. Current potential replacement and rehabilitation candidates include:
    - Lincoln Bridge
    - Fourth Street Viaduct over LA River
    - Seventh Street Viaduct over Railroads
- One or more of the six, seismically vulnerable City bridges on Table 5 of this report

A conceptual multi-year budget for possible inclusion in the City Capital Improvement Program is illustrated in Table 11 below.

4.2. Effort, Cost, and Schedule for Competitive Applications and Funding Requests

As noted in Section 1.7, the most appropriate use of external grants, allocations or appropriations is for a priority bridge replacement or rehabilitation project. The prioritization process is necessarily collaborative, and a draft spread sheet is attached to provide information and data to support that process (Appendix E).

- Federal Construction Grants. For construction purposes, the strongest bridge grant application for a discretionary federal grant is one that is the priority of its owner – a locality, region, or state, along with the following:
    - A bridge rating of “Poor” or a rating of “Fair” with the potential to become “Poor”
    - 30% PE and escalated cost estimate
    - NEPA completed or well underway
    - Network traffic study accompanying NEPA
    - Positive BCA, preferably above 1.4
    - 20-50% matching funds depending on the program
    - Ability to meet aggressive bridge obligation timelines (may require alternative delivery)

Excluding matching funds, the cost of meeting the above criteria can easily reach 10% of the bridge construction costs (e.g. PA-ED, NEPA/CEQA, traffic and outreach). These are significant costs that will largely be borne by the City. The cost of writing a discretionary federal construction grant for a major bridge will typically range from $40,000 to $60,000, provided the PE, NEPA, and traffic work is complete. For City bridges, the most relevant discretionary construction grant programs include:

  - RAISE for bridge projects with strong transit, bike and pedestrian usage https://www.transportation.gov/RAISEgrants/about
  - Bridge Investment Program (BIP) for bridges less than $100 million and bridges greater than $100 million https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program
- Federal Planning Grants. Some federal bridge planning grants can help advance bridge projects through certain levels of feasibility and general planning, but not for the 30% PE, NEPA, and traffic study required above. The cost of writing a discretionary federal planning grant will typically range from $20,000 to $30,000. For City bridges, the most relevant discretionary planning grants include:
  - Bridge Investment Planning grants that can only be used for feasibility, funding, and community studies. https://www.transportation.gov/rural/grant-toolkit/bridge-investment-program
  - PROTECT planning grants where resiliency issues such as sea level rise or severe and unanticipated scour related to climate change.

5. Development of Public Outreach Documents for Projects

Transportation projects, even small routine maintenance projects, can impact communities, businesses and travelers. A sustainable bridge maintenance and replacement program necessarily includes public outreach to manage expectations and build general support across diverse communities and interests.

An outreach plan should be considered to ensure that the City conducts each project with high public awareness, facilitated through effective and inclusive outreach tools and techniques.

Example of Metrics for Outreach Approach

- Outreach work plan and milestone schedule
- City and stakeholder collaboration
- Stakeholder database
- Multilingual approach
- All-inclusive notification program
- GIS mapping tools and digital surveys
- Comment logs and meeting summary reports

Example of Key Stakeholders

- Elected offices
- Neighborhoods/communities
- Businesses and properties along project footprint
- Various Community groups
- Medical facilities
- Police and Fire
- LADOT/LA Metro
- Other Adjacent stakeholders

Example of Technical Metrics

- Minimize unnecessary construction
- Provide creative yet simple solutions
- Minimize or eliminate right-of-way (ROW) takes
- Provide a constructible and cost-effective Project
- Mitigate parking loss for businesses (if applicable)
- Improve bicycle and pedestrian facilities
- Account for Special Events near the proposed project

General flow of project initiation and implementation is shown in the below flow chart:

