SUBREGIONAL MOBILITY MATRIX
LAS VIRGENES/MALIBU

Project No. PS-4010-3041-YY-01-01

Final Report – Final

Prepared for:

M Metro

Prepared by:
STV Incorporated
1055 West Seventh Street
Suite 3150
Los Angeles, CA 90017

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Subregional Mobility Matrix
Las Virgenes/Malibu
PS-4010-3041-YY-01-01

Prepared for:

Metro

Los Angeles County
Metropolitan Transportation Authority

Prepared by:
STV Incorporated

In Association With:
Iteris, Inc
Katherine Padilla & Associates
Ryan Snyder Associates, LLC

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SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

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List of Terms and Acronyms

Acronyms	Definitions
AB	Assembly Bill
ADT	Average Daily Traffic
BRT	Bus Rapid Transit
CalEnvironScreen	California Environmental Health Hazard Screening Tool
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
COG	Council of Governments
CSTAN	Los Angeles Countywide Strategic Truck Arterial Network
ITS	Intelligent Transportation Systems
LADOT	Los Angeles Department of Transportation
LOS	Level-of-Service
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
LVMCOG	Las Virgenes/Malibu Council of Governments
MAP-21	Moving Ahead for Progress in the 21st Century Act
Metro	Los Angeles County Metropolitan Transportation Authority
MPO	Metropolitan Planning Organization
OPR	Governor's Office of Planning and Research

Acronyms	Definitions
NCTC	North County Transportation Coalition
PCH	Pacific Coast Highway
PDT	Project Development Team
PeMS	Caltrans Freeway Performance Monitoring System
SB	Senate Bill
SBCCOG	South Bay Cities Council of Governments
SCAG	Southern California Council of Governments
SCS	Sustainability Communities Strategy
SFV	San Fernando Valley
SFVCOG	San Fernando Valley Council of Governments
SGVCOG	San Gabriel Valley Council of Governments
SRTP	Short Range Transportation Plan
STAA	Surface Transportation Assistance Act
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TSM	Transportation Systems Management
VMT	Vehicle miles traveled
WCCOG	Westside Cities Council of Governments

0.0 EXECUTIVE SUMMARY

0.1 Mobility Matrix Overview

In February 2014, the Los Angeles County Metropolitan Transportation Authority (Metro) Board approved the holistic, countywide approach for preparing Mobility Matrices for Central Los Angeles, the Las Virgenes/Malibu Council of Governments (LVMCOG), North County Transportation Coalition (NCTC), San Fernando Valley Council of Governments (SFVCOG), San Gabriel Valley Council of Governments (SGVCOG), South Bay Cities Council of Governments (SBCCOG) and Westside Cities Council of Governments (WCCOG) (see Figure ES-1). The Gateway Cities COG is developing its own Strategic Transportation Plan which will serve as its Mobility Matrix.

For the purposes of the Mobility Matrix work, cities with membership in two subregions selected one in which to participate. The cities of La Cañada Flintridge, Pasadena, and South Pasadena chose the SGVCOG, and Burbank and Glendale chose the SFVCOG. The City of Santa Clarita opted to be included in the SFVCOG instead of the NCTC. Boundaries between the WCCOG and Central Los Angeles, and the WCCOG and SBCCOG, were modified based on Metro Board direction in January 2015.

In January 2015, the Metro Board created the Regional Facilities category. Regional Facilities include projects and programs related to Los Angeles County's four commercial airports (Los Angeles International Airport, Burbank Bob Hope Airport, Long Beach Airport, and Palmdale Regional Airport), the two seaports (Port of Los

Angeles and Port of Long Beach), and Union Station. The projects/programs related to Regional Facilities have been removed from the subregional Mobility Matrices.

0.2 Project Purpose

The Mobility Matrix will serve as a starting point for the update of the Metro Long-Range Transportation Plan (LRTP) currently scheduled for adoption in 2017. This Las Virgenes/Malibu Mobility Matrix, along with concurrent efforts in other Metro subregions, includes the development of subregional goals and objectives to guide future transportation investments, an assessment of baseline transportation system conditions to identify critical needs and deficiencies, and an initial screening of projects and programs based on their potential to address subregional objectives and countywide performance themes.

The Mobility Matrix includes a preliminary assessment of anticipated investment needs and project and program implementation over the short-term (0-10 years), mid-term (11-20 years) and long-term (20+ years) timeframes. The Mobility Matrix does not prioritize projects, but rather serves as a basis for further quantitative analysis to be performed during the Metro LRTP update, expected in 2017.

Figure ES-1. Los Angeles County Mobility Matrix Subregions
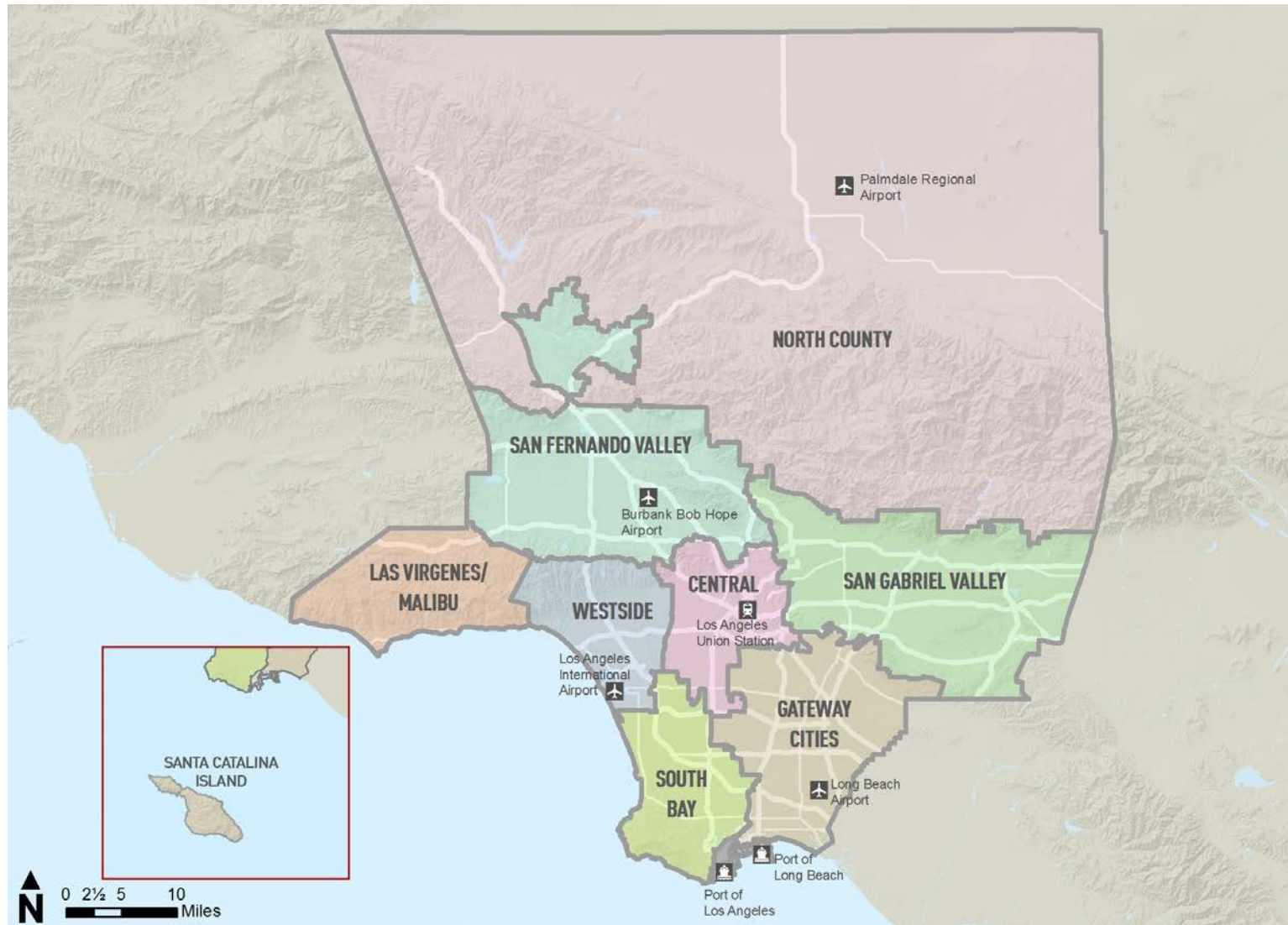
Source: STV, 2015

0.3   Process

To ensure proposed projects and programs reflect the needs and interests of the subregion, the Mobility Matrices followed a "bottoms-up" approach guided by a Project Development Team (PDT) selected by the subregion, consisting of city, stakeholder, and subregional representatives. The LVMCOG PDT consisted of representatives from the following jurisdictions and stakeholder agencies: LVMCOG, City of Agoura Hills, City of Calabasas, City of Hidden Hills, City of Malibu, City of Westlake Village, Los Angeles County Department of Public Works, California Department of Transportation (Caltrans), and the Southern California Association of Governments (SCAG). The PDT met six times over the eight-month study period to guide the creation of strategic goals and objectives, determine a subregional priority package of projects and programs, oversee the project and program evaluation process, and review and approve all work products associated with the Subregional Mobility Matrix.

0.4   Subregional Overview

The LVMCOG is an organization voluntarily established by its members under a Joint Powers Agreement to provide a forum for members to engage in subregional and cooperative planning and coordination of government services and responsibilities. A long-term goal of the LVMCOG is to build consensus on a vision for a future transportation system that embraces efficiency and innovation for continuous improvement of the quality of life in the subregion.

The Baseline Conditions Report, included as Appendix B, identified several key findings regarding the LVM Mobility Matrix Subregion, including but not limited to:

■ Employment and residential density is fairly low, and low growth is predicted for the Mobility Matrix Subregion.

■ The study area features a smaller population of at-risk residents compared to the County average.

■ Most commute trips leave the LVM study area, indicating that the subregion is a net export of work-based trips. The San Fernando Valley is the greatest origin and destination for morning peak hour travel.

■ There is a limited bikeway system in place. About half of the collisions involving pedestrians and bicyclists occur along the Pacific Coast Highway corridor, making active transportation safety a very high priority for the LVM Mobility Matrix Subregion.

■ The LVM Mobility Matrix Subregion is not well-served by transit, with a few express buses and limited municipal/local service. However, some cities have piloted summer shuttles to handle the seasonal demand for travel.

0.5 Goals and Objectives

Members of the PDT helped define the goals and objectives for the LVM Mobility Matrix Subregion. The goals are consistent with the county's overall framework, which consists of six broad themes common among all subregions (see Figure ES-2). The goals also reflect subregional priorities, and are based on recent studies, cities' general plans, and discussions with city staff. The LVM PDT developed goal statements intended to address transportation needs, to guide the evaluation of proposed projects/programs, and ultimately to inform Metro's forthcoming LRTP update.

LVM Mobility Matrix Goal Statements

- Increase multimodal mobility options for residents, visitors, and businesses.

- Implement operational, capacity, and multimodal projects that improve safety and enhance connectivity.

- Ensure that investments balance mobility, environmental, and livability needs.

- Maintain and preserve the subregion's transportation system.

Figure ES-2. Common Countywide Themes for All Mobility Matrices

Mobility

Develop projects and programs that improve traffic flow, relieve congestion, and enable residents, workers, and visitors to travel freely and quickly throughout Los Angeles County.

Safety

Make investments that improve access to transit facilities; enhance safety, or correct unsafe conditions in areas of heavy traffic, high transit use, and dense pedestrian activity where it is not a result of lack of normal maintenance.

Sustainability

Ensure compliance with sustainability legislation (Senate Bill [SB] 375) by reducing greenhouse gas emissions to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Economy

Develop projects and programs that contribute to job creation and business expansion resulting from improved mobility.

Accessibility

Invest in projects and programs that improve access to destinations such as jobs, recreation, medical facilities, schools, and others. Access to transit service within reasonable walking or cycling range.

State of Good Repair

Ensure funds are set aside to cover the cost of rehabilitating, maintaining, and replacing transportation assets.

0.6 Subregional Projects and Programs

An initial project and program list was compiled from Metro's December 2013 subregional project lists, which included unfunded LRTP projects; unfunded Measure R scope elements; and subregional needs submitted in response to requests by Directors Antonovich and Dubois. The project and program list was updated through the outreach process to incorporate input from the PDT members and other subregion stakeholders.

A total of 52 transportation improvement projects were identified for the LVM Mobility Matrix subregion. Many of the smaller projects were combined or grouped into larger programs or consolidated improvements for ease of analysis and reporting. Some of the larger improvements were maintained as individual projects for evaluation purposes. Table ES-1 lists the number of transportation improvement projects included in each Mobility Matrix program.

Table ES-1. LVM Transportation Programs

Mobility Matrix Program	Total Projects
Arterials Program	20
Highway Program	6
Active Transportation Program	19
Transit Program	7

The LVM project list includes transportation improvement priorities identified in countywide planning documents and by local jurisdictions. There is a fairly even focus on roadway projects versus active transportation and transit projects.

The LVM Mobility Matrix includes improvements that address both existing deficiencies in the transportation system as well as anticipated future needs. The LVM Mobility Matrix:

- Addresses subregional demand for greater travel time reliability and efficiency, proposing intersection improvements, increased seasonal bus service, and expanded park-and-ride facilities.

- Facilitates more robust transportation system demand management through technology applications and multimodal improvements such as Intelligent Transportation Systems (ITS), signal synchronization, park-and-ride facilities, and expanded transit services.

- Improves subregional active transportation options through bicycle and pedestrian projects, as well as strongly emphasizes bicycle/pedestrian safety.

- Supports the subregional and countywide priority of maintaining a state of good repair on the transportation system.

These improvements are intended to keep the multimodal transportation system functioning smoothly in the future in order to retain and attract business and development in the subregion.

0.7   Evaluation

Each project or program was evaluated in an initial, high-level screening based on its potential to contribute to subregional goals and objectives under each of the six countywide Mobility Matrix themes identified in Figure ES-2. Due to the limited timeframe for the Mobility Matrix completion and incomplete or inconsistent project/program details and data, this evaluation was qualitative in nature. The evaluation serves not as a prioritization, but as a preliminary screening process to identify projects and programs with the potential to address subregional and countywide transportation goals. This merely serves as a starting point for more quantitative analysis during the Metro LRTP update process.

Projects or programs received a single score for each subregional goal, as outlined in Table ES-2. Generally speaking, projects or programs that contribute to subregional goals on a larger scale received a higher benefit rating. Note that cost effectiveness was not considered in the application of performance evaluation scores.

The preliminary performance evaluation shown in Table ES-3 represents a collaborative effort spanning many months, and incorporates input from Metro, consultants and the LVM PDT. A full description of the evaluation methodology can be found in Appendix C.

Table ES-2. Evaluation Methodology

To Achieve the following score in a single theme:	Project must meet the corresponding criterion:
● HIGH BENEFIT	Significantly benefits one or more theme goals or metrics on a **subregional** scale
◑ MEDIUM BENEFIT	Significantly benefits one or more theme goals or metrics on a **corridor or activity center** scale
◔ LOW BENEFIT	Addresses one or more theme goals or metrics on a **limited/localized** scale (e.g., at a single intersection)
○ NEUTRAL BENEFIT	Has no cumulative positive or negative impact on theme goals or metrics
— NEGATIVE IMPACT	Results in cumulative negative impact on one or more theme goals or metrics

Table ES-3. Performance Evaluation – Summary by Subprogram

ID	# of Projects	Mobility	Safety	Sustainability	Economy	Accessibility	State of Good Repair
		•Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	•Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	•Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	•Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	•Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	•Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding
Arterials							
Widening Projects	7	●	◐	○	◔	○	◔
State of Good Repair/Safety Projects	5	◐	◐	◔	◔	○	●
TSM Programs	8	◐	○	○	○	○	○
Highways							
Arterial Interchange Projects	2	●	◐	○	○	◔	◔
Freeway Corridor Projects	2	●	—	○	○	○	○
Soundwall Projects	1	○	○	◐	○	○	○
TSM Projects	1	◐	◔	○	○	○	○

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ID	# of Projects	Mobility	Safety	Sustainability	Economy	Accessibility	State of Good Repair
		•Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	•Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	•Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	•Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	•Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	•Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding
Active Transportation							
Bicycle/Pedestrian Programs/Projects	8	◐	◐	●	◐	◐	○
Pedestrian Safety Projects	6	○	●	◔	○	◐	○
Sustainability Programs	2	○	○	●	○	○	○
TDM Program	1	◐	○	●	●	◐	○
Park and Ride Projects/Programs	2	◔	○	◐	◐	◐	◔
Transit							
Seasonal Transit Programs	2	●	○	◐	◐	●	○
Bus Programs	4	●	○	◐	○	●	○
Transit Center	1	◔	◔	◐	○	●	○

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0.8 Findings

Projects in the Arterial category perform well under the Mobility theme, as they focus on reducing regional traffic impacts and increasing efficiency. The Arterial category also includes several projects which focus exclusively on state of good repair, mostly located in Calabasas. These projects receive a full score for the theme of State of Good Repair, and also score well in all of the other categories.

The handful of Highway projects score well under Mobility, but have mixed scores for the other themes. Interchange improvements and transportation systems management (TSM) upgrades may be beneficial for Safety, but the US-101 widening projects may be detrimental, as they take away shoulder space.

The Active Transportation projects score quite highly under several themes, especially Safety and Sustainability. Active Transportation projects also perform well under Economy, since the Subregion receives many tourist and recreational bicyclists during the summer and these projects can better accommodate them.

The LVM Mobility Matrix Subregion only has a handful of Transit projects. The projects that increase bus service between the Subregion and other Subregions in the County have high benefits for Mobility, Sustainability, and Accessibility. The seasonal transit programs also receive high ratings, with additional benefits under the Economy theme, as they are targeted towards seasonal travel.

Other than the Arterial state of good repair projects, most of the other projects on the list score Neutral Benefit under the theme of State of Good Repair, since the majority of projects involve new infrastructure or have no need for or impact on maintenance or rehabilitation.

Overall, most projects perform very well under one or two Mobility Matrix themes, while also providing some secondary benefits in other themes. The projects in the Active Transportation and Transit categories appear to perform better and to achieve more subregional goals. However, it's important to note that the Arterial and Highway projects have far-reaching impacts throughout the subregion and region, and they are crucial in a Subregion with a limited roadway network.

The full list of the project ratings can be found in Appendix D.

0.9 Implementation Timeframes and Cost Estimates

The Mobility Matrix included the development of high-level, rough order-of-magnitude planning-cost ranges for short-, mid-, and long-term subregional funding needs. Table ES-4 indicates anticipated Mobility Matrix cost estimate ranges by project type and implementation timeframe.

Due to variations in project scope and available cost data, costs estimated for use in the Mobility Matrix are not intended to be used for future project-level planning. Rather, the cost ranges developed via this process constitute a high-level, rough order-of-magnitude

planning estimate range for short-, mid-, and long-term subregional funding needs for the Mobility Matrix effort only. For the most part, these estimates do not include vehicles, operating, maintenance and financing costs. More detailed analysis will be conducted in the Metro LRTP update process, which may necessitate refinement of project/program details and associated cost estimates. A full description of the cost estimation methodology can be found in Appendix C.

Projects or programs that cross subregional boundaries may be included in multiple subregional project lists. Where the same projects or programs are included in multiple subregions, the cost estimates include the total estimated project cost, not the cost share for each subregion. The cost sharing will be determined as part of future efforts.

Finally, due to lack of available data and the short timeframe of the Mobility Matrix effort, some of the projects and programs have missing cost estimates or do not include operations and maintenance (O&M) costs. Where O&M costs were available, they were included for the applicable timeframes. O&M costs will be revisited as part of the Metro LRTP update.

0.10 What's Next

The Mobility Matrix is the first step in identifying LVM transportation projects and programs that require funding. This important work effort serves as a "bottoms-up" approach towards updating Metro's LRTP in the future. Three major next steps should arise out of the Mobility Matrix process:

- **LVMCOG Prioritization of Projects.** This Mobility Matrix study does not prioritize projects. Instead, it provides some of the information needed for decision makers to prioritize projects/programs in the next phase of work, and an unconstrained list of all potential transportation projects/programs in the region. In preparation for a potential ballot measure and LRTP update (as described further below), the LVMCOG should decide how it wants to prioritize these projects/programs assuming a constrained funding scenario.

- **Metro Ballot Measure Preparations.** Metro will continue working with the PDTs of all the Subregions, as it starts developing a potential ballot measure. Part of the ballot measure work would involve geographic equity determination, as well as determining the amount of funding available for each category of projects/programs and subregion of the County.

- **Metro LRTP Update.** The potential ballot measure would then feed into a future Metro LRTP update and be integrated into the LRTP Finance Plan. If additional funding becomes available through a ballot measure or other new funding sources or initiatives, the list of projects developed through the Mobility Matrix and any subsequent list developed by the subregion could be used to update the constrained project list for the LRTP moving forward.

Table ES-4. Rough Order-of-Magnitude Project Cost Estimates and Categorizations (2015 dollars)

Type / Category	Arterial	Highway	Active Transport.	Transit	Total
Short-Term (0-10 yrs)	18 Projects $140M - $210M	4 Projects $48M - $72M	13 Projects $64M - $120M	6 Projects $6M - $14M	41 Projects $260M - $420M
Mid-Term (11-20 yrs)	4 Projects $62M - $77M	0 Projects $0	13 Projects $110M - $190M	3 Projects $2M - $3M	20 Projects $170M- $270M
Long-Term (>20 yrs)	2 Projects $3.8M - $7.7M	2 Projects $1.1B - $1.7B	1 Project $0.4M - $0.5M	0 Projects $0	5 Projects $1.1B - $1.7B
Total	20 Projects $210M - $300M	6 Projects $1.2B - $1.8B	19 Projects $170M - $310M	7 Projects $8M - $17M	52 Projects $1.5B - $2.4B

Notes:

*Some individual projects within the subprogram have missing costs, but they are not expected to greatly increase the overall cost of the program.

Some highway and transit projects are counted in multiple timeframes, thus total project counts for those types will not match totals row. Estimates under-represent operations and maintenance costs due to limited project data availability. Costs also may be underestimated where cost estimate ranges are still under development.

