B San Mateo Countywide Sustainable Streets Master Plan Project Identification and Prioritization Methodology Technical Memorandum

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TECHNICAL MEMORANDUM

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Project:	San Mateo Countywide Sustainable Streets Master Plan
Subject:	Project Identification and Prioritization Methodology – FINAL

1. Introduction

This memorandum describes the methodology used to identify and prioritize sustainable street project opportunities for the San Mateo Countywide Sustainable Streets Master Plan (Master Plan). It also provides a brief overview of subsequent project development processes including the methodology for determining project extents and phasing as well as assigning project implementation mechanisms. The Master Plan is a coordinated effort with 21 municipalities and Caltrans. The overarching purpose of the Master Plan is to bring together countywide active transportation, stormwater management, and climate change goals to prioritize locations for sustainable street improvements. The objectives of these improvements include:

- Facilitating active transportation by providing mobility, access, public realm, and safety improvements for bicyclists and pedestrians;
- Expanding the treatment of roadway runoff using green infrastructure to achieve permit-required water quality improvements;
- Reducing carbon emissions through supporting sustainable modes of transportation;
- Adapting the transportation network to better address rainfall and heat-related climate change impacts;
- Generating integrated projects to meet multiple government and community objectives and provide multiple benefits.

Examples of countywide and local initiatives that intersect with the Master Plan are highlighted in Figure 1.

Figure 1. Intersection of Sustainable Streets Master Plan with Countywide and Local Initiatives

San Mateo jurisdictions are engaged in numerous efforts to make active transportation, stormwater management, and climate change adaptation improvements to their street networks. This is illustrated by multiple recent and ongoing planning efforts, including the development of active transportation plans and green infrastructure plans by individual jurisdictions throughout San Mateo, as well as the development of the 2017 Stormwater Resource Plan for San Mateo County (SRP). The SRP was a countywide effort which identified and prioritized opportunities for green infrastructure and other stormwater management projects at a broad planning scale across San Mateo jurisdictions. More information on the SRP and its relationship to this current analysis can be found in Section 2.4.

In addition to active transportation and stormwater management planning, jurisdictions countywide have begun to prioritize planning efforts which incorporate climate change mitigation and adaptation. The policy goal of prioritizing mitigation and adaptation efforts is illustrated by the recent Declaration of Climate Emergency by the San Mateo County Board of Supervisors (BOS SMC, 2019). The Declaration demands accelerated actions on the climate crisis and calls on local and regional partners to join together to address climate change; the Declaration also emphasizes the importance of protecting vulnerable communities and focusing on equitable mitigation and adaptation strategies.

The master planning process project builds upon all of these countywide active transportation, stormwater, and climate change goals and planning efforts and brings them together into a targeted proposal for sustainable streets. More information on the current active transportation, stormwater management, and climate change planning efforts and the drivers for this work will be included in the full Master Plan document.

1.1 Sustainable Street Definition

"Sustainable Streets" are right-of-way projects that incorporate both complete street elements such as pedestrian and bicycle improvements as well as green street components such as stormwater planters and permeable pavement. Sustainable streets are designed to provide safe mobility and access for all users with the added environmental and community benefits of green infrastructure – which can include benefits such as water quality protection, flood risk reduction, groundwater recharge, and neighborhood greening. The term "Sustainable Streets" is relatively new, although planners and designers have been developing rights of way with "sustainable street" components through the Complete Streets, Better Streets, and Green Streets movements for decades. Figure 2 shows imagery of complete and green street elements that can be combined in "sustainable street" projects. The image above calls out complete street elements and the image below calls out green street elements.

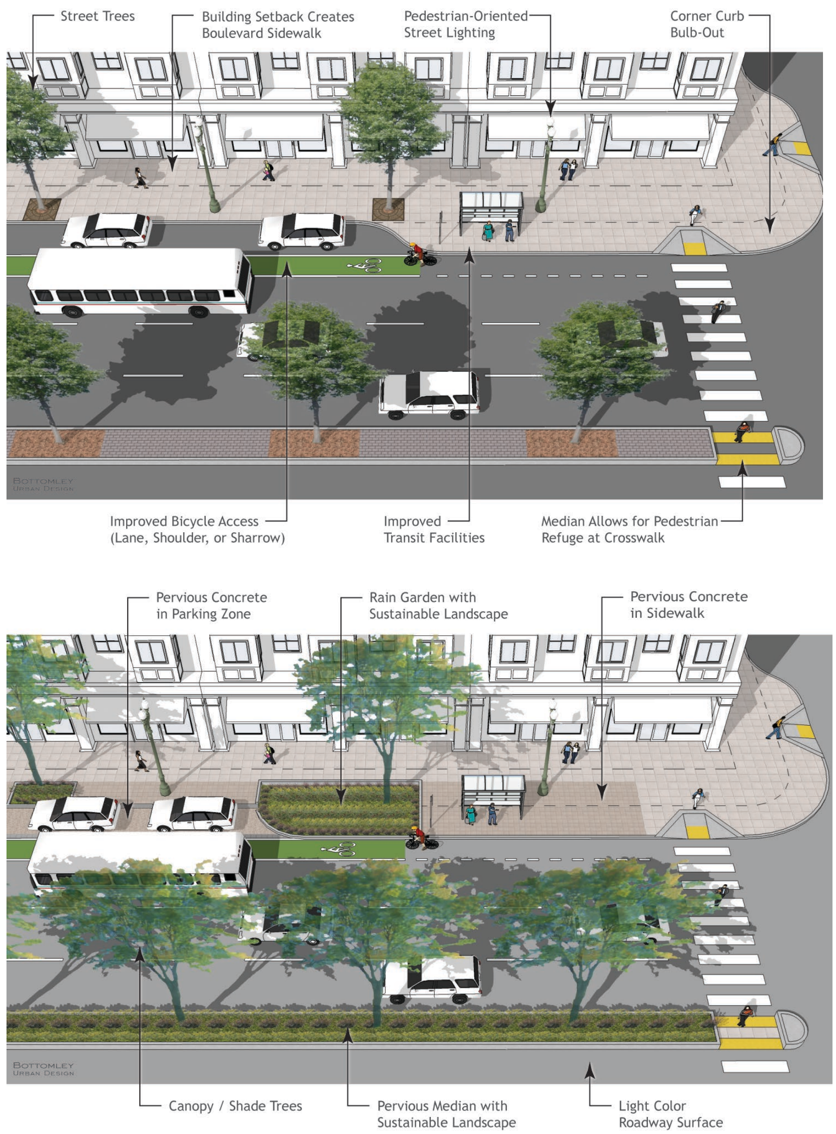

Figure 2. Sustainable Streets Combine Complete Street and Green Street Elements

1.2 Memorandum Content

The methodology described in this memorandum was developed to address goals and objectives articulated by the staff and member agencies of the City and County Association of Governments (C/CAG) of San Mateo County. First and foremost, this Master Plan is being developed to identify viable projects with active transportation and green infrastructure elements that help meet local transportation, stormwater management, and climate change goals. It is being designed to facilitate future project implementation by pairing project concepts with policy mechanisms and funding tools. These projects are being developed in the context of cost-constrained municipal budgets and therefore the plan should ensure that, to the extent possible, projects are being developed with cost-sharing potential between transportation and stormwater management elements. Also, importantly, these sustainable streets projects are being planned and designed within the context of climate change to better address and mitigate climate change impacts where possible. The memorandum is organized into the following sections:

- Section 1 - Introduction
- Section 2 - Project Identification and Prioritization Methodology
    - Methodology Overview
    - Sustainable Street Typologies
    - Project Opportunity Identification Methodology
    - Project Opportunity Prioritization Methodology
    - Additional Prioritization Information, Tools, and Considerations
- Section 3 - Prioritization Output
- Section 4 - Overview of Future Phases of Project Development

2. Project Identification and Prioritization Methodology

2.1 Methodology Overview

The project team developed a stepwise process to identify and prioritize project opportunities to meet Master Plan goals and objectives. Figure 3 provides a high-level overview of each step and the factors considered and/or resulting from implementation of the step.

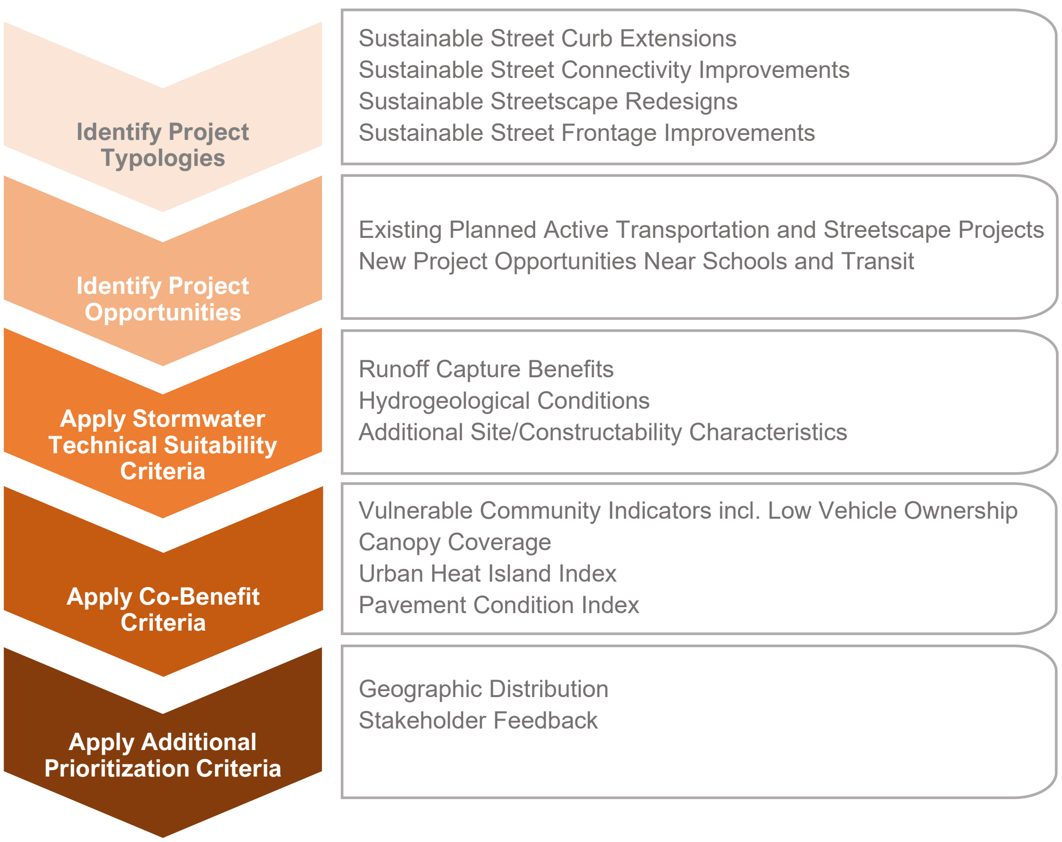

Figure 3. Sustainable Streets Identification and Prioritization Method

2.2 Sustainable Street Typologies

The first step in the process of identifying and prioritizing project opportunities was the development of a set of four sustainable street typologies. While the same active transportation and stormwater management components may be utilized in the different typologies, these typologies are characterized by differences in project drivers, geographic extent or size, and complexity and cost. The typologies identified include:

1. Sustainable Street Curb Extensions
2. Sustainable Street Connectivity Improvements
3. Sustainable Streetscape Redesign Projects
4. Sustainable Street Frontage Improvements for New Developments

The typologies are useful for Master Plan development for several reasons. The typologies assist Master Plan developers and stakeholders in understanding plan goals and envisioning the range of projects to be included in the Master Plan. For example, the typologies helped team members identify relevant project opportunities as they sorted through existing active transportation and streetscape plans. The typologies will also assist stakeholders and the project team in linking project opportunities to relevant implementation mechanisms and funding sources. For example, projects in the Sustainable Street Connectivity Improvement category will be funded differently and/or eligible for different sources of funding than projects in the Sustainable Streets Frontage Improvements for New Developments category. Different typologies may also need different policy mechanisms to facilitate implementation. Characteristics of each typology are further described in Sections 2.2.1-2.2.4 and a table summarizing typology characteristics can be found in Section 2.2.5.

2.2.1 Typology 1: Sustainable Street Curb Extensions

Sustainable Street Curb Extensions are modifications to existing curbs at intersections and mid-block crossings that narrow pedestrian crossing distances and contain green infrastructure facilities. They can be paired with crosswalks and specialized pedestrian safety signalization. The transportation driver for the improvement is generally pedestrian safety, but the facilities can also be used to provide traffic calming and a safer environment for bicyclists and other roadway users. The addition of green infrastructure facilities can serve both to manage stormwater as well as provide neighborhood greening. Projects in this category are often motivated by Safe Routes to School or Transit programs as well as general pedestrian safety and traffic calming efforts. From a stormwater perspective, projects are primarily driven by water quality improvement goals and regulatory requirements, as well as interest in additional benefits such as flood control, groundwater recharge, and mode-shifting to reduce dependence on single-occupancy vehicles and associated vehicle pollutants. These projects are also often characterized as spot improvements, and are implemented on single intersections, versus as part of longer linear corridor improvement projects. Figure 4 shows an example of a green infrastructure curb extension integrated with a pedestrian crossing improvement at a school in San Mateo. Before and after images of this project are shown in Figure 5.

Figure 4. Sustainable Street Curb Extension in San Mateo

Figure 5. Example of Typology 1: Sustainable Street Curb Extension at a School Crossing in San Mateo

2.2.2 Typology 2: Sustainable Street Connectivity Improvements

Sustainable Street Connectivity Improvements are longer, linear corridor improvements that include transportation facilities such as Class I separated bicycle paths, cycle tracks, and extended medians. Green infrastructure facilities can include stormwater curb extensions, stormwater planters, green gutters, tree wells, and pervious pavement, as well as other features. The transportation drivers for the improvements can include first/last mile projects, bicycle boulevard or other linear bicycle facility projects, Safe Routes to Transit programs, and Complete Street or gap closure project efforts. Stormwater management drivers are water quality improvement goals and regulatory requirements, as well as interest in additional benefits such as flood control and groundwater recharge. Note that like Typology 1, these projects can include curb extensions, but the curb extensions are incorporated into a transportation improvement project that focuses on network connectivity and is larger in scope and includes a longer stretch of roadway. Examples of this typology are shown in Figure 6. A before and after example of this typology in San Mateo County is shown in Figure 7.

Figure 6. Examples of Linear Green Infrastructure Integrated with Bicycle Improvements

Figure 7. Example of Typology 2: Road Diet, Bike Lane Addition, and Linear Green Infrastructure in San Mateo

2.2.3 Typology 3: Sustainable Streetscape Redesign Projects

Sustainable Streetscape Redesign Projects contain significant public realm improvements, potential transportation improvements, and green infrastructure facilities. The drivers for Sustainable Streetscape Redesign projects include commercial corridor and downtown revitalization initiatives, and streetscape improvement and Complete Street efforts. From a stormwater perspective, projects are primarily driven by water quality improvement goals and regulatory requirements, as well as interest in additional benefits such as flood control and groundwater recharge. Public realm improvements can include street trees, new pedestrian seating, new lighting and sidewalk widening as well as related transit, pedestrian and bicycle improvements. Green infrastructure facilities can include, but are not limited to, stormwater planters, stormwater curb extensions, stormwater trees, and pervious paving. These projects are often located in downtown or main street locations; efforts may be initiated by public realm improvement and commercial district revitalization goals as well as transportation and stormwater management goals. Projects are often several blocks in length and require significant funding due to major reconstruction efforts. Note that these projects can include curb extensions and connectivity improvements, also elements in Typologies 1 and 2, but are characterized by additional streetscape design goals and components. An example of this typology is shown in Figure 8. A before and after example is shown in Figure 9.

Figure 8. Green Infrastructure Integrated with Streetscape Improvements on Carolan Avenue in Burlingame

Figure 9. Example of Typology 3: Main Street Redesign with Green Infrastructure in Burlingame

2.2.4 Typology 4: Sustainable Street Frontage Improvements for New Developments

Sustainable Street Frontage Improvements for New Developments are transportation, public realm, and stormwater management improvements that are constructed in the frontage area of development projects as part of regulatory requirements for the project. These requirements may be initiated by resolutions or ordinances and codified in public works or other municipal code; they may also be imposed through conditions of approval or included in specific area plans. The drivers for Sustainable Street Frontage Improvements are new development projects, and the need to ensure that new development projects are engaged in mitigating negative effects on the environment and improving the livability of the neighborhoods where they are located. From a stormwater perspective, projects are primarily driven by water quality improvement goals and regulatory requirements, as well as interest in additional benefits such as flood control and groundwater recharge. Public realm and pedestrian facilities include, but are not limited to, street lighting, street trees, seating areas, and improved sidewalks. Green infrastructure facilities include, but are not limited to, tree wells, stormwater trees, and stormwater planters or curb extensions. Figure 10 shows an example of a development frontage improvement in San Mateo. A before and after example of this typology on the Peninsula is shown in Figure 11.

Figure 10. Development Frontage Improvements in San Mateo

Figure 11. Example of Typology 4: Development Frontage Incorporating Complete Street and Green Street Improvements on Bay Road in Redwood City

2.2.5 Summary Table of Typology Characteristics

Table 1 below presents the four typologies along with relative cost estimates, examples of transportation and green infrastructure facilities that could be included in projects in each category, as well as a list of potential project drivers. It is important to note that the first three typologies can be characterized as different levels of improvements, as projects in these three different categories can contain some of the same basic project components but generally increase in scope, cost and complexity from Typology 1 to Typology 3. For example, stormwater curb extensions are included in projects characterized as Typology 1 by definition, but can also be included in projects characterized as Typology 2 and 3 depending on project design.

Table 1. Sustainable Street Typologies

	Sustainable Street Typology	Relative Cost	Example Project Drivers	Example Transportation Design Elements	Example Stormwater Design Elements
1	Sustainable Street Curb Extensions	$	Safe Routes to School, Vision Zero Plans, Safe Routes to Transit, Traffic Calming Corridor,	Crosswalks, Curb Extensions, Pedestrian Refuges	Stormwater Curb Extension
2	Sustainable Street Connectivity Improvements	$$-$$$	First/Last Mile Project, Class I or IV Bikeways, Gap Closure Project	Cycle Tracks, Extended Medians, Bike Lanes	Stormwater Planter, Stormwater Curb Extension, Green Gutter, Pervious Pavement, Tree Well, Infiltration System
3	Sustainable Streetscape Redesign Projects	$$$$	Main Street Redesign, Complete Street Project, Corridor Beautification, Downtown Reinvestment	Street Trees, Seating, Lighting, Sidewalk Widening, Transit and Bike/Ped Improvements	Stormwater Planter, Stormwater Curb Extension, Tree Well Pervious Pavement, Infiltration System
4	Sustainable Street Frontage Improvements for New Developments	$-$$(1)	Development Conditions of Approval	Street Trees, Sidewalk and Pedestrian Improvements	Stormwater Planter, Stormwater Curb Extension, Pervious Pavement, Tree Well, Infiltration System

(1) Costs may be paid by private sector if tied to redevelopment requirements.

Projects which fall into Typologies 1-3 are generally publicly funded projects, whereas projects that fall into Typology 4 are generally privately funded.

2.3 Sustainable Street Project Opportunity Identification Methodology

2.3.1 Existing Planned Project Opportunities

There is strong potential for green infrastructure projects to be built alongside or included as designed components in bicycle, pedestrian, and streetscape improvement projects in San Mateo County; however, to date, many planned transportation and streetscape projects have been developed without green infrastructure goals in mind. As a result, the project team sought to identify planned active transportation and streetscape projects with the potential for green infrastructure to be incorporated into their design.

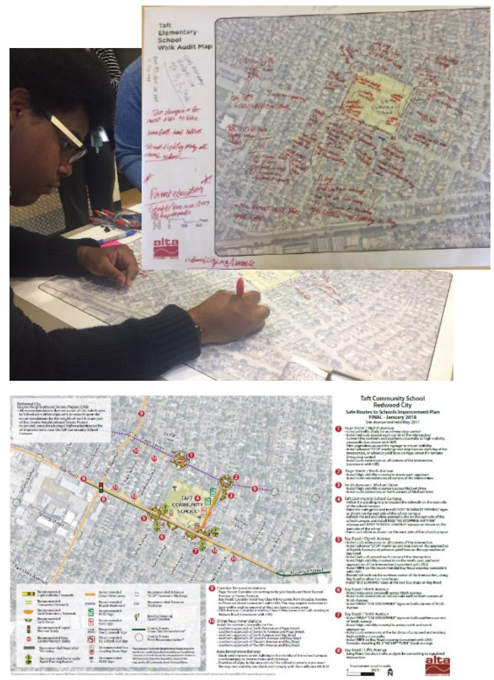

Figure 12. Analysis of Plans Included Review of Walk Audits and Safe Routes to School Recommendations

Process for Identifying Existing Planned Projects

To identify relevant bicycle, pedestrian, and streetscape projects, the project team assembled and reviewed planning documents and project databases from municipalities throughout San Mateo County. City, town, and County websites were reviewed to identify relevant projects from:

- Active Transportation Plans
- Green Infrastructure Plans
- General Planning Documents
- Neighborhood Specific Plans
- Safe Routes to School Planning Documents

Identified projects were compiled into a database where they were assigned a project typology and priority tier for the analysis. Whenever possible, geospatial data were requested and gathered directly from cities, towns, San Mateo County, or consultants involved in relevant planning processes. In many cases, geospatial data were not available, so data for each project was manually created by the project team.

Some data were not available due to active planning status, formatting, or public availability. For example, the City of Millbrae and the County of San Mateo are currently updating their active transportation plans, however information about the upcoming recommendations was not available at the time this memorandum was developed. In other cases, geospatial project data were not available at the time of the analysis after a countywide call for data provision. Table 2 lists the plans that have been incorporated into this analysis. Table 2 was updated through March 2020 as planning documents were completed, and data were shared with the project team.

Table 2. Plans Incorporated in the Master Plan Analysis

Jurisdiction	Plan, Planning Initiative, or Planning Document
Atherton	Atherton Green Infrastructure Plan
	Town of Atherton Bicycle and Pedestrian Master Plan (2014)
Belmont	Belmont Comprehensive Pedestrian & Bicycle Plan (2016)
	Ralston Ave Corridor Study and Improvements Plan
	Belmont Village Specific Plan
	Alameda de las Pulgas/Four Corners Study
Brisbane	Brisbane Bicycle and Pedestrian Master Plan
Burlingame	Draft Bicycle and Pedestrian Master Plan**
	CalTrans Broadway Grade Separation Project
Colma	Serramonte and Collins Master Plan
	Green Infrastructure Plan
Daly City	Green Infrastructure Plan
	Walk Bike Daly City**
East Palo Alto	East Palo Alto Bicycle Master Plan
	Ravenswood/4 Corners TOD Specific Plan
Foster City	Green Infrastructure Plan
Half Moon Bay	City of Half Moon Bay Bicycle and Pedestrian Plan
Menlo Park	Menlo Park Bicycle Plan**
	Menlo Park Green Infrastructure Plan
Millbrae	Green Infrastructure Plan
Pacifica	Walk Bike Pacifica (BMP Master Plan)**
Redwood City	El Camino Real Corridor Study
	Redwood City Moves (BPMP Master Plan)
San Bruno	San Bruno Green Infrastructure Plan
	Walk ‘n’ Bike Plan (BPMP Master Plan)
	Ralston Ave Corridor Improvement Project
San Carlos	Bicycle and Pedestrian Master Plan**
	Capital Improvement Project List
South San Francisco	Active South City (BPMP Master Plan)**
San Mateo (City)	Green Infrastructure Plan
	San Mateo Bicycle Master Plan 2020**
San Mateo County (C/CAG and Countywide)	Green Infrastructure Plan
	Stormwater Resource Plan
	Connect the Coastside Plan
	Safe Routes to Schools Project List
CalTrans	CalTrans District 4 Bicycle Plan
**Indicates an active planning process; draft recommendations incorporated in analysis and subject to change.	

Project Tier Categorization

Bicycle, pedestrian, and streetscape improvement projects have varying levels of synergy with green infrastructure projects. After assembling the project database, each project was designated as Tier 1 or Tier 2 in order to identify projects with greater or lesser potential for green infrastructure inclusion.

Tier 1 projects require major street reconfiguration and/or curb replacement. They are considered better opportunities for green infrastructure implementation due to the magnitude of the project scope. These Tier 1 projects generally take longer to plan, design, and build and require replacing and/or constructing new curbs, which is often also required for green infrastructure projects. Due to the similarities in construction requirements, these projects also present better opportunities for cost-sharing between the green infrastructure and transportation elements of the project. Projects categorized as Tier 1 include separated bikeways, shared-use paths, curb extensions, bulb outs, protected intersections, transit islands, sidewalk construction/reconstruction, some street furniture and landscape elements, and pedestrian refuge islands. These projects have more potential to include stormwater planters, rain gardens, permeable pavement, or other types of green infrastructure in addition to the proposed bicycle, pedestrian, or streetscape facility improvements. Green infrastructure may also be used to address drainage improvement requirements created by the transportation elements. Curb extensions or bulb outs may be incorporated to enhance the safety of the transportation features.