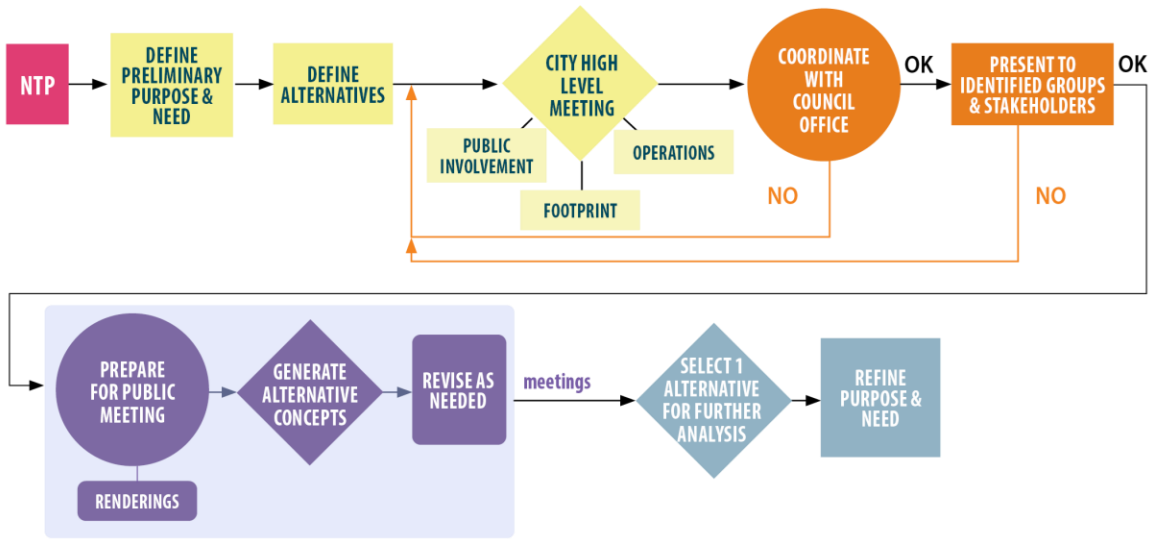


FIGURE 8: FLOW CHART OF PROJECT OUTREACH STRATEGY

5.1. Recommended Outreach Plan

A recommended outreach plan is developed by Arellano Associates (AA), as part of M&N to ensure effective communication and engagement with stakeholders and the general public regarding ongoing maintenance efforts. This plan establishes the approach and methods to be considered for the community engagement that will support the preliminary engineering and environmental documents. To achieve the outreach objectives for this project, AA recommends the following outreach tasks and techniques.

1. Pre-Project Planning
    a. Internal Kick-off Meeting: Conduct an initial outreach meeting with City staff and project team to align outreach objectives.
    b. Outreach Schedule: Develop a detailed outreach schedule, in collaboration with City staff and project team.
2. Team Meetings
    a. Attend outreach team meetings, plus additional ad-hoc and outreach coordination meetings, as needed.
    b. Arrange internal outreach-oriented coordination calls/meetings to refine and implement the public engagement plan.
3. Resources and Tools
    a. Work Plan
        i. Prepare a detailed schedule of outreach activities prior to each public meeting.
    b. Stakeholder Database
        i. Utilize existing stakeholder databases from LABOE and AA projects within the same geographic area.
        ii. Conduct original research to incorporate relevant stakeholders, including but not limited to:
            - Elected officials/offices
            - Community-based organizations
            - Businesses and properties along project footprint
            - Neighborhood associations
            - Medical facilities

- Police and Fire departments
- LADOT/LA Metro
- Other adjacent stakeholders
- Ongoing maintenance and reporting, as needed.

c. Branding
    i. Work with team to develop project logo and branding.
    ii. Develop a creative toolkit that includes templates for Eblast header, social widgets, PowerPoint template, etc.

d. Collateral Material
    i. Fact Sheet: Includes project overview, timeline, contact info, and ways to stay involved.
    ii. FAQ: addresses common questions.

e. Notifications (when possible, notifications will be in English and Spanish)
    i. Eblasts: Draft copy and design for project eblasts and will distribute to project stakeholders.
    ii. Social Media: Conduct a social media campaign to elevate public awareness and increase participation, as well as garner valuable input. AA will develop copy and graphics for City's social media accounts. AA will also develop and maintain a social media calendar.
    iii. Digital Medial Toolkit: Includes project resources, copy and paste messaging, and graphics.
    iv. Website: Develop website content in line with City guidelines and with City approval.