Projects or programs that cross subregional boundaries may be included in multiple subregional project lists. Where the same projects or programs are included in multiple subregions, the cost estimates include the total estimated project cost, not the cost share for each subregion. Any subregional cost-sharing

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1.0   INTRODUCTION

1.1   Mobility Matrix Overview

In February 2014, the Los Angeles County Metropolitan Transportation Authority (Metro) Board approved the holistic countywide approach for preparing Mobility Matrices for the San Gabriel Valley Council of Governments (SGVCOG), Central Los Angeles, Westside Cities Council of Governments (WCCOG), San Fernando Valley Council of Governments (SFVCOG), Las Virgenes/Malibu Council of Governments (LVMCOG), North County Transportation Coalition (NCTC), and South Bay Cities Council of Governments (SBCCOG) (see Figure 1-1). The Gateway Cities COG is developing its own Strategic Transportation Plan which will serve as their Mobility Matrix. The LVM Mobility Matrix Subregion is presented in Figure 1-2.

For the purposes of the Mobility Matrix work, cities with membership in two subregions selected one in which to participate. The cities of La Cañada Flintridge, Pasadena, and South Pasadena chose the SGVCOG, and Burbank and Glendale chose the SFVCOG. The City of Santa Clarita opted to be included in the SFVCOG instead of the NCTC.

In response to Metro Board direction in January 2015, the boundary between the WCCOG and the Central Los Angeles subregion was revised to roughly follow La Brea Avenue from north to south. The border between the WCCOG and the SBCCOG was revised to transfer a small portion of the City of Inglewood from the WCCOG subregion to the SBCCOG. The border between the

Central Los Angeles subregion and the SBCCOG was revised to transfer an area of South Los Angeles from the SBCCOG to the Central Los Angeles subregion.

Also in January 2015, the Metro Board created the Regional Facilities category. Regional Facilities include projects and programs related to Los Angeles County's four commercial airports (Los Angeles International Airport, Burbank Bob Hope Airport, Long Beach Airport, and Palmdale Regional Airport), two seaports (Port of Los Angeles and Port of Long Beach), and Union Station. The projects/programs related to the Regional Facilities will be included in a separate report.

1.2   Project Purpose

The purpose of the Las Virgenes/Malibu Subregional Mobility Matrix is to establish subregional transportation goals and objectives, to identify and evaluate projects and programs that meet these goals and objectives, and to serve as a starting point for the update of the Metro Long Range Transportation Plan (LRTP) currently scheduled for adoption in 2017. This Mobility Matrix, along with concurrent efforts in other Metro subregions, includes the development of subregional goals and objectives to guide future transportation investments, an assessment of baseline transportation system conditions to identify critical needs and deficiencies, and an initial screening of projects and programs based on their potential to address subregional objectives and countywide performance themes. The Mobility Matrix includes a high-level assessment of anticipated investment needs and project and program implementation over the short-term (2015-2024), mid-term (2025-2034) and long-term (2035-2045)

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time frames. The Mobility Matrix does not prioritize projects, but rather serves as a basis for a Strategic Transportation Plan for future transportation investments over the next 20 plus years.
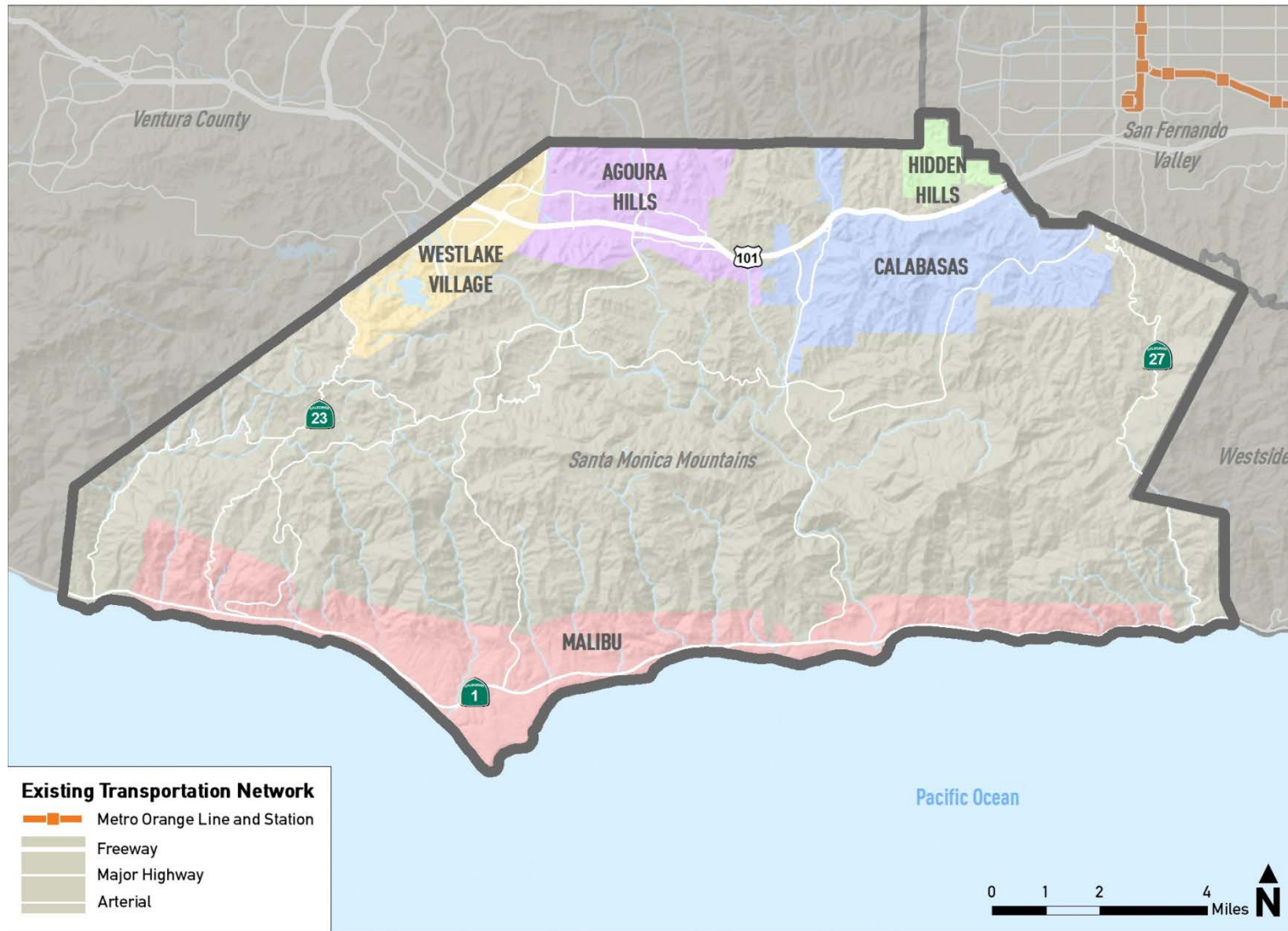
Figure 1-1. Los Angeles County Mobility Matrix Subregions

Source: STV, 2015

Figure 1-2. Las Virgenes/Malibu Mobility Matrix Subregion

Source: STV, 2015

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1.3 Developed by Subregional Jurisdictions and Stakeholders

To ensure proposed projects and programs reflect the needs and interests of the subregion, the Mobility Matrices followed a "bottoms-up" approach guided by a Project Development Team (PDT) selected by the subregion, consisting of city, stakeholder, and subregional representatives. The LVM PDT consisted of representatives from the following jurisdictions and stakeholder agencies:

- LVMCOG
- City of Agoura Hills
- City of Calabasas
- City of Hidden Hills
- City of Malibu
- City of Westlake Village
- Los Angeles County Public Works
- California Department of Transportation

The LVM PDT met six times over the eight-month study period to guide the creation of strategic goals and objectives, determine a subregional package of projects and programs, oversee the project and program evaluation process, and review and approve all work products associated with the Subregional Mobility Matrix. In addition, targeted outreach was conducted with city staff and other stakeholders on an as-needed basis to confirm project and program details. Coordination activities for this project are summarized in Appendix A.

1.4 What's in it for the Subregion?

The Mobility Matrix serves as a vehicle for communicating subregional needs into Metro's LRTP update process, providing:

- **A process for developing consensus.** Through the PDT and targeted outreach, the Mobility Matrix stakeholders built consensus around goals and objectives for improving mobility within the subregion, in order to more consistently address their priority transportation issues and proposed improvements in the next LRTP and beyond.

- **An initial framework for LRTP performance analysis.** The consensus-building process included articulating a set of subregional goals and objectives; a high-level analysis of potential projects and programs to address those goals and objectives; and development of a set of proposed performance measures.

- **An approved list of projects and programs.** The Mobility Matrix provides a list projects and programs approved by the subregion which is intended to address transportation system deficiencies and needs.

- **Draft investment needs and implementation time frames.** Based on high-level estimates of project/program readiness and project costs, the Mobility Matrix presents the subregional investment needs to be considered in the next LRTP over its 30-year time horizon.

1.5 Policy Context

The Subregional Mobility Matrix process was undertaken in the context of federal, state and local policies and is intended to complement local and regional planning efforts. A sampling of relevant policies considered during the development of subregional objectives and project and program evaluation includes:

1.5.1 Federal

- The Moving Ahead for Progress in the 21st Century Act (MAP-21), the 2012 Federal Transportation Authorization Bill, places a greater emphasis on performance-based planning for Metropolitan Planning Organizations (MPOs), LRTPs, and the Transportation Improvement Program (TIP).

1.5.2 State

- Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, set greenhouse gas (GHG) mitigation targets for California with a goal of reducing GHG emissions to 1990 levels by the year 2020 across all sectors.

- Senate Bill (SB) 375, the Sustainable Communities and Climate Protection Act of 2006, authorized the Air Resources Board (ARB) to set regional targets for GHG emissions reductions from passenger vehicles, and directed California MPOs to prepare a Sustainable Communities Strategy (SCS), incorporating land use, housing, and transportation strategies intended to help regions meet GHG emissions reduction targets.

- SB 743 (2013), the Jobs and Economic Improvement Through Environmental Leadership Act, directed the Governor's Office of Planning and Research (OPR) to develop a new approach for analyzing transportation impacts under the California Environmental Quality Act (CEQA). The law provides exemptions to CEQA requirements for certain types of development located in transit-priority areas that are consistent with adopted SCS or alternative planning strategies. An outcome of this Bill is the use of vehicle miles traveled (VMT) rather than level-of-service (LOS) metrics in CEQA transportation analysis. Whereas LOS evaluation prioritizes capacity expansion projects that reduce delay or congestion, VMT reduction can be attributed to projects that encourage ridesharing, transit use, transit-oriented development, and active transportation projects that contribute to the reduction of vehicle travel. In short, SB 743 allows for the use of VMT, rather than delay or congestion, to prioritize transportation investments. OPR has yet to establish comprehensive guidelines for the implementation of SB 743.

1.5.3 Local

- Metro's LRTP, a 30-year transportation planning document required for obtaining federal funding, was last updated in 2009. The Mobility Matrix will serve as an initial step in the 2017 LRTP update.

- Local Option Sales Tax Measures. Los Angeles County voters have approved three half-cent sales tax ballot measures over the past three decades: Proposition A, Proposition C, and Measure R. Unlike the first two tax measures, which do not expire and did not designate

funding for specific projects, Measure R expires in 30 years and contains a specific expenditure plan. Metro is considering placing a new sales tax on the 2016 Ballot. Through the Mobility Matrix process, subregional stakeholders began the project/program vetting process by identifying goals and priorities specific to their subregion. These goals and unmet needs will help focus potential additional funding on key subregional projects and programs.

1.6 Document Overview

The Subregional Mobility Matrix contains the following chapters:

- Chapter 2.0 – Subregional Overview. An overview of the LVM Mobility Matrix Subregion, including key trends and issues impacting the subregional transportation system and highlighting critical needs.

- Chapter 3.0 – Subregional Goals and Objectives. A summary of LVM Mobility Matrix Subregion objectives that guide subregional transportation investments.

- Chapter 4.0 – Subregional Mobility Matrix. An initial evaluation of subregional priority projects and programs for considetaion in the LRTP.

- Chapter 5.0 – Implementation Timeframes and Cost Estimates. A proposed categorization of project and program implementation, including short-, mid- and long-term investment needs, as well as what the subregion foresees as its next steps.

- Appendices – Includes a log of the PDT and outreach process; baseline conditions report; methodology

memorandum; and a full project list with evaluation, categorization, and cost estimates.

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

2.0 SUBREGIONAL OVERVIEW

This chapter presents an overview of the 2014 baseline transportation conditions within the LVM Mobility Matrix Subregion. It provides key information, at the subregional level, that can be used to understand the major transportation conditions and issues in the area, and is used to assist in the subregional needs assessment as well as project/program level assessment.

A Baseline Conditions Report was prepared for the LVM Mobility Matrix Subregion. The following information was assessed as part of this baseline conditions analysis effort:

■ Existing projects and studies;

■ Demographics: Land uses, population and employment change projected from 2014 to 2024, and environmental justice measures (transit- dependent communities and disadvantaged/at-risk communities, such as pollution burden, poverty, asthma, education rates, etc.);

■ Travel markets: an assessment of trip origins and destinations to, from, and within the subregion, as well as subregional commute travel mode choice;

■ Freeways: average daily traffic flow and peak hour speeds;

■ Arterial roadways: daily traffic flow and peak hour speeds;

■ Goods movement: designated truck routes per the cities' Mobility Plans, Surface Transportation

Assistance Act (STAA), and the Draft Countywide Strategic Truck Arterial Network (CSTAN) within the area;

■ Active transportation: existing and proposed bicycle routes, and bicycle/pedestrian-involved collisions

■ Transit: bus routes and average weekday boardings

The following sections summarize the results of the Mobility Matrix baseline conditions analysis. The full Baseline Conditions Report can be found in Appendix B.

2.1 Land Use and Demographics

The study area's land uses are primarily open space/recreation and vacant. Open and vacant space take up about 80% of the study area, while 10% is composed of housing. Hidden Hills is almost exclusively made up of single-family housing in areas without public access, while the other cities have a mix of single-family and multi-family housing. Some industrial land use is located in Agoura Hills and in Westlake Village along the US-101 corridor, but overall, industrial land use is negligible in the Mobility Matrix Subregion. Commercial land use is only a small fraction of the study area, with most of the commercial development located along the Pacific Coast Highway (PCH) and US-101. The unincorporated area is mostly open space, with only 2% residential land use.

2.1.1 Population and Employment

According to the Southern California Association of Governments (SCAG) population and employment estimates and forecasts developed for the Metro 2014 Short Range Transportation Plan (SRTP), the LVM

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Mobility Matrix Subregion will have low growth through 2024 compared to the rest of Los Angeles County. The number of residents in the Las Virgenes area is expected to grow about 4% from 2014 to 2024. Employment is projected to increase by over 2%. Much more growth is expected for Malibu and the Santa Monica Mountains area; population is projected to increase by 10% and employment by over 23%. Figure 2-1 shows the forecasted change in population and employment.

2.1.2 Environmental Justice

Concentrations of minority and low-income communities were identified using U.S. Census Bureau American Community Survey (ACS) 2012 data and also the California Environmental Health Hazard Screening Tool (CalEnviroScreen). CalEnviroScreen aggregates variables that indicate certain types of socioeconomic vulnerability

or physical exposure, such as low income, low education attainment, linguistic isolation, pollution exposure, hazardous waste exposure, or traffic exposure. The resulting indexed score shows the communities most disproportionately burdened by multiple types of exposure and risk, with a high score indicating higher levels of exposure and risk.

The cities in the LVM Mobility Matrix subregion are fairly affluent, with median incomes in each city above $110,000. The cities also have low percentages of minority populations and people living below the poverty level compared to the County. Compared to Los Angeles County, the LVM Mobility Matrix Subregion scores in the lowest percentiles for pollution and environmental risk.

Figure 2-1. Projected Changes in Employment and Residents, 2014-2024
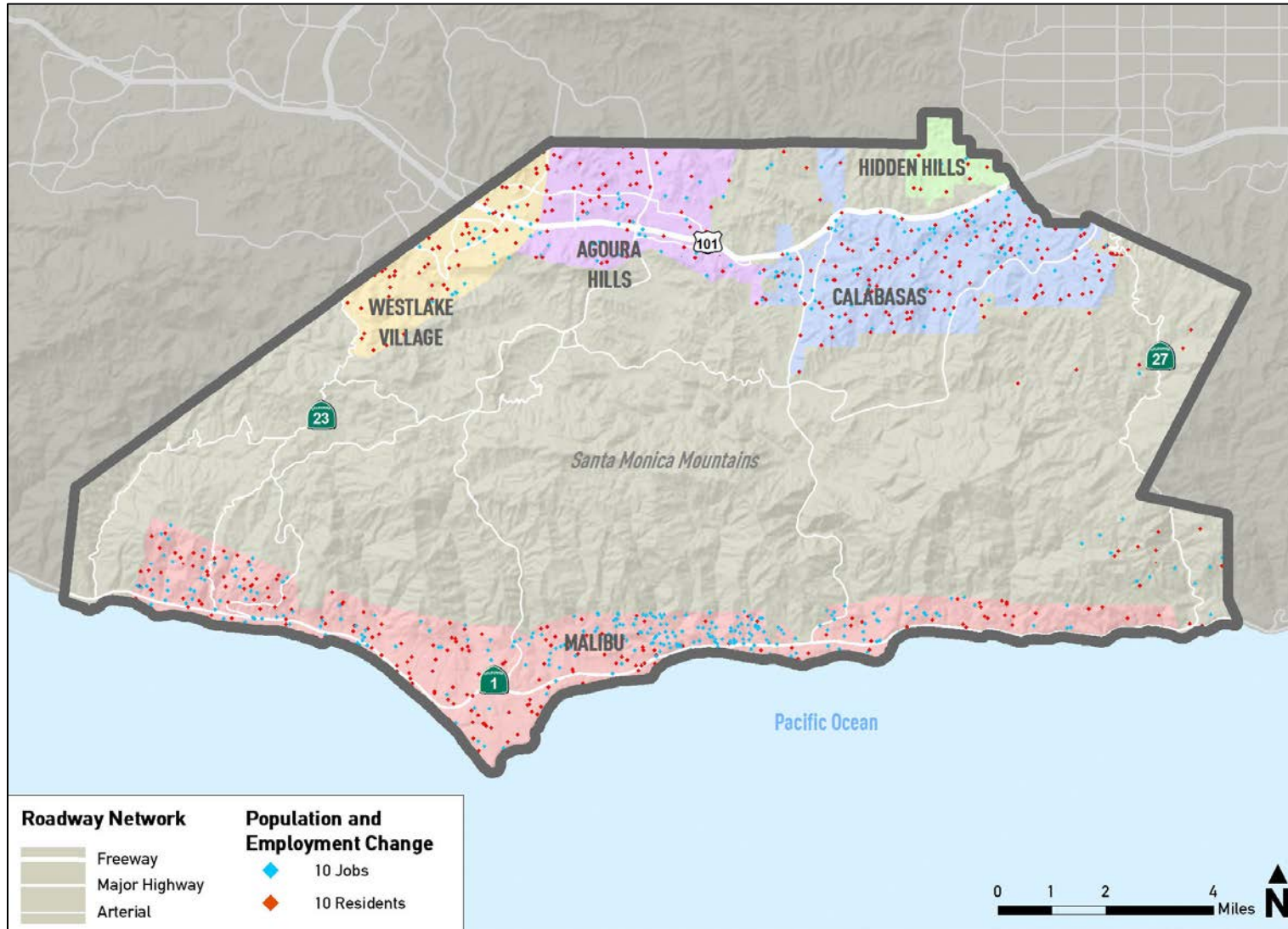
Source: STV, 2015; Metro 2014 SRTP

2.2 Travel Patterns

Subregional trip patterns were developed for the study area using the Metro 2014 SRTP model. The model data were summarized for two conditions: Total Daily Person Trips and AM Peak Hour Home-Based Work Person Trips. The model was used to determine the number of trips to and from the Mobility Matrix Subregion, as well as trips within the Subregion. This provides a general understanding of the major patterns of trip movements associated with people who live and work in the LVM Mobility Matrix Subregion.

Table 2-1 provides an estimate of the average weekday vehicle travel both to and from the LVM study area and neighboring Mobility Matrix subregions in 2014. Figure 2-2 illustrates the daily person trips, which include all trips made for any reason throughout the day.

**Table 2-1. Daily Trip Productions and Attractions (2014)**

To/from Subregion	Trips Produced	% of Trips Produced	Trips Attracted	% of Trips Attracted
Las Virgenes/Malibu	159,166	46%	159,166	42%
San Fernando Valley	73,004	21%	82,868	22%
Ventura County	37,686	11%	62,712	17%
Westside	31,880	9%	22,120	6%
Central Los Angeles	13,646	4%	10,343	3%
Orange County	14,299	4%	2,529	1%
San Gabriel Valley	3,213	1%	16,840	4%
Gateway Cities	5,361	2%	7,045	2%
South Bay	2,573	1%	6,753	2%
Other	5,176	1%	6,121	1%
Total	346,004	100%	376,497	100%

Source: Iteris, 2014; Metro 2014 SRTP

Note: Trip patterns are based on aggregation of trip table data from the Travel Demand Model utilized for the Metro 2014 SRTP formatted by Los Angeles County subregional boundaries, as depicted in the Mobility Matrix work effort, which do not exactly correspond to the 2009 Metro LRTP subregional boundaries.