Tier 2 projects include bicycle or pedestrian improvements, but do not present as strong of an opportunity for green infrastructure improvements due to the lack of requirements for significant street reconstruction. These projects include proposed bicycle lanes, bicycle routes, bicycle boulevards, crosswalks, pedestrian/bicycle signals, and signage installation. Due to inconsistent levels of detail across the various data sources used, projects with limited descriptions were categorized as Tier 2.

Project Typology Categorization

After assigning a project tier, projects were categorized within one of three sustainable streets typologies based on the transportation design elements in the project description. These typologies are defined more extensively in Section 2.2: Sustainable Streets Typologies.

Sustainable Street Curb Extensions: Projects categorized within this typology include transportation improvements such as proposed crosswalks, curb extensions, protected intersections, and pedestrian refuges.

Sustainable Street Connectivity Improvements: Projects categorized within this typology include transportation improvements such as proposed bicycle lanes, extended medians, bicycle turn boxes, pedestrian/bicycle signalization, pedestrian/bicycle overcrossings, road diets, traffic calming, and separated bikeways. These projects can also include curb extensions, but the curb extensions are incorporated into a transportation improvement project that focuses on network connectivity and is larger in scope and includes a longer stretch of roadway and additional improvements.

Sustainable Streetscape Redesign Projects: Projects categorized within this typology include infrastructure improvements along a road segment or corridor such as sidewalk widening, street furniture, lighting, transit islands, transit amenities, bicycle/pedestrian improvements that include parking and shared spaces, pedestrian plaza creation, downtown or specific area streetscape projects, and other improvements to the pedestrian realm. These projects can also include curb extensions and linear connectivity improvements, but are characterized by additional streetscape design goals and components.

The planned project analysis did not identify projects in the Sustainable Street Frontage Improvements for New Developments typology, as it is assumed that this type of project is generally not currently included in most municipal planning documents and will be implemented through regulatory requirements for new developments or other policy mechanisms, as opposed to through municipal capital programs.

The working results of the analysis of planned transportation projects are shown in Figure 13. Planned active transportation projects were organized by typology, and those projects whose scope made them stronger candidates to integrate green infrastructure were categorized as Tier 1.

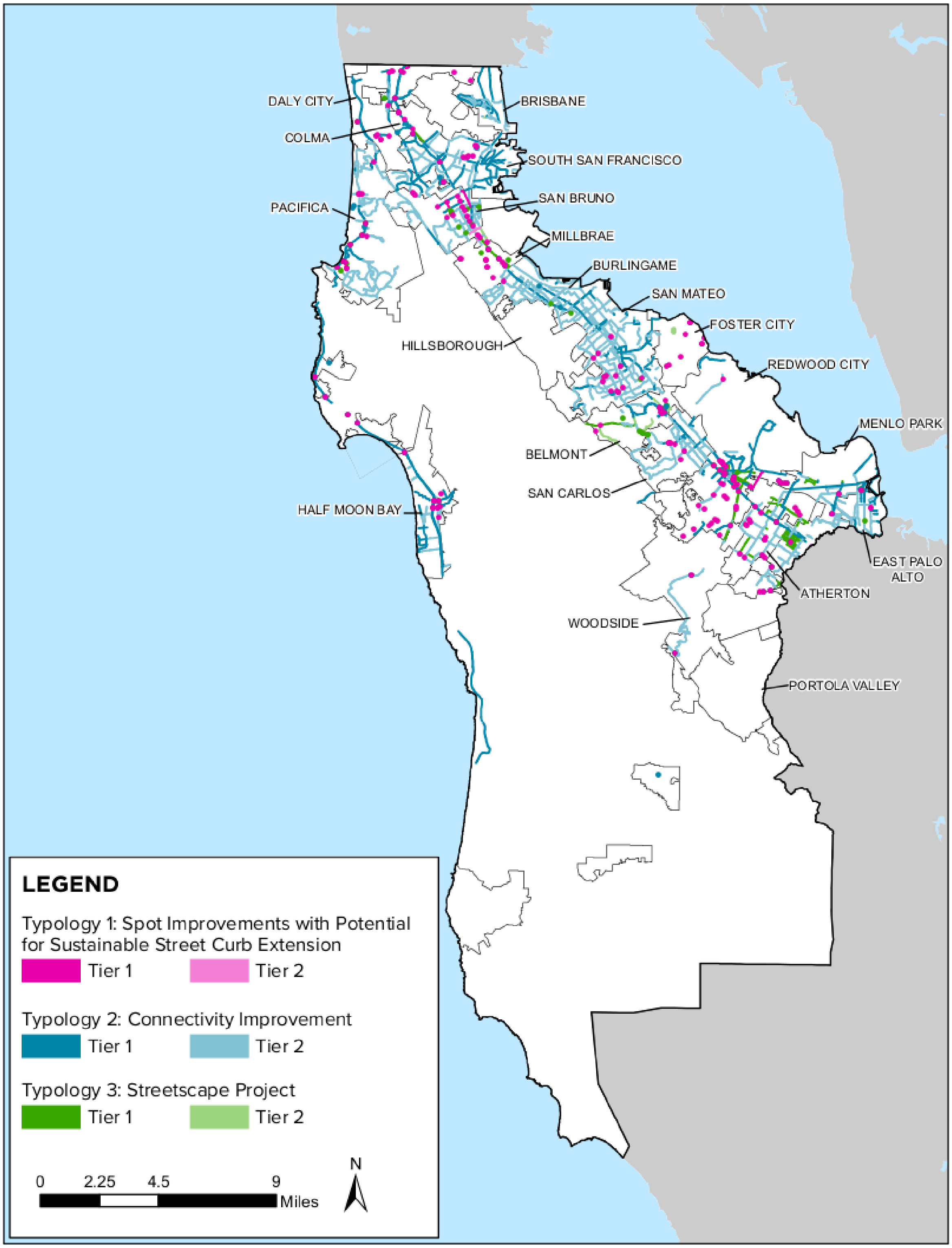

Figure 13. Planned Transportation Projects with Green Infrastructure Integration Potential

2.3.2 New Project Opportunities

In addition to identifying existing planned project opportunities which can be re-envisioned and redesigned to include green infrastructure and become "sustainable streets," the project team also developed a methodology for identifying "new" sustainable street project opportunities.

One of the goals of this methodology was to develop sustainable street curb extension project opportunities that would support stakeholders' robust interest in Safe Routes to School and Transit programs. Intersections within half a mile of schools and major transit stops can benefit from traffic calming and pedestrian safety improvements as they are within the "walking shed" of these major trip generators. Another goal of the methodology was to identify project opportunities that have synergies with future pavement reconstruction projects and may provide opportunities for cost sharing and reduction of construction impacts through implementation of the two projects simultaneously.

According with these two goals, the analysis identified intersections within a 0.5-mile walking distance from schools and major transit stops which are located on streets which are designated for reconstruction due to very poor pavement conditions. The 2018 street pavement condition index compiled by the Metropolitan Transportation Commission (MTC) was used to identify streets with poor or failed surface conditions. Intersections along an arterial or collector with a poor or failed surface condition were selected as eligible project opportunity locations. The identification process screened out intersections located along local roads due to probable lower traffic volumes and less need for traffic calming and pedestrian safety improvements. Additionally, intersections with dead-end streets or cul-de-sacs were removed from consideration as these areas see lower levels of pedestrian and vehicular traffic. Major transit stops are defined by MTC as an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

A total of 282 new project opportunities were identified countywide using this methodology with more than 10 intersections identified in the cities of San Bruno, Millbrae, Pacifica, Belmont, Menlo Park, San Carlos, Daly City, and South San Francisco. The countywide results are shown in Figure 14. For enhanced understanding of how the analysis was applied, Figure 15 displays close-up imagery of an example area.

The Sustainable Street Prioritization Scoring Methodology, described in Section 2.4 below, will be applied to these intersections to further vet the results and identify locations that are stronger candidates for green bulb out or curb extension projects based on stormwater technical suitability and additional co-benefits.

Project opportunities which score well using the prioritization scoring methodology will be used to "fill in" the sustainable street network; cities which have fewer existing planned project opportunities will be given the opportunity to fill in their network using these curb extension opportunities. In order to more comprehensively vet the potential projects, prioritized project opportunity locations and descriptions will be shared with C/CAG member agency representatives along with a rapid intersection assessment tool which can be used to investigate green infrastructure feasibility at the site scale. Member agency representatives can work with their transportation agency and stormwater program staff to assess the intersections for bulb out feasibility using the intersection assessment tool.

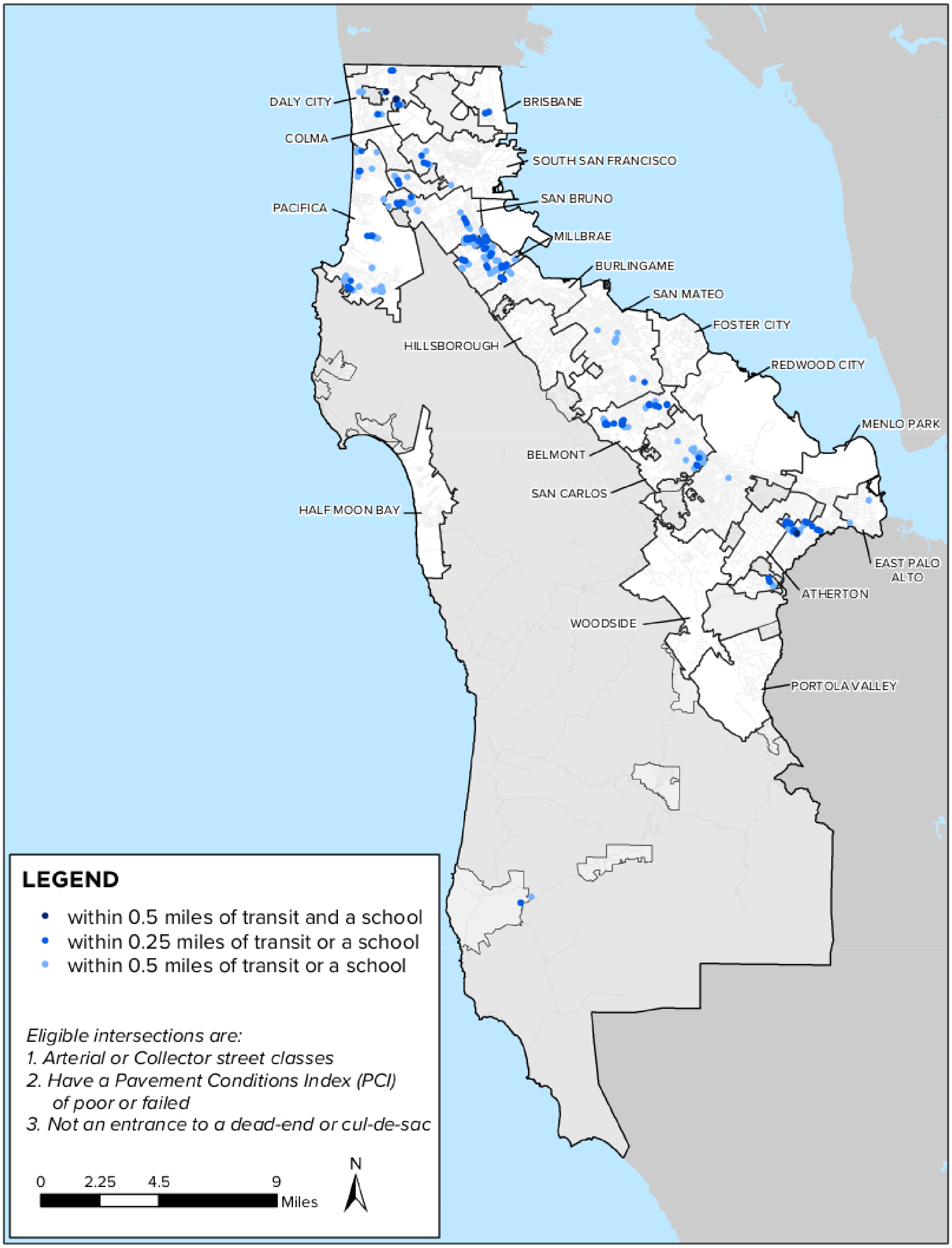

Figure 14. New Sustainable Street Opportunities at Intersections

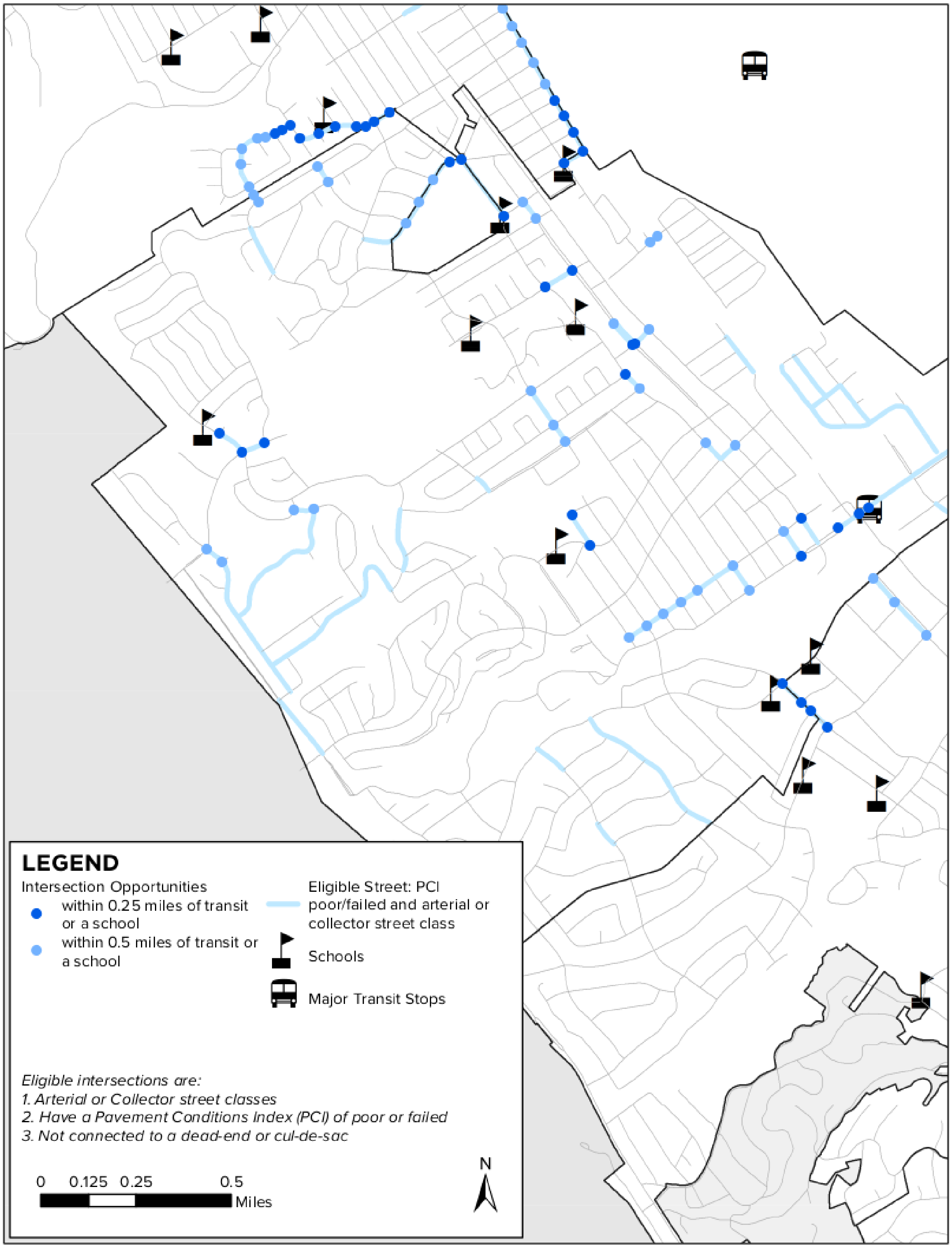

Figure 15. New Opportunities at Intersections (Close-up Example)

2.4 Sustainable Street Project Opportunity Prioritization Scoring Methodology

The Sustainable Street Project Opportunity Prioritization Scoring Methodology was developed by the project team to further evaluate existing planned project opportunities and "new" project opportunities on the basis of technical suitability for green infrastructure and additional co-benefits. The scoring methodology leverages previous countywide planning efforts from the 2017 Stormwater Resource Plan for San Mateo County (SRP). The scoring methodology builds upon methods used in the SRP, but uses more refined prioritization criteria, updated data, and new analyses. This section describes the updated methodology. Note that the scoring methodology is a planning level tool and provides a planning scale vetting of opportunities. Additional feasibility analysis will be necessary as part of subsequent project planning and design phases.

The SRP was a countywide evaluation of opportunities for stormwater capture, treatment, and use. The SRP was prepared by C/CAG through a collaborative effort with stakeholders and the public and was tailored to the specific stormwater and dry weather runoff issues in the County. The main goals of the SRP were to identify and prioritize opportunities for stormwater and dry weather capture projects in San Mateo County through analysis of watershed processes and surface and groundwater resources, input from stakeholders and the public, and analysis of multiple benefits. The SRP prioritization analysis identified green street opportunities within the public rights-of-way, screened them based on site constraints, and prioritized them based on their potential to achieve multi-benefit performance. However, the SRP was applied to the full network of streets across San Mateo County and resulted in an extensive list of potential opportunities in each jurisdiction. For the Master Plan, stakeholders have requested a sustainable streets analysis which focuses on a smaller number of opportunities and highlights project opportunities with more potential for eventual implementation. The Sustainable Streets Prioritization Scoring Methodology adds to the SRP evaluation by utilizing more refined prioritization criteria, updated data, and new analyses. It is also only applied to "existing planned" transportation and streetscape project opportunities and "new" project opportunities identified through the Master Plan analysis. It is not applied to the full network of countywide streets.

2.4.1 Screening Criteria

The prioritization methodology was applied to street segments (typically one block) within and/or connected to the identified "existing planned" and "new" project opportunities identified in Section 2.3 using the San Mateo County street centerline data. Public access, street functional class, and slope were used to screen street segments suitable for sustainable street projects. Streets were screened using the same criteria as the SRP with the exception of the inclusion of streets with slopes ranging between 5 and 10%. The screening criteria for potential sustainable streets projects is shown in Table 3.

Table 3. Screening Criteria for Potential Sustainable Streets Projects

Category	Factor	Criteria
Identification	Access	Public
Screening	Street Functional Class	Alley
		Arterial
		Local
		Parking lot road
	Road Slope	≤ 10%(1)

Notes:
(1) Relative to SRP, slope screening criteria was expanded from 5% to 10% to capture more possible candidate streets.

2.4.2 Technical Suitability Criteria

Eleven technical suitability criteria and five co-benefit criteria were used in the evaluation of sustainable streets projects. The technical suitability criteria included five criteria from the SRP methodology and six new criteria. These six new criteria include datasets updated or made available since the SRP as well as new analyses performed for this prioritization. The eleven technical suitability criteria can be subdivided into three categories: runoff capture benefits, hydrogeologic conditions, and site space constraints. Each criterion is described below. Table 4 presents the technical suitability criteria along with their proposed scores and weights. Appendix A includes maps which present the technical suitability criteria spatially countywide.

Runoff Capture Benefits

The runoff capture benefit criteria were developed to prioritize sustainable street opportunities in strategic locations that have the potential to improve water quality most cost effectively, while contributing to other stormwater capture benefits such as flood mitigation and groundwater recharge.

Water Quality

As part of meeting stormwater permit requirements for the San Francisco Bay, C/CAG conducted a Reasonable Assurance Analysis (RAA) to estimate countywide stormwater pollutant loads to the Bay and set goals for the amount of green infrastructure needed to meet pollution reduction targets by 2040 (SMCWPPP 2019). The RAA is a comprehensive hydrologic and hydraulic modeling effort that quantified the projected pollutant load reductions out to 2040 from the following GI project types: existing public and private GI projects countywide, future C.3 redevelopment projects, identified regional GI projects, green streets, and LID retrofits on public parcels. Through this process, the RAA generated an estimate of green streets needed in each subwatershed to meet 2040 water quality goals.

Using this RAA output, subwatersheds that must rely more heavily on green streets to meet water quality targets receive a higher score in the sustainable streets prioritization. To account for the differences in scale of the subwatersheds, the prioritization criterion normalizes the green street need in each subwatershed by the subwatershed's total area.

The RAA was only conducted for watersheds draining to San Francisco Bay, and resultant data is hence only used in this analysis to prioritize Bayside subwatersheds. For the watersheds not included in the RAA that drain to the ocean, catchment areas that generated more runoff in the model receive a higher score. This prioritizes areas where green infrastructure has the potential to provide more volume capture, treatment benefits, and adaptive capacity.

Within Watershed of Flood Prone Channel

Project opportunities located within the watersheds of flood-prone streams were given higher prioritization scores due to their potential to help mitigate flood risks and reduce hydromodification impacts by limiting the volume of runoff that reaches impacted streams. A list of flood prone streams was provided by C/CAG staff and used for project prioritization in the SRP. This same list of flood prone streams was utilized for the prioritization of sustainable street projects in the Master Plan.

Contains PCB Interest Areas

Project opportunities located in PCB interest areas were given higher prioritization scores to target projects with the potential for source control. PCBs are one of the primary pollutants of concern within the Bay Area; therefore, siting stormwater capture projects in PCB interest areas can potentially address water quality issues. The PCB interest area dataset was developed in a separate C/CAG study (SMCWPPP 2016). The interest areas are organized into either a High or Moderate category. High interest areas include land uses (most commonly old industrial, electrical, recycling, railroad, and military) that have a relatively higher likelihood of having elevated concentrations of PCBs (≥0.5 mg/kg) in street dirt, sediment from the MS4, or in stormwater runoff (particle concentration). These areas generally have not been redeveloped and do not contain stormwater treatment facilities.

Augments Water Supply

Project opportunities were given higher prioritization scores if they are located above a groundwater basin and are located outside known contamination areas. There are nine groundwater basins partially or fully within San Mateo County including the Westside Basin and San Mateo Plain. These basins are used for public water supply, private water supply, irrigation, and other uses. Groundwater basin extents were provided by the California Department of Water Resources. Active GeoTracker sites were used to identify potential contaminated areas. These are sites with hazardous substances or waste discharges from underground storage tanks that are tracked by the State Water Board.

Climate Change Impacts

Project opportunities located in areas where climate change impacts on runoff depth are anticipated to be more severe were given higher prioritization scores in order to target mitigation efforts. As part of Master Plan development, the countywide hydrologic model used for the RAA was used to simulate increases in runoff depth associated with various 6-hour design storms (2, 5, 10, 25, and 100-year return period storms) under different future climate change scenarios. Additionally, the runoff increase from roadways was isolated to consider locations where sustainable street projects would be most impactful. Watersheds that are projected to have relatively higher amounts of runoff from the transportation network during the RCP 8.5 10-year 6-hour event were prioritized highest. Since the 10-year storm is a typical storm drain design consideration, that storm was selected for the prioritization process as an indicator of the likelihood of exceeding capacities of storm drain networks, resulting in increased local flooding due to climate change impacts. The values for this criterion are derived from the climate change modeling analysis described in a separate document (SMCWPPP 2020), which describes the model inputs and procedure, and the process for isolating runoff from the transportation network, in greater detail.

Hydrogeologic Conditions

Hydrogeologic Soil Group

Natural Resources Conservation Service (NRCS) soil data was used to prioritize project opportunities in areas with well-draining soils. Infiltration is a major element in restoring natural watershed processes by reducing overland flow and removing pollutants conveyed by runoff. Green infrastructure projects located above well-draining (A-type) soils provide better performance and are more cost effective than projects located in areas with poor draining (D-type) soils.

Groundwater Constraints

Depth to groundwater was used to identify and deprioritize project opportunities likely to have shallow groundwater that would make grading and infiltration for green infrastructure difficult or infeasible. Groundwater elevations were derived from the San Mateo Plain Groundwater Assessment (EKI Environment & Water 2018) and the South Westside Basin Shallow Groundwater Study (RMC 2016). Areas where the groundwater elevation is less than 10 feet below ground surface were given the lowest priority. Additionally, areas where the groundwater elevation is between 10 and 20 feet below ground surface were given a relatively low priority to reflect the higher probability of groundwater impacts such as increased cost of determining groundwater elevations during project design, and potential elevated groundwater levels in the future due to sea level rise.

Slope

Project opportunities along flat grades were given higher prioritization scores. Steep slopes can make implementing green infrastructure along streets more expensive due to factors such as deeper excavation to account for grade changes and installation of check dams and energy dissipation for managing flow. Street slope was calculated from San Mateo County LiDAR digital elevation model data.

Site Space Constraints

Site space constraints that would impact constructability of green infrastructure were evaluated to identify streets that have adequate space available for a project.

Available Width for Green Infrastructure by Street Class

Project opportunities with more presumed available width for green infrastructure implementation were given higher prioritization scores. The width of the right-of-way was calculated for each eligible street segment. These widths were assessed by street class (e.g., primary, secondary/collector, or local) to identify streets that have a wide right-of-way relative to their class. The widest third of streets in each street class were given a higher priority and the narrowest third of streets in each street class were given a lower priority. This identified street segments that likely have adequate space between the driving lane edge and the edge of the right-of-way, where green infrastructure can be located.