FIGURE 9: EXAMPLE OF SOCIAL MEDIA POSTS

f. Mapping
    i. Utilize "ESRI StoryMap", an interactive mapping tool that combines maps with narrative text, images and multimedia content. This tool makes it easy to harness the power of maps and geography to tell a story and provides a seamless interface that includes interactive maps, videos, images, infographics, text, online surveys and links to project resources. AA has much success with the current StoryMap developed for the City's 710 Mobility Project. Click here to view.

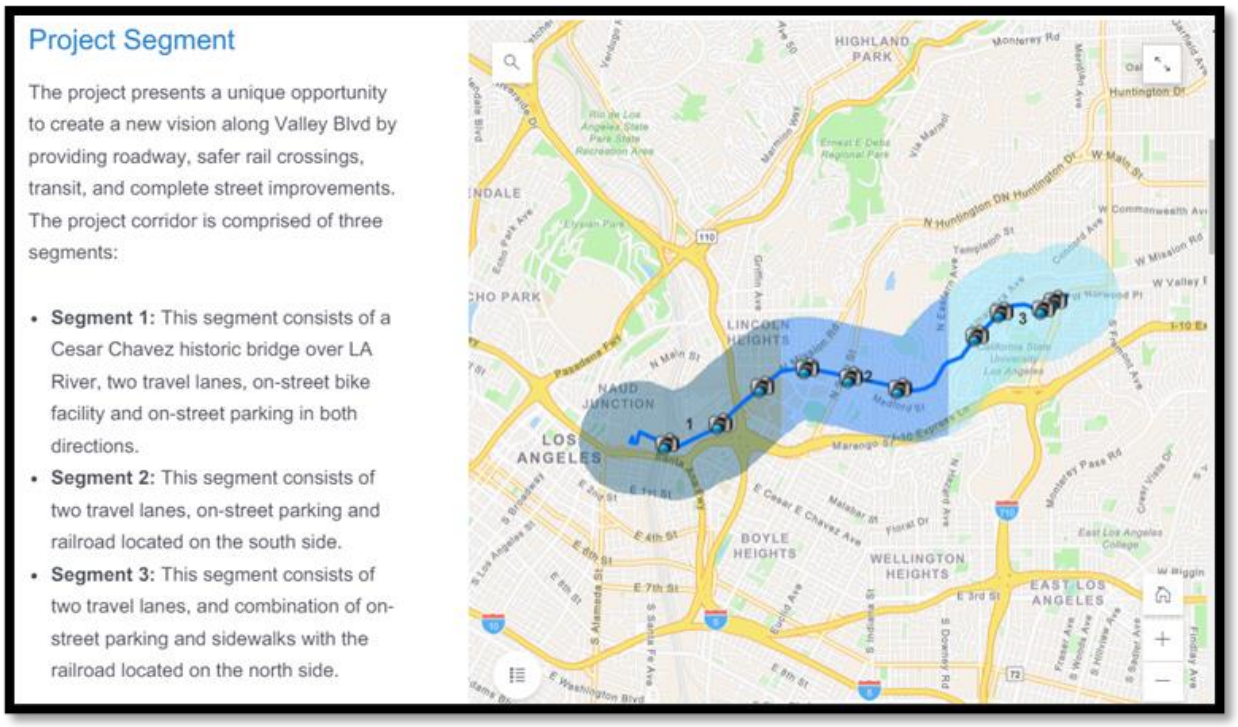


FIGURE 10: EXAMPLE OF STORY MAP

g. Online Surveys

Utilize Typeform, an online survey tool that is used to create forms and surveys that contain both text and graphics. This platform makes asking questions easy on any device and gives respondents a seamless interface for answering them. The tool supports 'skip logic' and a variety of question types, including multiple choice, open ended, picture choice, rating, etc.