Figure 2-2. 2014 Average Daily Trips To/From LVM Mobility Matrix Subregion
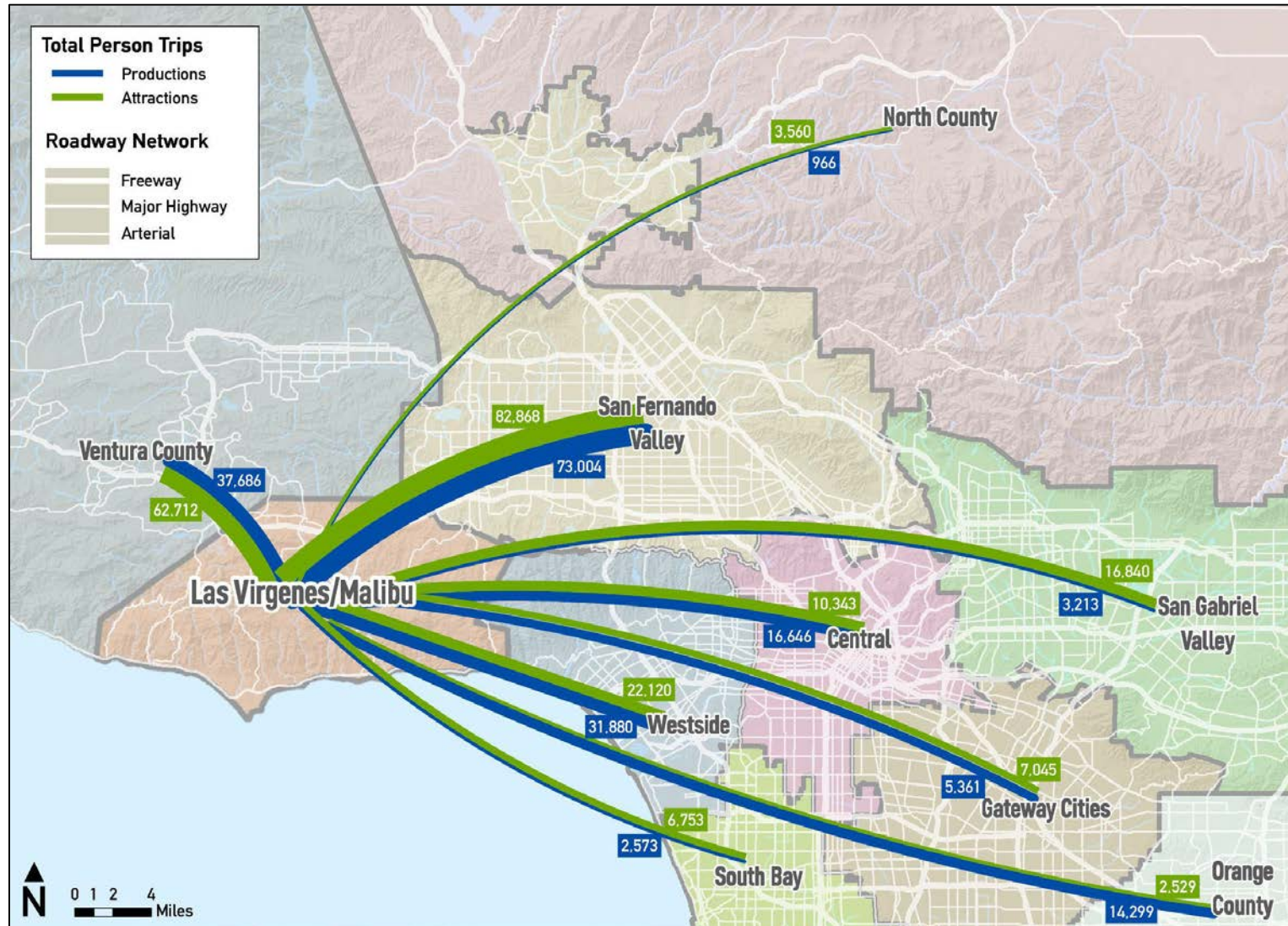
Source: STV, 2015; Iteris, 2014; Metro 2014 SRTP. Note: See Page 2-4 regarding subregional boundaries.

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The model shows that approximately 346,000 daily trips are produced and 376,500 trips are attracted to the LVM Mobility Matrix Subregion; nearly half of the trips stay within the Subregion, while the other half go to other areas. The highest trip producer and attractor is the San Fernando Valley Mobility Matrix Subregion. Approximately 21% of all trips produced by the LVM study area go to the San Fernando Valley on an average day. Nearly 22% of all trips coming into the study area are from the San Fernando Valley. Ventura County has the second highest number of trip interactions with the LVM area; 11% of the outbound daily trips go to Ventura County, and 17% of the inbound trips are from Ventura County.

Home-based work trips are trips from home to work and back. For AM peak hour home-based-work trips, over 80% of the morning commute trips leave the study area, indicating that the Subregion is a net exporter of work-based trips. Almost a third of the workers who live in the LVM Mobility Matrix Subregion commute to the San Fernando Valley for work purposes, and 30% of the total inbound AM trips come from the San Fernando Valley. The Westside Mobility Matrix Subregion, Ventura County, and the Central Mobility Matrix Subregion are the next highest origins and destinations of home-based-work trips. Between the three areas, about 43% of the home-based-work trips leave the study area and travel to these three areas for work. About 39% of all trips entering the study area for work come from these three areas.

2.3 Vehicle Travel

2.3.1 Freeways

The Caltrans Freeway Performance Monitoring System (PeMS) was used to assess freeway volumes and speeds. Within the study area, Caltrans PeMS monitoring locations were available through the freeway system at various locations. October 2013 speed data were reviewed, with only typical weekdays (non-holiday Tuesdays, Wednesdays and Thursdays) as a basis for the average speed data extraction. Speeds were extracted over the 24 hours of every weekday, with the peak hours chosen based on the slowest observed speeds during the peak commute period.

The segment of the US-101 freeway that runs through the LVM Mobility Matrix Subregion has average daily traffic (ADT) volumes ranging from 150,500 vehicles per day at the western end of the subregion at the Ventura County line, to 195,500 vehicles per day at the eastern end near the border of the San Fernando Valley Mobility Matrix Subregion.

During the AM peak hour, only the westbound segment of US-101 at the eastern edge of the study area has slowing below 50 miles per hour. The remaining portion of the freeway typically operates at speeds exceeding 50 mph, and in much of the subregional study area, at 60 mph or faster. During the PM peak hour, there is much more slowing observed in the eastbound direction. Approximately half of the eastbound segment of US-101 in the subregion experiences very slow speeds of under 30 mph during the evening peak hour.

Figure 2-3. Average Daily Traffic Volumes on LVM Mobility Matrix Subregion Freeways
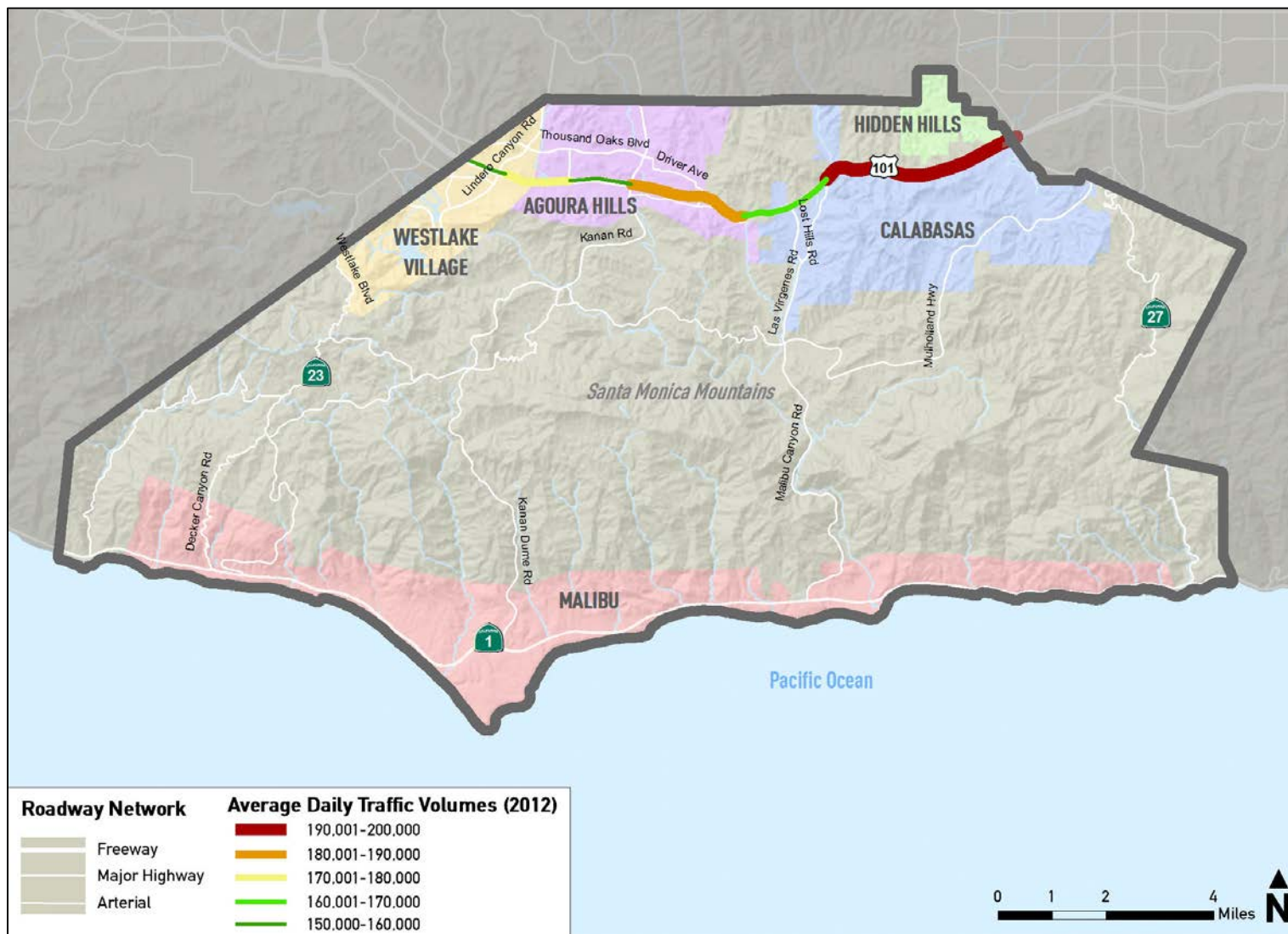
Source: STV, 2015; Iteris, 2014; Caltrans, 2014

2.3.2 Arterial Roadways

Unlike the freeway PeMS system, there is no single comprehensive source of daily traffic flow information on arterial roadways. Due to the lack of available count-based arterial volume data, the Metro 2014 SRTP model was used to identify daily volumes on selected key arterial corridors. Peak hour traffic speeds on the arterial roadways were analyzed through the use of iPeMS system. The iPeMS gathers vehicle probe data along arterials and then delivers real-time and predictive traffic analytics. For this analysis, vehicle probe data were assessed for the months of January through April 2013, and for the hours of 7:30-8:30 AM and 4:30 to 5:30 PM.

Peak hour slowing occurs on portions of PCH southbound in the morning at the eastern end of the study area, as well as southbound on Topanga Canyon Boulevard in the morning.

2.3.3 Goods Movement

The study area contains a few municipal routes which have been designated for use by trucks, and are located in the City of Agoura Hills. STAA routes follow state routes such as SR-23, SR-1, and SR-27. The Draft CSTAN routes overlap with the STAA routes.

2.4 Active Transportation

The existing bikeway network in the LVM Mobility Matrix Subregion is limited. Agoura Hills and Westlake Village have bike lanes on significant portions of their primary access streets, while Calabasas has bike lanes on some portions of their main streets. Malibu has a bike route

along the length of PCH. Bikeways of any type are relatively sparse in the remainder of the study area, although the LVMCOG Bicycle Master Plan which is currently being developed will greatly increase the bikeway coverage in the area.

2.5 Transit

Most of the transit in the LVM Mobility Matrix Subregion is limited to a few express buses and city-run trolleys and shuttles. The Metro express bus on PCH is the most heavily traveled bus line in the Subregion, at over 3,000 riders per weekday. Boardings and alightings in the study area are highest around Pepperdine University and Malibu Civic Center, as well as near the Trancas Country Market Center and Zuma Beach.

In the Las Virgenes area, the Los Angeles Department of Transportation (LADOT) and Metro operate along the US-101 corridor, with routes that carry over 500 and 1,400 riders, respectively.

Calabasas provides the most municipal transit in the study area, with seven lines that carry between 15 and 40 riders per line daily. Malibu and Agoura Hills do not offer daily bus service, though Agoura Hills' summer Beach Bus serves an average of 181 riders per day. Westlake Village's weekend trolley, which was piloted during Summer 2014, was very successful with about 130 daily passengers on average. All the cities, except for Hidden Hills, offer dial-a-ride services.

Figure 2-4. Transit Service and Average Weekday Boardings
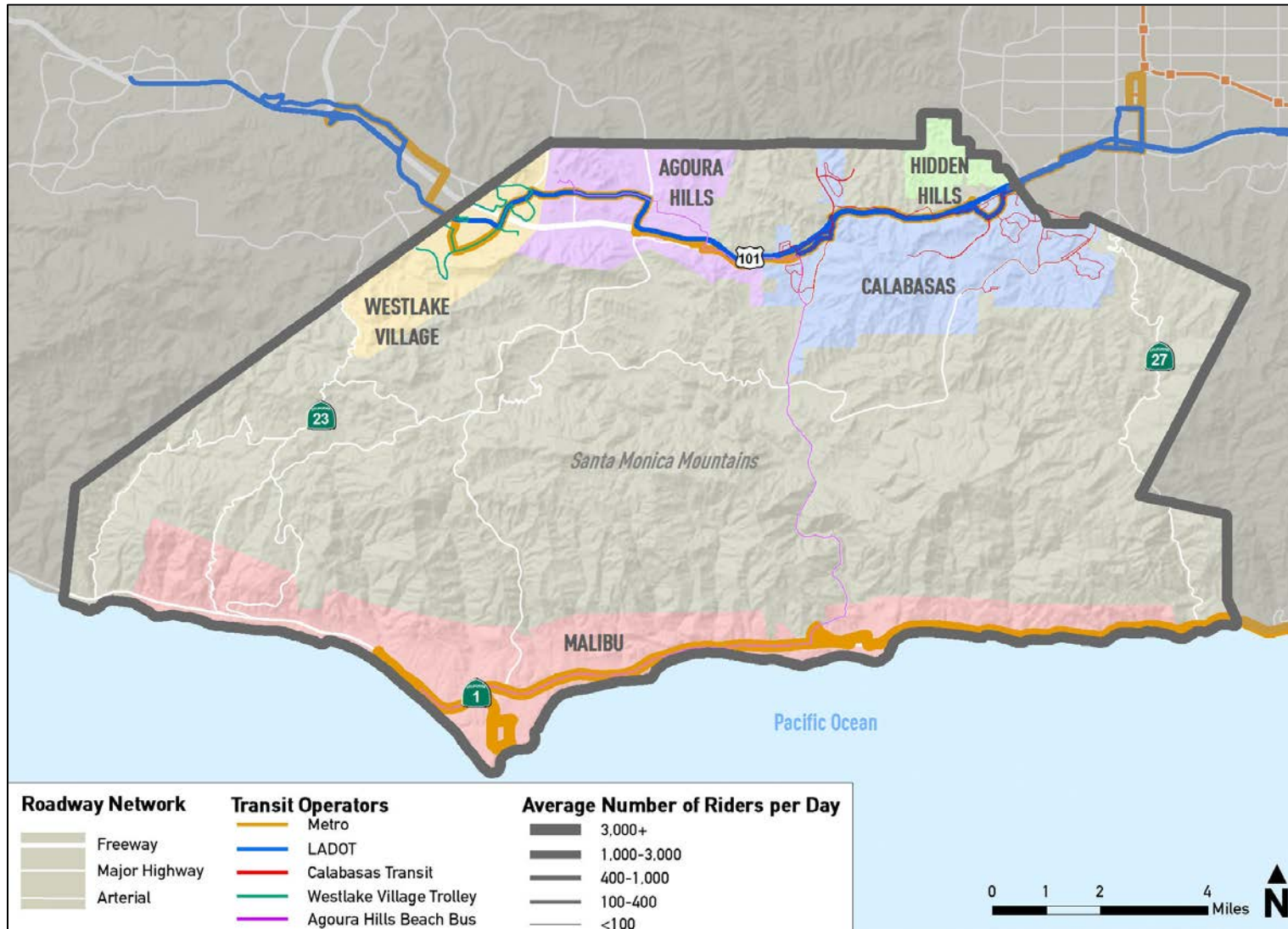
Source: STV, 2015

3.0   GOALS AND OBJECTIVES

This section describes the goals and objectives of the LVM Mobility Matrix Subregion. The goals are consistent with the county's overall goals framework, which consists of six broad themes common among all the subregions. The goals also reflect the Subregion's priorities, and are based on recent studies, cities' general plans, and discussions with the cities and LVMCOG.

3.1   Mobility Matrix Themes

Six themes guide the development of the Mobility Matrix. The themes are defined in Figure 3-1. These were developed in consultation with Metro and the Mobility Matrix consultant teams to highlight the importance of recent federal and state legislation and to reflect the shared concerns of all Los Angeles County jurisdictions. Each program considered in the Mobility Matrices receives one evaluation score for each of the six themes.

Figure 3-1. Common Countywide Themes for All Mobility Matrices

Mobility

Develop projects and programs that improve traffic flow, relieve congestion, and enable residents, workers, and visitors to travel freely and quickly throughout Los Angeles County.

Safety

Make investments that improve access to transit facilities; enhance safety, or correct unsafe conditions in areas of heavy traffic, high transit use, and dense pedestrian activity where it is not a result of lack of normal maintenance.

Sustainability

Ensure compliance with sustainability legislation (Senate Bill [SB] 375) by reducing greenhouse gas emissions to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Economy

Develop projects and programs that contribute to job creation and business expansion resulting from improved mobility.

Accessibility

Invest in projects and programs that improve access to destinations such as jobs, recreation, medical facilities, schools, and others. Access to transit service within reasonable walking or cycling range.

State of Good Repair

Ensure funds are set aside to cover the cost of rehabilitating, maintaining, and replacing transportation assets.

Although the new projects or programs proposed by the subregion do not necessarily require repair or maintenance, State of Good Repair is included as a Mobility Matrix theme because it is a priority for Metro and local jurisdictions.

MAP-21 calls for a renewed focus on ensuring transportation infrastructure is maintained in good conditions. The federal bill includes national performance measures for interstate highway conditions, and a requirement that state and metropolitan plans indicate how project selection helps achieve these targets. There are similar requirements for federally-funded transit projects, where agencies must develop transit asset management plans and system condition reporting.

The State of Good Repair theme is included in the Mobility Matrix to ensure its compliance with this renewed federal attention to system preservation, and it also highlights projects and programs that help Los Angeles County achieve its countywide goal of maintaining a state of good repair on transportation infrastructure.

3.2 Subregional Priorities

The PDT was asked to consider the six Mobility Matrix themes and develop goals and objectives for each theme which reflected subregional priorities. Overall, while communities wish to improve their major streets, there is also a desire to maintain the small-town character and preserve the rural quality of life. The subregion has limited room for growth, and cities are seeking ways to make travel more efficient and reliable without inducing

greater travel demand. All stakeholders are interested in improving incident management, as well as providing some transit options to visitors and tourists in order to alleviate seasonal congestion. Additionally, safety is a major concern, and many jurisdictions are pushing for improved bicyclist and pedestrian facilities to reduce accidents and injuries.

Table 3-1 lists the goals and performance measure for each goal.

Table 3-1. Goals and Performance Measures for the LVM Mobility Matrix Subregion

Theme	Goal	Performance Measure
Mobility	**Reduce impacts of regional traffic** – The subregion wishes to better manage regional traffic impacts, as the US-101 and PCH are used heavily by regional commuters, and peak-hour congestion frequently leads to traffic spilling onto local streets.	**Regional Traffic Impact** – Accommodate regional trips and reduce regional trips on local streets
	Build a multimodal transportation system to reduce dependence on automobiles – There is a lack of viable alternatives to driving, and a need for improved bicycle and pedestrian infrastructure, as well as for an expansion of transit service.	**Mode Share** – Increase percentage of trips by modes other than auto
	Improve travel time reliability by reducing impacts of non-recurring congestion – Non-recurring congestion from accidents and other incidents is a major problem, as there are no alternatives to the major arterials and freeways in the region. There is a need to add network redundancy or provide alternatives during cases of incidents.	**Reliability** – Improve the consistency, predictability, and on-time performance of travel
	Maximize transportation system efficiency by making better use of existing infrastructure – Improve system efficiency, through greater use of advanced technologies such as Intelligent Transportation Systems (ITS).	**Efficiency** – Accommodate additional trips within existing transportation infrastructure
Safety	**Ensure safety for all users of the road** – There is a desire to provide safe interactions between all modes of travel that use the subregion's transportation network.	**Transit Safety/Security** – Improve safety/security of riders and reduce incidents
	Improve pedestrian and bicyclist safety – Bicyclist and pedestrian injuries and fatalities are a major concern, especially on PCH. There is a need for better active transportation infrastructure.	**Bicycle/Pedestrian Safety** – Improve bicycle/pedestrian safety and reduce incidents
	Improve safety on area roads – Slope stabilization, guardrails, and improved sightlines are some of the needed improvements.	**Roadway Safety** – Improve auto safety on area roadways and reduce incidents.
Sustainability	**Protect the natural environment** – With a scenic highway along the coast and the Santa Monica Mountains covering most of the region, environmental protection is a high priority.	**Environmental Impact** – Minimize impact of project on the natural environment
	Preserve community character – The subregion's communities have a suburban or rural nature, which residents wish to maintain.	**Quality of Life** – Preserve quality of life in community

Theme	Goal	Performance Measure
	Reduce greenhouse gas emissions – Reduce greenhouse gas emissions to help meet SB 375 targets. The subregion is interested in pursuing clean vehicle technologies and encouraging mode shift from cars to other modes.	**GHG Emissions** – Reduce GHG emissions due to a shift to more efficient modes, reduced trips, shorter trips, etc
Economy	**Provide adequate means to safely move goods** – While freight and goods movement is not a major issue for the subregion, heavy trucks should stay on designated arterials to minimize impacts on infrastructure.	**Goods Movement Impact** – Accommodate trucks and other goods movement vehicles away from neighborhoods, etc
	Better accommodate seasonal visitors to subregion – Increase seasonal travel options. Currently, seasonal fluctuations in travel demand greatly stress the existing transportation infrastructure.	**Seasonal Travel Impact** – Accommodate peak season visitors
	Encourage transportation demand management strategies to reduce peak-hour home to work trips – TDM strategies, such as encouraging people to take fewer trips or take trips during off-peak hours, can help reduce congestion.	**Total Trips** – Reduce peak hour trips in the subregion
Accessibility	**Improve first/last mile connections** – Better connections to transit, bicycle routes, and pedestrian routes are needed in order to reduce the reliance on automobiles.	**First/Last Mile Connections** – Serve as many houses, jobs, and activity centers as possible
	Accommodate persons with disabilities/seniors/comply with the Americans with Disabilities Act – Improvements are needed for pedestrian and transit infrastructure to increase safety and connectivity and to provide a comfortable environment.	**Dependent Populations Served** – Increase access to transportation services for those with high levels of transit dependence
	Improve local transit connections to regional destinations – Local shuttles and dial-a-ride services exist within cities, but better coordination is needed to connect people to regional transit.	**Regional Transit Connections** – Improve connections between local and regional transit
State of Good Repair	**Preserve transportation assets and infrastructure** – There is a need to focus on maintaining existing infrastructure.	**Life of Facility or Equipment** – Increase the number of viable years before assets need to be replaced or updated
	Minimize impact of goods movement on local streets and arterials – Designate arterials for heavy trucks to keep them off of local streets and neighborhoods.	**Goods Movement Impact** – Improve designated goods movement corridors to reduce impact on local streets
	Leverage regional and state funding sources to maintain regional and state routes – Many cities find themselves expending funds to maintain state routes. There is a desire for greater funding support from state agencies.	**State and Federal Funding** – Focus on projects that receive state and federal funding support

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4.0 SUBREGIONAL MOBILITY MATRIX

An initial LVM Mobility Matrix Subregion project and program list was prepared consisting of Metro's December 2013 subregional project lists, which included: unfunded LRTP projects; unfunded Measure R scope elements; and subregional needs submitted in response to a request by Directors Antonovich and Dubois. The project and program list was then updated through the outreach process and incorporates input from the PDT members and other subregion stakeholders. The list reflects not only the subregional transportation needs within the cities, but also includes many projects with wider subregional and regional impacts.