Available Length for Green Infrastructure by Street Class

Project opportunities with more presumed available length for green infrastructure implementation were given higher prioritization scores. Length constraints were used to assess likely conflicts for green infrastructure implementation along eligible roadway segments. Length constraints assessed included transit stops, fire hydrants, and number of parcels. Parcels were used as a proxy to account for likely conflicts associated with utility laterals and driveways. Constraints were normalized by length of roadway.

Utility Conflict

Utility conflicts are an important factor for green infrastructure feasibility. Large utilities are often cost-prohibitive to relocate or design around. Large electric and gas transmission mains are considered a conflict that is prohibitive to GI implementation. Additionally, rail lines such as CalTrain or BART are considered a large conflict. Streets with these major utility conflicts are therefore given a lower priority.

2.4.3 Co-Benefits

The prioritization scoring methodology also includes five criteria related to the co-benefits of active transportation improvements and green infrastructure facilities in sustainable streets. These are described below.

Vulnerable Community Indicators

Vulnerable and disadvantaged communities are those that are considered the most burdened by health, economic, and environmental factors. Higher prioritization scores were assigned to project opportunities that intersect multiple datasets that indicate disadvantaged or vulnerable communities. The datasets used include the Median Household Income- (MHI) based Disadvantaged Communities (DACs) dataset from the U.S. Census American Community Survey data, economically DACs dataset from the San Francisco Bay Restoration Authority, Cal Enviroscreen DAC dataset, MTC's Communities of Concern dataset, and the top tier of the San Mateo County Community Vulnerability Index. This prioritization criterion was given a weight of 2 in order to further prioritize projects located in vulnerable and disadvantaged communities throughout the County.

Low Vehicle Ownership

Residents who do not own vehicles are more likely to be dependent on alternative modes of transportation, such as biking, walking, or transit. Project opportunities in communities where more than 10% of households do not own a vehicle were given higher prioritization scores. This criterion is included in the San Mateo County Community Public Health Indicator Index as a community health indicator. Census data were utilized to identify tracts with low vehicle ownership.

Urban Heat Island Effect

The CalEPA Urban Heat Island Index (UHII) was used to identify areas that are more affected by the urban heat island effect. Project opportunities in areas with higher UHII scores were given higher prioritization scores due to the potential for green infrastructure, especially when incorporating trees, to help mitigate impacts. The urban heat island (UHI) effect is the thermal impact of urban areas on local microclimates and air temperature. UHI can exacerbate the negative health impacts of heat events in urban areas.

The UHII is derived from meteorological modeling of different regions in California. Urban heat island effects were modeled separately for the San Francisco area and the San José area with the boundary between the two models located in the southern portion of San Mateo County. The UHII derived from the San Francisco model indicates that urban heat island effects increase as you go further south in San Mateo County; however, the San José model indicates that the urban heat island effects are at a minimum in the same southern county region. The UHII values are unitless and designed to be comparable across regions, however this large change across the boundary between the two models seems to not account for the influence of San Francisco's urban heat island impacts on the San José region. For this reason, the San José UHII values were not used in this prioritization analysis, and cities that fall outside the San Francisco UHII model boundaries were given a neutral prioritization score.

Canopy Coverage

Existing vegetation density can be used to identify areas that would benefit from increased vegetation in the urban landscape, including green infrastructure. The Golden Gate National Parks Conservancy has developed a county-wide high-resolution land cover database that distinguishes between impervious and pervious surfaces and classifies vegetation. The database includes canopy coverage of vegetation greater than 15 feet. Canopy coverage within 100 feet of each road was used to identify streets with lower vegetation density for prioritization.

Pavement Condition

MTC provides a Pavement Condition Index (PCI) for streets throughout San Mateo County. The PCI was used to identify streets in need of paving and reconstruction. Street condition is divided into four quantiles: very good/excellent, fair/good, at risk, and failed/poor. Project opportunities with lower pavement condition index scores were given higher prioritization scores to reflect potential for developing a synergistic project including both sustainable street components and street reconstruction or repaving.

Table 4. Sustainable Streets Prioritization Criteria

Metric[1]		Points						Weight Factor
		0	1	2	3	4	5	
TECHNICAL SUITABILITY CRITERIA								
Runoff Capture Benefits								
Water Quality	**Bayside: RAA Green Street and Other LID Runoff Capture Needed**[2]	**<0.001**	**0.001-0.002**	**0.002-0.003**	**0.003-0.004**	**0.004-0.005**	**>0.005**	--
	Oceanside: Annual Runoff Depth	**<2 inches**	**2-5**	**5-8**	**8-10**	**10-15**	**>15 inches**	
Within Watershed of Flood Prone Channel		No					Yes	--
Contains PCB Interest Areas		None			Moderate		High	--
Augments Water Supply (Above Groundwater Basin and Outside Contamination Area)		No					Yes	--
Climate Change Impacts: Runoff Increase from Transportation Network During RCP 8.5 10-yr 6-hr Event (inches by subwatershed)		**No runoff from roads**	**0 – 0.0014**	**0.0014 – 0.0066**	**0.0066 – 0.0199**	**0.0199 – 0.0418**	**0.0418 – 0.0940**	--
Hydrogeological Conditions								
Hydrologic Soil Group			D	Unknown	C	B	A	--
Groundwater Constraints		**Depth to GW < 10 ft**		**Depth to first GW 10-20 ft**			**Depth to first GW > 20 ft**	--
Slope (%)		**10 ≥ X > 5**	5 ≥ X > 4	4 ≥ X > 3	3 ≥ X > 2	2 ≥ X > 1	1 ≥ X > 0	--
Site Space Constraints								
Available Width per Street Class			**Narrowest 33% by Class**		**Middle 33% by Class**		**Widest 33% by Class**	--
Available Length per Block[3] Parcels per Block, Hydrants, SamTrans Stops			**Length lost >300 ft per 1000 ft**		**Length lost ≤300 ft per 1000 ft**		**Length lost <200 ft per 1000 ft**	--
Major Utility Conflicts		**Major Utility Conflict (PG&E, BART, CalTrain)**					**No Major Utility Conflict Present**	--
CO-BENEFITS								
Vulnerable Community Indicators - **In American Community Survey DAC** - **In SFBRA-based DAC** - **In top tier of SMC CVI** - In MTC COC - In CalEnviroScreen DAC (AB 535)		**Not in any vulnerable community dataset**	**In 1 vulnerable community dataset**		**In 2 or more vulnerable community datasets**		**In 4 or more vulnerable community datasets**	**2**
Community Benefit Vehicle-Ownership		**Fewer than 10% of households do not own a vehicle**					**More than 10% of households do not own a vehicle**	--
CalEPA Urban Heat Island Index		**< 4,000**	**4,000 – 8,000**	**8000 – 12,000**	**12,000 – 16,000**	**16,000 – 20,000**	**> 20,000**	--
Canopy Coverage (% within 100-ft of street)		**>50%**	**40%-50%**	**30%-40%**	**20%-30%**	**10%-20%**	**<10%**	--
Pavement Condition Index		**Excellent/Very Good, Good/Fair**			**At Risk**		**Poor/Failed**	--

Bold = additions relative to criteria used in the SRP

(1) Refer to Section 2.4 for the data source for each metric.
(2) RAA runoff capture for green streets and other LID measured as acre-feet capacity per acre of watershed.
(3) Length constraints: laterals based on parcel density (2' per parcel), transit stops (10' per stop), fire hydrants (4' per hydrant).

Table 4 presents the technical suitability and co-benefits criteria along with their proposed scores and weights. Each street is assigned a score (1 to 5) for each criterion based on the attributes of the street. For example, a street with a slope of 2.5 percent will be assigned 3 points for the slope criterion. Each street is assigned up to 55 points for technical suitability based on a maximum of 5 points for the eleven technical criteria. Each street is additionally assigned a co-benefit score up to 30 points based on a maximum of 5 points for 5 criteria with the vulnerable communities indicator criteria being weighted by a factor of 2. For each street the technical suitability score is added to the co-benefits score to arrive at a total prioritization score of up to 85 points.

2.5 Application of Additional Prioritization Information, Tools and Considerations

After initial prioritization scoring and vetting of the planned and new project opportunities is complete, there are several additional factors that may affect project inclusion in the sustainable street network. Two critical factors are geographic distribution and stakeholder feedback.

The project team will assess the geographic distribution of viable planned project opportunities across San Mateo County. If there are large gaps and/or cities with a very limited quantity of projects, the team will utilize additional strategies to identify viable opportunities in these areas. This will include adding opportunities from the "new" project opportunity analysis (i.e. project opportunities in proximity to schools and transit) as indicated in Section 2.3 and may also include research and stakeholder outreach to locate additional planned transportation project opportunities for further assessment.

Stakeholder feedback will also play a critical role in project prioritization and inclusion in the sustainable streets network. Municipal representatives and community members have critical on-the-ground knowledge of existing planned project opportunities and site conditions unavailable to the project team. The project team will solicit feedback on the draft sustainable street network from these stakeholders, and make changes, including additions and deletions, to the network based on feedback and knowledge. In order to get additional targeted feedback from engaged stakeholders, the team will also solicit feedback from the Master Plan's Stakeholder Advisory Committee. The Stakeholder Advisory Committee was formed at the beginning of the planning process to ensure feedback and knowledge-sharing and consists of representatives from the bicycle planning and advocacy community, public health and sustainability experts, and government representatives with expertise in stormwater management and active transportation.

3. Prioritization Output

This section presents high level prioritization output to demonstrate how the methodology described in Section 2 is applied.

3.1 Technical Suitability Results

Summary maps presenting the geospatial results for the technical suitability criteria are presented in Figure 16 through Figure 18. Appendix A includes individual maps for each technical suitability criteria. Figure 19 presents the draft technical suitability scores for all street segments countywide. Each street is assigned a technical suitability score up to 55 points based on a maximum of 5 points for the eleven technical criteria. The technical suitability score does not include the additional points the street will be assigned for co-benefits as described in the next section. The spatial distribution of technical suitability criteria countywide highlights the opportunities and constraints for green infrastructure in different regions.

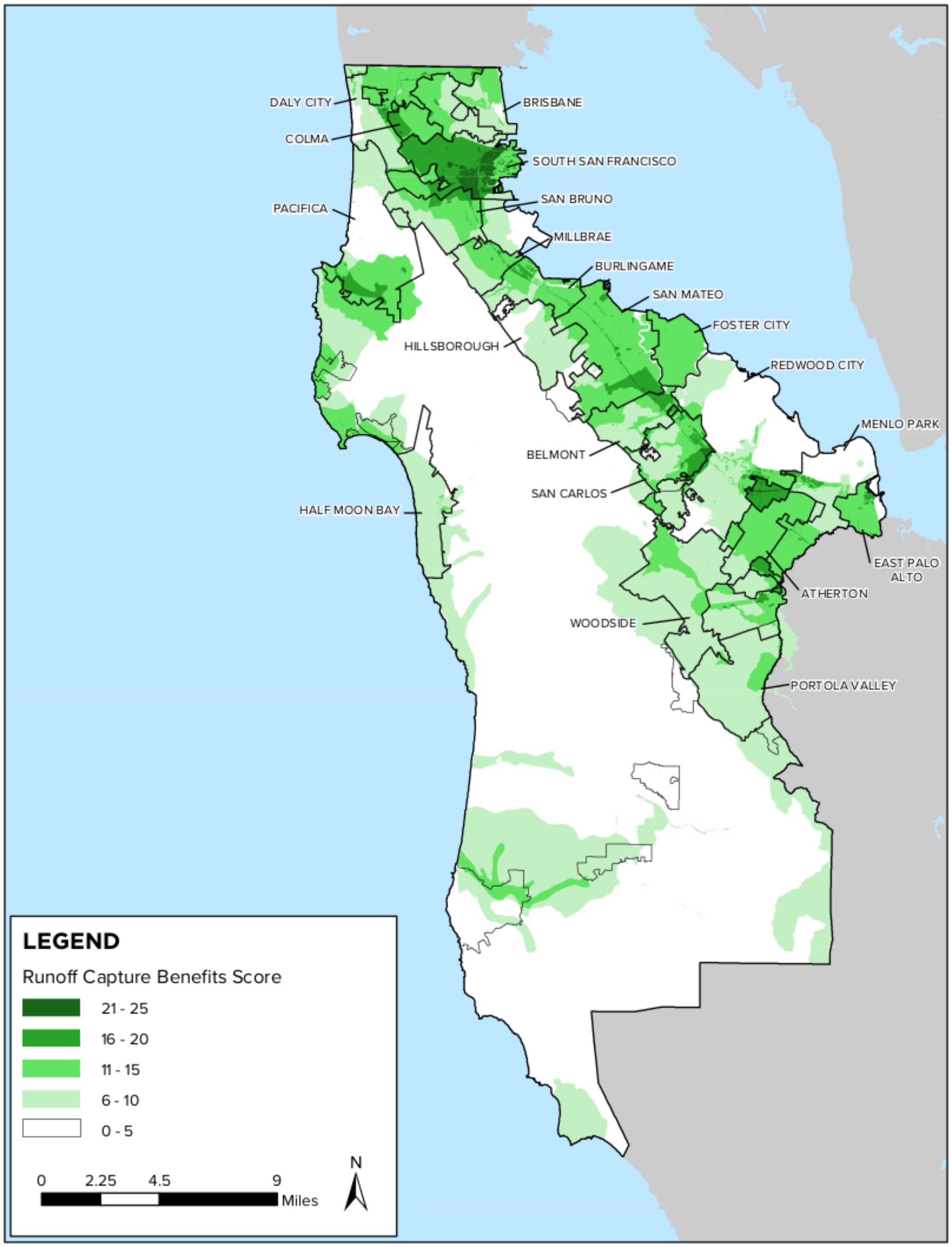

Figure 16. Summary Map of Runoff Capture Benefits[1]

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[1] Summary map includes the following criteria: Water Quality, PCB Interest Areas, Areas above Groundwater Basins and outside Contamination Areas, Areas within Watersheds of Flood Prone Channels, and Climate Change Impacts. Individual maps for each criterion can be found in Appendix A. The darker green colors in this map indicate stronger opportunities for green infrastructure.

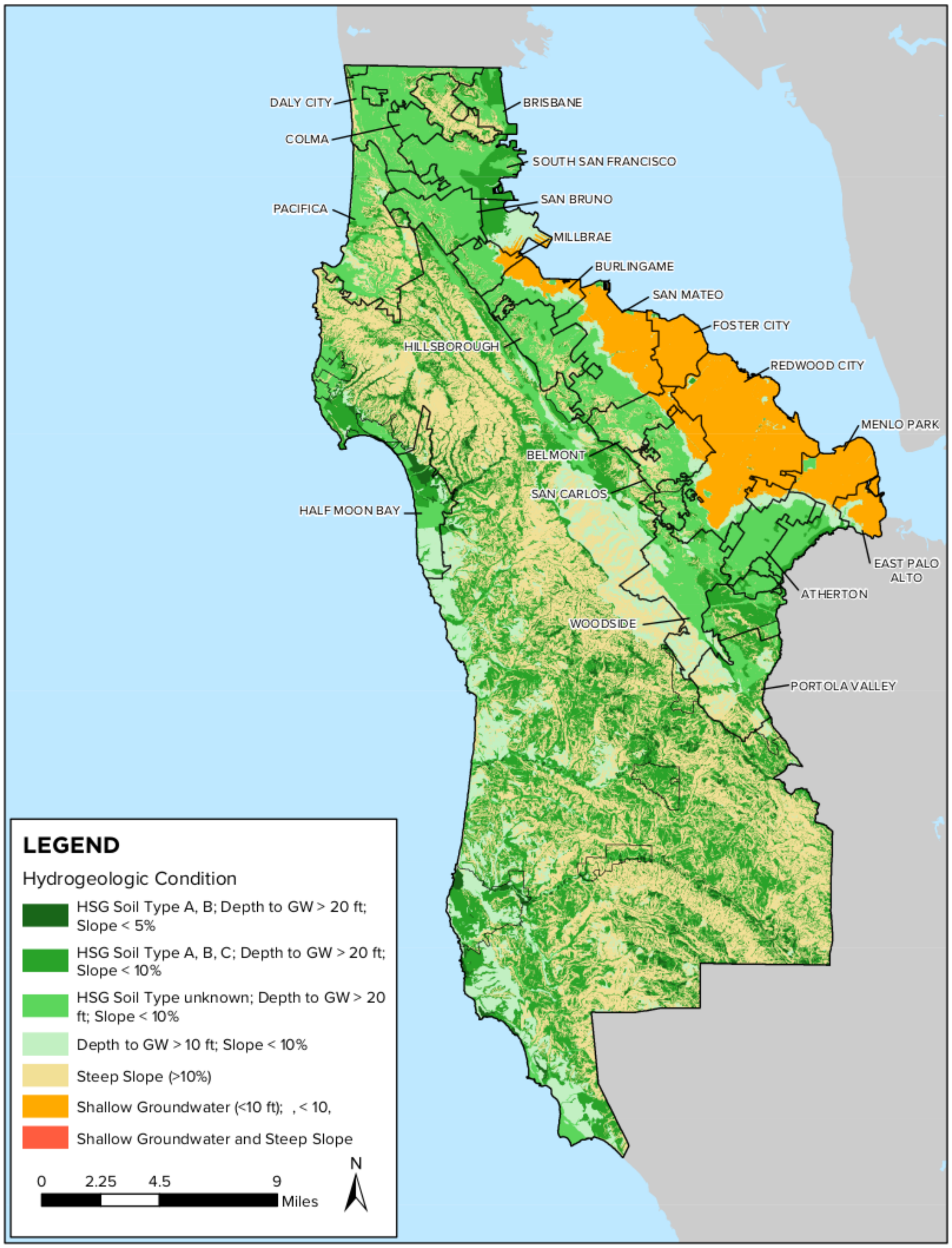

Figure 17. Summary Map of Hydrogeologic Conditions[2]

[2] Summary map includes the following criteria: Hydrologic Soil Group, Groundwater Constraints, and Slope. Individual maps for each criterion can be found in Appendix A. The darker green colors in this summary map indicate better conditions for green infrastructure; orange and red indicate more constrained conditions.

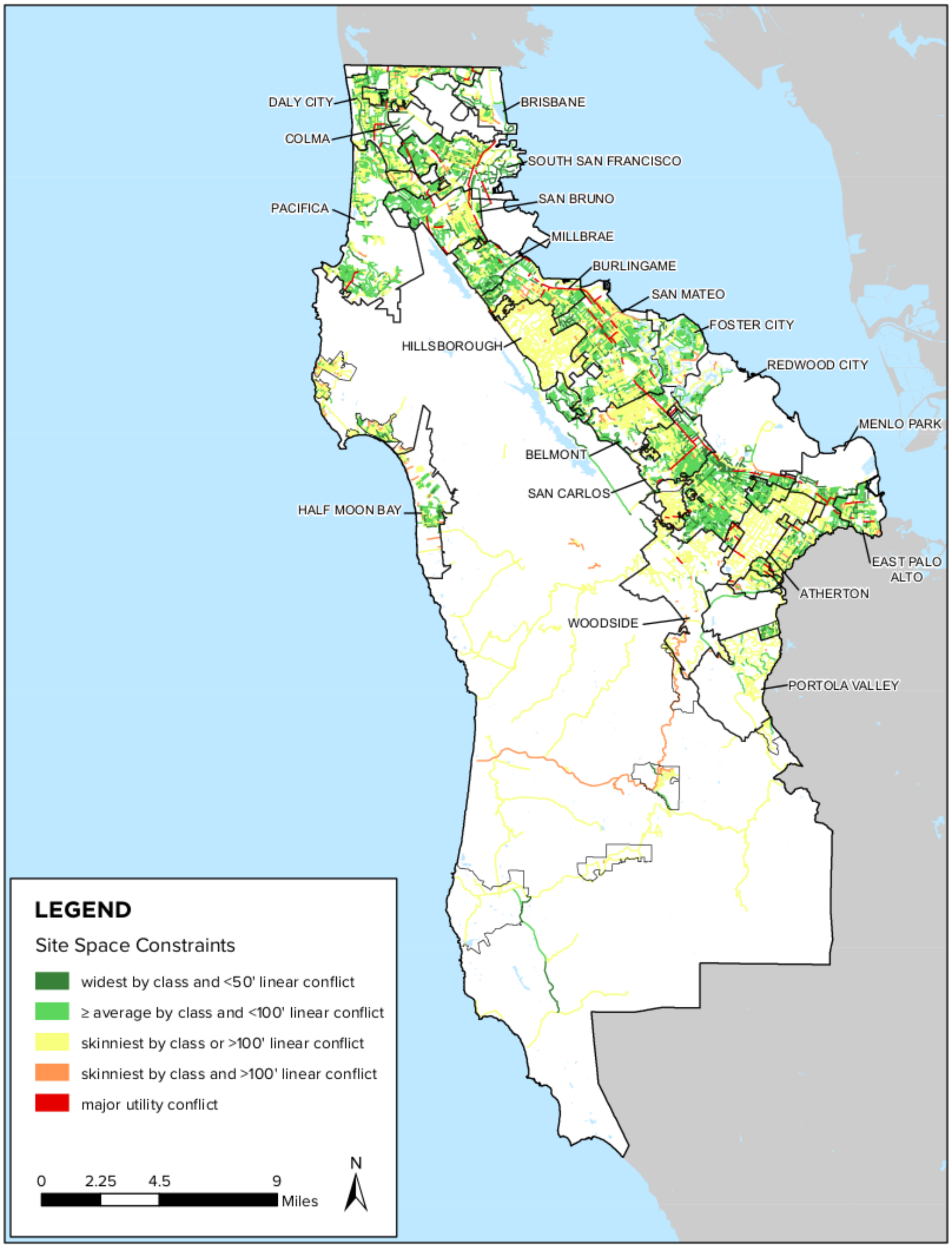

Figure 18. Summary Map of Site Space Constraints[3]

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[3] Summary map includes the following criteria: Available Width per Street Class, Available Length per Block, and Major Utility Conflicts. Individual maps for each criterion can be found in Appendix A. The darker green colors in this summary map indicates better conditions for green infrastructure; orange and red indicate more constrained conditions.

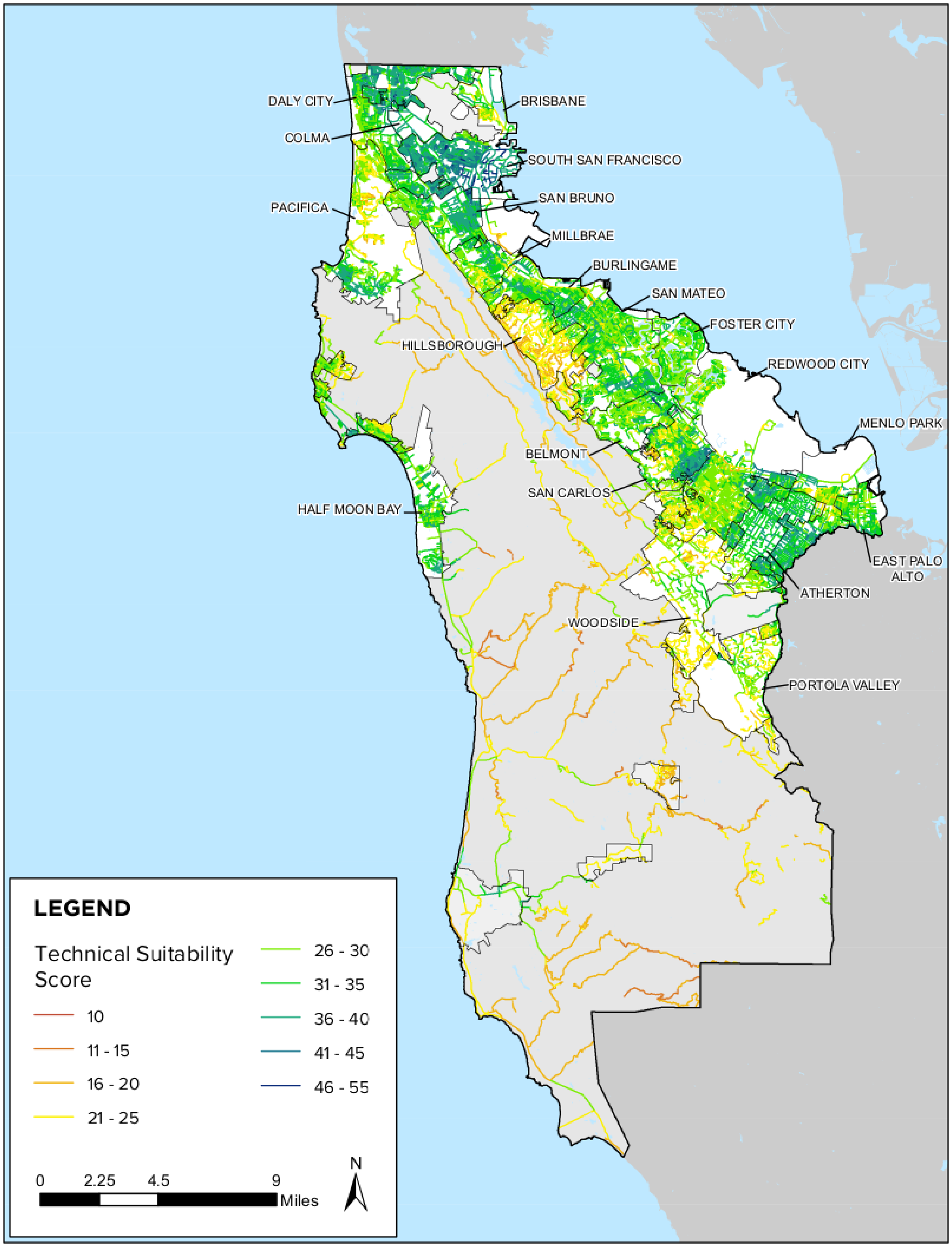

Figure 19. Technical Suitability Scores for Streets Countywide

3.2 Prioritization Results

Each street within the County is assigned a co-benefit score up to 30 points which is combined with the technical suitability score up to 55 points to arrive at a total prioritization score up to 85 points. Each co-benefit criterion is mapped in Figure 20; larger maps are included in Appendix A. Figure 21 shows the total prioritization score for each street countywide. Figure 22 shows the prioritization scores of street segments that are co-located with the existing planned project opportunities identified through this analysis. A total of 1,530 street segments intersect a Tier 1 existing planned project opportunity and a total of 1,751 street segments intersect a Tier 2 existing planned project. Figure 23 shows the prioritization scores of project opportunities identified through the "new" project opportunity analysis.