4. Public Involvement and Reporting
   a. Public Meetings
      i. Logistics: Handle all aspects of meeting logistics such as venue arrangement, virtual tech support, and staffing.
      ii. Notification: Implement a comprehensive notification strategy utilizing eblasts, social media, direct mail, and digital ads, as needed.
      iii. Meeting Support: Provide support during meetings including registration, feedback collection, and interactive exercises.
      iv. Interpretation: Spanish interpretation could be provided to increase project accessibility.
      v. Meeting Reports: Develop a detailed meeting summary report that includes discussions, feedback, attendance, and notification campaign.
   b. Stakeholder Briefings
      i. Meet with key stakeholder groups to build awareness, identify opportunities and constraints, and facilitate support for the project.
   c. Outreach Summary Report
      i. A final outreach summary report will be prepared at the conclusion of the project to document the overall process for public records.

6. Recommendations

The BSP establishes a comprehensive and prioritized framework for bridge maintenance, rehabilitation, and replacement, ensuring structural resilience and public safety while maximizing funding opportunities at the federal, state and local level.

6.1. Inventory Assessment and Prioritization

Bridge rehabilitation and replacements are considered bridge improvement projects which include seismic retrofit, bridge widening and bridge replacement. A list identifying the potential bridge candidates across the city for improvements is explained in Section 2.1 and shown in Appendix E. Based on the suggested scope of work and prioritization matrix, a recommended annual budget for bridge improvement projects is provided (Table 11).

- Identifies 51 priority bridges requiring repairs. Details are provided in Table 11.
- Categorize bridges based on condition, structural needs and funding eligibility to optimize resource allocation.

6.2. Funding Strategy and Federal Compliance

- Seek $15 million over five years to repair 42 bridges and complete the design for 2 additional bridge projects. Details are provided in Table 11.

6.3. Non-Routine Maintenance and Long-Term Planning

- Establish an annual baseline maintenance budget of $1.5 million, starting FY 2026-2027 for non-routine maintenance scope of work that is not eligible for funding from Caltrans BPMP.

6.4. Flexibility in Design and Technical Support

- Seek annual budget of $500,000 to provide urgent design and technical support services using PQOC Consultants contract.

6.5. Seismic Safety and Structural Resilience

- Identifies six (6) structurally vulnerable bridges needing urgent attention.
- Within the next five years:
    - Seismic retrofitting of three (3) high-risk bridges
    - Design completion of one (1) structurally vulnerable bridge
    - Strategic planning for two (2) additional bridges.

6.6. Establish and Maintain Bridge Asset Management System

The Bureau of Engineering – Bridge Improvement Division (BOE-BID) will leverage existing platforms, including InspectX and an Asset Management System, to establish and maintain a comprehensive bridge asset management system. The specific implementation approach will be guided by factors such as licensing fees, implementation requirements, training needs, and technical support costs.

6.7. Recommended Roles and Responsibility Across the City

To implement a comprehensive BSP, the City must clearly define roles and responsibilities across various bureaus and departments involved in bridge maintenance and improvement efforts.

- BOE-BID (Bureau of Engineering - Bridge Improvement Division) – Manages bridge replacement, rehabilitation and non-routine maintenance projects, coordinates funding and contractor approvals, and maintains bridge asset management system.
- Caltrans bridge inspection reports for federally listed bridges.
- BOE-SED (Bureau of Engineering - Structural Engineering Division) – Conducts bridge inspections, structural assessments and maintenance recommendations in collaboration with Caltrans, and maintains bridge inspection system. The inspections include Local bridge inspections for short-span bridges ($\leqslant$ 20 feet clear openings) and pedestrian bridges, which Caltrans does not inspect.
- StreetsLA (Bureau of Street Services) – Handles routine bridge-related roadway maintenance, pavement repairs and accessibility improvements.
- BSL, LADOT, LASAN, RAP – Handles routine bridge maintenance for street lighting (BSL), traffic control devices (LADOT), storm drains (LASAN) and park infrastructure at RAP properties.

The recommended delegation of responsibilities is outlined in Figure 11 on the next page as a reference for managing different types of repairs and maintenance.