This chapter summarizes the needs of the LVM Mobility Matrix Subregion, as demonstrated by the project list, and describes the high-level evaluation of project performance.

4.1 Project List

A total of 52 projects and programs were identified for the LVM Mobility Matrix Subregion. The projects are divided into four broad categories: Arterial, Highways, Active Transportation, and Transit. Within each category, the projects are grouped by similarity into subcategories.

The Subregion identified a limited number of roadway and highway projects. Malibu proposed several projects along PCH, while Calabasas had a greater focus on improving road and highway shoulder safety in their city. Signal synchronization and Transportation System Management (TSM) upgrades emerged as priorities, as

the cities are interested in making their existing roadways more efficient, rather than increasing overall capacity.

Active transportation projects compose about one-half of the project list. The cities are interested in building out their bicycle networks, and there is a very strong focus on improving pedestrian and bicycle safety. Transit service in the LVM Mobility Matrix area is limited, but the cities proposed several projects which would enhance seasonal transit options.

The PDT members submitted many projects and programs within their own jurisdictions, but there was also a consensus on a several programs that would benefit the entire subregion. The project list includes general programs such as State of Good Repair, transportation demand management (TDM) strategies, and parking structures near new key activity centers throughout the Subregion.

A full list of the projects and programs can be found in Appendix D. Figure 4-1 shows the location of the projects and programs. Additionally, an interactive website allowing users to view Mobility Matrix project locations and information is under development and will be available upon completion of this effort.

Figure 4-1. Project and Programs Overview
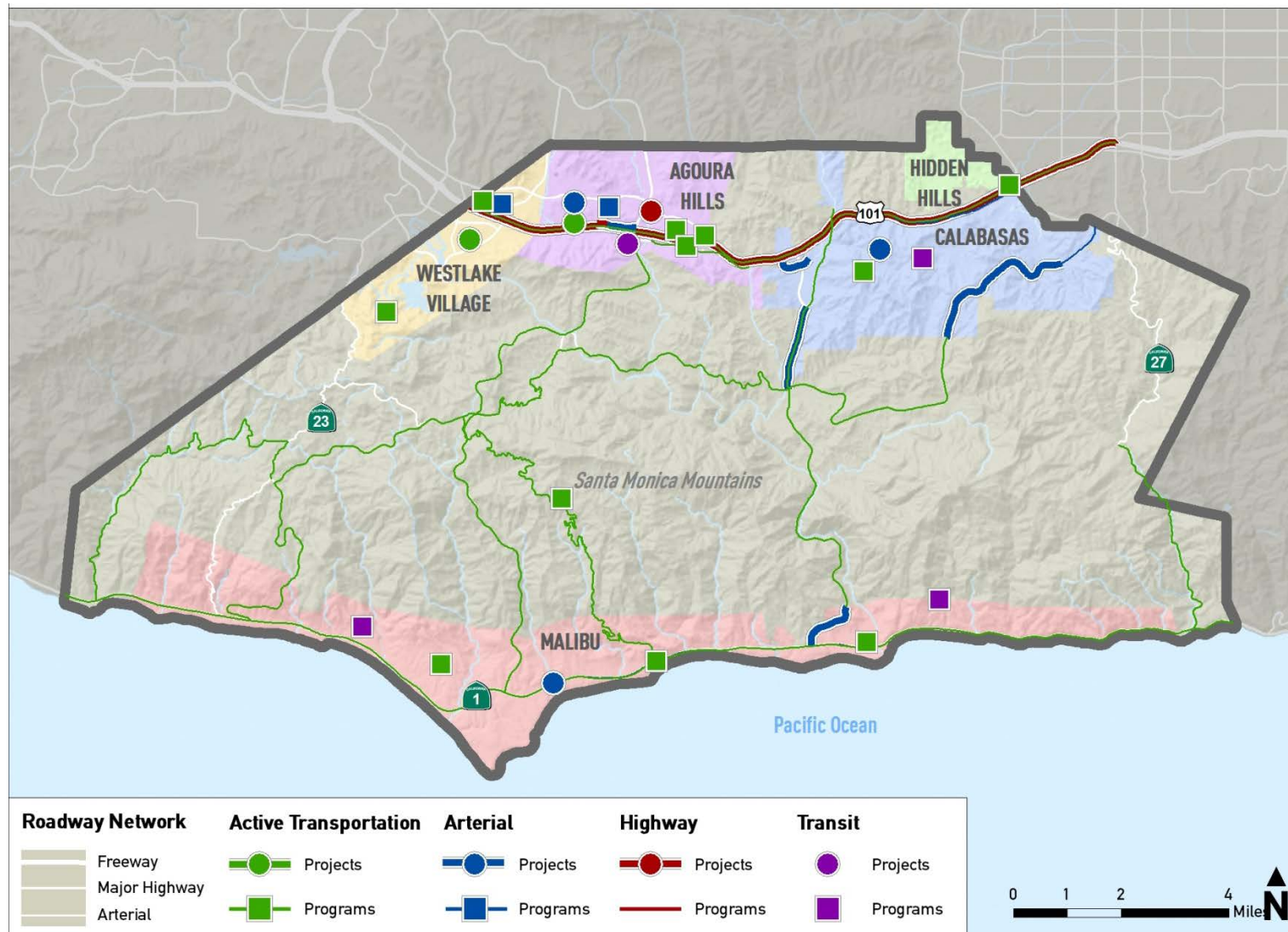
Source: STV, 2015

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4.2 Evaluation

The evaluation is meant to identify at a high level of analysis the projects and programs that have the potential to address subregional and countywide transportation goals for later quantitative analysis in the LRTP update. The Mobility Matrix does not prioritize the projects, but rather is to be used as a screening tool and a starting point for the LRTP update process. The evaluation is qualitative in nature, due to a limited time frame for completion and largely incomplete and inconsistent project/program details and data. The evaluation methodology shown in Table 4-1 represents a collaborative effort spanning many months, and incorporates input from subregional representatives across Los Angeles County.

A full description of the evaluation methodology can be found in Appendix C.

4.2.1 Evaluation Matrix

Due to the subregional scale of the study, many of the smaller projects were combined or grouped together into larger subcategories or programs for ease of analysis. The evaluation assigns ratings at the subcategory level for each of the six Mobility Matrix themes. As discussed in Chapter 3, each Mobility Matrix theme has three or four corresponding goals; projects were rated based on their potential to contribute to one or more of the subregional goals. The ratings are shown in Table 4-2.

Table 4-1. Evaluation Methodology

To achieve the following score in a single theme:	Project must meet the corresponding criterion:
HIGH BENEFIT ●	■ Significantly benefits one or more theme goals or metrics on a <u>subregional</u> scale
MEDIUM BENEFIT ◑	■ Significantly benefits one or more theme goals or metrics on a <u>corridor or activity center</u> scale
LOW BENEFIT ◔	■ Addresses one or more theme goals or metrics on a <u>limited/localized</u> scale (e.g., at a single intersection)
NEUTRAL BENEFIT ○	■ Has no cumulative positive or negative impact on theme goals or metrics
NEGATIVE IMPACT ▬	■ Results in cumulative negative impact on one or more theme goals or metrics

Table 4-2. Performance Evaluation – Summary by Subprogram

ID	# of Projects	Mobility	Safety	Sustainability	Economy	Accessibility	State of Good Repair
		•Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	•Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	•Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	•Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	•Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	•Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding
Arterials							
Widening Projects	7	●	◑	○	◔	○	◔
State of Good Repair/Safety Projects	5	◑	◑	◔	◔	○	●
TSM Programs	8	◑	○	○	○	○	○
Highways							
Arterial Interchange Projects	2	●	◑	○	○	◔	◔
Freeway Corridor Projects	2	●	○	○	◔	○	○
Soundwall Projects	1	○	○	◑	○	○	○
TSM Projects	1	◑	◔	○	○	○	○

ID	# of Projects	Mobility	Safety	Sustainability	Economy	Accessibility	State of Good Repair
		•Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	•Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	•Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	•Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	•Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	•Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding
Active Transportation							
Bicycle/Pedestrian Programs/Projects	8	◑	◑	●	◑	◑	○
Pedestrian Safety Projects	6	○	●	◔	○	◑	○
Sustainability Programs	2	○	○	●	○	○	○
TDM Program	1	◑	○	●	●	◑	○
Park and Ride Projects/Programs	2	◔	○	◑	◑	◑	◔
Transit							
Seasonal Transit Programs	2	●	○	◑	◑	●	○
Bus Programs	4	●	○	◑	○	●	○
Transit Center	1	◔	◔	◑	○	●	○

4.3   Findings

Overall, most projects perform very well under one or two Mobility Matrix themes, while also providing some secondary benefits in other themes. Only a few freeway projects receive negative scores under the Sustainability theme, but the negative impacts should be weighed against the positive mobility effects these projects might bring. Some projects have many Neutral Benefit scores, but that does not mean they do not provide benefits; rather, those projects tend to be tightly focused on one theme.

Projects in the Arterial category perform well under the Mobility theme, as they focus on reducing regional traffic impacts and increasing efficiency. The arterial projects also have Safety benefits, as many of them contain bicycle and pedestrian safety improvements or address areas with existing unsafe conditions. The Arterial category also includes several projects which focus exclusively on state of good repair, mostly located in Calabasas. These projects receive a full score for the theme of State of Good Repair, and also score well in all of the other categories.

The handful of Highway projects score well under Mobility, but have mixed scores for the other themes. While interchange improvements and TSM upgrades may be beneficial for Safety, the proposed US-101 widening projects may be detrimental, as they take away shoulder lanes.

The Active Transportation projects score quite highly under several themes. All of the PDT members expressed a desire to improve bicycle and pedestrian facilities for both safety and sustainability reasons; these projects score highly under those two themes. Active Transportation projects also perform well under Economy, since the Subregion receives many tourist and recreational bicyclists during the summer and these projects can better accommodate them.

The LVM Mobility Matrix Subregion only has a handful of Transit projects. The projects that increase bus service between the Subregion and other Subregions in the County have high benefits for Mobility, Sustainability, and Accessibility. The seasonal transit programs also receive high ratings, with additional benefits under the Economy theme, as they are targeted towards seasonal travel.

Other than the Arterial state of good repair projects, most of the other projects on the list score Neutral Benefit under the theme of State of Good Repair, since the majority of projects involve new infrastructure or have no need for or impact on maintenance or rehabilitation.

When looking at the scores for all six Mobility Matrix themes, the projects in the Active Transportation and Transit categories appear to perform better and to achieve more subregional goals. This is not surprising, since the subregional goals emphasize safety and encourage travel by fuel-efficient modes. However, it's important to note that the scale of some of the Active Transportation projects is very small, such as a single pedestrian bridge or sidewalks in a business park. In contrast, the Arterial and Highway projects have more far-reaching impacts throughout the subregion and region, and they are crucial in a Subregion with a limited roadway network. The full list of the project ratings can be found in Appendix D.

5.0 IMPLEMENTATION TIMEFRAMES AND COST ESTIMATES

5.1 Implementation Timeframes

The projects and programs described in Chapter 4.0 were categorized into the three different timeframes based on a number of factors, including their readiness, need, funding availability or potential, and phasing. A 20-plus year timeframe was used as the basis for categorizing projects, with breakpoints at the ten and twenty year timeframes. The timeframes correspond to when the projects are completed and in operation. Some projects span multiple timeframes, particularly those involving on-going operations or maintenance and programs.

Metro, the Mobility Matrix consultants, PDT members, cities and other stakeholders worked collaboratively to determine project implementation timeframes. A full description of the categorization methodology can be found in Appendix C. Table 5-1 provides a summary of the categorizations.

Most of the projects in the LVM Mobility Matrix Subregion fall into the short- and mid-term timeframes. The long-term projects typically are those which are phased across the 20-plus time period and are more regional in scale. The emphasis on the shorter term is partially a result of the bottoms-up approach, whereby cities submitted projects intended to address their immediate needs.

Nearly all of the Arterial projects are classified as short-term. These projects are meant to improve existing traffic operations through TSM improvements and through eliminating current bottlenecks. The only Arterial project which is expected to be implemented in more than ten years is the Westlake Village business park improvements, which are tied to future development of the area.

The Highway projects are skewed towards the longer term, as several of the projects propose significant changes such as adding lanes or modifying complex freeway interchanges. Examples include widening US-101 or improving the US-101/Kanan interchange. However, the TSM and soundwall improvements could be implemented in the short-term.

The majority of the Active Transportation projects fall into shorter timeframes, although bikeway improvement projects are phased, in accordance to the cities' and county's bicycle master plans. All of the PDT members cited safety as an immediate priority, which explains the shorter timeframes for the Active Transportation category.

Finally, the Transit projects propose adding new service or improving existing service, which explains the shorter implementation timeframe; none of the Transit projects involve large capital costs or construction.

Table 5-1. LVM Mobility Matrix Projects and Programs Categorization Summary

Programs	# of Projects	Timeframe Categories		
		Short-Term (0-10 years)	Mid-Term (11-20 years)	Long-Term (20+ years)
Arterials				
Widening Program	7	✓	✓	
State of Good Repair/Safety Program	5	✓	✓	✓
TSM Program	8	✓	✓	✓
Goods Movement				
Grade Crossing Safety Improvement Program	1	✓	✓	✓
Arterial Program	1	✓	✓	✓
Rail Program	1	✓	✓	✓
Highways				
Arterial Interchange Program	2	✓		
Freeway Corridor Program	2			✓
Soundwall Program	1	✓		
TSM Program	1	✓		
Active Transportation				
Bicycle/Pedestrian Program	8	✓	✓	
Pedestrian Safety Program	6	✓	✓	
Sustainability Program	2	✓	✓	
TDM Program	1	✓	✓	✓
Park-and-Ride Program	2	✓	✓	
Transit				
Seasonal Transit Program	2	✓	✓	
Bus Program	4	✓	✓	
Transit Center Program	1	✓		

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5.2   Cost Estimates

This section describes the cost range estimates at the program level. Due to variations in project scope and available cost data, costs estimated for use in the Mobility Matrix are not intended to be used for any future project-level planning. Rather, the cost ranges developed via this process constitute a high-level planning estimate for short-, mid-, and long-term subregional funding needs for the Mobility Matrix effort only.

The purpose of this section is to outline the approach for preparing rough order-of-magnitude capital cost estimates for planning purposes. For the most part, these estimates do not include vehicles, operating, maintenance and financing costs. For consistency, all estimated project and program costs were reported in year 2015 dollars, as this is the base year of the 2014 Short Range Transportation Plan. Estimates from prior years were escalated to year 2015 dollars at a three-percent annual rate.

Since the list was compiled from various sources, some of the projects in the list overlap in their scope or purpose, leading to some duplicative costs in the cost estimate totals. Projects or programs that cross subregional boundaries may be included in multiple subregional project lists. Where the same projects or programs are included in multiple subregions, the cost estimates include the total estimated project cost, not the cost share for each subregion. The cost sharing will be determined as part of future efforts.

Finally, due to lack of available data and the timeframe of the Mobility Matrix effort, some of the projects and

programs have missing cost estimates or do not include operations and maintenance (O&M) costs. Where O&M costs were available, they were included for the applicable timeframes. O&M costs will be updated as part of the LRTP as the subregions prioritize their projects and programs. It should be noted that for this reason, the cost established may be understated.

A full description of the cost estimate methodology can be found in Appendix C. shows the costs for each category, divided into the three time periods.

Most of the Arterial projects are expected to be implemented or completed in the short-term; approximately $140 to $210 million is estimated to be needed. About $60 to $80 million would go towards mid-term Arterial projects, while only a very small amount is needed for the long-term projects. Overall, the Arterial projects are projected to cost approximately $200 to $300 million.

The Highway project costs comprise the majority of the total costs, at about $1.2 to $1.8 billion, with most of the funding expected to be used in the long-term for the US-101 widening/restriping projects.

The costs for Active Transportation projects are relatively large compared to the other project categories, at about $170 to $300 million over 20-plus years. Most of this funding is expected to be used in the short-and mid-term timeframes, as the cities build out their bicycle plans, construct pedestrian bridges, and implement green streets.

The cost range totals for the Transit projects are fairly modest, at about $8 to $17 million. The proposed Agoura Hills Transit Center has the highest capital costs in this category, while the other projects require a small amount of funding. A few of the proposed transit projects will not only have capital costs, but also have increased operating and maintenance costs throughout the life of the project. Those operating costs are not included in the report. However, some transit projects have no capital costs at all, since they only propose to increase service. For those projects, the operating and maintenance costs are included in the totals, although they will likely be funded through a different source.

Table 5-2 shows the costs for by subprogram, divided over the three time periods. Table 5-3 shows the costs for each category of projects, as well as timeframes.

Table 5-2. Rough Order-of-Magnitude Capital Cost by Subprogram (2015 thousands of dollars)

Program	# of projects	Projects with Estimated Costs	Projects with Original Costs	Cost Estimates					
				Short-Term		Mid-Term		Long-Term	
				Low	High	Low	High	Low	High
Arterial									
Widening Program	7	4	3	$61,000	$91,000	$58,000	$69,000	$0	$0
State of Good Repair/Safety Program	5	5		$23,000	$27,000	$1,800	$2,700	$1,800	$2,700
TSM Program	8	5	3	$60,000	$94,000	$2,000	$5,000	$2,000	$5,000
Highway									
Arterial Interchange Program	2	1	1	$32,000	$48,000	$0	$0	$0	$0
Freeway Corridor Program	2	2		$0	$0	$0	$0	$1,100,000	$1,700,000
Soundwall Program	1	1		$4,600	$8,100	$0	$0	$0	$0
TSM Program	1		1	$11,000	$16,000	$0	$0	$0	$0
Active Transportation									
Bicycle/Pedestrian Program	8	8		$10,000	$29,000	$8,500	$23,000	$0	$0
Pedestrian Safety Program	6	4	2	$46,000	$71,000	$38,000	$58,000	$0	$0
Sustainability Program	2	2		$3,800	$15,000	$3,800	$15,000	$0	$0
TDM Program	1	1		$370	$530	$370	$530	$370	$530
Park-and-Ride Program	2	2		$3,000	$5,000	$60,000	$90,000	$0	$0
Transit									
Seasonal Transit Program	2	2		$50	$60	$50	$60	$0	$0
Bus Program	4	4		$3,100	$4,900	$2,000	$3,200	$0	$0
Transit Center Program	1	1		$3,000	$9,000	$0	$0	$0	$0
Total	**52**			**$260,000**	**$420,000**	**$170,000**	**$270,000**	**$1,100,000**	**$1,700,000**

Table 5-3. Rough Order-of-Magnitude Project Cost Estimates and Categorizations (2015 dollars)

Type / Category	Arterial	Highway	Active Transport.	Transit	Total
Short-Term (0-10 yrs)	18 Projects $140M - $210M	4 Projects $48M - $72M	13 Projects $64M - $120M	6 Projects $6M - $14M	41 Projects $260M - $420M
Mid-Term (11-20 yrs)	4 Projects $62M - $77M	0 Projects $0	13 Projects $110M - $190M	3 Projects $2M - $3M	20 Projects $170M- $270M
Long-Term (>20 yrs)	2 Projects $3.8M - $7.7M	2 Projects $1.1B - $1.7B	1 Project $0.4M - $0.5M	0 Projects $0	5 Projects $1.1B - $1.7B
Total	20 Projects $210M - $300M	6 Projects $1.2B - $1.8B	19 Projects $170M - $310M	7 Projects $8M - $17M	52 Projects $1.5B - $2.4B

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5.3   Funding and Finance

5.3.1   2009 LRTP and Identified Additional Needs

The 2009 LRTP lays out a 30-year strategy for keeping Los Angeles County moving and is based on a financial forecast of continued economic growth and moderate inflation. The 2009 LRTP identifies a $297.6 billion investment in Los Angeles County's transportation system through 2040 and is funded with more than 45 sources of federal, state and local revenue. A majority of funding is locally generated through three half-cent voter initiatives, Propositions A and C and Measure R. These local initiatives, other local sources of revenue such as passenger fares, advertising, real estate rentals, bonding, and competitive grants account for 75 percent of Metro's 30-year financial forecast. Many more projects and programs are needed in Los Angeles County than the transportation funding is available. These additional needs constitute the Strategic Unfunded Plan. However, both the funded 2009 Plan and the Strategic Unfunded Plan will require new funding in order to add projects and services and/or accelerate projects identified for funding. Metro's commitment to maintain and improve Los Angeles County's transportation system will depend on funding availability and strategies for obtaining new or increased funding.

5.3.2   2017 LRTP Update and Exploration of New Funding Options

The 2017 LRTP will incorporate significant changes that have occurred since the 2009 LRTP was adopted, including changes in economic conditions, growth patterns, and the transportation costs and funding

forecast. It is anticipated that this Plan would incorporate existing 2009 LRTP projects as well as new project initiatives such as those that may be identified by the sub regions through the Mobility Matrices process. As with past LRTPs, this update will include recommendations for constrained (funded) projects as well as strategic (unfunded) projects that could be built if additional funding becomes available, consistent with adopted Metro Board priorities and actions. The LRTP update will revise funding recommendations for various major transportation programs, including funds available to the Call for Projects by funding category, Regional Rail/Metrolink, Access Services and other programs.   The Plan will also address state of good repair needs, new requirements for sustainability, and other initiatives and policies not anticipated in the 2009 LRTP.