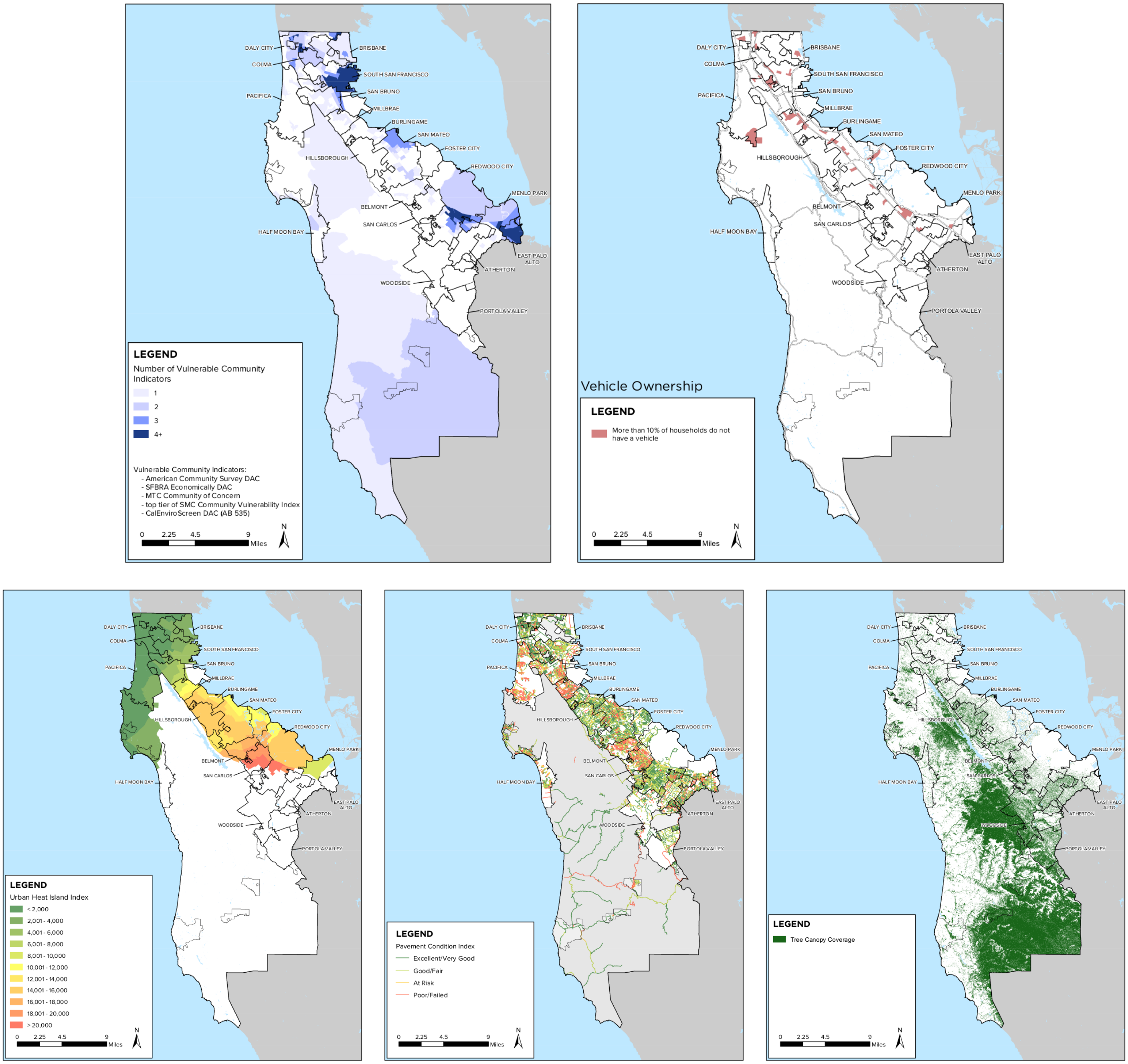

Figure 20. Co-Benefit Criteria Maps[4]

[4] Larger versions of the co-benefit maps can be viewed in Appendix A

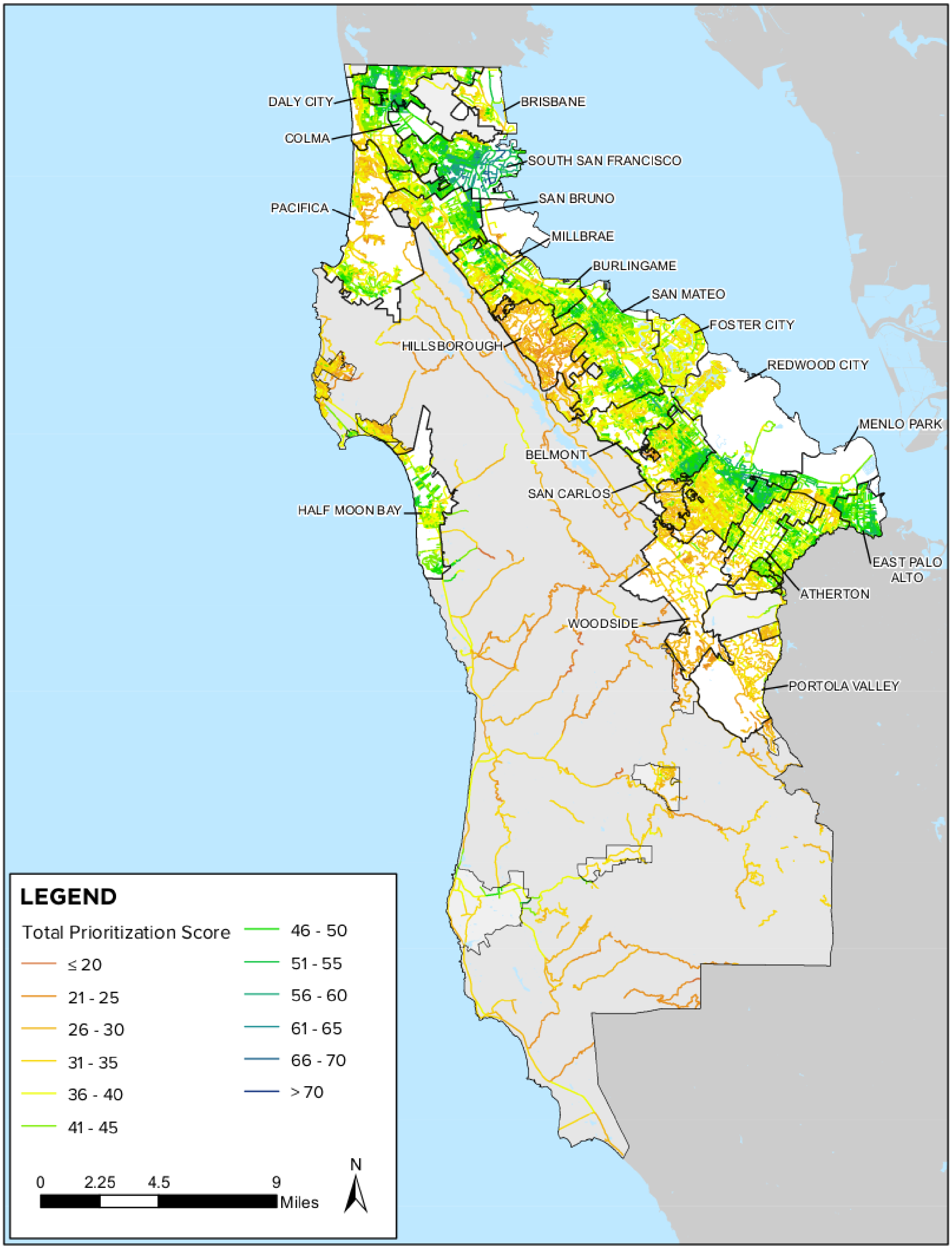

Figure 21. Total Prioritization Scores for Streets Countywide

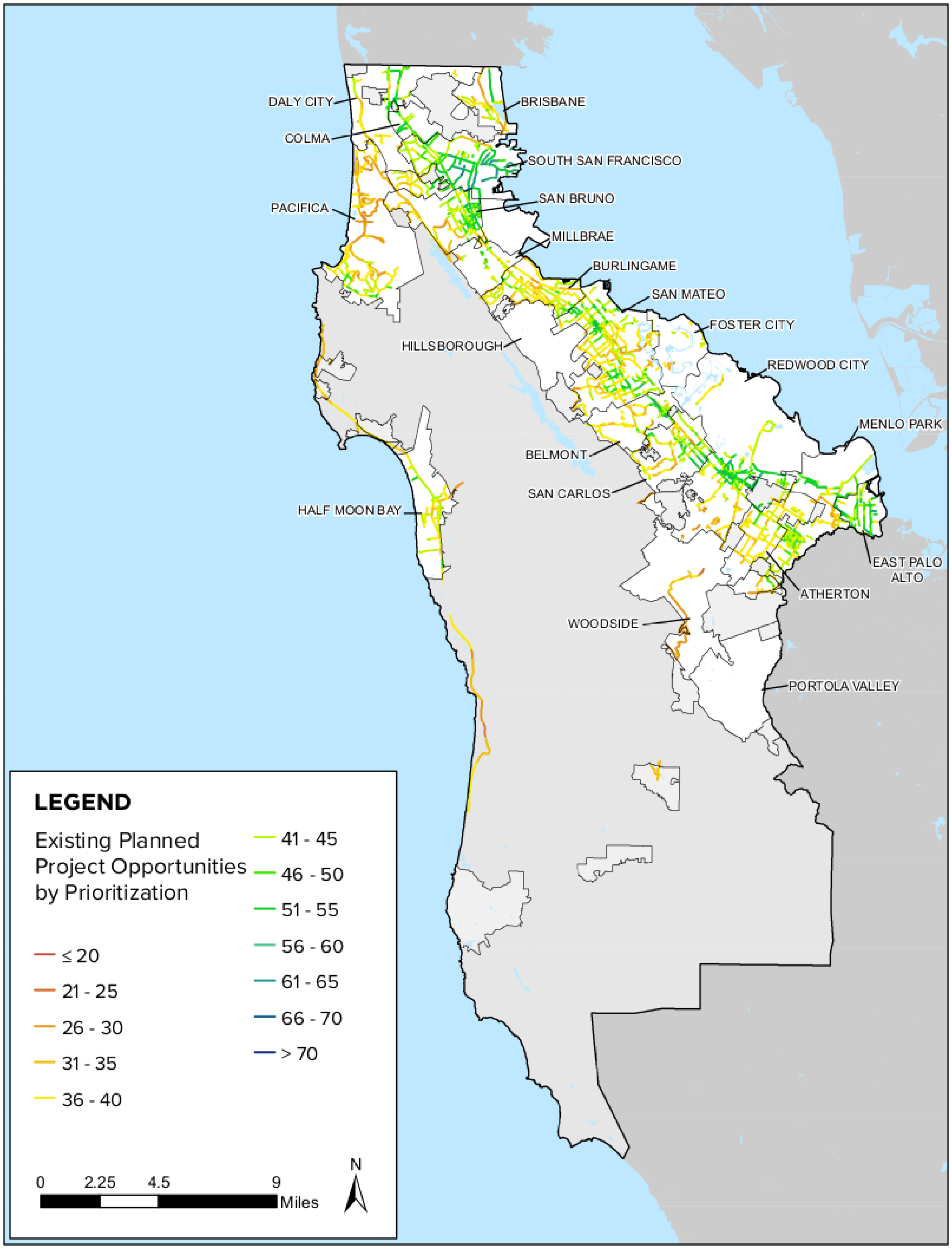

Figure 22. Total Prioritization Scores for Existing Planned Project Opportunities

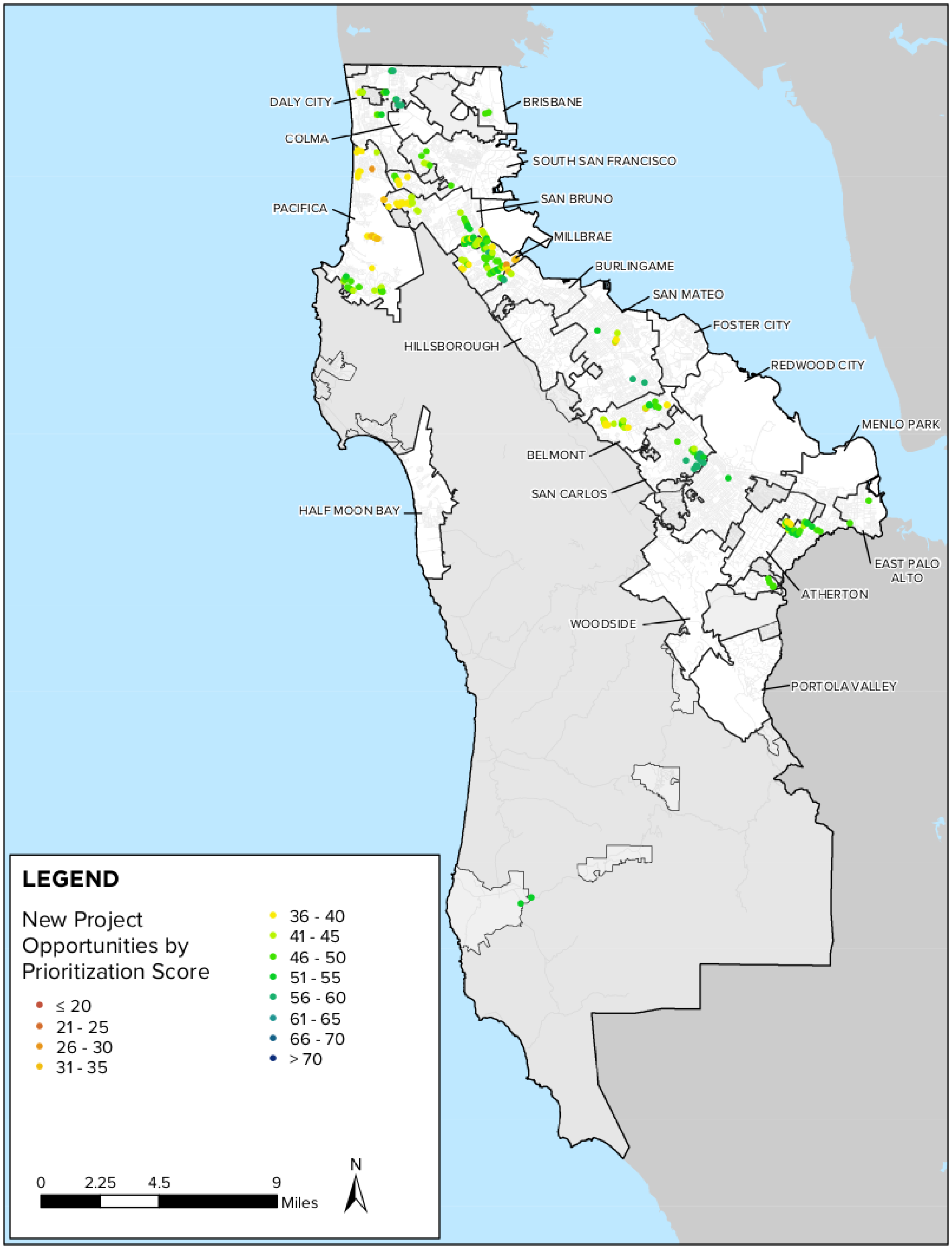

Figure 23. Total Prioritization Scores for New Project Opportunities

4. Overview of Future Phases of Project Development

Figure 24: Phases of Project Development

The project team will undertake a number of steps following the identification and prioritization phase in order to more fully define the projects included in the sustainable street network and provide municipalities with tools for implementation. Future steps will include defining the project extents and recommending timeframes for implementation, as well as linking projects with implementation mechanisms such as policies, programs, and funding sources.

Project Extents: The primary factor in defining the geographic extent of a sustainable street project will be the boundaries of any related existing planned project opportunities, if applicable. However, the project team may also assess street segments at both ends of the planned project to determine whether it is appropriate to recommend extending the project based on favorable conditions for green infrastructure. The team will also use the results of the detailed drainage basin analysis in support of assigning drainage areas to prioritized projects. Another critical factor in determining project extents will be feedback from stakeholders who may have better local knowledge of site opportunities and constraints.

Project Timing: The primary factors in determining the recommended timeframe for project phasing and implementation will be the timing information associated with any related existing planned project opportunities, if applicable and available, as well as stakeholder feedback. The project team will also consider drainage area and cost effectiveness, as well as the need to spread fiscal and staffing resources into a feasible annual allocation, in the creation of a project phasing plan.

Implementation Mechanisms: The project team will evaluate and link project typologies to recommended implementation mechanisms such as policies, programs, and funding sources. Due to an anticipated significant number of projects, the team will primarily make recommendations by project typology, however, for projects recommended for near term implementation, such as projects slated for conceptual design, the project team will consider more specific recommendations.

5. References

BOS SMC (Board of Supervisors, San Mateo County). 2019. Resolution Endorsing the Declaration of a Climate Emergency in San Mateo County that Demands Accelerated Actions on the Climate Crisis and Calls on Local and Regional Partners to Join Together to Address Climate Change. File No. 19-847. BOS SMC. Redwood City, CA. September 2019.

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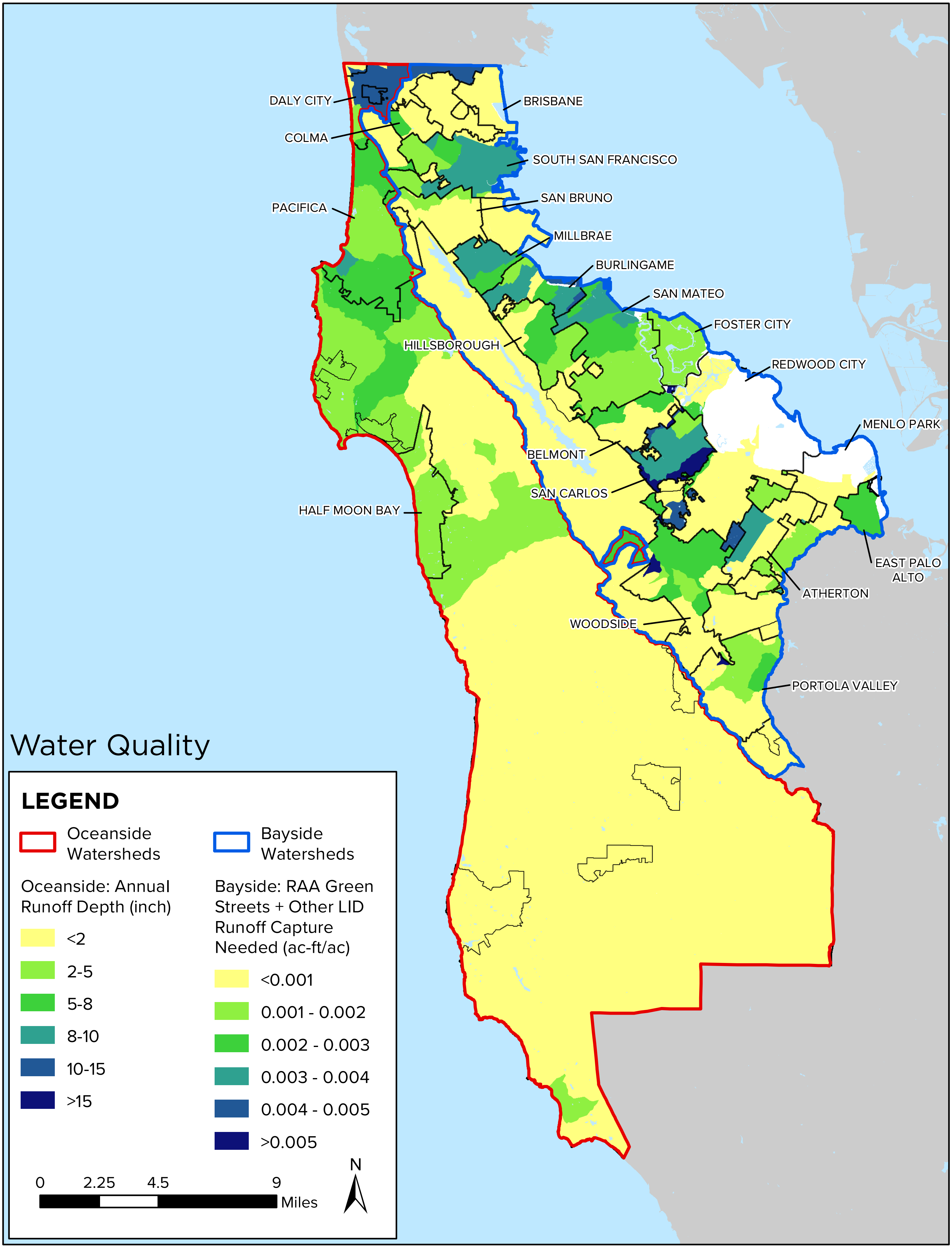
Appendix A