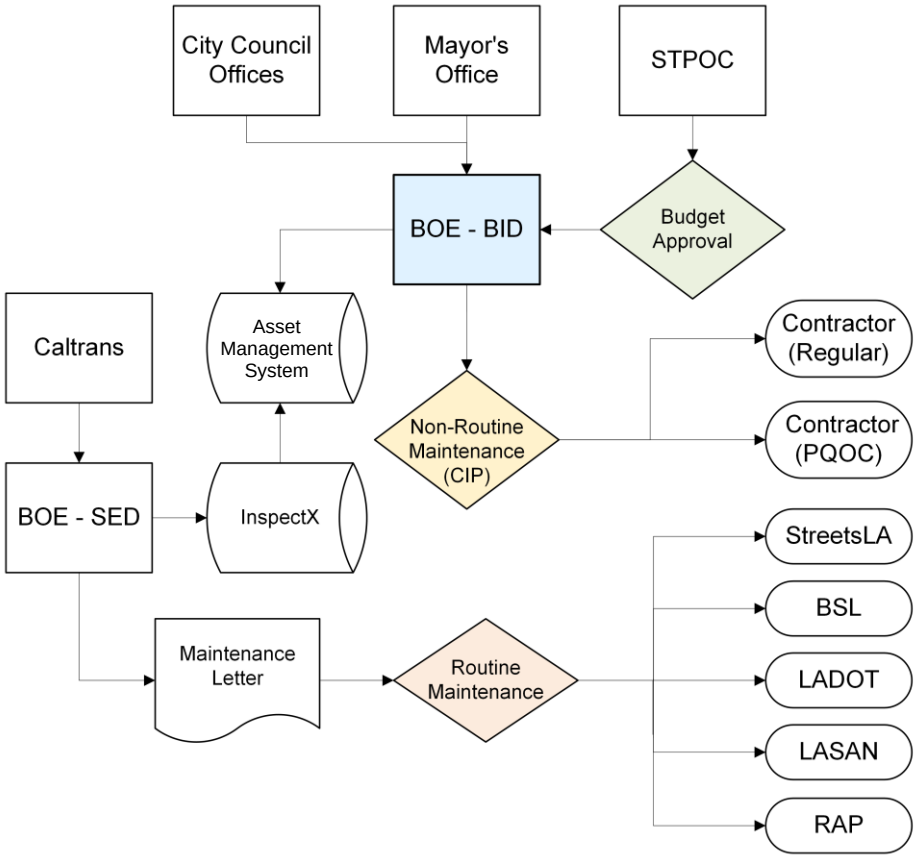


FIGURE 11: RECOMMENDED ROLES AND RESPONSIBILITIES ACROSS THE CITY DEPARTMENTS AND BUREAUS

6.8. Establish Bridge Emergency On-Call Contractors List

To ensure timely and cost-effective urgent and emergency repairs to bridges and transportation infrastructure, it is recommended that BID establishes a five-year contract to solicit construction services from pre-qualified contractors on the Bridge Emergency On-Call Contractors List.