The 2017 LRTP update includes the exploration of several new funding sources beyond those identified in the 2009 LRTP. Most notable is the exploration of a new transportation sales tax measure that could be considered by Los Angeles County voters as soon as November 2016. Approval of a 2016 transportation sales tax measure could significantly augment the availability of new funding included in the LRTP update and increase the size of the constrained plan. In addition to a new transportation sales tax measure, Metro is continuing the exploration of Public-Private Partnerships and congestion pricing for applicable highway and transit projects. Other new funding sources under consideration include, but are not limited to, land value capture around transit stations and California State Cap & Trade funds.

5.4   What's Next?

The Mobility Matrix is the first step in identifying the subregion's transportation projects and programs that require funding. The Mobility Matrix also identifies the subregion's goals and objectives for their unique needs and geographic considerations. The Mobility Matrix work effort resulted in a subregional, project/program list, as well as estimating those projects and program costs. This important work effort serves as a "bottoms-up" approach towards updating Metro's LRTP in the future.

Three major next steps should arise out of the Mobility Matrix process:

- **LVMCOG Prioritization of Projects** – This Mobility Matrix study does not prioritize projects. Instead, it provides some of the information needed for decision makers to prioritize projects/programs in the next phase of work, and an unconstrained list of all potential transportation projects in the region. In preparation for a potential ballot measure and LRTP update (as described further below), the LVMCOG should decide how it wants to prioritize these projects assuming a constrained funding scenario.

- **Metro Ballot Measure Preparations** – Metro will continue working with the PDTs of all the Subregions as it starts developing a potential ballot measure. Part of the ballot measure work would involve geographic equity determination, as well as determining the amount of funding available for each category of projects/programs and subregion of the County.

- **Metro LRTP Update** – The potential ballot measure would then feed into a future Metro LRTP update and be integrated into the LRTP Finance Plan. If additional funding becomes available through a ballot measure or other new funding sources or initiatives, the list of projects developed through the Mobility Matrix and any subsequent list developed by the subregion could be used to update the constrained project list for the LRTP moving forward.

6.0   APPENDICES

The following appendices provide further information on issues discussed in this document.

Appendix A: Meeting Matrix

Appendix B: Baseline Conditions Report

Appendix C: Methodologies

Appendix D: Project Detail Matrix

SUBREGIONAL MOBILITY MATRIX
LAS VIRGENES/MALIBU

Project No. PS-4010-3041-YY-01-01

Appendix A – Meeting Matrix – Final

Prepared for:

Ⓜ Metro

Prepared by:

STV Incorporated
1055 West Seventh Street
Suite 3150
Los Angeles, CA 90017

March 2015

Appendix A – Meeting Matrix – Final

Subregional Mobility Matrix
Las Virgenes/Malibu
PS-4010-3041-YY-01-01

Prepared for:

Los Angeles County
Metropolitan Transportation Authority

Prepared by:
STV Incorporated

In Association With:
Iteris, Inc
Katherine Padilla & Associates
Ryan Snyder Associates, LLC

Quality Review Tracking

Version	Date	Reviewer	Reviewer Signature
Draft	1/29/15	STV Reviewer: Tyler Bonstead	TRB
Final	3/11/15	STV Reviewer: Tyler Bonstead	TRB

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

The following matrix documents coordination meetings and calls with cities, Project Development Team (PDT) members, and others as part of the Las Virgenes/Malibu Subregional Mobility Matrix Study.

Meeting Type	Date/Time	Meeting Location	Discussion Points
PDT Meeting #1	08/13/14 11:00 AM to 1:00 PM	Calabasas City Hall, Conference Room #3, 100 Civic Center Way, Calabasas, CA 91302	Obtain consensus on the following issues: ■ Mobility Matrix guiding principles, schedule, and approach ■ Schedule to update initial project list previously submitted by PDT members ■ Sub-regional goals and objectives
One-on-one coordination meetings with PDT members	09/04/14 09/04/14 09/08/14 09/8/14 09/10/14 09/16/14 09/22/14	Caltrans – District 7 Westlake Village Los Angeles Department of Transportation Malibu Los Angeles County Calabasas Agoura Hills	Review of: ■ Initial Project/Program List ■ Literature Review documents
PDT Meeting #2	09/16/14 10:30 AM to 12:00 PM	Founders Hall 200 Civic Center Way Calabasas, CA 91302	Obtain Project Development Team (PDT) feedback on the preliminary project list, and discuss goals and objectives as well as approaches and options for performance metrics.
Las Virgenes /Malibu Council of Governments (LVMCOG) Board Meeting	09/16/14	Calabasas City Hall, Conference Room #3, 100 Civic Center Way, Calabasas, CA 91302	Give initial briefing on project

Meeting Type	Date/Time	Meeting Location	Discussion Points
PDT Meeting #3	10/14/14 10:30 AM to 12:00 PM	Community Room, Westlake Village Civic Center 31200 Oak Crest Dr. Westlake Village, CA 91361	Obtain consensus and feedback on the following issues: ■ Goals and Objectives ■ Draft Performance Measures ■ Preliminary Baseline Conditions Report ■ Regional Facilities Category of the Mobility Matrix
LVMCOG Board Meeting	10/21/14	Calabasas City Hall	Obtain approval of initial project/program list
PDT Meeting #4	11/18/14 10:30 AM to 12:00 PM	Founders Hall 200 Civic Center Way Calabasas, CA 91302	Obtain feedback and consensus on the following issues: ■ Updated Project and Programs List ■ Final Goals and Objectives and Performance Measures ■ Baseline Conditions Report ■ Performance Analysis ■ Project Categorization ■ Mobility Matrix Relationship to Long Range Transportation Plan/Ballot Measure ■ Next Steps

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

Meeting Type	Date/Time	Meeting Location	Discussion Points
One-on-one calls with PDT members	12/08/14 12/11/14 12/15/14 12/15/15 12/16/14 12/17/14	Westlake Village Metro Caltrans Calabasas LADOT Malibu	Review of: ■ Initial Performance Analysis Results ■ Project Categorization Recommendations
PDT Meeting #5	01/20/15 10:30 AM to 12:00 PM	Agoura Hills City Hall Multi-Purpose Room 30001 Ladyface Circle Agoura Hills, CA 91301	Obtain feedback and consensus on the following issues: ■ Baseline Conditions Report ■ Relationship to Ballot Measure/Metro Long Range Transportation Plan ■ Performance Analysis ■ Project/Program Categorization ■ Cost Estimating Overview ■ Next Steps
PDT Meeting #6	02/17/15 10:30 AM to 12:00 PM	Agoura Hills City Hall Multi-Purpose Room 30001 Ladyface Circle Agoura Hills, CA 91301	Review Draft Cost Estimates and Final Report
LVMCOG Board Meeting	03/07/15	Calabasas City Hall	Obtain approval of Mobility Matrix Final Report

SUBREGIONAL MOBILITY MATRIX
LAS VIRGENES/MALIBU

Project No. PS-4010-3041-YY-01-01

Appendix B – Baseline Conditions Report – Final

Prepared for:

Ⓜ **Metro**

Prepared by:

STV Incorporated
1055 West Seventh Street
Suite 3150
Los Angeles, CA 90017

March 2015

Appendix B – Baseline Conditions Report – Final

Subregional Mobility Matrix
Las Virgenes/Malibu
PS-4010-3041-YY-01-01

Prepared for:

Los Angeles County
Metropolitan Transportation Authority

Prepared by:
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In Association With:
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Katherine Padilla & Associates
Ryan Snyder Associates, LLC

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Draft	11/14/14	STV Reviewer: Tyler Bonstead	TRB
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SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

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List of Terms and Acronyms

Acronyms	Definitions
ADT	Average Daily Traffic
Caltrans	California Department of Transportations
CMP	Los Angeles County Congestion Management Program
COG	Council of Governments
1TS	Intelligent Transportation Systems
LOS	Level-of-Service
LRTP	Long Range Transportation Plan
LVM	Las Virgenes/Malibu
LVMCOG	Las Virgenes/Malibu Council of Governments
Metro	Los Angeles County Metropolitan Transportation Authority
PCH	Pacific Coast Highway
PeMS	Caltrans Freeway Performance Monitoring System
SRTP	Short Range Transportation Plan
STAA	Surface Transportation Assistance Act

1.0 INTRODUCTION

1.1 Study Background

The Los Angeles County Metropolitan Transportation Authority (Metro) initiated the development of seven subregional mobility matrices to provide consistent countywide corridor performance measures to be used to identify and evaluate transportation improvements to address subregional needs. These matrices will provide a performance evaluation methodology to identify short, mid and long term projects, programs, and policies through a subregional collaborative process. It is envisioned that these matrices will assist the subregions in identifying projects for future updates to the Metro Long Range Transportation Plan (LRTP) as well as future transportation funding.

In February 2014, the Metro Board approved the holistic countywide approach for preparing Mobility Matrices for the San Gabriel Valley Council of Governments (COG), Central Los Angeles, Westside Cities COG, San Fernando Valley COG, Las Virgenes/Malibu COG, North County Transportation Coalition, and South Bay Cities COG. For the purposes of the Mobility Matrix work effort, cities with membership in two COGs were given the opportunity by the Board to select one COG in which to participate. Specifically, the Arroyo Verdugo Cities' local jurisdictions are included in both the SGVCOG and SFVCOG and that subregion decided to have the cities of La Cañada Flintridge, Pasadena, and South Pasadena included in the SGVCOG, while Burbank and Glendale are included in the SFVCOG. The City of Santa Clarita opted to be

included in the San Fernando Valley COG instead of North County. The Gateway Cities COG is developing its own Strategic Transportation Plan which will serve as their Mobility Matrix. These subregional boundaries, as defined for the Mobility Matrices, will be used in the analysis of existing conditions. An overview of the subregions being evaluated in the Mobility Matrix Studies is provided in Figure 1-1.

The Las Virgenes/Malibu (LVM) Council of Governments (COG) is an organization voluntarily established by its members under a Joint Powers Agreement to provide a forum for members to engage in subregional and cooperative planning and coordination of government services and responsibilities. A geographic map of the LVMCOG borders is shown in Figure 1-2. A long-term goal of the LVMCOG is to build consensus on a vision for a future transportation system that embraces efficiency and innovation for continuous improvement of the quality of life in the subregion. To accomplish this goal, a mobility matrix will be developed for the LVMCOG region as part of this study that identifies and applies screening criteria to corridors in the subregion to develop a framework for potential transportation improvements.

1.2 Report Purpose and Structure

This document establishes baseline conditions in the subregion. It describes projects which have recently been completed or funded, gives an overview of the study area's demographics, and presents a high level inventory of the transportation facilities being evaluated, including highways, arterials, transit, and bike/pedestrian facilities.

Section 2.0 describes the existing projects and plans in the subregion, and their relationships to the Mobility Matrix goals. The land uses and demographics of the study area are covered in Section 3.0. Section 4.0 contains an overview of existing travel patterns. Sections 5.0, 6.0, and 7.0 analyze the freeways and arterials, the bicycle facilities, and transit service in the area, respectively. Finally, Section 8.0 provides a summary and conclusions.

Figure 1-1. Mobility Matrix Subregions – Overview

Source: STV, 2015

Figure 1-2. Las Virgenes/Malibu Council of Governments
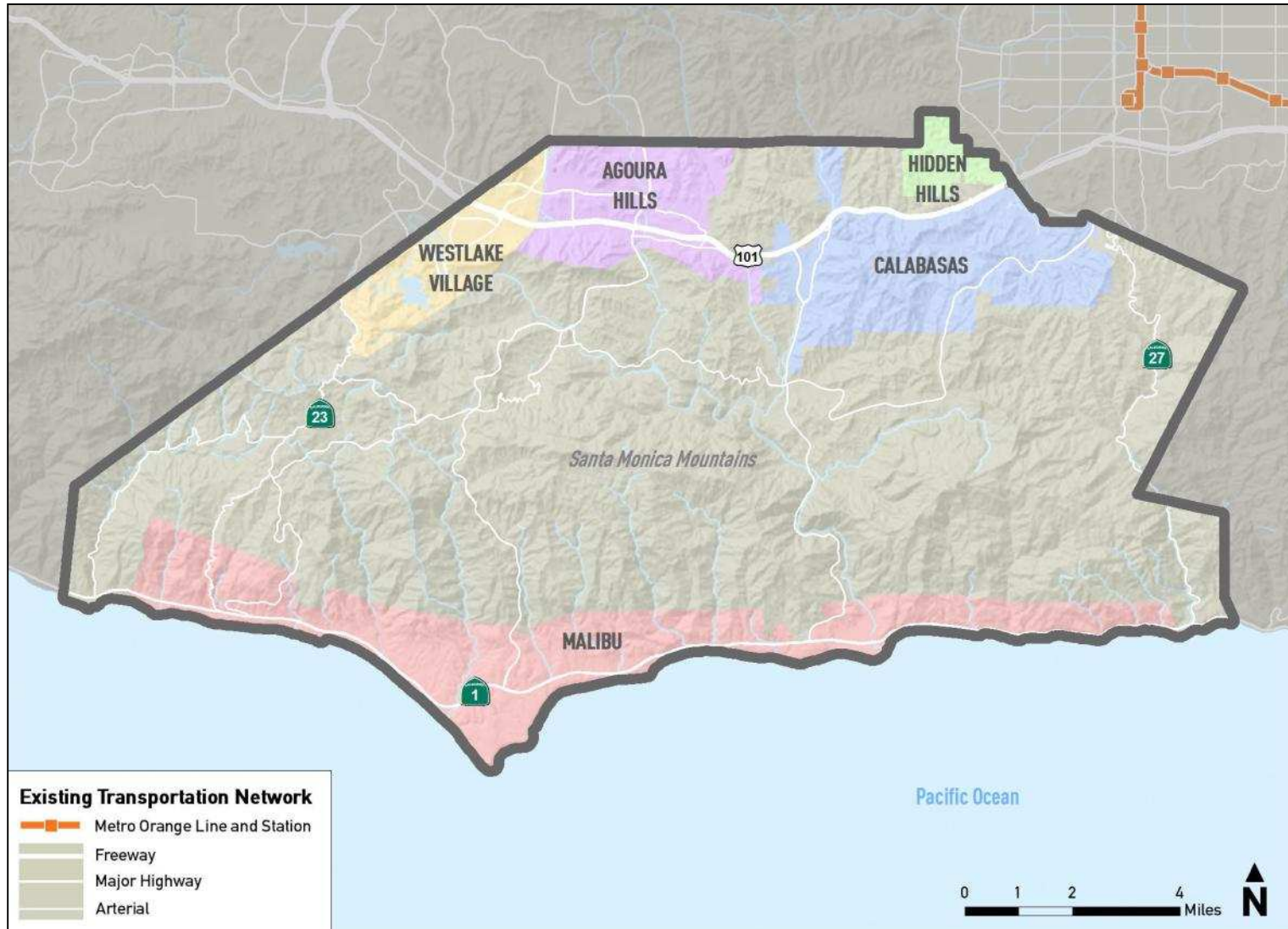
Source: STV, 2015

2.0   EXISTING PROJECTS AND STUDIES

Table 2-1 lists projects within the LVMCOG Mobility Matrix Subregion which have been recently completed or are in progress. The projects were drawn from a variety of sources, including the preliminary project list, the cities' General Plans, Metro's Call for Projects, and other regional planning documents. The status of these projects has been confirmed after meetings with representatives from each of the COG cities.

The projects include ones that are local in scope, but help achieve the Mobility Matrix goals, as well as projects with wider subregional and regional impacts.

Table 2-1. List of Completed or Funded Projects

Project Type	City/Corridor	Project Description	Status
Local	Agoura Hills	Kanan Rd/Agoura Rd signalized intersection project	In design
		Widen Agoura Rd from western City limits to Cornell Dr	In construction
	Calabasas	Old Town Calabasas park-and ride lot	Funded
		Las Virgenes Rd Scenic Corridor Widening	In design
	Malibu	Civic Center Way Improvements	In design
		PCH raised median and channelization	In design
		PCH intersection improvements	In design
		PCH/Kanan Dume Rd intersection and arrester bed	In construction
		PCH bike routes improvements	In construction
	Westlake Village	Park-and-ride facility	In construction
Regional	US-101	Parkway Calabasas/US-101 SB off-ramp improvements	In design
		US-101/Lost Hills Interchange	In design
		US-101/Agoura Rd/Chesebro Rd Interchange	In design
		US-101/Lindero Canyon bridge widening	In construction
		US-101/Reyes Adobe Rd interchange	Completed
		US-101/Lindero Canyon Rd interchange	Completed
	PCH	PCH regional traffic messaging system	Funded
	Mulholland Highway	Mulholland Highway Scenic Corridor Phase III	Funded

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

3.0   STUDY AREA DEMOGRAPHICS

The following section describes general demographic characteristics for the LVMCOG study area. Characteristics that are examined include land use patterns, population and employment, environmental justice communities, and travel patterns.

3.1   Land Use

The study area's land uses are primarily open space/recreation and vacant. Open and vacant space take up about 80% of the study area, while housing makes up 10%. Hidden Hills is almost exclusively made up of single-family housing in areas without public access, while the other cities have a mix of single-family and multi-family housing. Some industrial land use is located in Agoura Hills and in Westlake Village along the US-101 corridor, but overall, industrial land use is negligible in the Mobility Matrix Subregion. Commercial land use is only a small fraction of the study area, with most of the commercial development located along PCH and US-101. The unincorporated area is mostly open space, with only 2% taken up by residential land uses. The study area's land uses are shown in Table 3-1 and Figure 3-1 with the data and categories taken from the 2008 SCAG land use database.

Table 3-1. Land Uses in Study Area

City/Area	Low Density Residential	Medium/ High Density Residential	Commercial	Industrial	Public Facilities/ Institutions	Transportation/ Utilities	Mixed Use	Open Space/ Recreation	Vacant	Other
Agoura Hills	33%	4%	6%	3%	5%	1%	0%	13%	34%	0%
Calabasas	25%	4%	4%	0%	2%	4%	0%	3%	56%	1%
Hidden Hills	90%	0%	0%	0%	1%	0%	0%	2%	7%	0%
Malibu	24%	1%	3%	1%	1%	0%	0%	6%	60%	5%
Westlake Village	24%	5%	9%	2%	2%	1%	0%	8%	39%	10%
Unincorporated Area	2%	0%	1%	0%	0%	0%	0%	1%	90%	7%
LVMCOG Study Area	9%	1%	2%	1%	1%	1%	0%	2%	78%	6%

Source: SCAG, 2008

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

Figure 3-1. 2008 Land Use – LVM Mobility Matrix Subregion
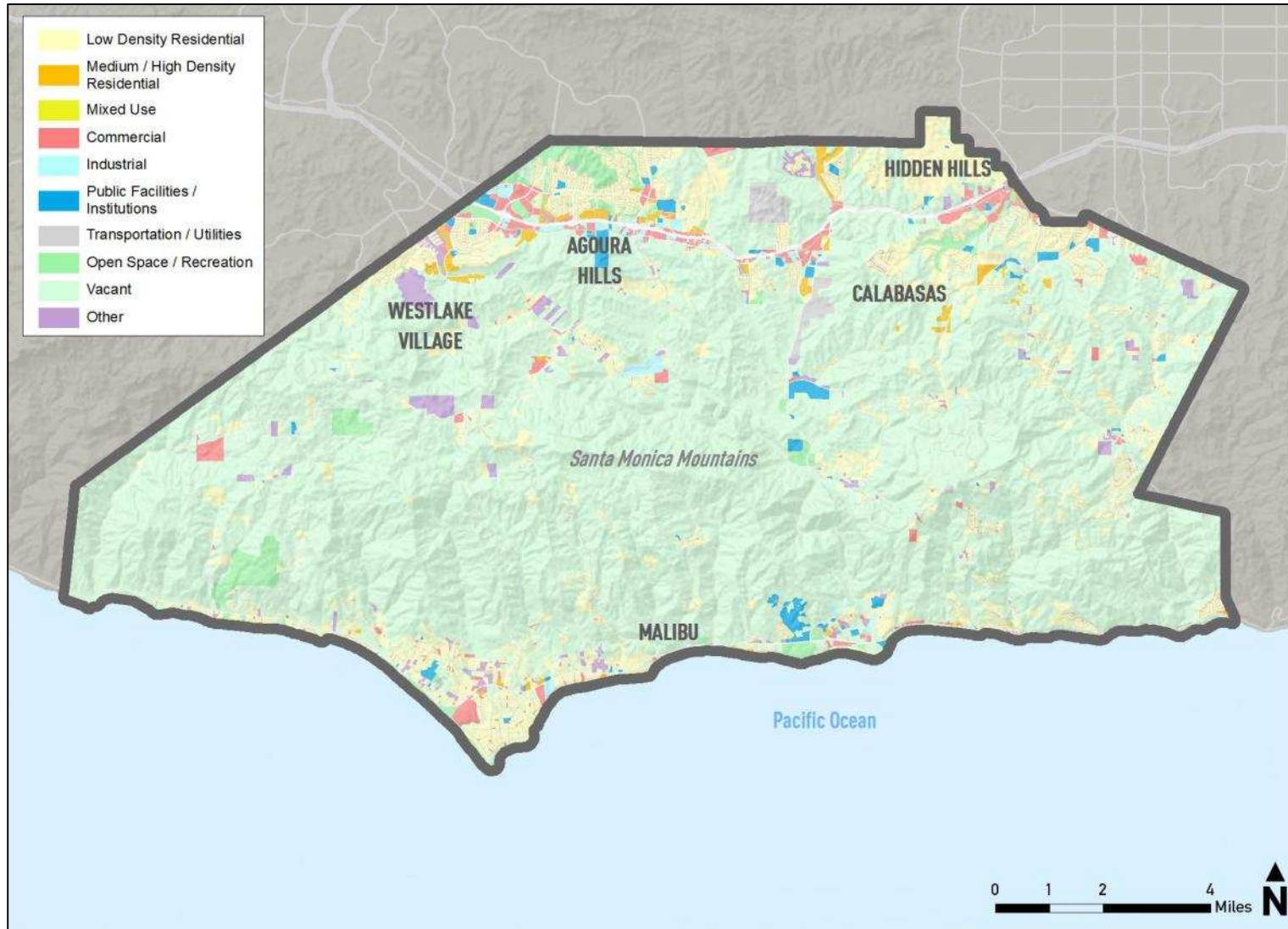
Source: STV, 2015; SCAG, 2008

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3.2   Population and Employment

3.2.1   2014 Population and Employment

Population and employment density in the LVM Mobility Matrix Subregion is fairly low, as most of the Subregion is comprised of vacant and open space. Evaluating only cities and census designated places shows that residents and employment centers are primarily located in the Las Virgenes area, which consists of Westlake Village, Agoura Hills, and Calabasas; and the Malibu and Santa Monica Mountains area. The major activity centers for the study area include:

- **Westlake Village:** Business Park, Westlake Village Shoppes

- **Agoura Hills:** Twin Oaks Shopping Center, Agoura Meadows Shopping Center

- **Calabasas:** Old Town Calabasas/Civic Center

- **Malibu:** State Beaches, Pepperdine University, Civic Center, Malibu Pier

Table 3-2 shows the population and employment densities for 2014, with data drawn from the Metro 2014 Short Range Transportation Plan (SRTP). Figure 3-2 illustrates the population and employment along with some of the major activity centers.