Prioritization Maps



DALY CITY
BRISBANE
COLMA
SOUTH SAN FRANCISCO
SAN BRUNO
PACIFICA
MILLBRAE
BURLINGAME
SAN MATEO
FOSTER CITY
HILLSBOROUGH
REDWOOD CITY
MENLO PARK
BELMONT
SAN CARLOS
HALF MOON BAY
EAST PALO ALTO
ATHERTON
WOODSIDE
PORTOLA VALLEY
Water Quality
LEGEND
Oceanside Watersheds
Bayside Watersheds
Oceanside: Annual Runoff Depth (inch)
<2
2-5
5-8
8-10
10-15
>15
Bayside: RAA Green Streets + Other LID Runoff Capture Needed (ac-ft/ac)
<0.001
0.001 - 0.002
0.002 - 0.003
0.003 - 0.004
0.004 - 0.005
>0.005
0
2.25
4.5
9
Miles
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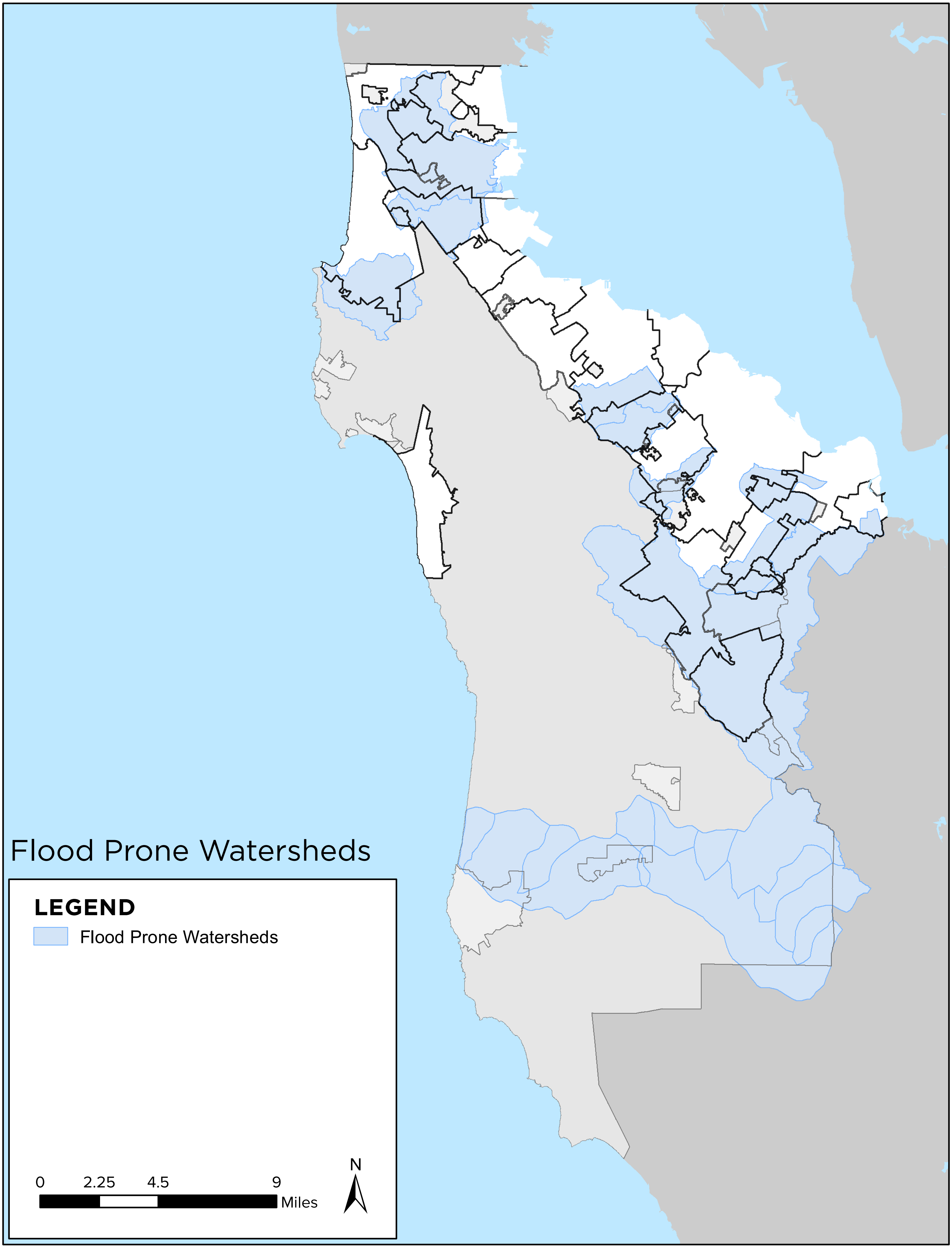
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Flood Prone Watersheds
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4.5
9
Miles
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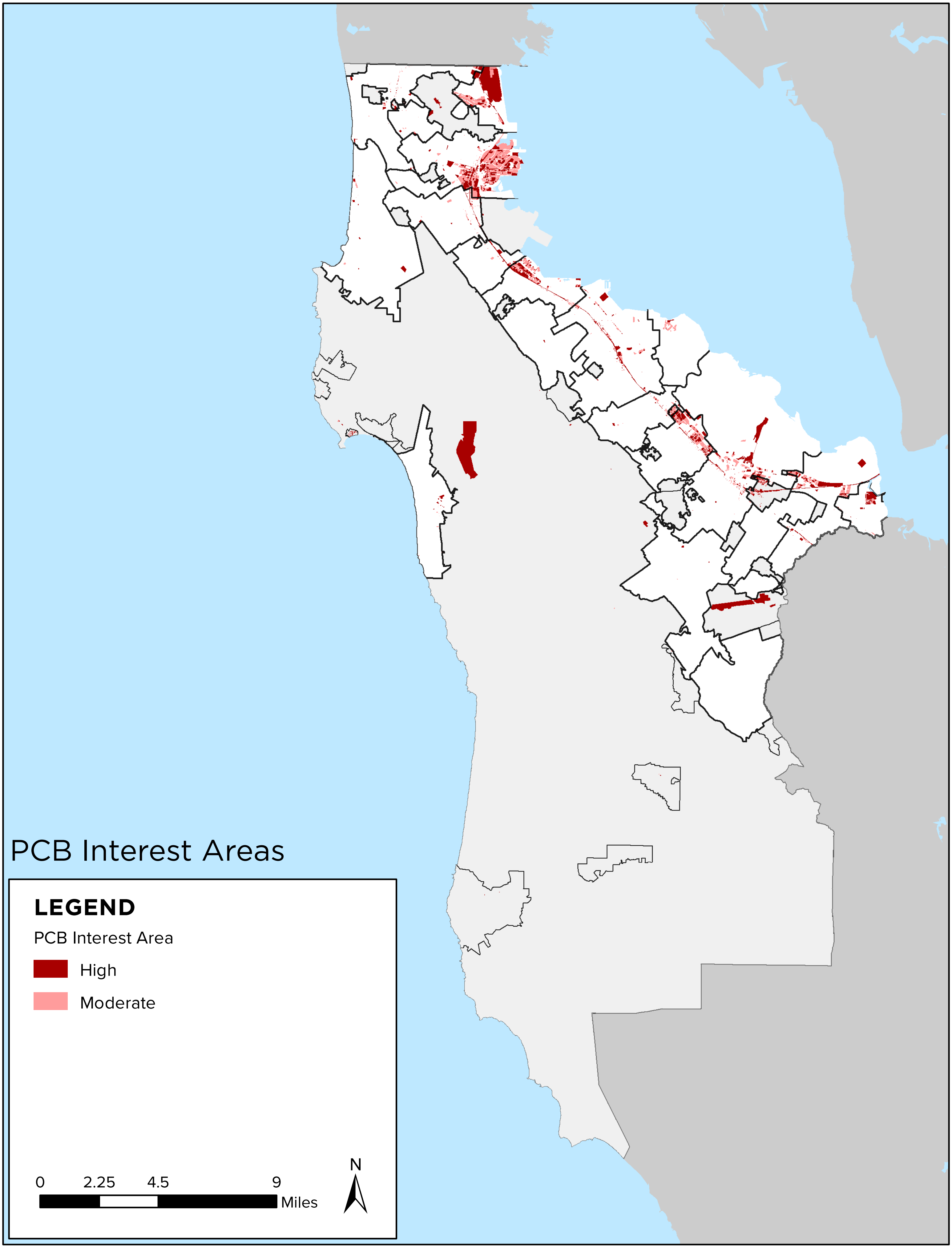
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Miles
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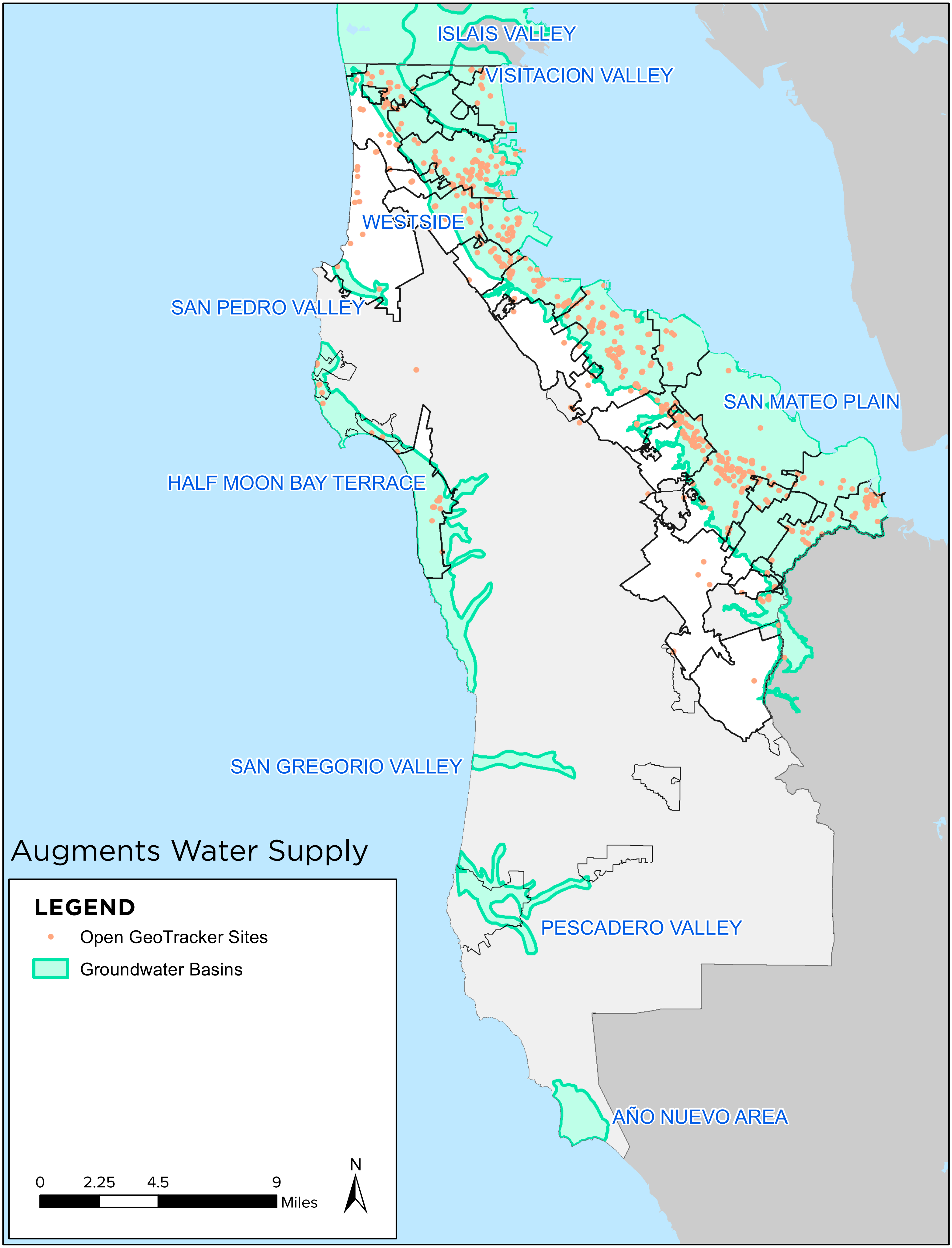
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VISITACION VALLEY
WESTSIDE
SAN PEDRO VALLEY
SAN MATEO PLAIN
HALF MOON BAY TERRACE
SAN GREGORIO VALLEY
Augments Water Supply
LEGEND
Open GeoTracker Sites
Groundwater Basins
PESCADERO VALLEY
AÑO NUEVO AREA
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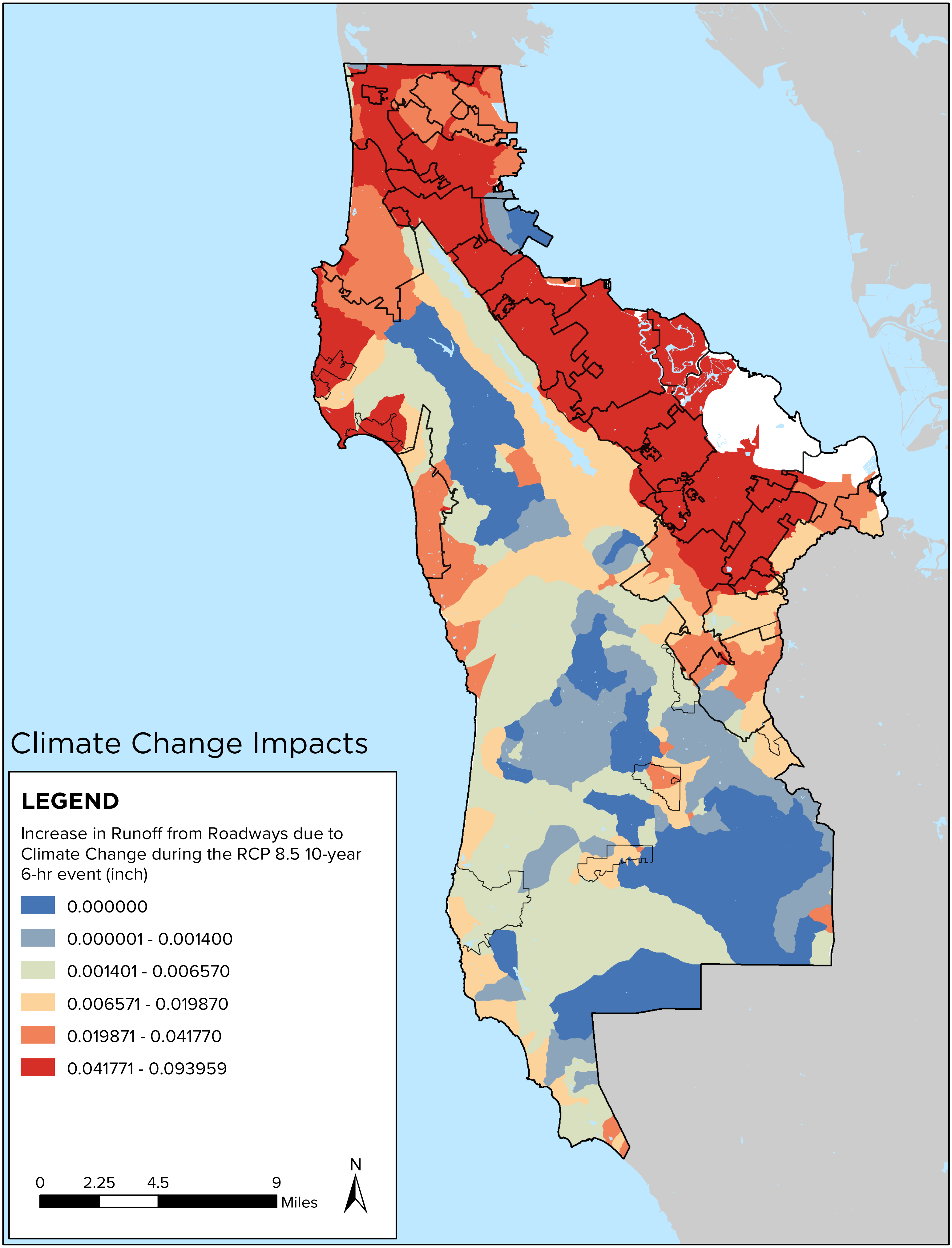
2.25
4.5
9
Miles
N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0.006571 - 0.019870
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2.25
4.5
9
Miles
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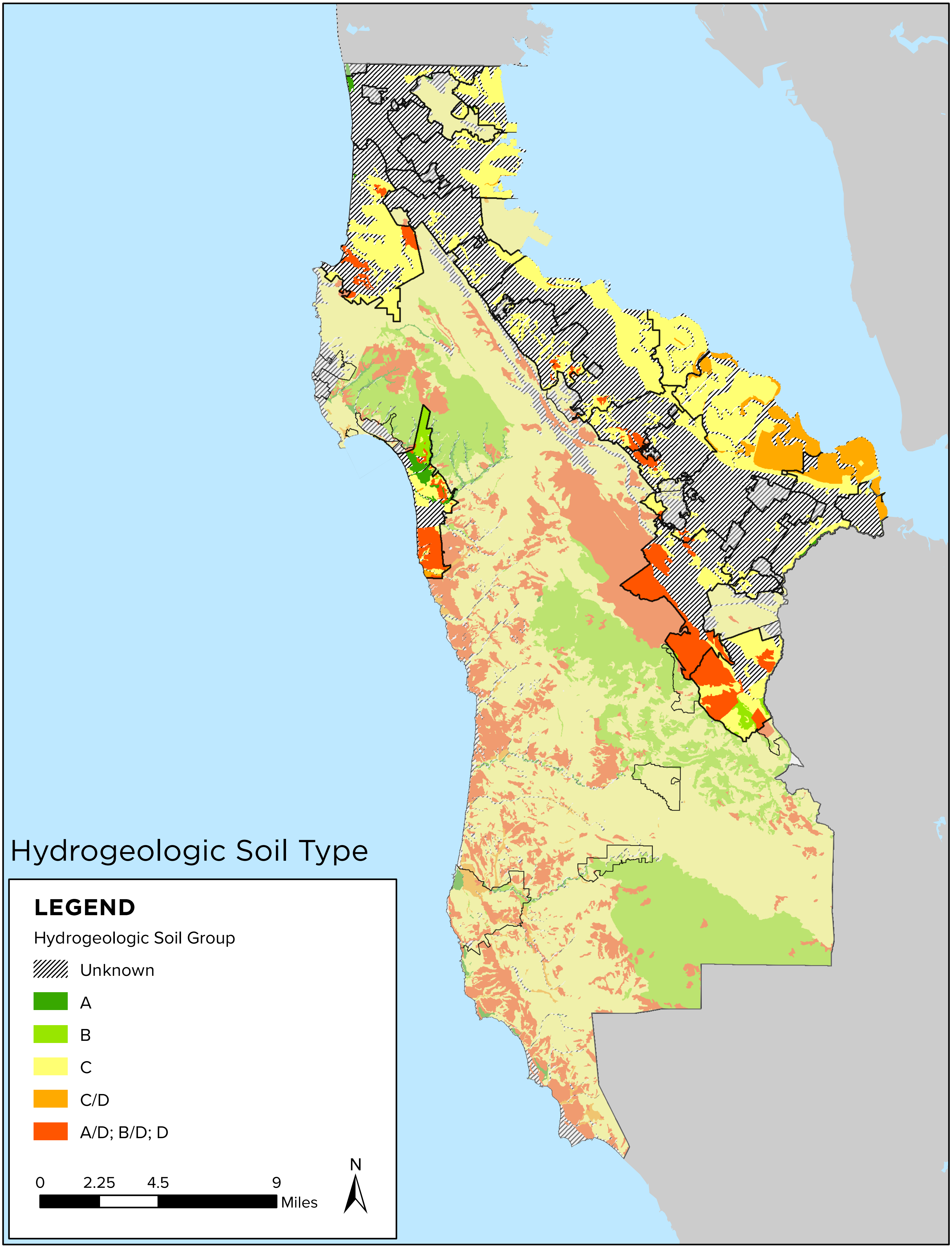
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B
C
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4.5
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Miles
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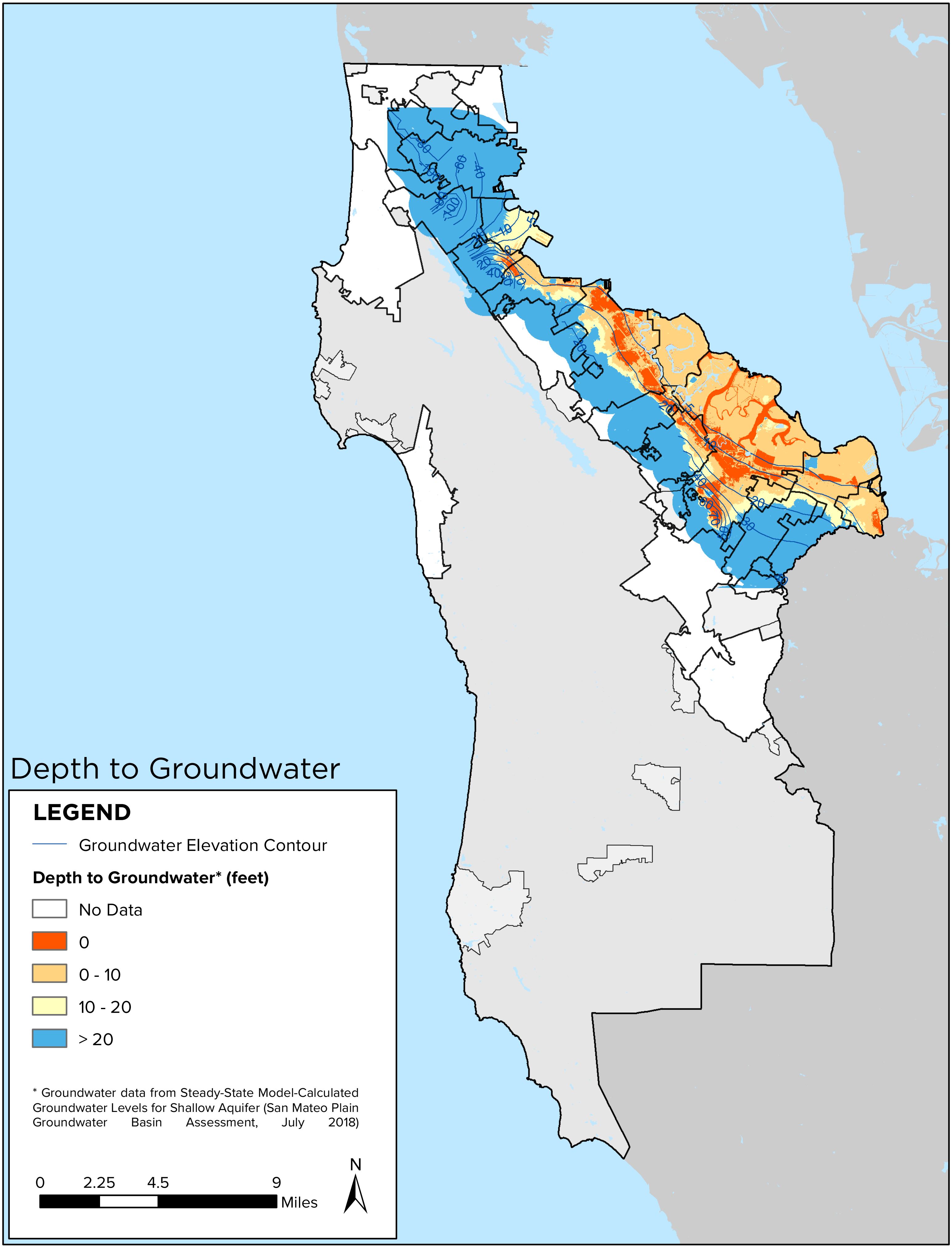
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Groundwater Elevation Contour
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0 - 10
10 - 20
> 20
* Groundwater data from Steady-State Model-Calculated Groundwater Levels for Shallow Aquifer (San Mateo Plain Groundwater Basin Assessment, July 2018)
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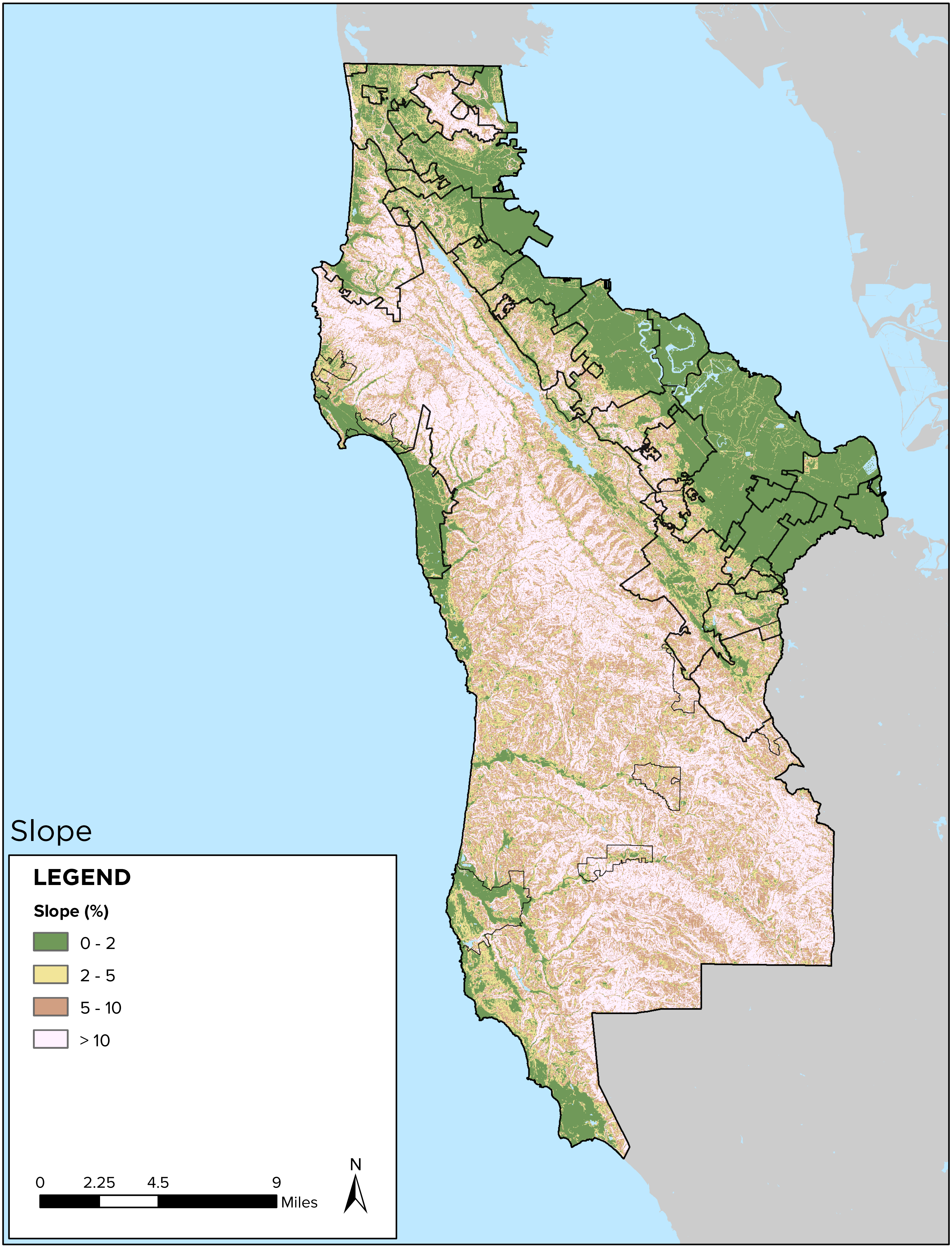
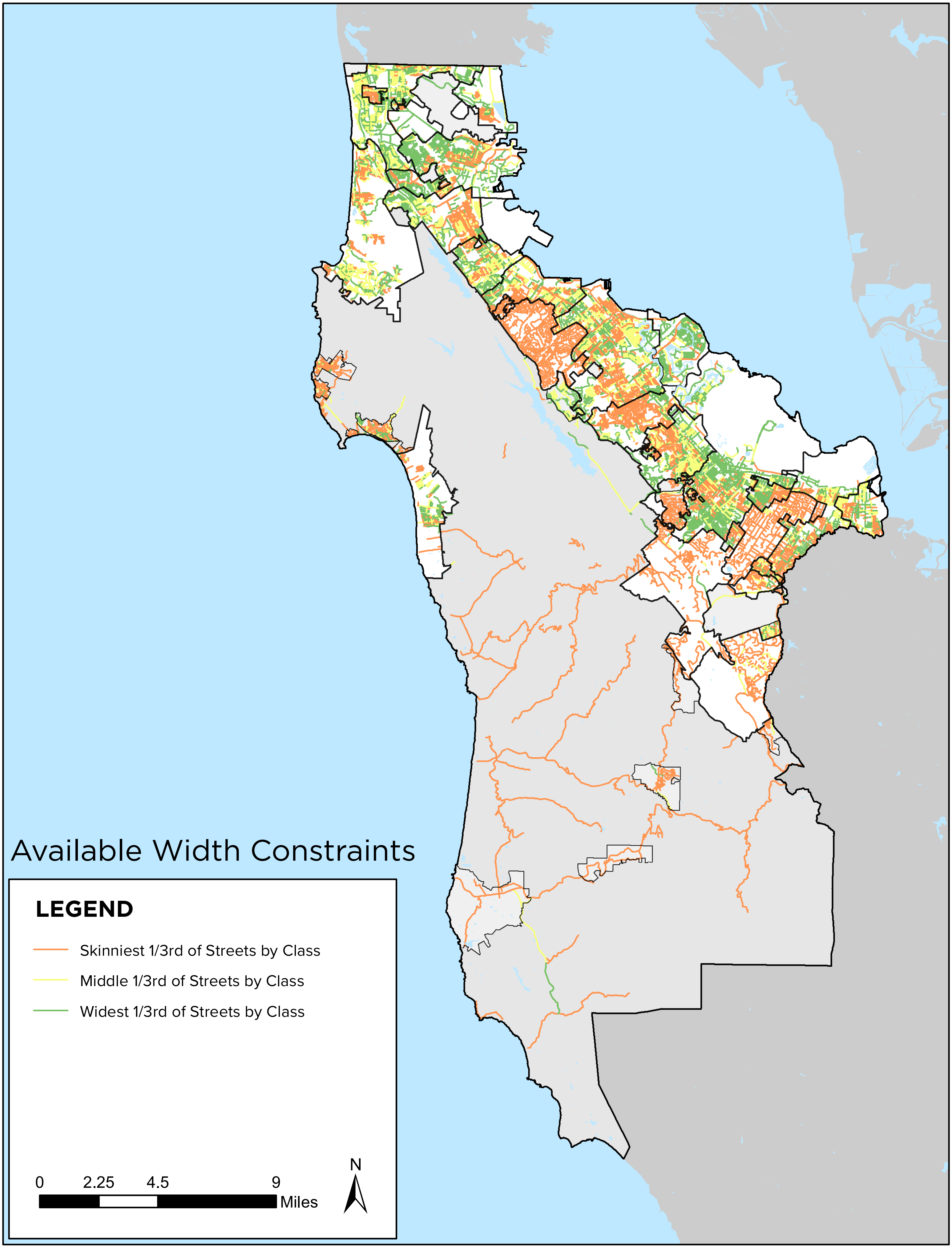
2.25
4.5
9
Miles
N