TABLE 11: RECOMMENDED BRIDGE PROGRAM FINANCIAL PLAN

SEQ	Bridge State #	Bridge Name (Design & Construction)	Duration (Years)	Sufficiency Rating	Condition	Scope	Project Cost	Engineering & CM Cost	Grant Match Amount (80/20)	Grant Application Cost	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2032-2033
1	53C2251	Dimmick Dr. Sidehill Viaduct	2	51.1	Fair	Repair spalls	$55,000	$32,500			$32,500	$22,500						
2	53C1690	Dell Ave Bridge O/Howland Canal	2	53.1	Fair	Repair spalls	$20,000	$12,500			$12,500	$7,500						
3	53C1688	Dell Ave Bridge O/Carroll Canal	2	53.3	Fair	Repair spalls	$20,000	$12,500			$12,500	$7,500						
4	53C1689	Dell Ave Bridge O/Linnie Canal	2	54.3	Fair	Repair spalls	$20,000	$12,500			$12,500	$7,500						
5	53C0161	Franklin Ave Bridge	2	54.3	Fair	Repair spalls	$225,000	$130,000			$130,000	$95,000						
6	53C1057	Channel Lane Bridge O/Santa Monica Canyon Channel	2	68.6	Fair	Repair Spalls	$15,000	$15,000			$15,000	$10,000						
7	53C1058	Charlotte St Bridge O/Sptco Rr	2	65.1	Fair	Repair Spalls	$115,000	$67,500			$67,500	$47,500						
8	53C1759	Lassen St Bridge O/Granada Channel	2	71.3	Fair	Repair Spalls	$55,000	$32,500			$32,500	$22,500						
9	53C1302	Roscoe Blvd Bridge O/Chatsworth Creek	2	72.3	Fair	Repair Spalls	$70,000	$40,000			$40,000	$30,000						
10	53C1249	Mc Vine Ave Bridge O/Haines Canyon Channel	2	68.3	Fair	Repair Spalls & Cracks	$60,000	$35,000			$35,000	$25,000						
11	53C1061	Miller Dr Sidehill Slope Viaduct	2	72.2	Fair	Replace Roadway Slab	$35,000	$20,000			$20,000	$15,000						
12	53C1047	Burbank Blvd Bridge (N Rdwy) O/Los Angeles River	2	67.3	Fair	Resurface Deck	$445,000	$262,500			$262,500	$182,500						
13	53C1109	Burbank Blvd Bridge (S Rdwy) O/Los Angeles River	2	67.3	Fair	Resurface Deck	$445,000	$262,500			$262,500	$182,500						
14	53C0125	4Th St Viaduct O/Flower St And Figueroa St*	2	67.9	Fair	Resurface Deck	$1,115,000	$725,000			$725,000	$390,000						
15	53C1354	Van Nuys Blvd Bridge O/Pacoima Wash	2	69.9	Fair	Resurface Deck	$65,000	$37,500			$37,500	$27,500						
16	53C1369	Victory Blvd Bridge O/Los Angeles River	2	70.1	Fair	Resurface Deck	$960,000	$565,000			$565,000	$395,000						
17	53C0301	San Fernando Rd (West Rdwy) Bridge O/Beacon Wash	2	57.3	Fair	Resurface deck & Repair spall	$75,000	$45,000			$45,000	$30,000						
18	53C0067	Anaheim St Bridge O/Abandon Rr	2	59.9	Fair	Resurface the deck	$330,000	$195,000			$195,000	$135,000						

TABLE 11: RECOMMENDED BRIDGE PROGRAM FINANCIAL PLAN – CONTINUED

SEQ	Bridge State #	Bridge Name (Design & Construction)	Duration (Years)	Sufficiency Rating	Condition	Scope	Project Cost	Engineering & CM Cost	Grant Match Amount (80/20)	Grant Application Cost	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2032-2033
19	53C1720	Mount Gleason Ave And Valmont St Bridge	2	54.5	Fair	Resurface Deck	$300,000	$177,500			$177,500	$122,500						
20	53C1216	Kester Ave Bridge O/Los Angeles River	2	69.4	Fair	Resurface the deck	$180,000	$105,000				$75,000	$105,000					
21	53C0063	Lindley Ave Bridge O/Los Angeles River	2	65.7	Fair	Resurface & Repl Shear Key	$440,000	$260,000				$180,000	$260,000					
22	53C1723	Roscoe Blvd Bridge O/Pacoima Wash	2	61.6	Fair	Seal Cracks on Pier Wall	$160,000	$92,500				$67,500	$92,500					
23	53C1691	Dell Ave Bridge O/Sherman Canal	2	54.3	Fair	Seal Cracks on Slab	$35,000	$20,000				$15,000	$20,000					
24	53C0308	Sepulveda Blvd O/Fox Hills Wash	2	54.3	Good	Remove Sediment/Inst. MH	$100,000	$60,000				$40,000	$60,000					
25	53C2037	Foothill Blvd O/Haines Cyn	2	54.1	Good	Repair Metal Stairs	$90,000	$55,000				$35,000	$55,000					
26	53C1157	East Channel Rd Bridge O/Santa Monica Canyon Channel	2	65.8	Good	Repair Spalls	$10,000	$5,000				$5,000	$5,000					
27	53C1137	Chautauqua Blvd Sidehill Bridge	2	66.5	Good	Repair Spalls	$225,000	$130,000				$95,000	$130,000					
28	53C1316	Saticoy St Bridge O/Pacoima Wash	2	67.1	Good	Repair Spalls	$145,000	$85,000				$60,000	$85,000					
29	53C1252	West Channel Rd And Mesa Rd Bridge O/Sm Canyon Channel	2	66.6	Good	Repair Spalls	$250,000	$145,000				$145,000	$105,000					
30	53C1304	Roscoe Blvd Bridge O/Bull Creek	2	69.5	Good	Repair Spalls	$195,000	$112,500					$112,500	$82,500				
31	803	Beckett St Bridge O/Haines Canyon Channel	2	70.3	Good	Repair Spalls	$25,000	$15,000					$15,000	$10,000				
32	53C1111	Burbank Blvd O/Culvert	2	69	Good	Resurface Deck	$120,000	$70,000					$70,000	$50,000				
33	53C2038	Foothill Blvd Bridge O/Haines Canyon Channel	2	69.3	Good	Resurface Deck	$85,000	$50,000					$50,000	$35,000				
34	53C1236	Ventura Blvd Bridge O/Dry Canyon Creek	2	67.3	Good	Seal Cracks at Pier Wall	$55,000	$32,500					$32,500	$22,500				
35	53C1877	Avenue 43 Bridge O/Arroyo Seco Channel	2	56.6	Good	Seal Cracks	$85,000	$50,000					$50,000	$35,000				
36	53C1151	Desoto Ave Bridge Over The Los Angeles River	2	74.2	Good	Seal Cracks at Soffit	$365,000	$215,000					$150,000	$215,000				