Table 3-2. 2014 Population and Employment Densities – LVM Mobility Matrix Subregion

Area	Population Density (residents/sq. mile)	Employment Density (jobs/sq. mile)
Las Virgenes area	1,515	1,079
Malibu/Santa Monica Mountains area	757	493

Source: STV, 2015; Metro 2014 SRTP

Figure 3-2. 2014 Population and Employment – LVM Mobility Matrix Subregion

Source: STV, 2015; Metro 2014 SRTP.

3.2.2 Population and Employment Change

The number of residents in the Las Virgenes area is expected to grow about 4% from 2014 to 2024. Employment is projected to increase by over 2%. Much more growth is expected for Malibu and the Santa Monica Mountains area; population is projected to increase by 10% and employment by over 23%. Overall, the Mobility Matrix Subregion will have low growth, compared to the rest of Los Angeles County.

Table 3-3 and Figure 3-3 show the projected changes from 2014 to 2024.

Table 3-3. Projected Population and Employment Change, 2014-2024 – LVM Mobility Matrix Subregion

Area	Measure	2014	2024	*% change*
Las Virgenes area	Residents	65,675	68,258	*3.9%*
	Jobs	46,802	47,844	*2.2%*
Malibu/Santa Monica Mountains area	Residents	18,322	20,170	*10.1%*
	Jobs	11,938	14,721	*23.3%*
LVMCOG Study Area	Residents	83,997	88,428	*5.3%*
	Jobs	57,216	62,565	*9.3%*
LA County	Residents	17,717,883	19,660,579	*11%*
	Jobs	7,672,301	8,454,216	*10.2%*

Source: STV, 2015; Metro 2014 SRTP.

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

Figure 3-3. Population and Employment Change – 2014-2024 – LVM Mobility Matrix Subregion

Source: STV, 2015; Metro 2014 SRTP.

3.3 Environmental Justice Communities

3.3.1 Minority and Low-Income Populations

Compared to the averages for Los Angeles County, the LVM Mobility Matrix Subregion has few disadvantaged communities. The cities are fairly affluent, with median incomes in each city above $110,000. The cities also have low percentages of minority populations and people living below the poverty level compared to the County; Agoura Hills and Calabasas have the highest minority populations, around 20%, which is less than one-third of the average for the County. None of the cities have areas with transit dependent populations.

Table 3-4 describes racial and economic characteristics for the study area, using data from the 2010 Census.

Table 3-4. Racial and Economic Characteristics – LVM Mobility Matrix Subregion

Community	Percentage Total Minority	Median Household Income[1]	Population Living Below Poverty Level
Agoura Hills	22%	$110,716	5%
Calabasas	21%	$119,624	6%
Hidden Hills	10%	$250,000+	-
Malibu	13%	$135,530	7%
Westlake Village	16%	$115,018	3%
Los Angeles County	72%	$55,476	16%

[1] Median income was determined by averaging the median income of Census tract groups that were within the study area

Source: STV, 2015; Census, 2010

### 3.3.2 Pollution and Vulnerable Populations

The CalEnviroScreen 2.0 methodology was used to evaluate communities which may be disproportionately burdened by pollution. The CalEnviroScreen scores incorporate a broad range of factors related to pollution and health; they include environmental indicators, such as particulate matter and traffic, and also socioeconomic characteristics, such as elderly populations, poverty levels, and educational attainment. Census tracts with lower scores have a lesser pollution burden, while tracts with higher scores face higher environmental risks and have more sensitive populations.

Compared to Los Angeles County, the LVM Mobility Matrix Subregion scores in the lowest percentiles for pollution and environmental risk. The relatively high incomes, low percentages of minority populations, and geographical location all contribute to low scores for the Mobility Matrix Subregion.

Figure 3-4 illustrates the pollution burdens for the study area, relative to the scores for the entire County. The scores are broken down into percentiles, with green representing the lowest burden and red representing the highest.

Figure 3-4. LVM Mobility Matrix Subregion Pollution Burdens and Vulnerable Populations, Relative to Los Angeles County
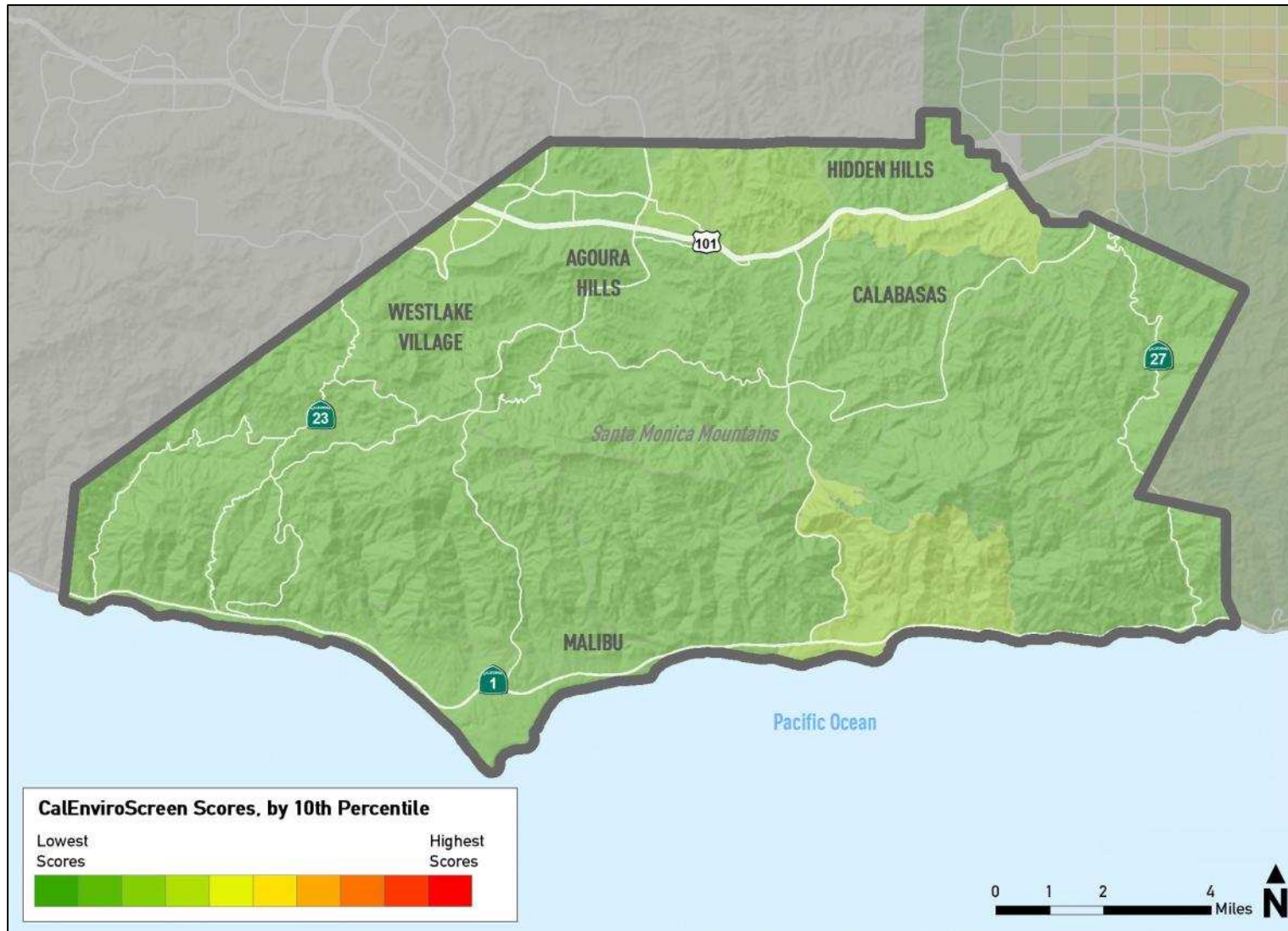
Source: STV, 2015; CalEPA, 2014

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4.0 TRAVEL MARKETS

To set the stage for examining the existing transportation system in the Mobility Matrix subregion, this section analyzes the key travel markets of the area. This can be used to determine where commuters are heading to/from, and which movements require the most attention for potential improvement programs and projects.

4.1 Definitions

Subregional trip patterns were developed using the Metro model (year 2014). The model data were summarized for two conditions: Total Daily Person Trips, and AM Peak Hour Home Based Work Trips. The model was used to determine the number of trips from the LVM Mobility Matrix Subregion to other Southern California destinations and vice versa. This gives a general understanding of the major travel patterns associated with people who live and work in the LVM study area.

Some basic definitions that apply to trips as described in this section are as follows:

- **Trip**: One-way journey or movement from a point of origin to a point of destination.

- **Home-based trip**: When the home of the trip maker is either the origin or destination of the trip.

- **Non-home based trip**: Neither end of the trip is the home of the trip maker.

- **Trip Production**: Home end (origin or destination) of a home-based trip, or origin of a non-home-based trip.

- **Trip Attraction**: Non-home end (origin or destination) of a home-based trip, or destination of a non-home based trip.

The plots and data provided show daily person trips, which include all trips made for any reason throughout the day, and home based work trips which are trips from home to work and back.

4.2 Daily Trip Patterns

The model shows that approximately 346,000 daily trips are produced and 376,500 trips are attracted to the LVM Mobility Matrix Subregion; nearly half of the trips stay within the Subregion, while the other half go outside to other areas.

The highest trip producer and attractor is the San Fernando Valley Mobility Matrix Subregion. Approximately 21% of all trips produced by the LVM study area go to the San Fernando Valley on an average day. Nearly 22% of all trips coming into the study area are from the San Fernando Valley.

Ventura County has the second highest number of trip interactions with the LVM area; 11% of the outbound daily trips go to Ventura County, and 17% of the inbound trips are from Ventura County. The Westside subregion is the third highest daily trip producer and attractor. All the remaining regions together represent less than 15% of the trip origins and destinations.

Table 4-1 and Figure 4-1show the trips produced and attracted for the study area.

Table 4-1. Daily Trip Productions and Attractions (2014) – LVM Mobility Matrix Subregion

To/from Subregion	Trips Produced	% of Trips Produced	Trips Attracted	% of Trips Attracted
Las Virgenes/Malibu	**159,166**	**46%**	**159,166**	**42%**
San Fernando Valley	73,004	21%	82,868	22%
Ventura County	37,686	11%	62,712	17%
Westside	31,880	9%	22,120	6%
Central Los Angeles	13,646	4%	10,343	3%
Orange County	14,299	4%	2,529	1%
San Gabriel Valley	3,213	1%	16,840	4%
Gateway Cities	5,361	2%	7,045	2%
South Bay	2,573	1%	6,753	2%
Other	5,176	1%	6,121	1%
Total	**346,004**	**100%**	**376,497**	**100%**

Source: Iteris, 2014; Metro 2014 SRTP

Note: Trip patterns are based on aggregation of trip table data from the Travel Demand Model utilized for the Metro 2014 SRTP formatted by Los Angeles County subregional boundaries, as depicted in the Mobility Matrix work effort, which do not exactly correspond to the 2009 Metro LRTP subregional boundaries.

Figure 4-1. Daily Trip Productions and Attractions (2014) – LVM Mobility Matrix Subregion
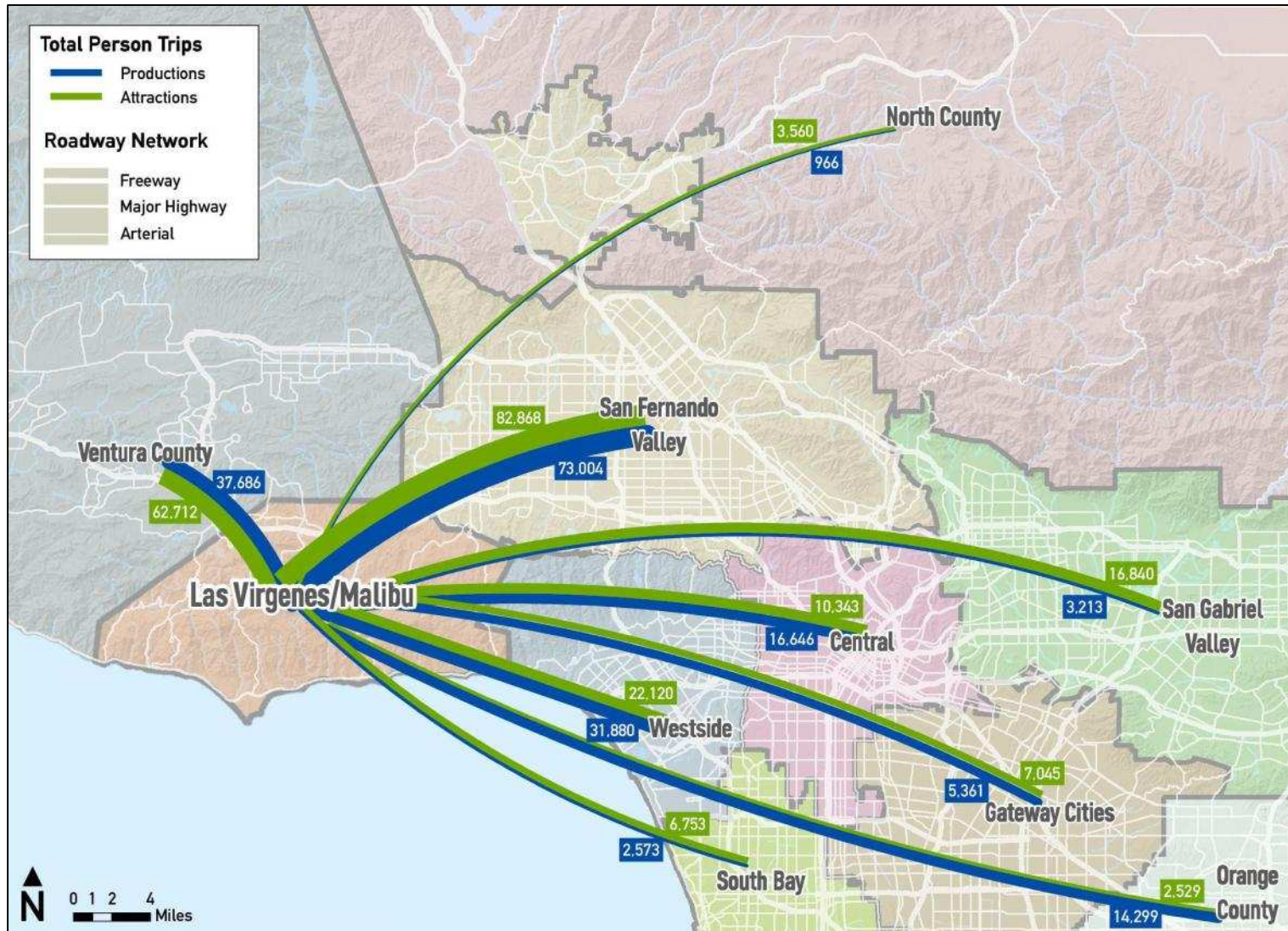
Source: STV, 2015; Iteris, 2014; Metro 2014 SRTP. Note: See Page 4-2 regarding subregional boundaries.

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4.3   AM Peak Hour Trip Patterns

There are approximately 45,000 AM peak hour home-based-work trips produced and 54,580 trips attracted by the LVM Mobility Matrix subregion. Over 80% of the morning commute trips leave the study area, indicating that the Subregion is a net exporter of work-based trips.

For AM peak hour travel, the San Fernando Valley is the greatest origin and destination. Almost a third of the workers who live in the LVM Mobility Matrix Subregion commute to the San Fernando Valley for work purposes; 30% of the total outbound morning trips go to the San Fernando Valley. Additionally, 30% of the total inbound AM trips come from the San Fernando Valley.

The Westside Mobility Matrix Subregion, Ventura County, and the Central Mobility Matrix Subregion are the next highest origins and destinations of home-based-work trips. Between the three areas, about 43% of the home-based-work trips leave the study area and travel to these three areas for work. About 39% of all trips entering the study area for work come from these three areas.

Table 4-2 and Figure 4-2 show the AM peak hour home-based work trips produced and attracted for the study area.

Table 4-2. AM Peak Hour Home-Based-Work Trip Productions and Attractions (2014) – LVM Mobility Matrix Subregion

To/from Subregion	Trips Produced	% of Trips Produced	Trips Attracted	% of Trips Attracted
San Fernando Valley	13,679	30%	16,426	30%
Westside	11,002	25%	3,134	6%
Las Virgenes/Malibu	**8,525**	**19%**	**8,525**	**16%**
Ventura County	4,949	11%	15,234	28%
Central Los Angeles	3,674	8%	2,672	5%
San Gabriel Valley	1,017	2%	2,083	4%
South Bay	898	2%	2,072	4%
Gateway Cities	926	2%	1,816	3%
Other	318	1%	2,621	5%
Total	**44,988**	**100%**	**54,583**	**100%**

Source: Iteris, 2014; Metro 2014 SRTP

Note: Trip patterns are based on aggregation of trip table data from the Travel Demand Model utilized for the Metro 2014 SRTP formatted by Los Angeles County subregional boundaries, as depicted in the Mobility Matrix work effort, which do not exactly correspond to the 2009 Metro LRTP subregional boundaries.

Figure 4-2. AM Peak Hour Home-Based-Work Trip Productions and Attractions (2014) – LVM Mobility Matrix Subregion
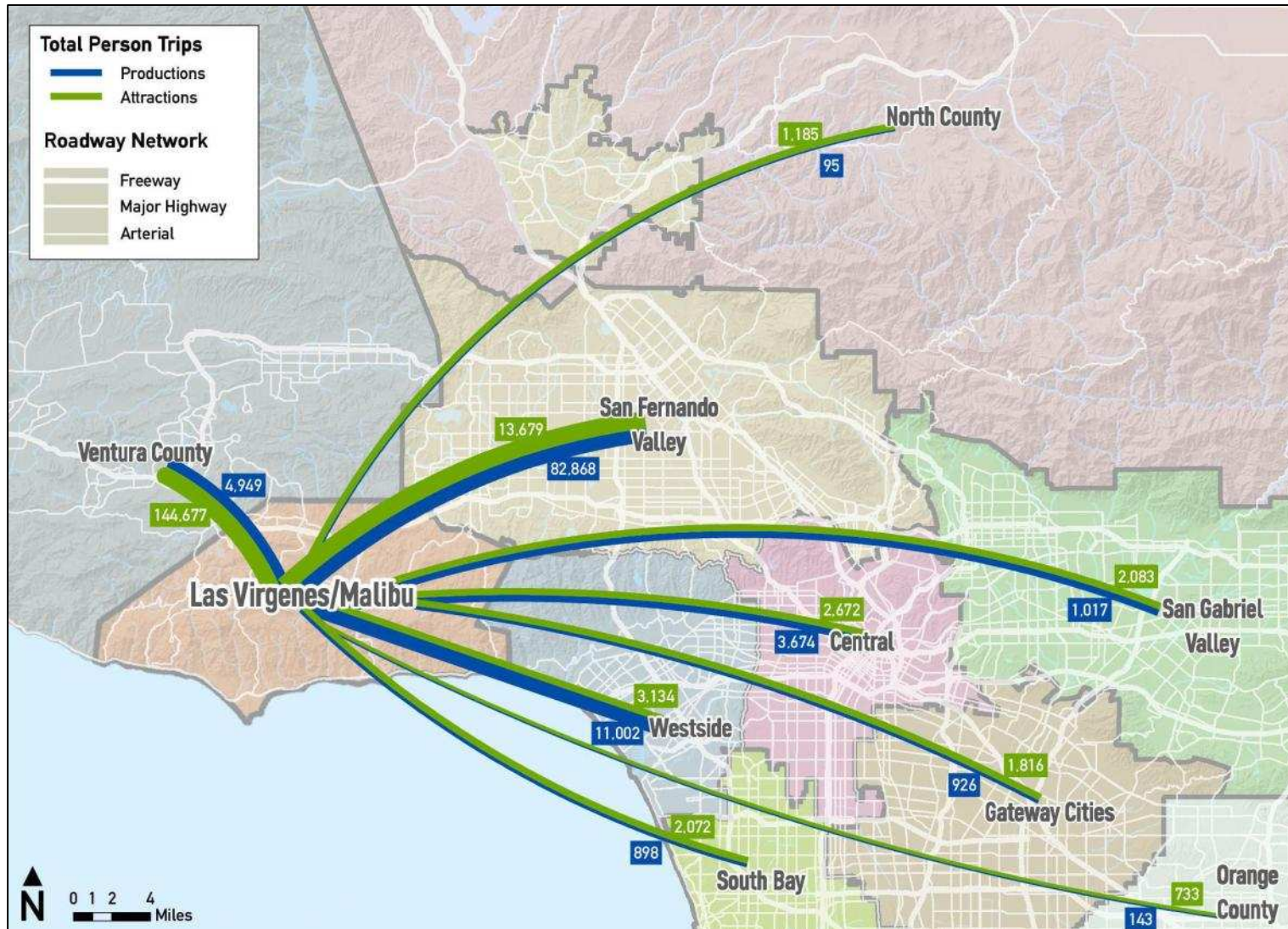
Source: STV, 2015; Iteris, 2014; Metro 2014 SRTP. Note: See Page 4-4 regarding subregional boundaries.

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

5.0 FREEWAYS AND ARTERIALS

Travel demand modeling analysis, as well as review of speeds and slow spots, was used to determine existing baseline conditions and future conditions on the freeways and key arterial roadways.

5.1 Freeway Volumes

The Caltrans Freeway Performance Monitoring System (PeMS) was used to assess freeway volumes and speeds. PeMS is used by Caltrans for performance analysis, including monitoring of traffic flow, congestion monitoring and estimating travel time reliability. Within the study area, Caltrans PeMS monitoring locations were available through the freeway system at various locations.