Slope

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Skinniest 1/3rd of Streets by Class
Middle 1/3rd of Streets by Class
Widest 1/3rd of Streets by Class
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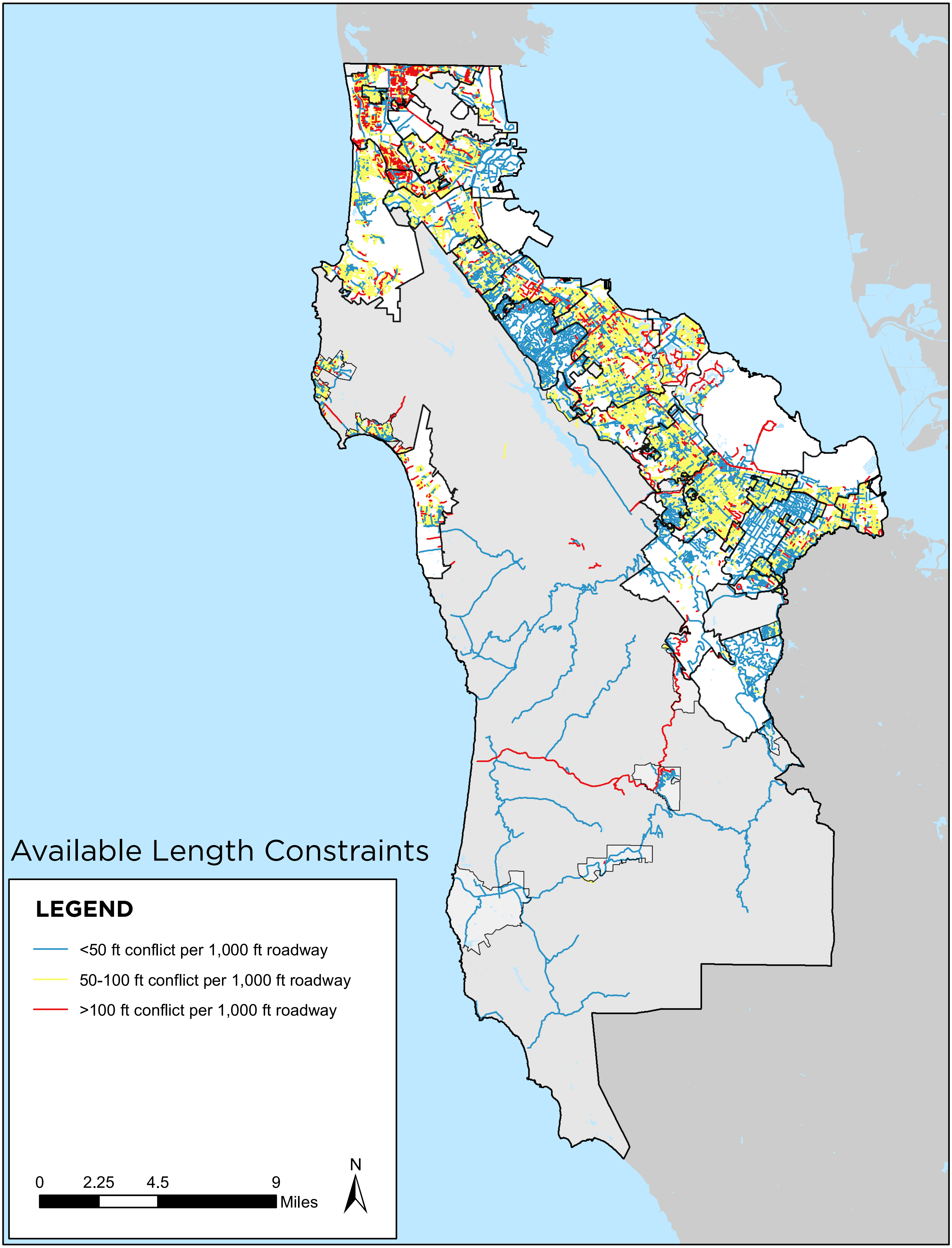
2.25
4.5
9
Miles
N



Available Length Constraints
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50-100 ft conflict per 1,000 ft roadway
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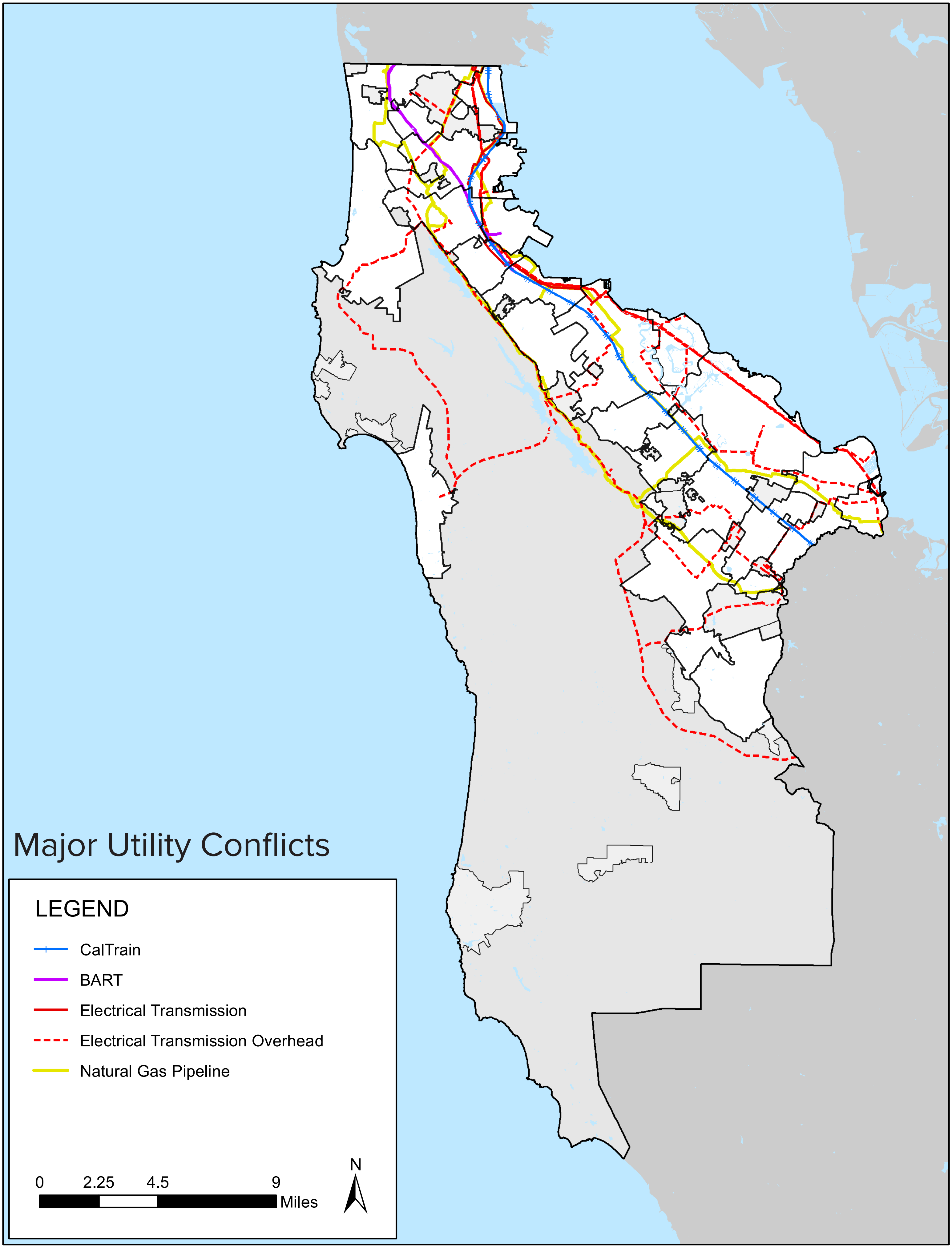
2.25
4.5
9
Miles
N


Major Utility Conflicts
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CalTrain
BART
Electrical Transmission
Electrical Transmission Overhead
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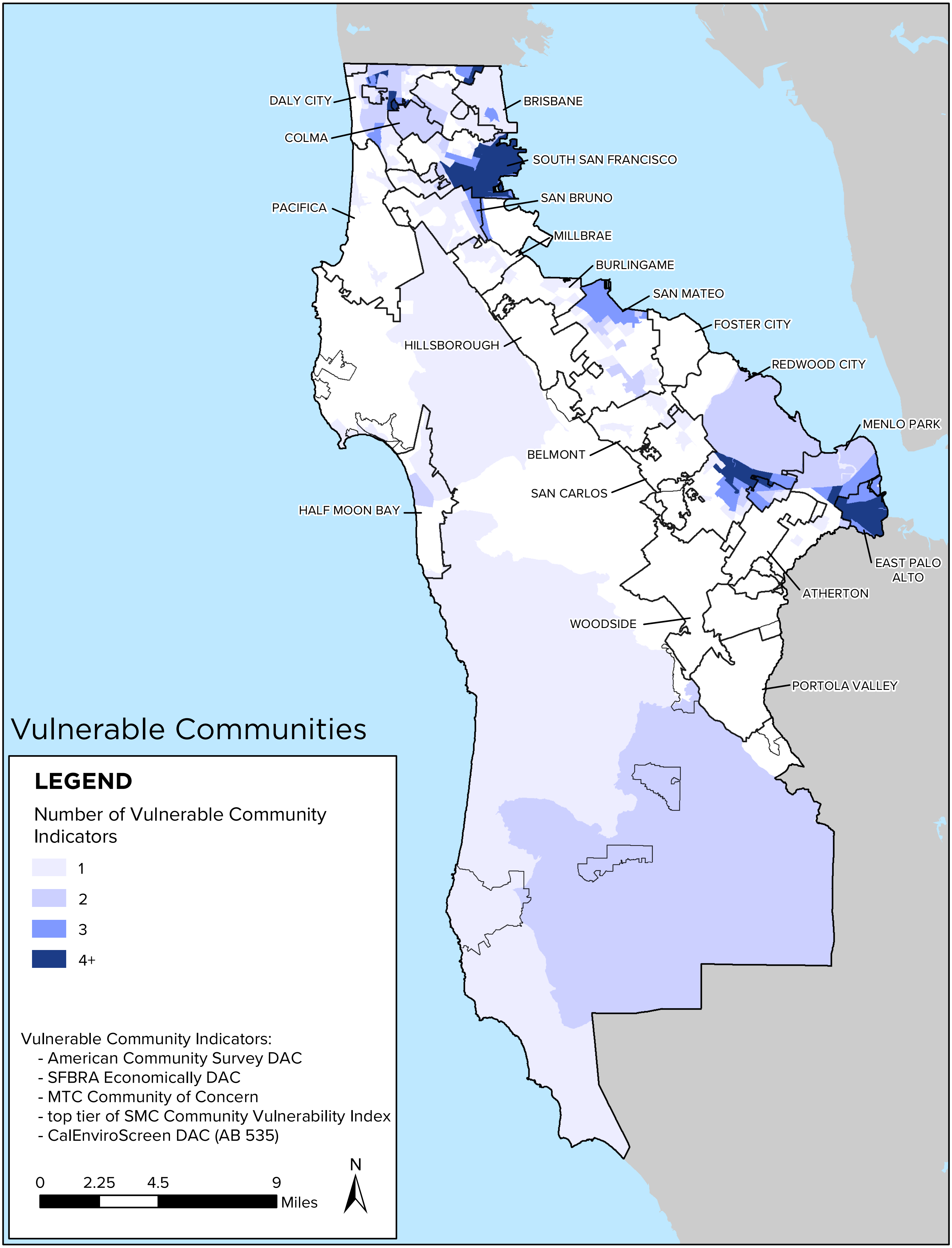
2.25
4.5
9
Miles
N

Vulnerable Communities



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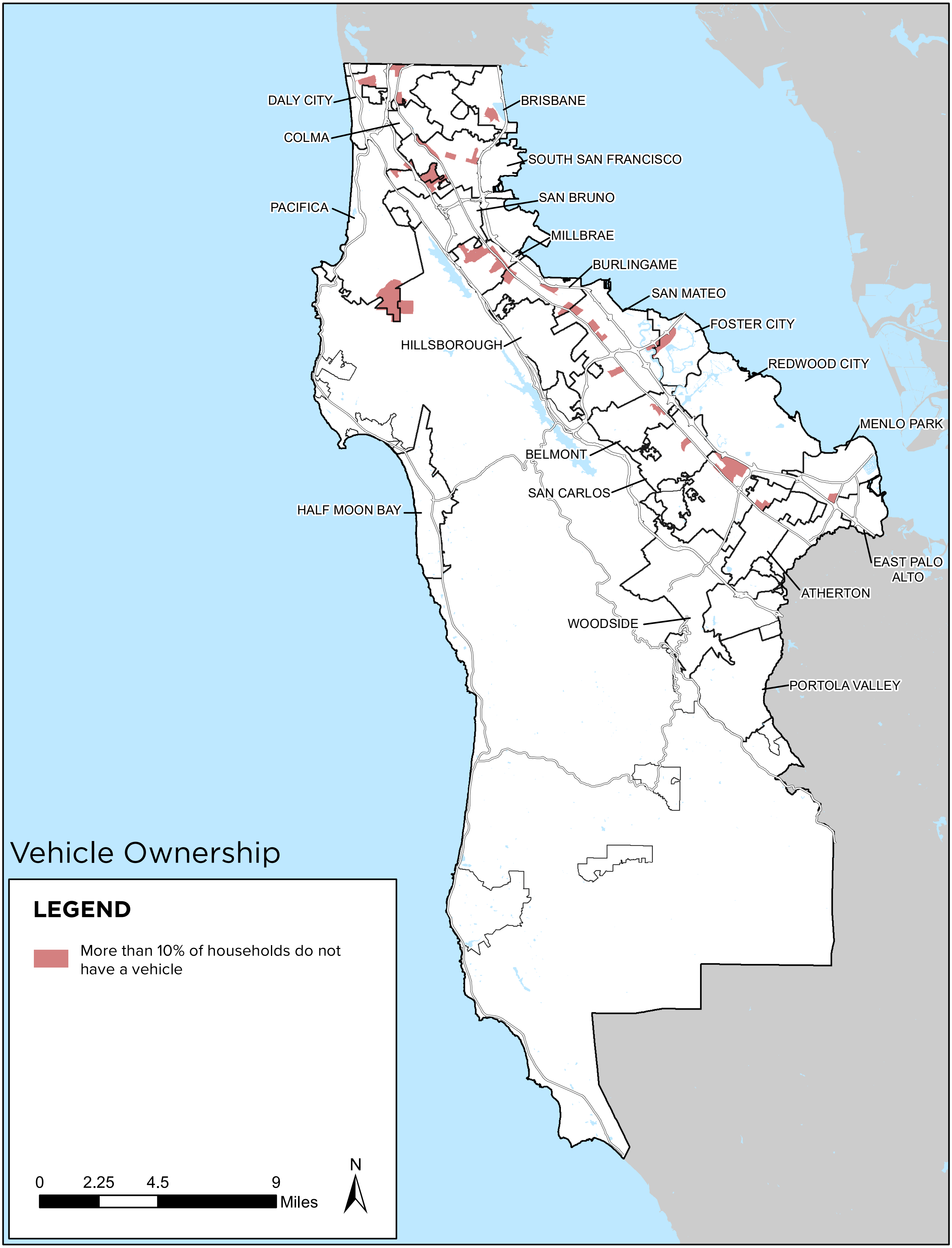

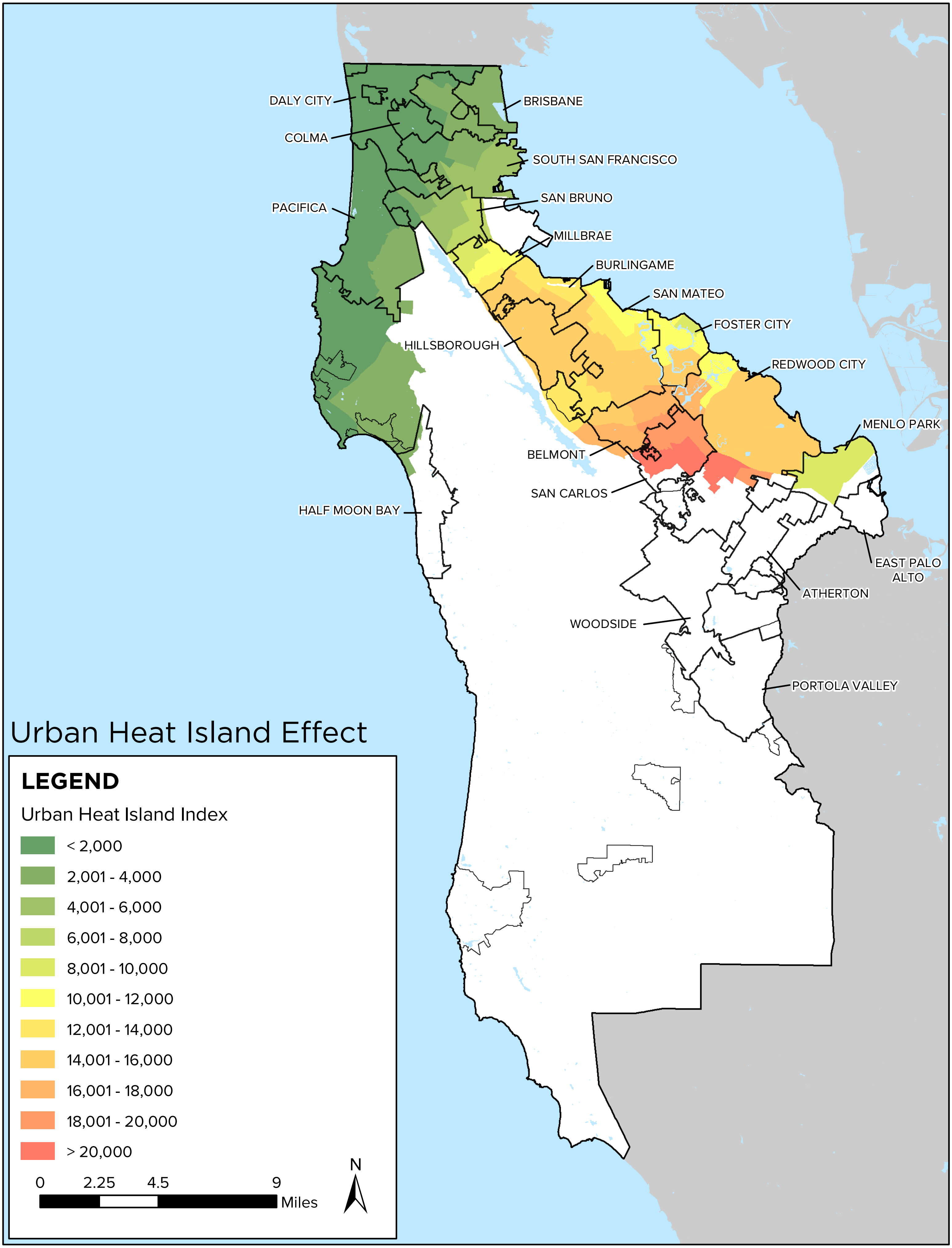
DALY CITY
BRISBANE
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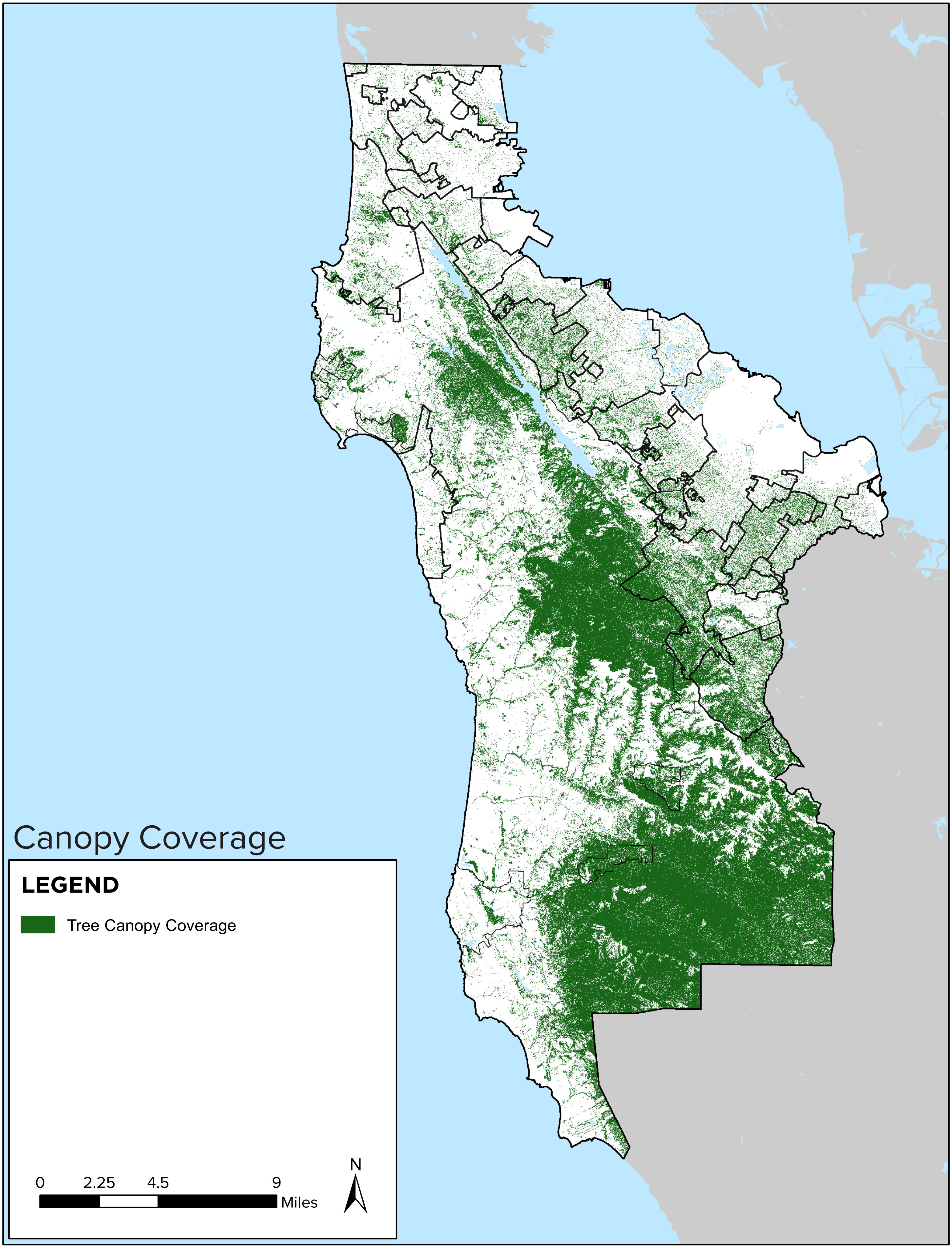
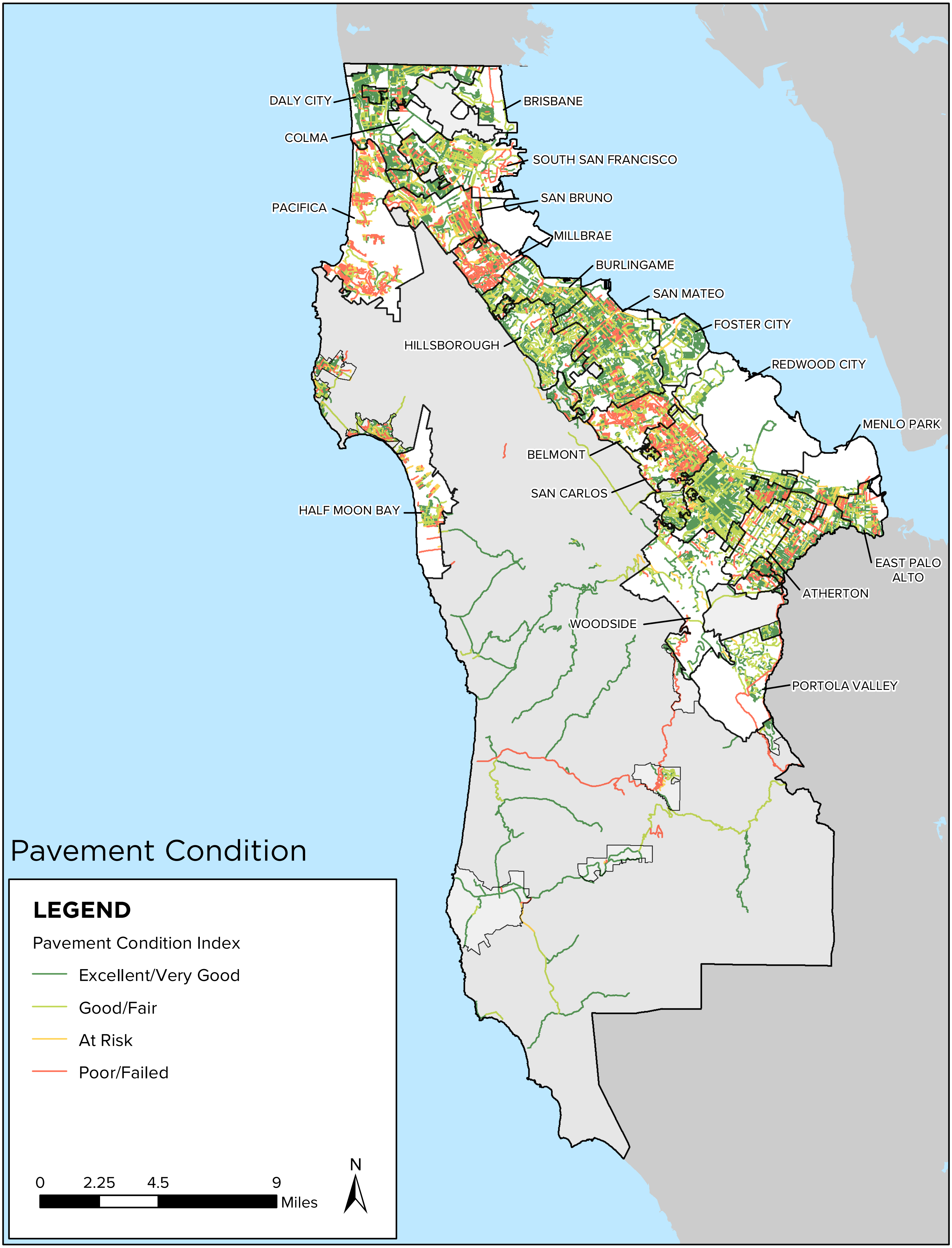
SOUTH SAN FRANCISCO
SAN BRUNO
PACIFICA
MILLBRAE
BURLINGAME
SAN MATEO
FOSTER CITY
HILLSBOROUGH
REDWOOD CITY
MENLO PARK
BELMONT
SAN CARLOS
HALF MOON BAY
EAST PALO ALTO
ATHERTON
WOODSIDE
PORTOLA VALLEY
Urban Heat Island Effect
LEGEND
Urban Heat Island Index
< 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 8,000
8,001 - 10,000
10,001 - 12,000
12,001 - 14,000
14,001 - 16,000
16,001 - 18,000
18,001 - 20,000
> 20,000
0 2.25 4.5 9
Miles
N