TABLE 11: RECOMMENDED BRIDGE PROGRAM FINANCIAL PLAN – CONTINUED

SEQ	Bridge State #	Bridge Name (Design & Construction)	Duration (Years)	Sufficiency Rating	Condition	Scope	Project Cost	Engineering & CM Cost	Grant Match Amount (80/20)	Grant Application Cost	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2032-2033
37	53C1321	7Th St Viaduct O/Mission Rd*	2	74.2	Good	Resurface Deck	$2,325,000	$1,512,500				$212,500	$300,000	$1,812,500				
38	53C0351	Avenue Of The Stars Bridge O/Olympic Blvd	3	62.6	Poor	Soffit Repairs	$815,000	$670,000	$135,000	$10,000			$100,000	$345,000	$370,000			
39	53C2048	Haines Canyon Ave Bridge O/Haines Canyon Channel	3	56.8	Fair	Soffit Repairs	$330,000	$265,000	$55,000	$10,000			$30,000	$35,000	$265,000			
40	53C1874	York Blvd Bridge O/Arroyo Seco Channel	3	73.2	Fair	Seismic Retrofit	$930,000	$765,000	$155,000	$10,000			$55,000	$100,000	$765,000			
41	53C0958	Foothill Blvd Bridge O/Pacoima Wash	3	57.8	Fair	Seismic Retrofit	$1,655,000	$1,365,000	$275,000	$15,000			$290,000	$365,000	$1,000,000			
42	53C1380	West Blvd Bridge O/Venice Blvd	3	64.1	Fair	Seismic Retrofit	$1,036,000	$855,000	$171,000	$10,000			$81,000	$100,000	$855,000			
100% Construction of 42 Bridges (Subtotal 1)							**$14,081,000**				**$2,680,000**	**$2,685,000**	**$2,253,500**	**$3,207,500**	**$3,255,000**			

SEQ	Bridge State #	Bridge Name	Duration (Years)	Sufficiency Rating	Condition	Scope	Project Cost	Engineering & CM Cost	Grant Match Amount (80/20)	Grant Application Cost	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033
43	53C1686	Westridge Rd Bridge O/Arroyo Canyon	3	63.5	Fair	Seismic Retrofit	$500,000	$410,000	$80,000	$10,000				$90,000	$79,000	$421,000		
44	718	Lighthouse St Pedestrian Bridge O/Ballona Lagoon	4	N/A	Poor	Remove and Replace	$4,965,000	$4,105,000	$820,000	$40,000			$250,000	$250,000	$250,000	$4,105,000		
100% Design of 2 Bridges (Subtotal 2)							**$919,000**				**$0**	**$0**	**$250,000**	**$340,000**	**$329,000**	**$4,526,000**		