The segment of the US-101 freeway that runs through the LVM Mobility Matrix Subregion has average daily traffic (ADT) volumes ranging from 150,500 vehicles per day at the western end of the subregion at the Ventura County line, to 195,500 vehicles per day at the eastern end near the border of the San Fernando Valley Mobility Matrix Subregion.

Figure 5-1 illustrates the average daily traffic volumes in the study area.

Figure 5-1. Average Daily Traffic Volumes on LVM Mobility Matrix Subregion Freeways

Source: STV, 2015; Iteris, 2014; Caltrans, 2014

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU
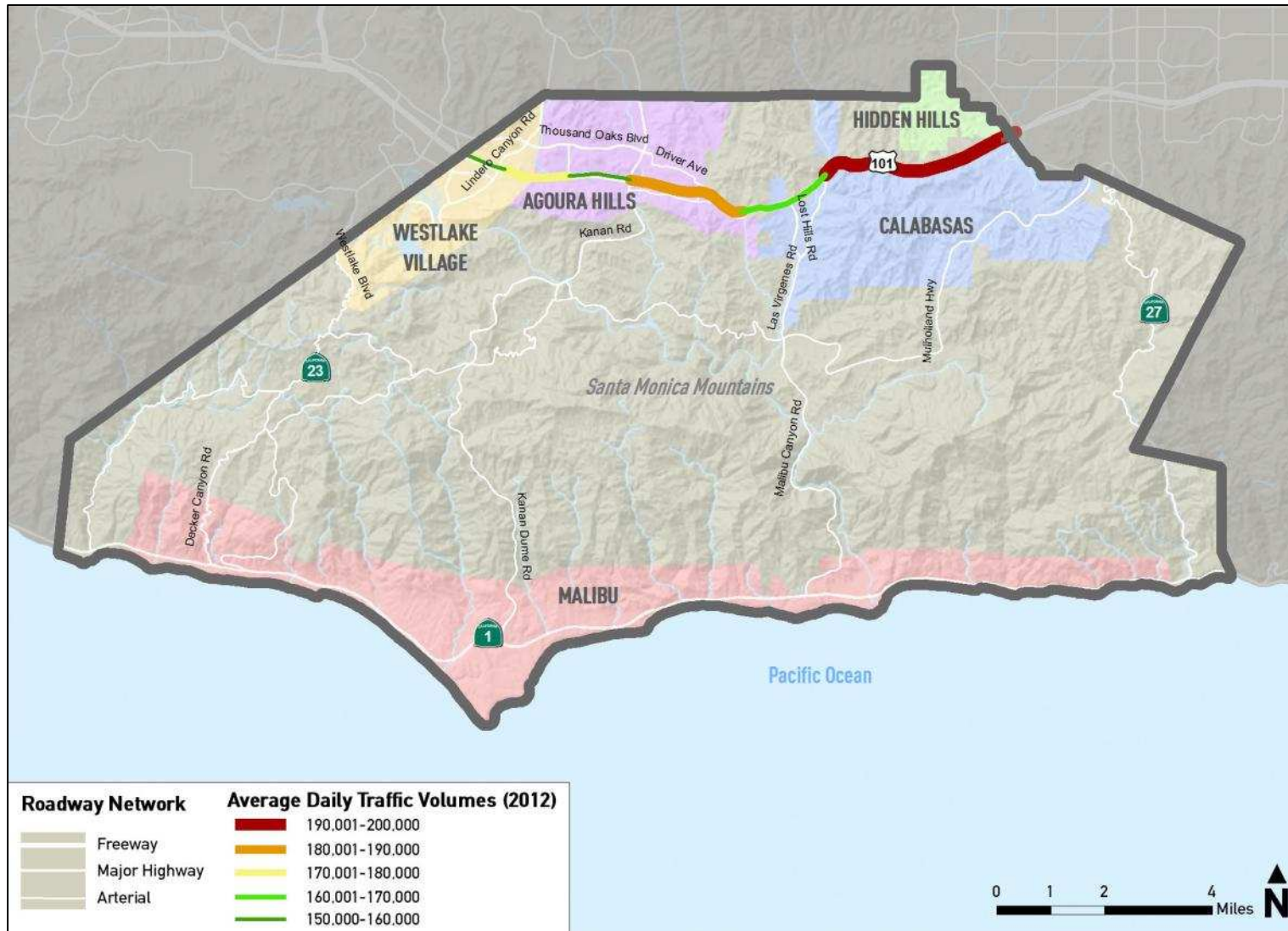
5.2   Freeway Speeds

Using the PeMS database, average speeds were extracted for freeways in the study area. October 2013 speed data were reviewed to understand typical peak hour operating speeds on the freeway system in the subregion. Only typical weekdays (non-holiday Tuesdays, Wednesdays and Thursdays) were used as a basis for the average speed data extraction. Speeds were extracted over the 24 hours of every weekday, with the peak hours chosen based on the slowest observed speeds during the peak commute period.

During the AM peak hour, only the westbound segment of US-101 at the eastern edge of the study area has slowing below 50 miles per hour. The remaining portion of the freeway typically operates at speeds exceeding 50 mph, and in much of the subregional study area, at 60 mph or faster.

During the PM peak hour, there is much more slowing observed in the eastbound direction. Approximately half of the eastbound segment of US-101 in the subregion experiences very slow speeds of under 30 mph during the evening peak hour.

Figure 5-2 illustrates the AM peak hour freeway speeds in the Mobility Matrix Subregion.

Figure 5-2. AM Peak Hour Speeds on LVM Mobility Matrix Subregion Freeways
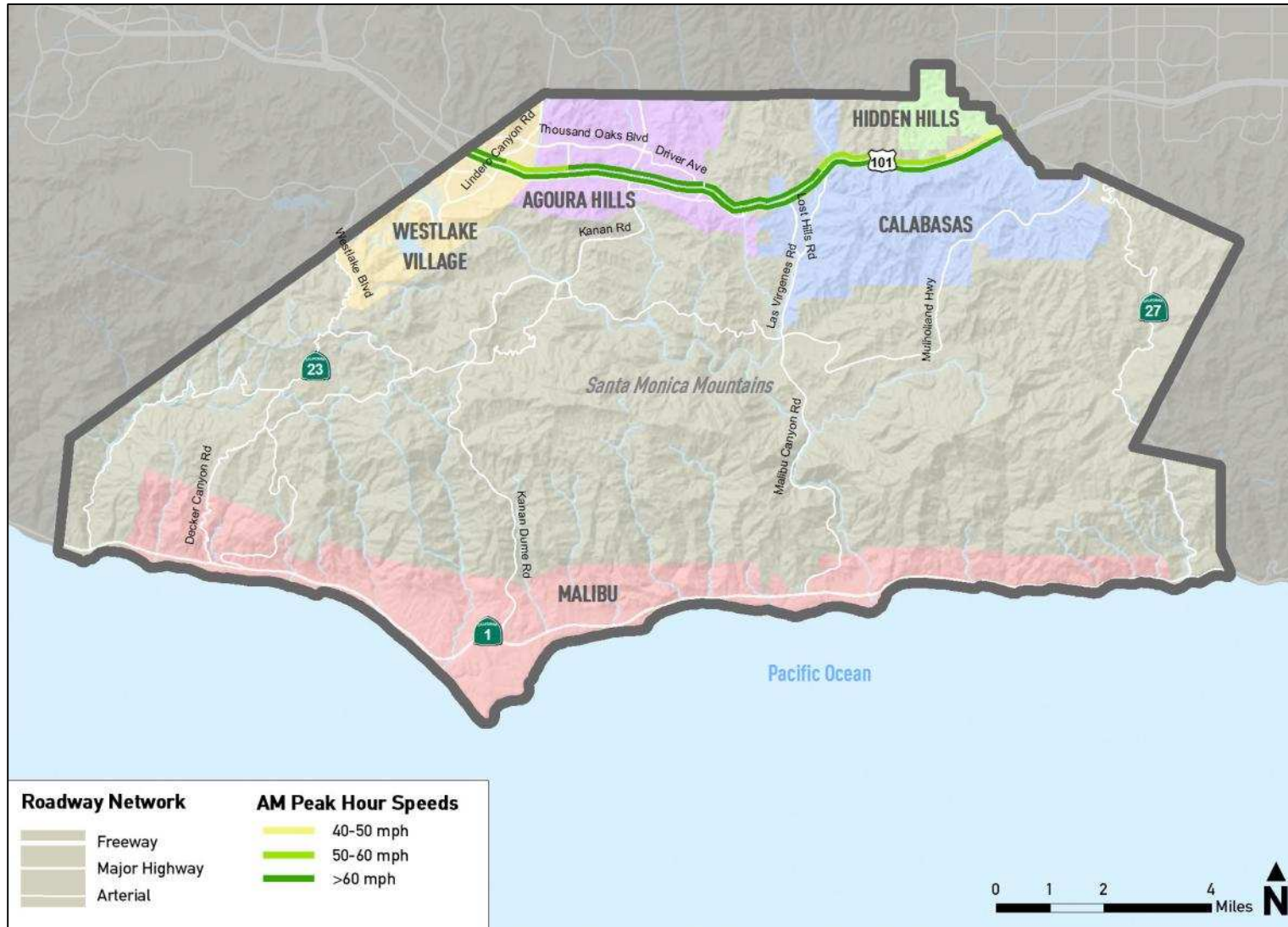
Source: STV, 2015; Iteris, 2014; Caltrans, 2014

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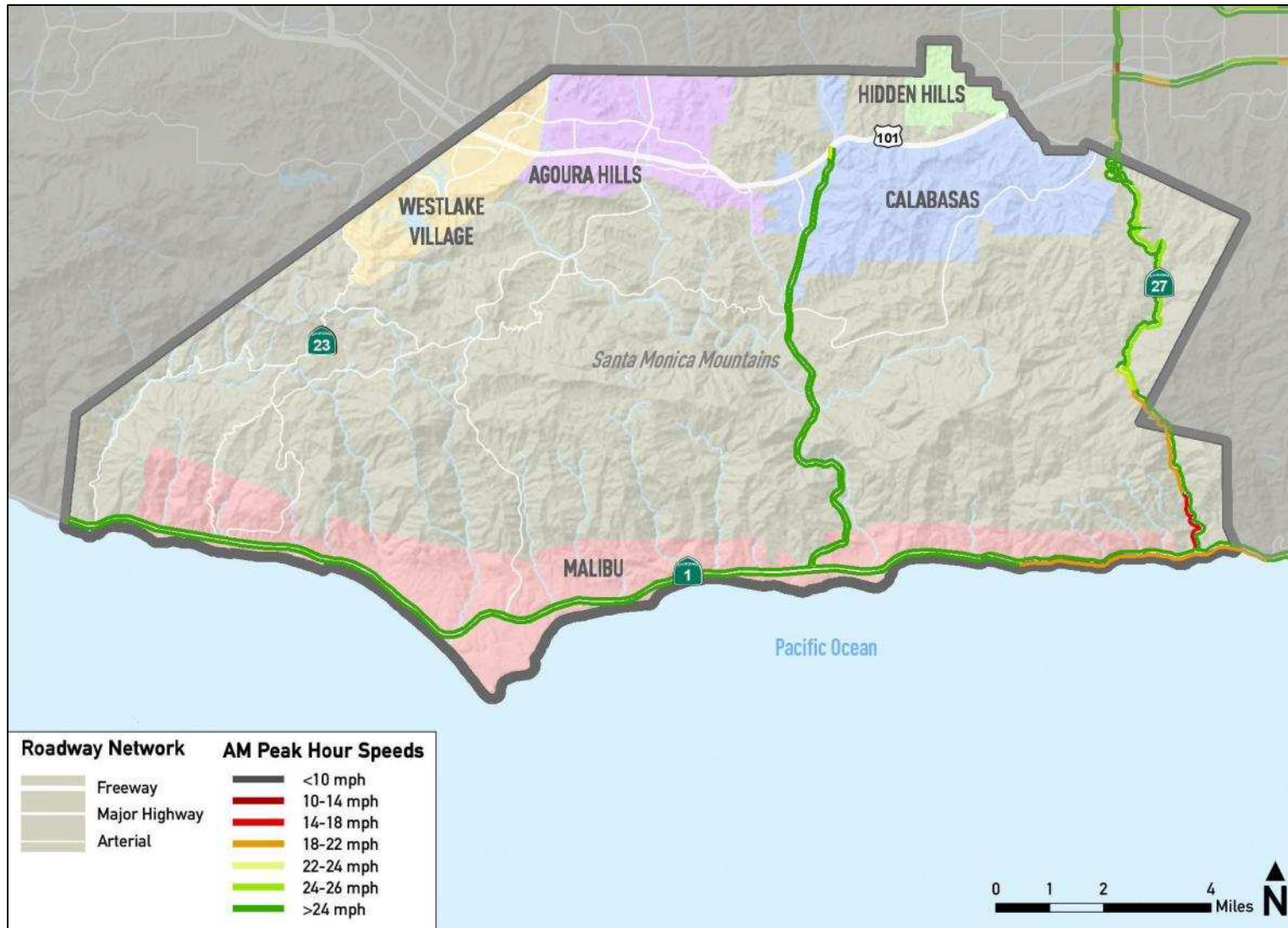
5.3   Arterial Volume and Speed

Unlike the freeway PeMS system, there is no single comprehensive source of daily traffic flow information on arterial roadways. Many cities do not regularly collect traffic counts or only do so for special studies or as needed in selected locations. Due to the lack of available count-based arterial volume data, the Metro 2014 travel model was used to identify daily volumes on selected key arterial corridors. The model is a good tool to assess the overall magnitude of arterial traffic flow and to understand which roadways and segments carry the highest amount of traffic in the subregion.

Peak hour traffic speeds on the arterial roadways were also analyzed through the use of iPeMS system. The iPeMS gathers vehicle probe data along arterials and then delivers real-time and predictive traffic analytics. For this analysis, vehicle probe data were assessed for the months of January through April 2013, and for the hours of 7:30-8:30 AM and 4:30-5:30 PM. Similar to freeway PeMS, the data can be used to assess points of slowing on the arterial system.

The corridors which were analyzed include arterial roadways that are a part of the 2010 Los Angeles County Congestion Management Program (CMP), along with other key regionally significant corridors that were selected for the study.

Peak hour slowing occurs on portions of PCH southbound in the morning at the eastern end of the study area, as well as southbound on Topanga Canyon Boulevard in the morning. Figure 5-3 illustrates the average speeds for the AM peak period.

Figure 5-3. AM Average Peak-Hour Speeds on LVM Arterials

Source: STV, 2015; Iteris, 2014

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5.4 Goods Movement

There are a limited number of truck routes in the LVM Mobility Matrix Subregion. These routes are designated for use by trucks, including non-local "through" trucks which do not have a local destination. Other trucks making local deliveries can legally use the entire arterial system, unless specifically prohibited by ordinance. Non-local through trucks must use the designated truck route system.

Traffic crash data for the three year period of 2008 to 2011 were reviewed to determine where crashes have occurred which involve a truck. While there have been some truck-related crashes in the study area, there have been no hot spots where three or more collisions occurred in the same area.

Figure 5-4 shows truck routes in the Mobility Matrix Subregion, including municipal routes, routes designated by the Surface Transportation Assistance Act (STAA), and the DRAFT Los Angeles Countywide Strategic Truck Arterial Network (CSTAN). This is a strategic goods movement arterial plan network of facilities designated by Metro.

Figure 5-4. Designated Truck Routes – LVM Mobility Matrix Subregion
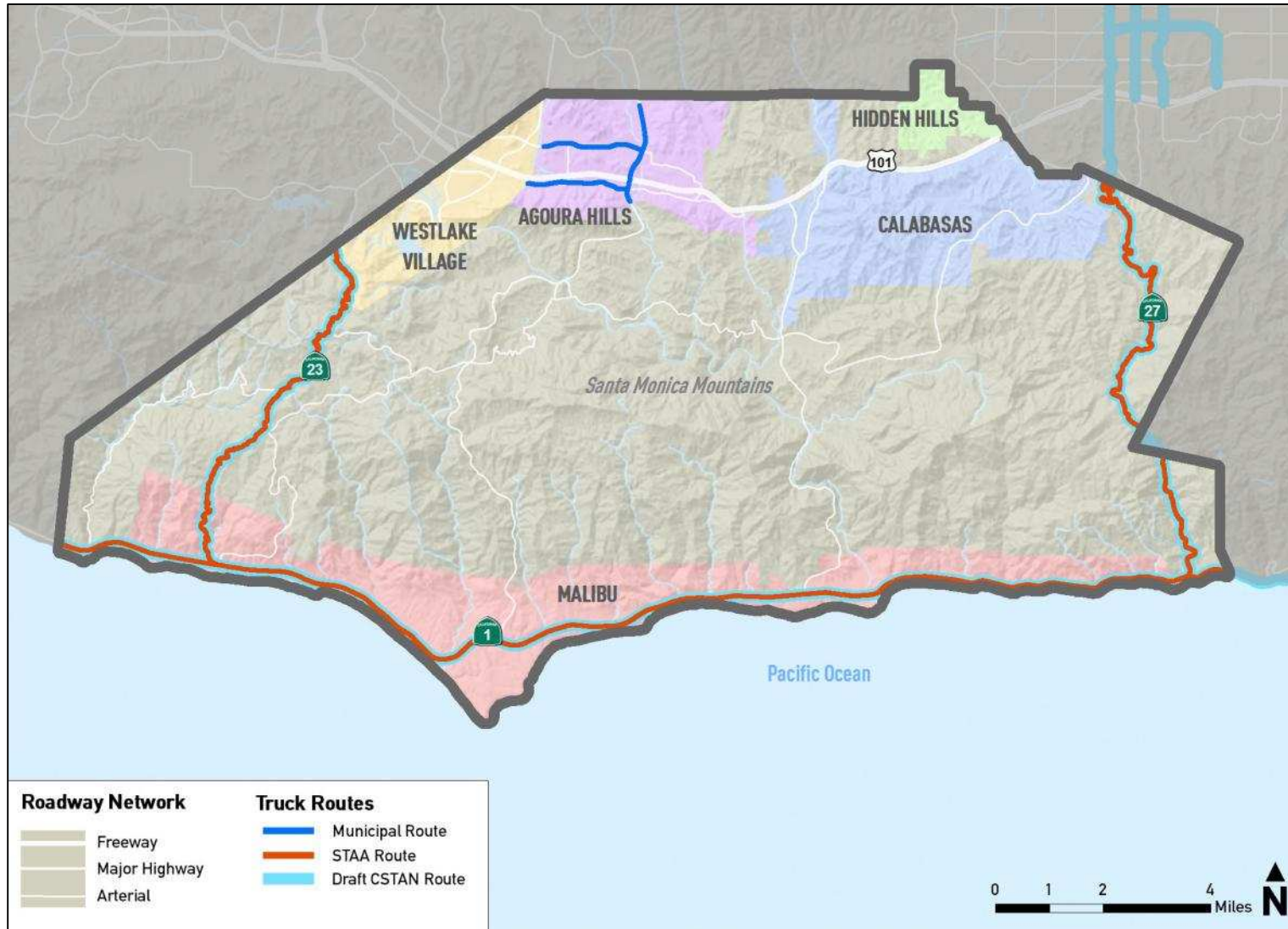
Source: STV, 2015; Iteris, 2014

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6.0 ACTIVE TRANSPORTATION

The Las Virgenes-Malibu area has been built with a suburban form that does not lend itself to bicycling or walking. The street network consists of primarily disconnected streets. Large arterial streets lead to residential culs-de-sac with no grids and relatively few options for people to walk or bicycle from one street to the other without going along a circuitous route. This pattern makes schools, parks, stores and other destinations inconvenient to reach by walking or bicycling.

Land use in the area also follows a suburban form that separates residential uses from commercial land. While some parks and schools are integrated into residential neighborhoods, the dominant land use pattern coupled with the disconnected street network renders walking and bicycling inconvenient. Moreover, low density land uses spread distances in the region. People living in residential areas near The Commons in Calabasas have opportunities to walk to shopping, recreation, schools, and the civic center. Residents living near Thousand Oaks Boulevard in Agoura Hills can walk to shopping, recreation, and schools. Residents living between Agoura Road and Lindero Canyon Road in Westlake Village are close enough to stores, parks, City Hall, and schools. In Malibu, residents near the Pacific Coast Highway between Civic Center Way and the Malibu Pier can walk to stores, restaurants, and the civic center.

Table 6-1 shows that bicycling and walking represent a tiny fraction of commute modes in the study area, at less than 3% combined. Over three quarters of commuters drive alone to work.

Table 6-1. Bicycling and Walking Commute Mode Share

Mode	Mode Share
Bicycling	0.3%
Walking	2.4%
Drive Alone	77.4%

Source: Census, 2010

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

6.1 Bicycle Facilities

6.1.1 Existing Bicycle Facilities

Some communities within the Las Virgenes-Malibu area have installed bikeways in limited locations. The following bikeway definitions are used.

- **Bike paths (Class I):** Exclusive paved paths separated from the roadway for bicyclists and other non-motorized users
- **Bike lanes (Class II):** Striped, stenciled, and signed lanes in the street dedicated for bicycles
- **Bike routes (Class III):** Signed bicycle routes in lanes that are shared with other traffic
- **Bike boulevards:** Bicycle routes that are enhanced with traffic calming measures such as, but not limited to, traffic circles in lieu of stop controls, roundabouts, diverters, or bicycle-only traffic signals
- **Protected bike lanes:** Bike lanes that are in the street and are physically separated from the other travel lanes by parked cars, a painted area, planters or other barriers.

Figure 6-1 shows the existing and proposed bikeways in the LVM Mobility Matrix Subregion, which were collected from city bicycle plans, the County's Bicycle Master Plan, and the draft LVMCOG Bicycle Master Plan.

6.1.2 Proposed Bicycle Facilities

Table 6-2 shows that Agoura Hills and Westlake Village have bike lanes on significant portions of their primary access streets. Some of these include Thousand Oaks Boulevard and Agoura Road in Agoura Hills, and Lindero Canyon and Agoura Road in Westlake Village. Calabasas has bike lanes on some of their primary access streets, such as Calabasas Road and Agoura Road. Bikeways of any type are relatively sparse in the remainder of the study area. Malibu has a bike route along the length of PCH. While some streets in the study areas have existing bikeways, the bike lanes are primarily on wide, high-speed thoroughfares.

Table 6-3 shows currently planned facilities in the Mobility Matrix Subregion. Overall, total mileage of bikeways is planned to nearly quadruple. However, the bike lane miles would less than double. Fully 78% of the new bikeway miles will be signed bike routes, and 75% of these will be on rural roads through mountainous areas. This is likely due to the lack of space available to add bike lanes or any enhanced type of bikeway. Many miles of mountain roads are narrow with steep sides and widening would require significant grading at great cost.