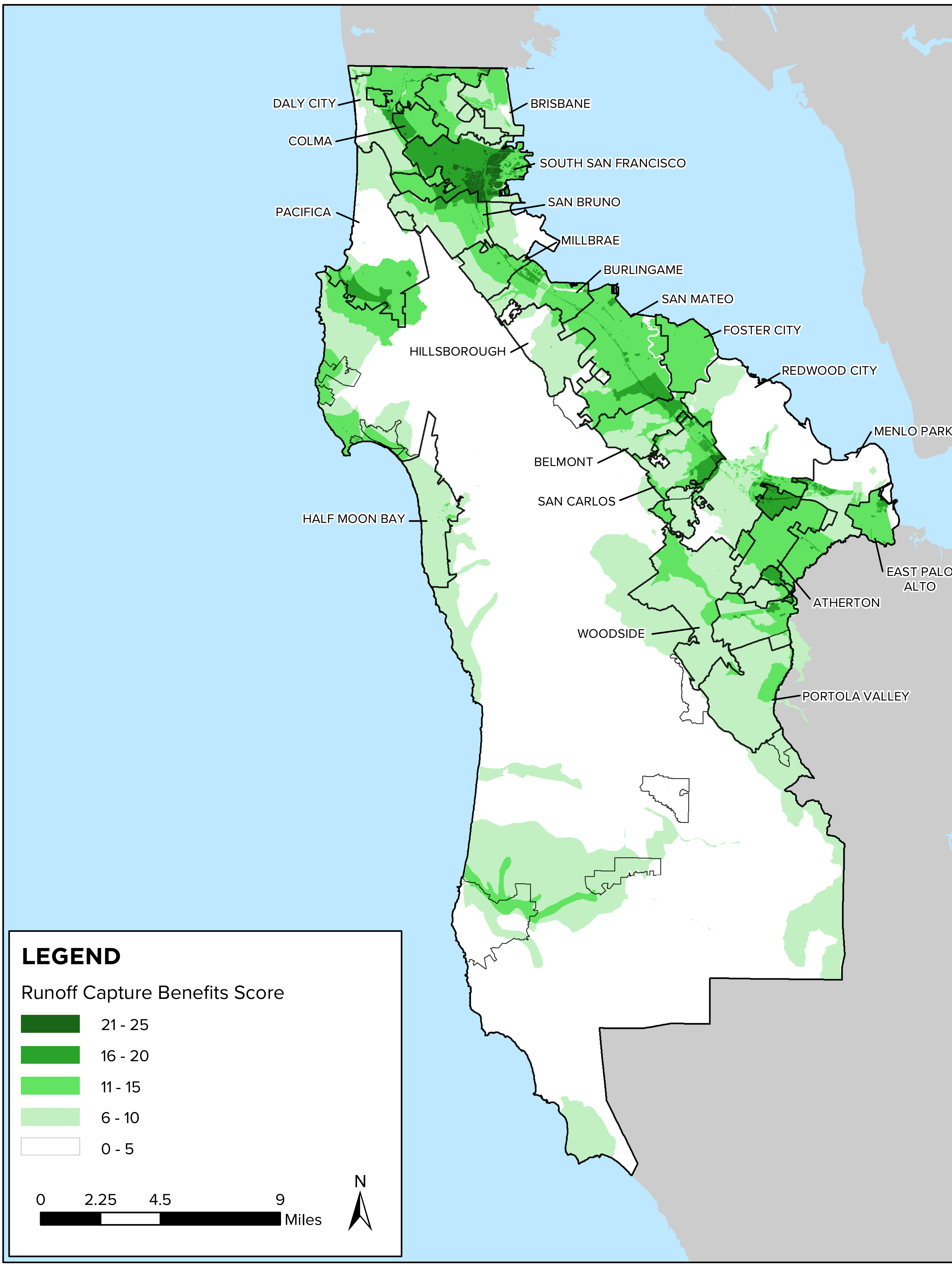
Canopy Coverage



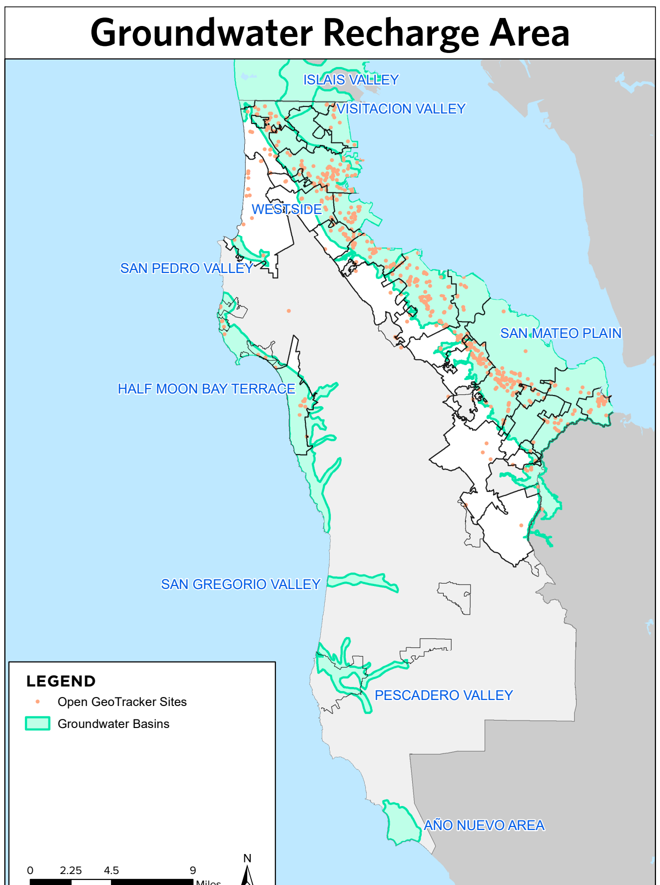
Pavement Condition



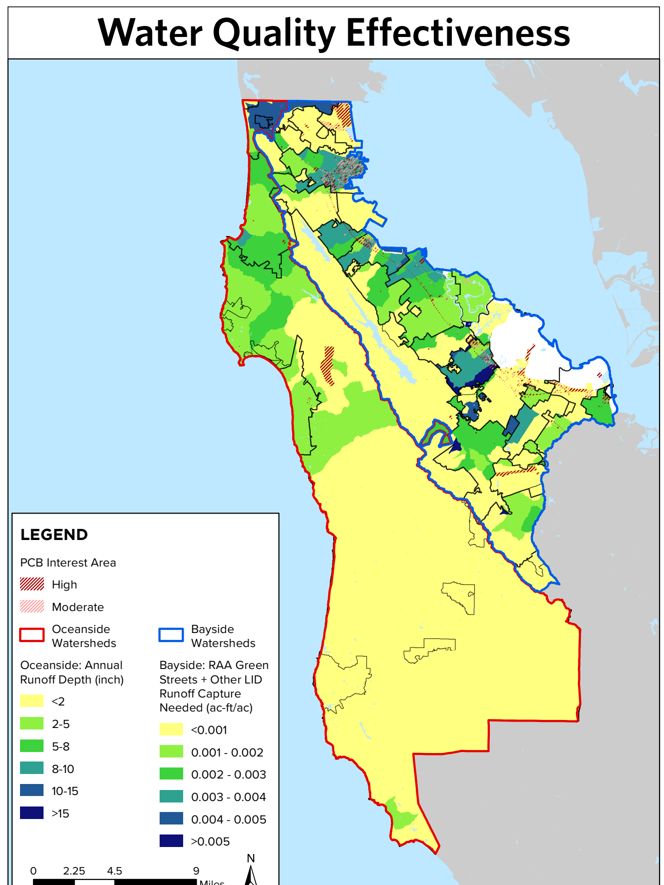
TECHNICAL SUITABILITY: RUNOFF CAPTURE BENEFIT



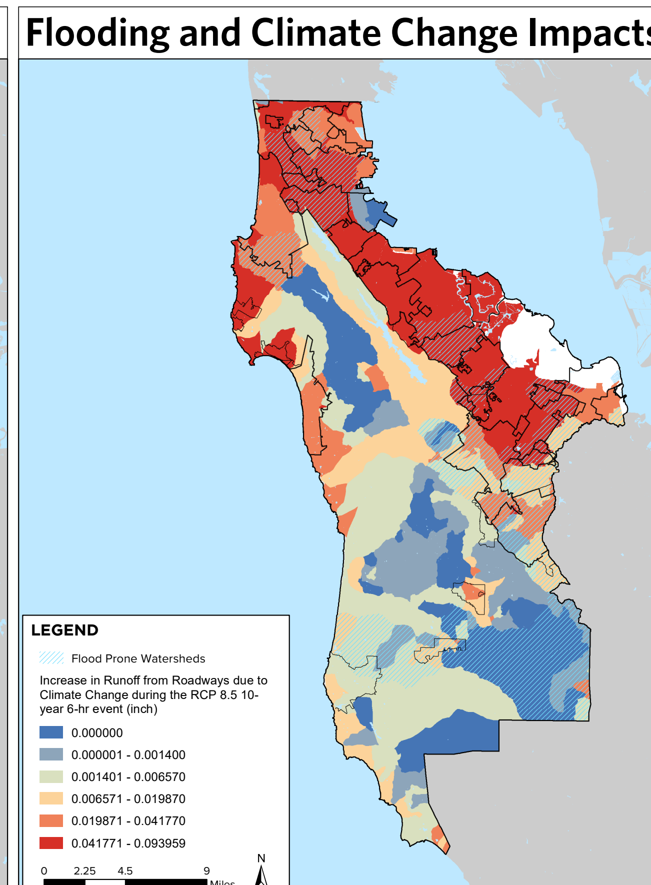
Groundwater Recharge Area



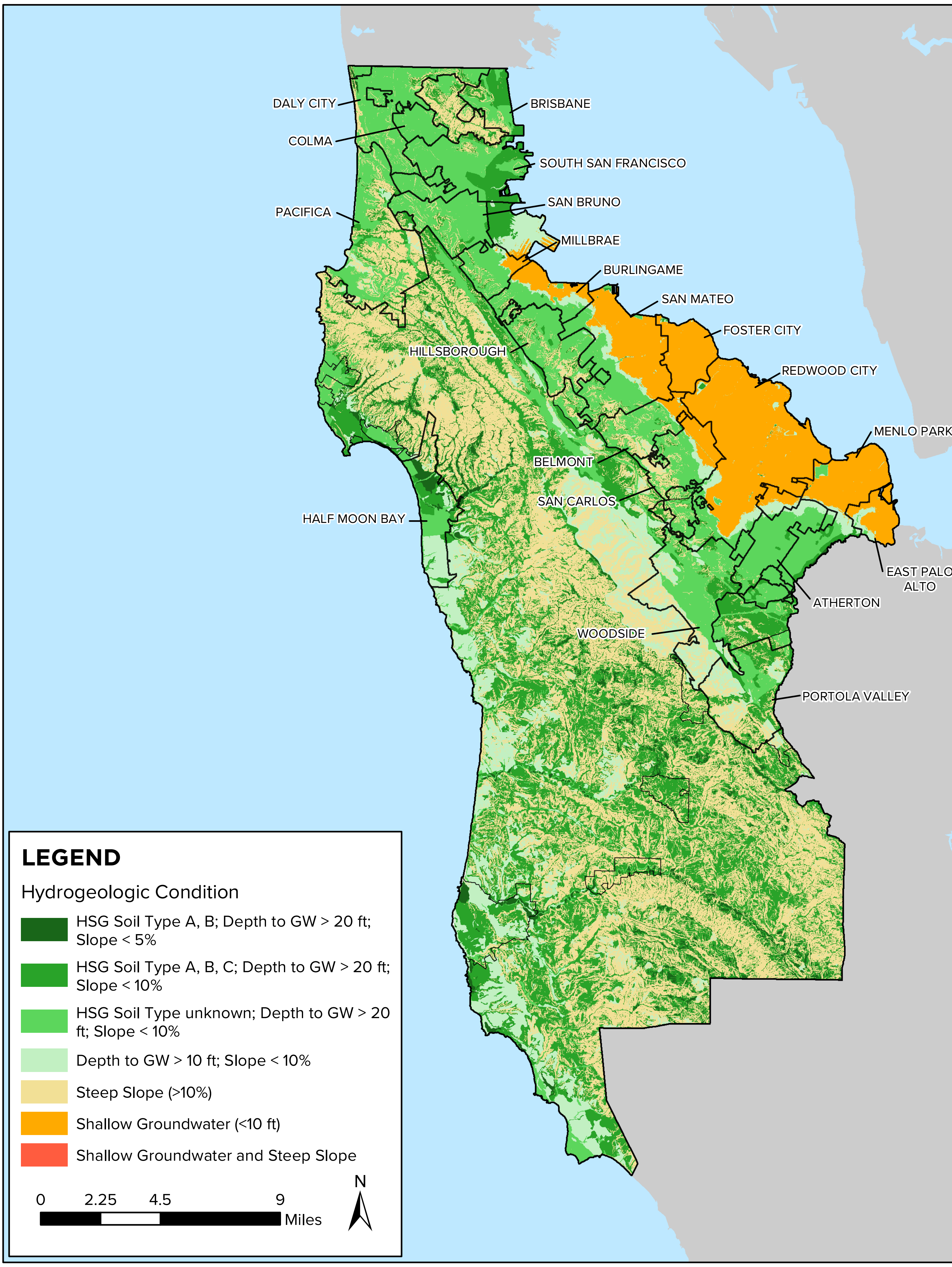
Water Quality Effectiveness



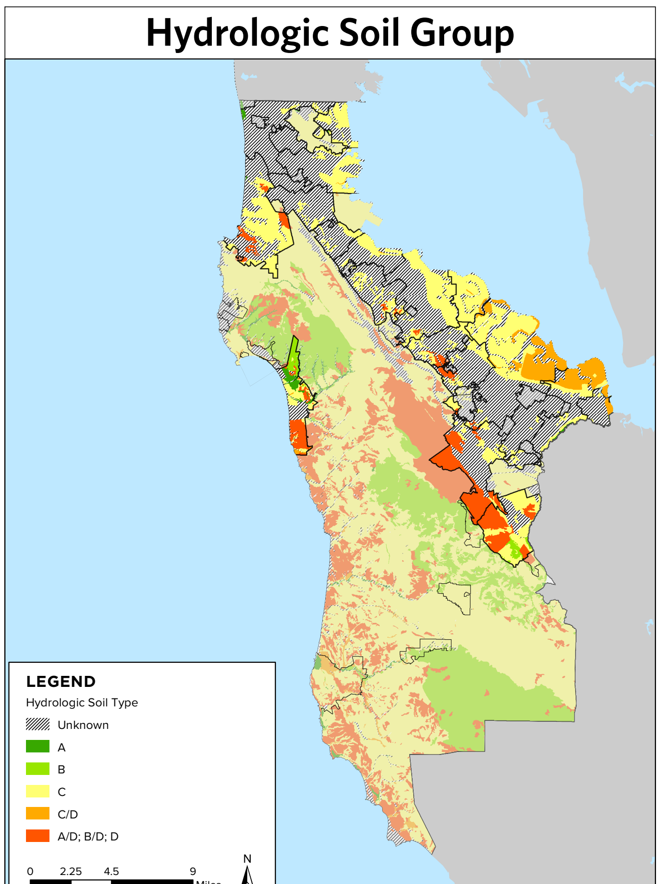
Flooding and Climate Change Impacts



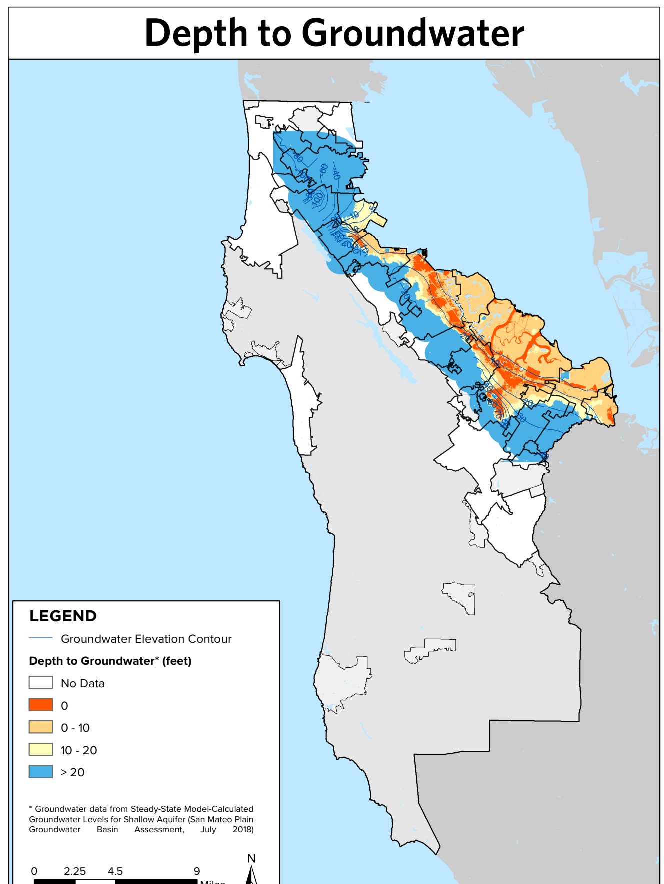
TECHNICAL SUITABILITY: HYDROGEOLOGIC CONDITION



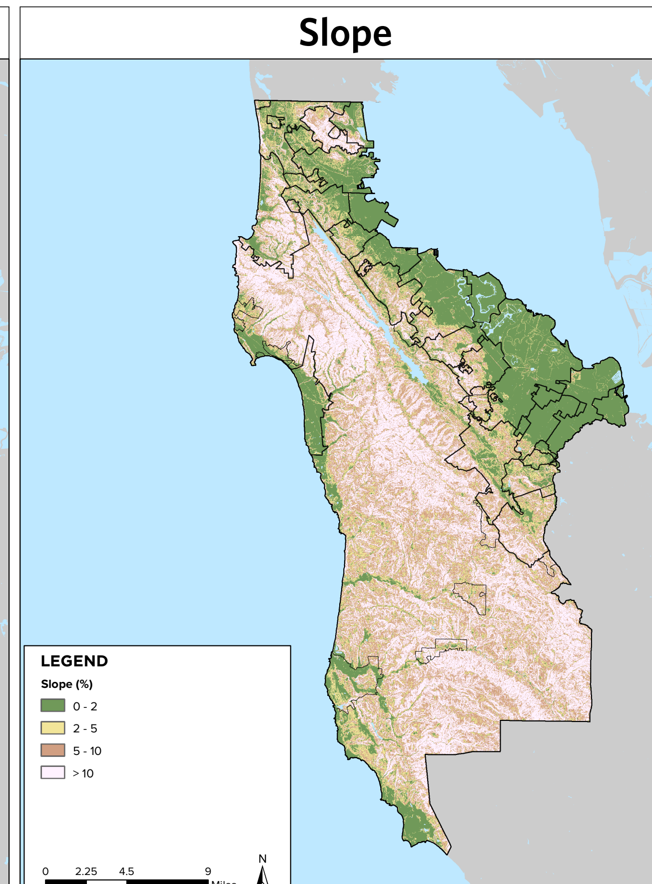
Hydrologic Soil Group



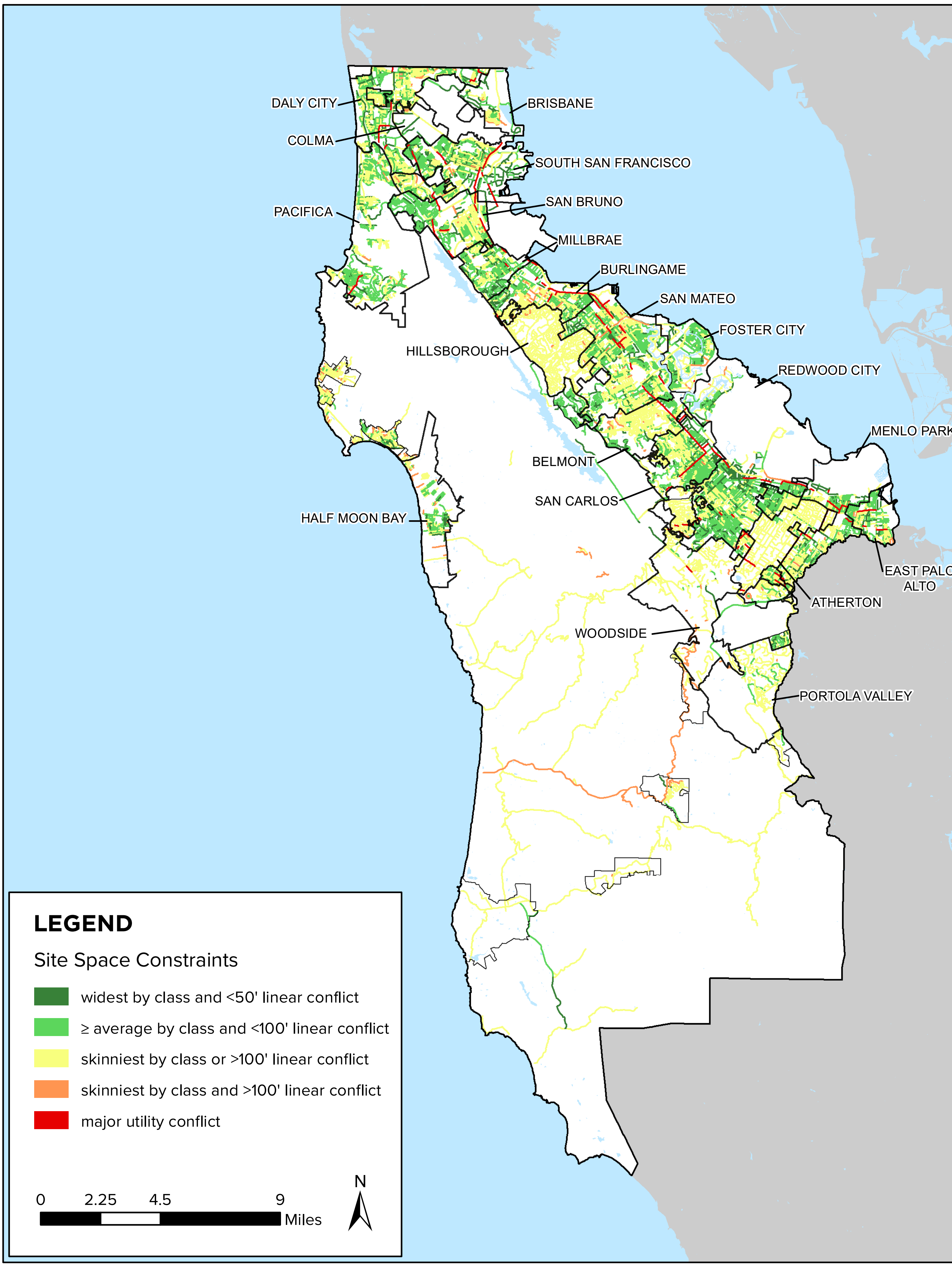
Depth to Groundwater



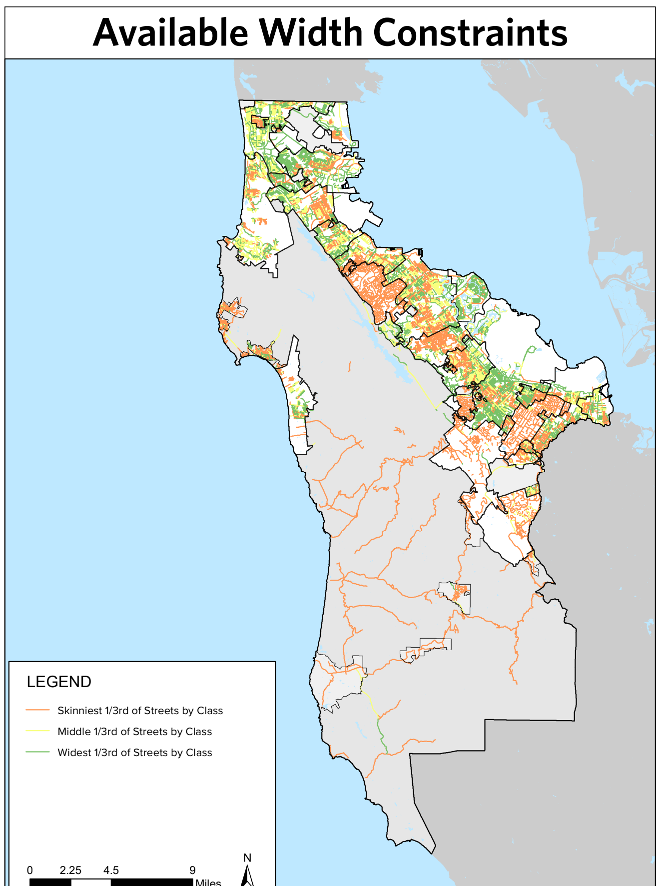
Slope



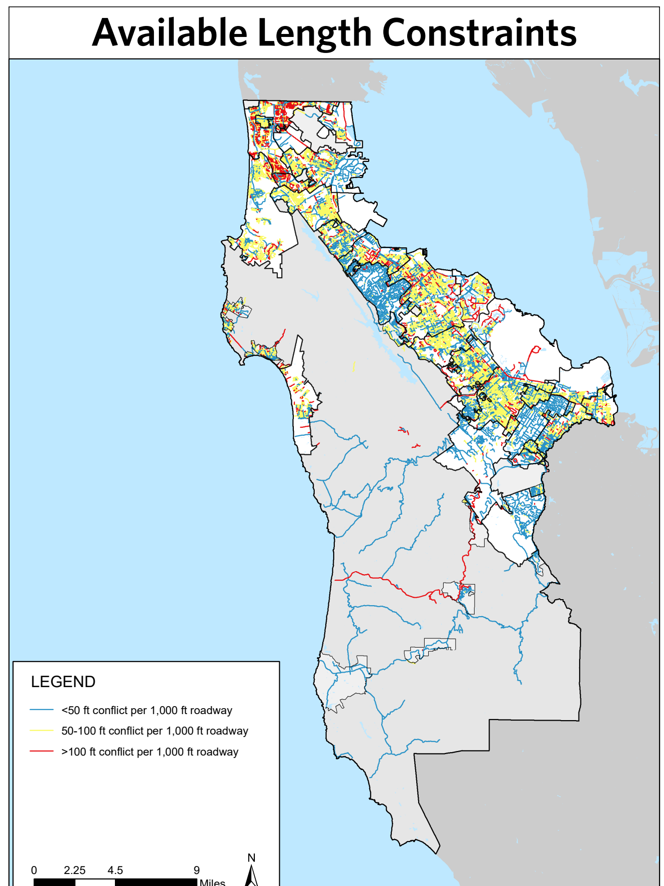
TECHNICAL SUITABILITY: SITE CONSTRAINTS



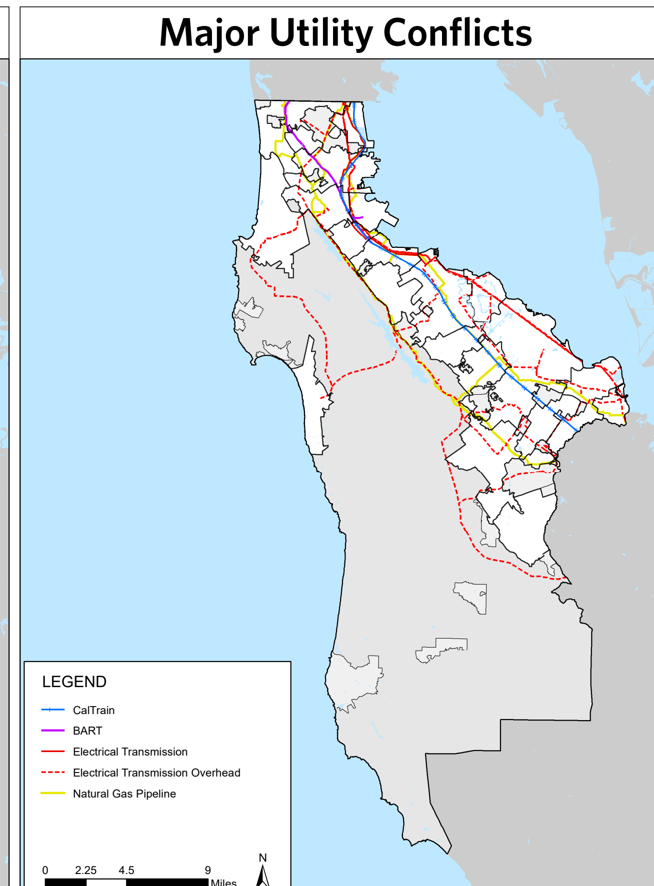
Available Width Constraints

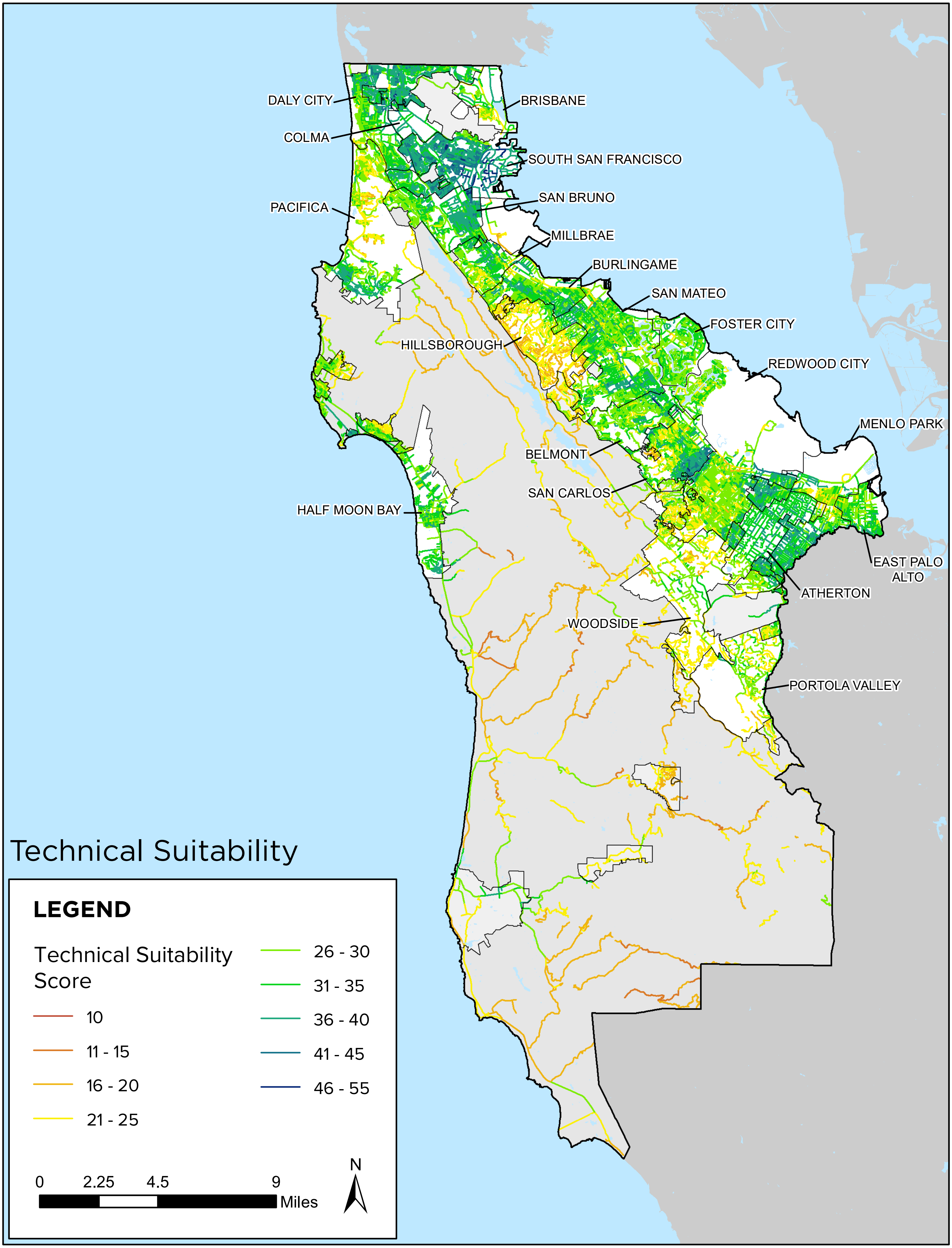


Available Length Constraints



Major Utility Conflicts





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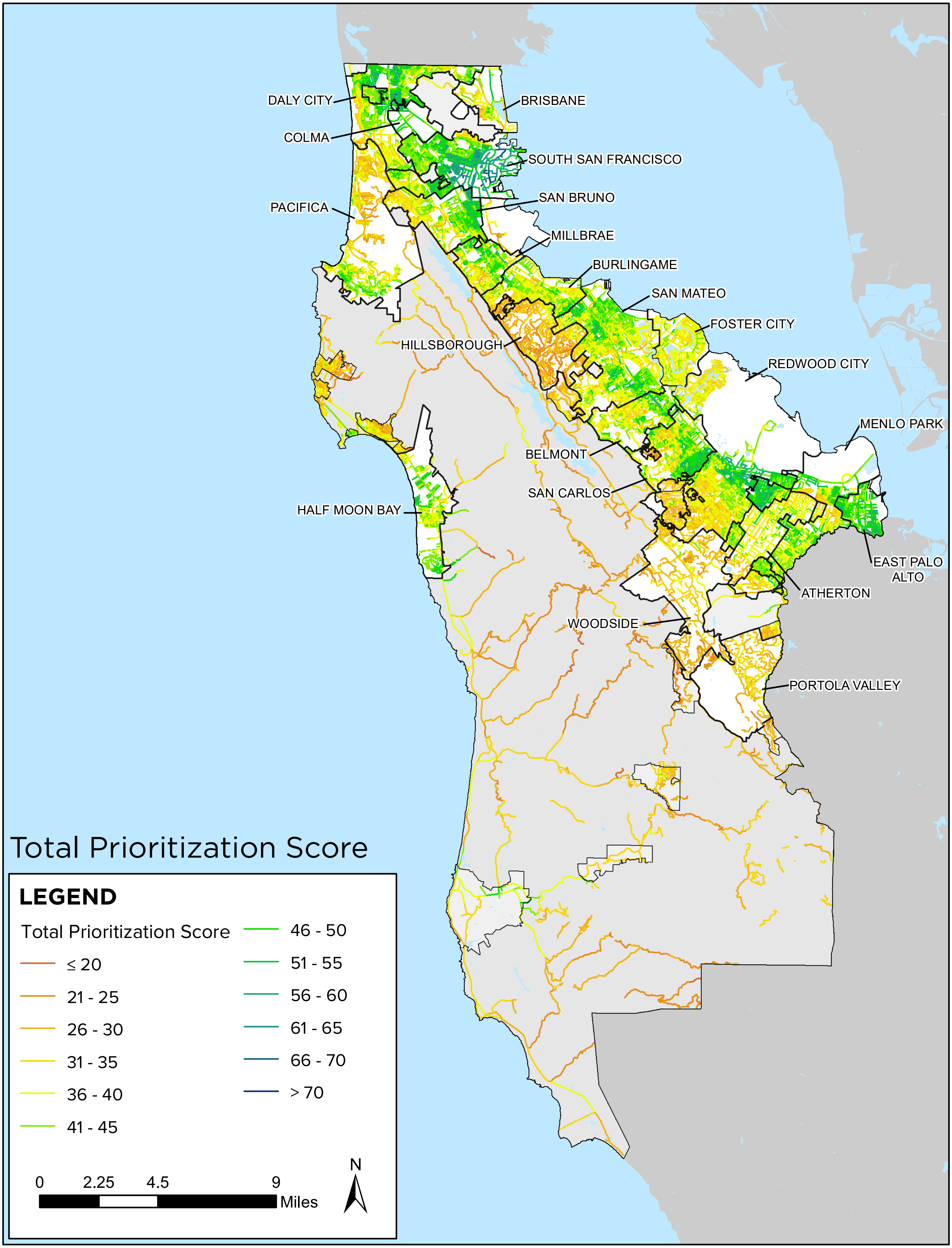
ATHERTON
WOODSIDE