	2026-2027	**2027-2028**	**2028-2029**	**2029-2030**	**2030-2031**	**2031-2032**	**2032-2033**	**2032-2033**
Construction of 42 Bridges and Design of 2 Bridges (Subtotal 1 + Subtotal 2)	**$2,680,000**	**$2,685,000**	**$2,503,500**	**$3,547,500**	**$3,584,000**			
Non-Routine Maintenance of Bridges (Subtotal 3)	**$1,000,000**	**$1,000,000**	**$1,000,000**	**$1,000,000**	**$1,000,000**			
Total (Subtotal 1 + Subtotal 2 + Subtotal 3)	**$3,680,000**	**$3,685,000**	**$3,503,500**	**$4,547,500**	**$4,584,000**			

TABLE 11: RECOMMENDED BRIDGE PROGRAM FINANCIAL PLAN – CONTINUED

SEQ	Bridge State #	Bridge Name	Duration (Years)	Sufficiency Rating	Condition	Scope	Total Project Cost	Construction, Engineering & CM Cost	Grant Match Amount (80/20)	Grant Application Cost	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2032-2033
45	625	Pacific Ave Bridge O/Ballona Creek	4	N/A	Fair	Remove and Replace	$6,455,000	$5,335,000	$1,065,000	$55,000						Design Start		
46	53C0151	1St St Bridge O/Figueroa St	7	67.6	Poor	Remove and Replace	$22,210,000	$18,355,000	$3,670,000	$185,000						Design Start		
47	53C0300	San Fernando Rd Bridge O/Tujunga Wash	9	43.9	Poor	Remove and Replace	$33,790,000	$27,925,300	$5,585,000	$280,000						Design Start		
48	53C0183	Sierra Hwy Bridge O/Sprr	4	57.2	Fair	Remove and Replace	$11,380,000	$9,405,000	$1,880,000	$95,000						Design Start		
49	53C0130	Cesar E Chavez Ave Viaduct O/Los Angeles River*	9	72.4	Fair	Seismic Retrofit	$26,590,000	$21,975,000	$4,395,000	$220,000						Design Start		
50	53C0044	4Th St Viaduct O/Los Angeles River*	9	70.2	Good	Seismic Retrofit	$47,560,000	$39,305,000	$7,860,000	$395,000						Design Start		
51	53-0118	Lincoln Blvd Over Ballona Creek (SR1)	10	84.2	Fair	Remove and Replace	$129,700,000	$107,190,000	$21,440,000	$1,070,000						Design Start		
						COST SUMMATION	**$323,569,000**	**$229,490,300**	**$45,895,000**	**$2,300,000**	**$0**	**$0**	**$0**	**$0**	**$0**			

NOTES

1. Summary and yearly expenditure costs are rounded to the nearest $5,000 and $500, respectively.
2. Bridges marked with an asterisk (*) are assumed to be 'Iconic' bridges for the City of Los Angeles, indicating they are candidates for replacement with a distinctive structure involving significant logistical complexities.
3. The unit price for Iconic bridge replacement is $1,972 per square foot and is based on pricing for the Glendale Hyperion Bridge Improvement project, with an escalation of 10%.
4. The unit price per square foot for non-Iconic bridge replacement is considered 50% of an Iconic Bridge replacement at $986.
5. Spall repair and deck resurfacing costs are based on 2% of a non-iconic bridge replacement cost applied to the bridge square footage.
6. Crack sealing scope budgetary estimate based on 2% of the bridge's replacement value, plus an additional $15,000 to account for Contractor mobilization and demobilization.
7. Seismic Retrofit costs are estimated at 15% of the bridge's replacement cost.
8. Cost distribution is modeled on the standard construction 'S-curve'.
9. Grant application cost is estimated at 1% of the construction and engineering cost or $10,000, whichever is greater.
10. Engineering cost is 25% of construction cost.
11. Cost escalations and inflation assumptions are not included in this table.
12. Given the broad scope and limited construction and repair specifics of this assessment, the costs presented in this table are highly preliminary.