PORTOLA VALLEY
Technical Suitability
LEGEND
Technical Suitability Score
10
11 - 15
16 - 20
21 - 25
26 - 30
31 - 35
36 - 40
41 - 45
46 - 55
0
2.25
4.5
9
Miles
N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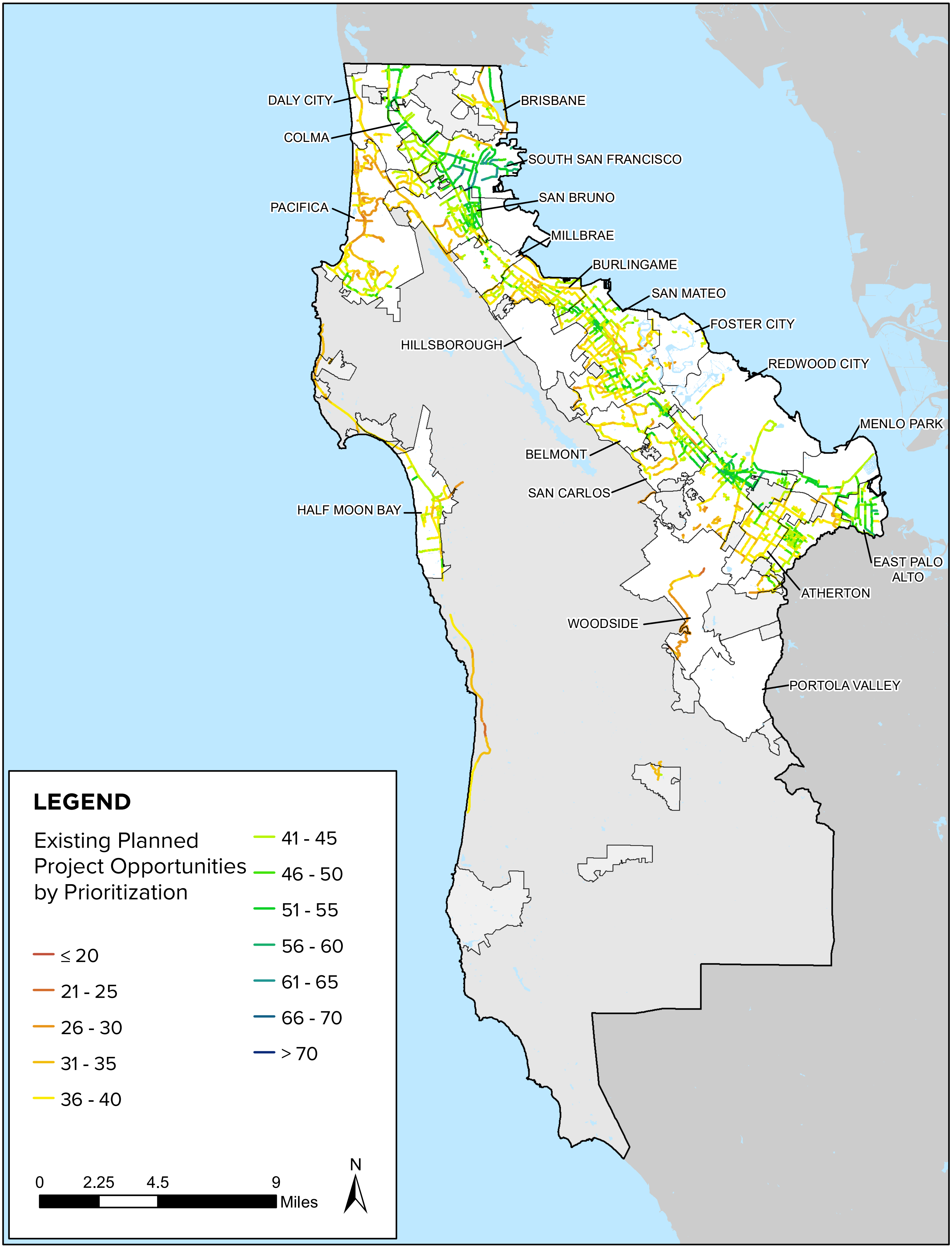
ATHERTON
WOODSIDE
PORTOLA VALLEY
Total Prioritization Score
LEGEND
Total Prioritization Score
≤ 20
21 - 25
26 - 30
31 - 35
36 - 40
41 - 45
46 - 50
51 - 55
56 - 60
61 - 65
66 - 70
> 70
0
2.25
4.5
9
Miles
N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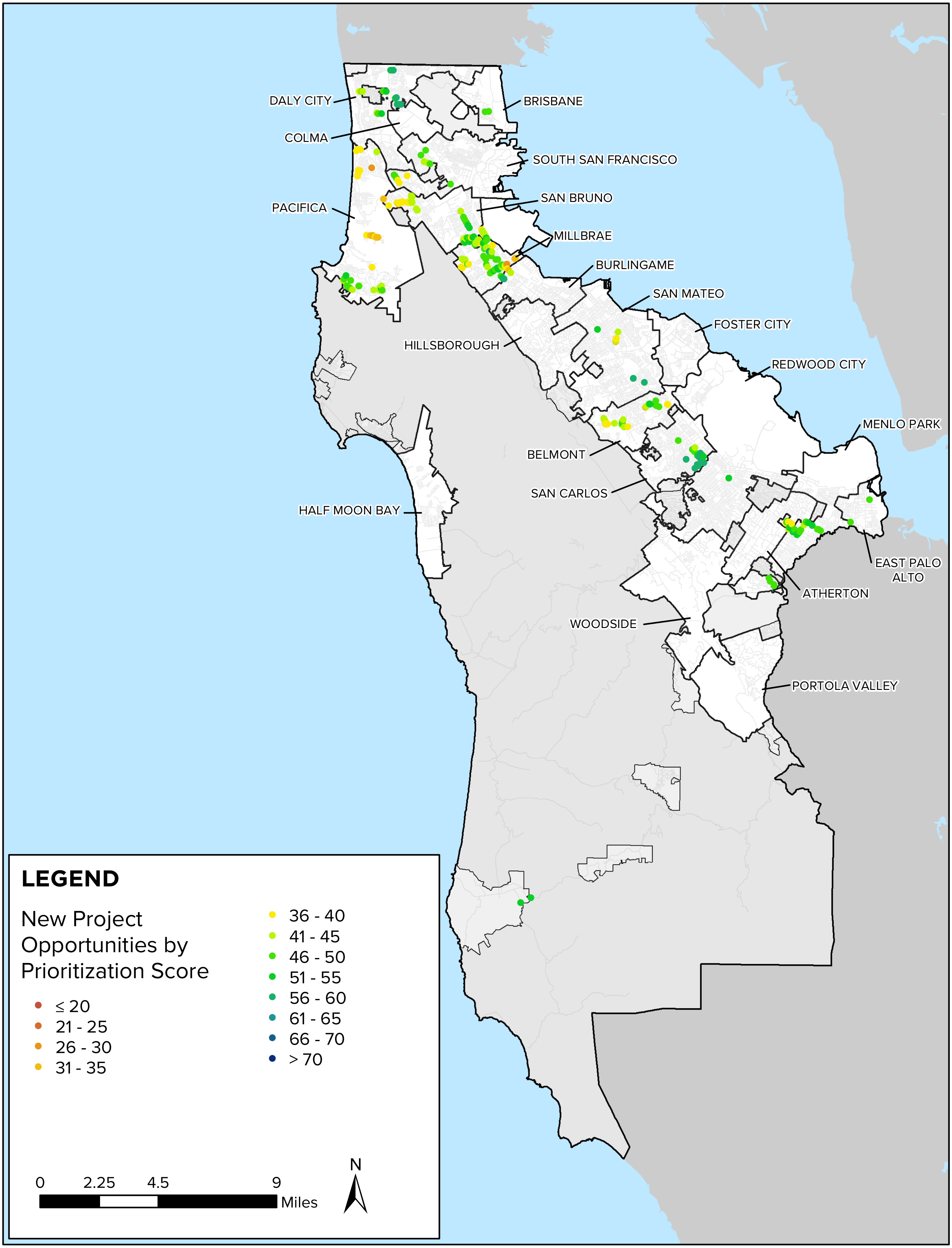
SAN CARLOS
HALF MOON BAY
EAST PALO ALTO
ATHERTON
WOODSIDE
PORTOLA VALLEY
LEGEND
Existing Planned Project Opportunities by Prioritization
≤ 20
21 - 25
26 - 30
31 - 35
36 - 40
41 - 45
46 - 50
51 - 55
56 - 60
61 - 65
66 - 70
> 70
0
2.25
4.5
9
Miles
N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SAN CARLOS
HALF MOON BAY
EAST PALO ALTO
ATHERTON
WOODSIDE
PORTOLA VALLEY
LEGEND
New Project Opportunities by Prioritization Score
≤ 20
21 - 25
26 - 30
31 - 35
36 - 40
41 - 45
46 - 50
51 - 55
56 - 60
61 - 65
66 - 70
> 70
0
2.25
4.5
9
Miles
N