Figure 6-1. Existing and Proposed Bikeways – LVM Mobility Matrix Subregion
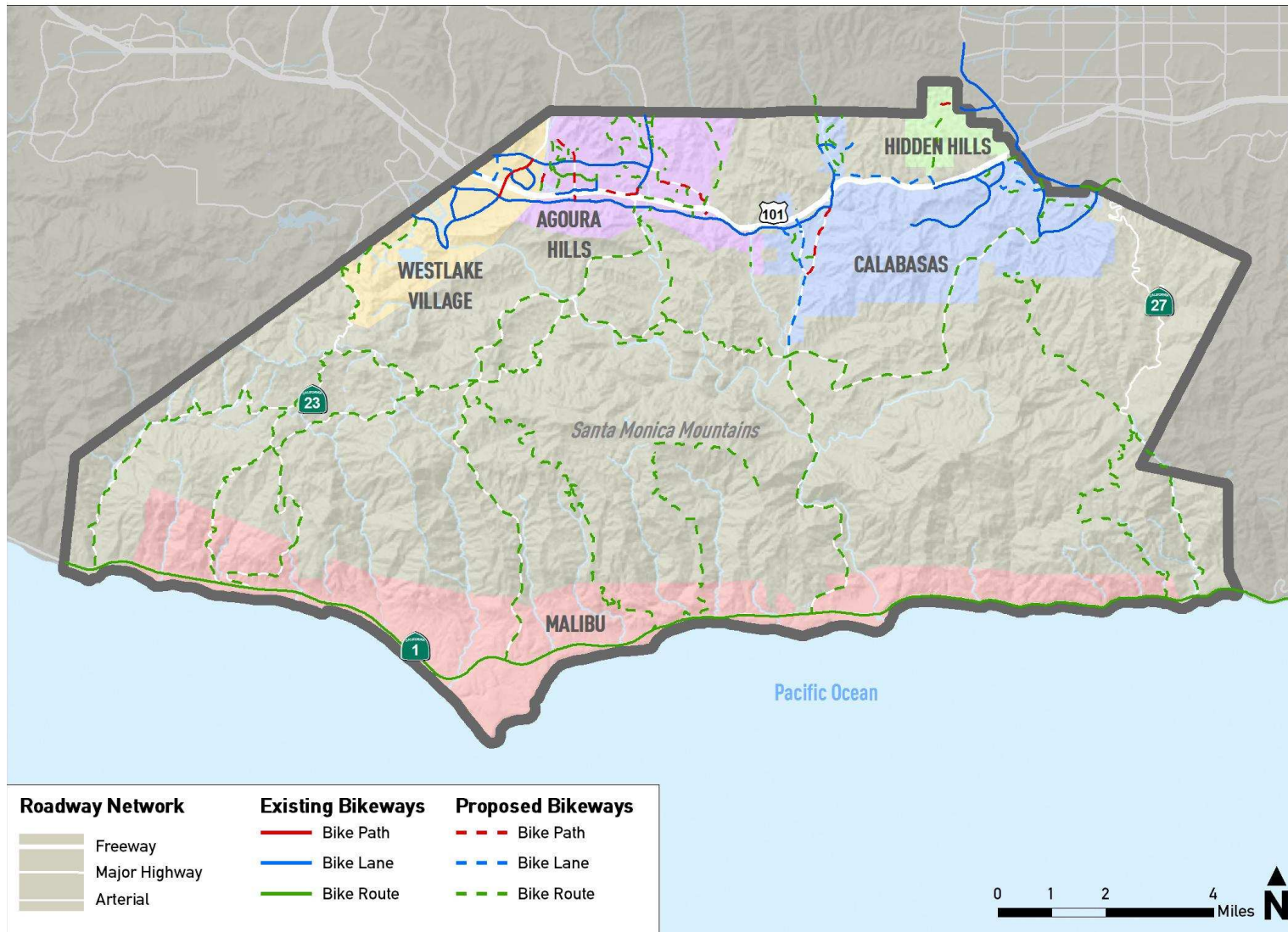
Source: STV, 2015; RSA, 2014

Table 6-2. Existing Bicycle Facilities in Study Area

Type	Agoura Hills	Calabasas	Hidden Hills	Malibu	Westlake Village	Unincorporated County	Total
	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)
Bike path	0.0	0.0	0.0	0.0	0.8	0.0	0.8
Bike lane	9.9	8.4	0.0	1.1	7.7	0.5	27.6
Bike route	0.9	0.0	0.0	18.8	0.0	0.0	19.7
Total	10.8	8.4	0.0	19.9	8.5	0.5	48.1

Source: RSA, 2014

Table 6-3. Proposed Bicycle Facilities in Study Area

Type	Agoura Hills	Calabasas	Hidden Hills	Malibu	Westlake Village	Unincorporated County	Total
	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)	Length (mi.)
Protected bike lane	1.0	0.0	0.0	0.0	0.0	0.0	1.0
Bike path	4.1	1.6	0.0	0.3	0.0	0.0	6.0
Bike lane	2.8	17.1	0.04	0.1	1.2	1.8	23.0
Bike route	11.3	10.3	0.2	9.2	1.4	95.8	128.2
Bike route/ bike lane	0.0	0.0	0.0	3.9	0.0	0.0	3.9
Bike route/ bike boulevard	2.5	0.0	0.0	0.0	0.0	0.0	2.5
Bike boulevard	0.0	0.0	0.0	0.0	2.1	0.0	0.0
Total	21.7	29.0	0.2	13.5	4.7	97.6	164.6

Source: RSA, 2014

**SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU**

6.2   Safety

Safety is a major concern in the subregion, especially in Malibu. From 2008 to 2012, there has been an average of about 30 bicycle or pedestrian collisions per year in the LVM Mobility Matrix Subregion. Bicycle collisions outnumber pedestrian collisions. Most collisions result in moderate or minor injuries, while 4% of collisions are fatal.

Half of the collisions involving bicyclists and pedestrians occurred along PCH, with a higher concentration on the eastern side of Malibu. Several factors explain the high rates of collisions along PCH, including high traffic speeds, a lack of safe crossings for pedestrians, a lack of bicycle lanes for bicyclists, and the prevalence of on-street parking. High collision rates may indicate deficiencies in active transportation infrastructure, but may also be due to high levels of walking and biking in certain areas.
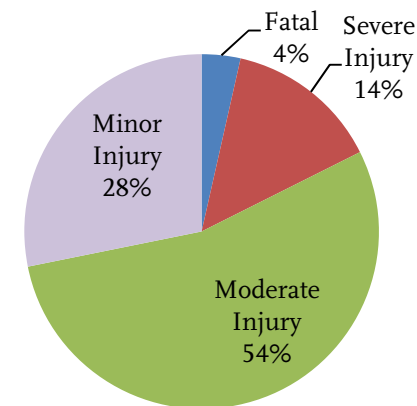
Figure 6-2. Number of Collisions from 2008-2012 shows the general trend of collisions across the five years, and Figure 6-3 summarizes the severity of all the collisions. Figure 6-4 depicts the relative density of the incidents, showing several hot spots at major intersections as well as some high-incident corridors.

Figure 6-2. Number of Collisions from 2008-2012
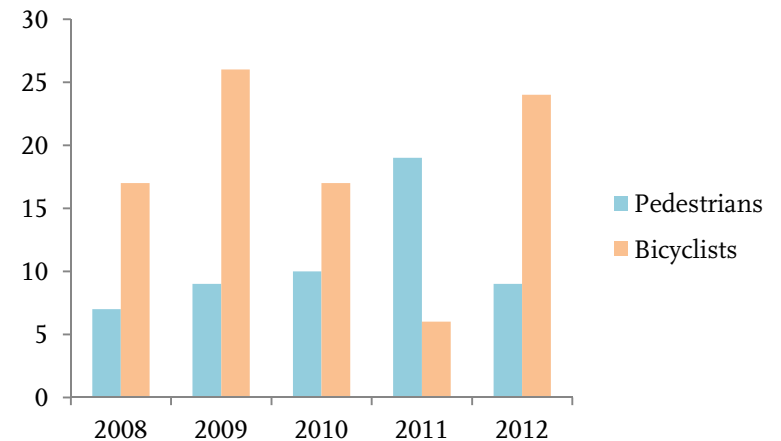
Source: SWITRS, 2008-2012

Figure 6-3. Severity of Collisions in Study Area, 2008-2012

Source: SWITRS, 2008-2012

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

Figure 6-4. Bicycle and Pedestrian Collisions 2008-2012 – LVM Mobility Matrix Subregion
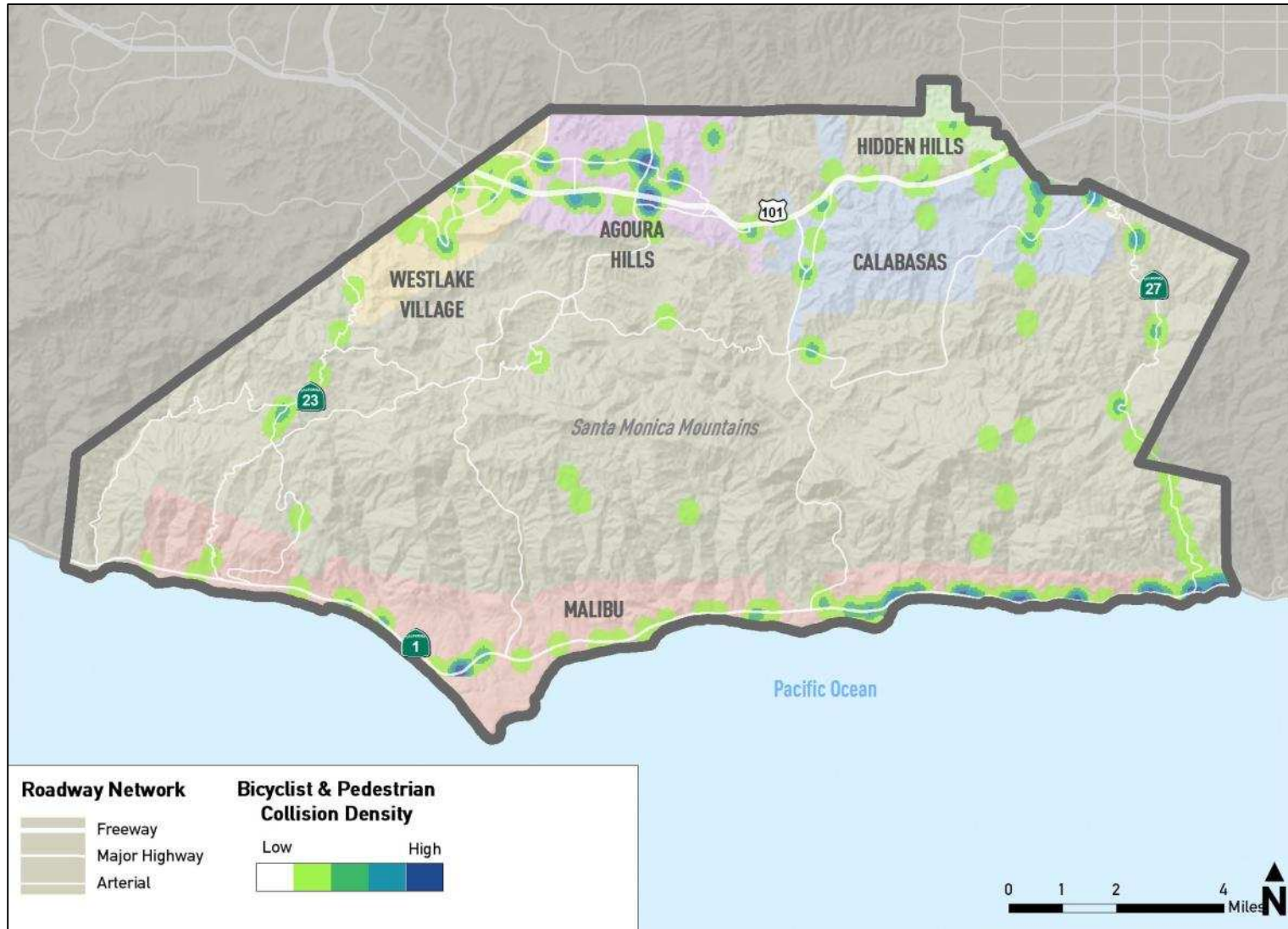
Source: STV, 2015; SWITRS, 2008-2012

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

7.0 TRANSIT

Most of the transit in the LVM Mobility Matrix Subregion is limited to a few express buses and city-run trolleys and shuttles. The Metro express bus on PCH is the most heavily traveled bus line in the Subregion, at over 3,000 riders per weekday. Boardings and alightings in the study area are highest around Pepperdine University and Malibu Civic Center, as well as near the Trancas Country Market Center and Zuma Beach.

In the Las Virgenes area, LADOT and Metro operate along the US-101 corridor, with routes that carry over 500 and 1,400 riders, respectively.

Calabasas provides the most municipal transit in the study area, with seven lines that carry between 15 and 40 riders per line daily. Malibu and Agoura Hills do not offer daily bus service, though Agoura Hills' summer Beach Bus serves an average of 181 riders per day. Westlake Village's weekend trolley, which was piloted during Summer 2014, was very successful with about 130 daily passengers on average. All the cities, except for Hidden Hills, offer dial-a-ride services.

Table 7-1 and Figure 7-1 summarize the transit service and ridership levels in the LVM Mobility Matrix Subregion.

Table 7-1. Transit Service and Average Daily Ridership in Study Area

Operator	Service Type	Transit Lines	Average Daily Ridership
Metro	Express	534	3,109
	Local	161	1,480
LADOT	Express	423	537
Calabasas Transit	Shuttle	1	30
		2	23
		3	18
		4	17
		5	35
		6	36
		Trolley	27
Westlake Village	Seasonal	Summer Trolley	137*
Agoura Hills	Seasonal	Summer Beach Bus	181**

*Service on weekends only
**Service on weekdays only

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

Figure 7-1. Transit Service – LVM Mobility Matrix Subregion

Source: STV, 2015

SUBREGIONAL MOBILITY MATRIX – LAS VIRGENES/MALIBU

8.0 CONCLUSIONS AND NEXT STEPS

Recently completed and funded projects in the LVM Mobility Matrix Subregion focus on improving operations at key freeway interchanges, but there are few projects which expand or build new facilities. The topography constrains the cities' ability to build more capacity, and as a result, there is strong interest in improving operational efficiency on existing roads.

While the ADT and peak hour speeds on the study area's freeways and arterials are not as congested or as slow compared to the rest of the County, non-recurring congestion is an important issue. Furthermore, there are several key intersections where performance is low. Overall, based on the travel patterns and arterial speeds, improvements to the freeways and arterials in the subregion should be focused on US-101 near the San Fernando Valley.

Expanding active transportation mode share can help decrease the number of vehicles on the road, but existing facilities are sparse, and the land use patterns are not conducive to walking and biking. The existing bikeways tend to be signed routes, which do not add much perceived safety. However, the planned bikeways will do much to improve safety and will close gaps in the bikeway network.

Transit service is limited in the area, with only a handful of commuter lines coming in from the Westside and San Fernando Valley, and some city-operated shuttles. However, the city's seasonal shuttles are successful at moving summer travelers to the beach. Several cities have expressed interest in creating transit links between the Las Virgenes area and the Malibu area, and this could be accomplished with shuttles such as Agoura Hills' Summer Beach Bus.

The baseline data described in this report will be used in the evaluation of the preliminary project list, which is the next step in this study.
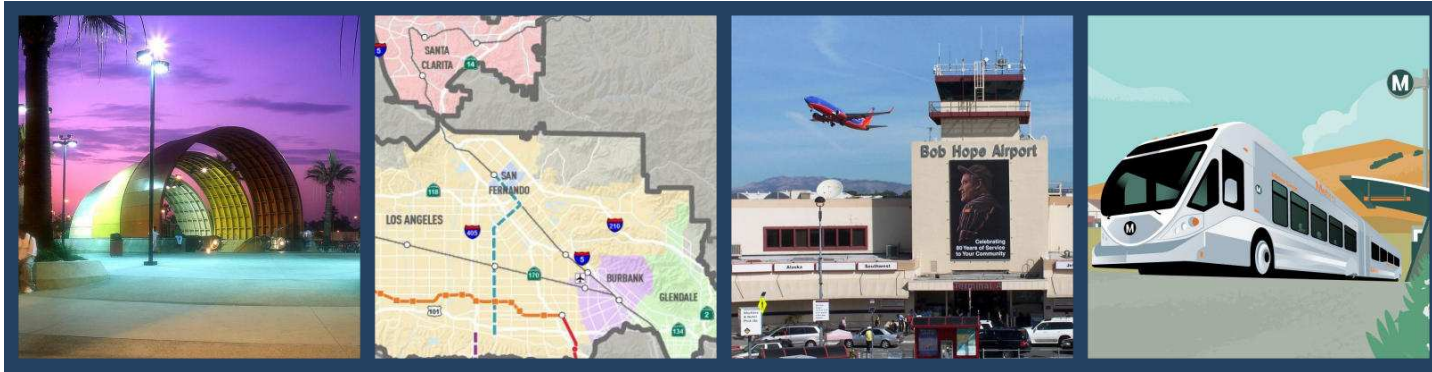
SUBREGIONAL MOBILITY MATRIX

Project No. PS-4010-3041-YY-01-01

Appendix C – Methodologies – Final

Prepared for:

M **Metro**

Prepared by:

STV Incorporated
1055 West Seventh Street
Suite 3150
Los Angeles, CA 90017

March 2015

Appendix C – Methodologies – Final

Subregional Mobility Matrix
PS-4010-3041-YY-01-01

Prepared for:

Metro
Los Angeles County
Metropolitan Transportation Authority

Prepared by:
STV Incorporated

In Association With:
Iteris, Inc
Katherine Padilla & Associates
Ryan Snyder Associates, LLC

Quality Review Tracking

Version	Date	Reviewer	Reviewer Signature
Draft	1/30/15	STV Reviewer: Tyler Bonstead	TRB
Final	3/11/15	STV Reviewer: Tyler Bonstead	TRB

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1.0 INTRODUCTION

The following document describes the methodologies used for the performance evaluation, project categorization, and cost estimating exercises for Metro's Subregional Mobility Matrix studies.

2.0 PROGRAM EVALUATION METHODOLOGY OVERVIEW

This document outlines the context and approach for evaluating projects and programs submitted for consideration in the subregional Mobility Matrices.

2.1 Background and Context

The Mobility Matrices are intended as a preliminary input into Metro's forthcoming Long Range Transportation Plan (LRTP) update process. The Mobility Matrix effort has involved collecting improvement projects and defining subregional improvement programs, defining subregional goals and objectives, analysis of baseline conditions, and a high-level evaluation of programs submitted for consideration. This document outlines the approach for evaluation of subregional projects and programs.

The Mobility Matrix process does not involve any prioritization. Rather, the Mobility Matrix is intended as a screening tool and a starting point in the Metro 2017 LRTP update process. It is also a tool to assist subregions in reaching consensus on goals and objectives and unmet transportation needs.

The intent of the Mobility Matrix process is to identify subregional projects and programs with the potential to address subregional and countywide transportation needs and goals for later quantitative analysis.

Metro and the Mobility Matrix consultant teams investigated the potential for a quantitative screening evaluation process, but this proved infeasible for the following reasons:

- **Inconsistent project details**. Most cities in Los Angeles County did not have the resources or staff available to provide detailed data on their project concepts within the Mobility Matrix development timeframe. Performing quantitative analysis on inconsistent project lists would result in skewed evaluations.

- **Insufficient time and scope to fill in all data gaps**. The condensed time frame and limited scope of Mobility Matrix process was deemed insufficient to warrant a detailed outreach to all 89 jurisdictions to collect all the data and project details necessary for a rigorous quantitative evaluation.

Due to the limited time frame for completion and largely incomplete and inconsistent project/program details and data, the Mobility Matrix evaluation is qualitative in nature, focusing on each program's potential to address countywide and subregional goals and objectives. This was done to ensure a consistent, holistic county-wide approach.

2.2 Countywide Mobility Matrix Themes

Six broad themes guide the development of the Mobility Matrices, as shown below. These themes were developed based on the Metro LRTP and are shared among all subregions in the county. Each program considered in the Mobility Matrices receives one score for each of these six themes. The themes are defined as:

- **Mobility:** Develop projects and programs that improve traffic flow, reduce travel times, relieve congestion, and enable residents, workers, and visitors to travel freely and quickly throughout Los Angeles County.

- **Safety:** Make investments that improve access to transit facilities; enhance personal safety; or correct unsafe conditions in areas of heavy traffic, high transit use, and dense pedestrian activity where it is not a result of lack of normal maintenance.

- **Sustainability:** Ensure compliance with sustainability legislation (Senate Bill [SB] 375) by reducing greenhouse gas emissions to meet the needs of the present without compromising the ability of future generations to meet their own needs.

- **Economy:** Develop projects and programs that contribute to job creation and business expansion resulting from improved mobility.

- **Accessibility:** Invest in projects and programs that improve access to destinations such as jobs, recreation, medical facilities, schools, and others. Provide access to transit service within reasonable walking or cycling range.

- **State of Good Repair:** Ensure funds are set aside to cover the cost of rehabilitating, maintaining, and replacing transportation assets.

Although many of the projects/programs do not necessarily require repair or maintenance, State of Good Repair is included as a Mobility Matrix theme because it is a priority for Metro and local jurisdictions. The federal bill Moving Ahead for Progress in the 21st Century Act (MAP-21) calls for a renewed focus on ensuring transportation infrastructure is maintained in good conditions. The State of Good Repair theme is included in the Mobility Matrix to ensure its compliance with this renewed federal attention to system preservation, and it also highlights projects and programs that help Los Angeles County achieve its countywide goal of maintaining a state of good repair on transportation infrastructure.

2.3 Subregional Goals and Objectives

Through the Mobility Matrix process, each Metro subregion developed a set of subregion-specific goals and objectives associated with the six countywide themes above. A program's score is determined by its potential to contribute to one or more of these subregional goals and objectives.

2.4 Subregional Performance Metrics

The Mobility Matrix processes also included the development of subregional performance metrics associated with the six countywide themes identified in Section 1.2. These performance metrics are intended to inform future evaluation through the 2017 LRTP update process.

2.5 Evaluation Scores

The qualitative screening evaluation of projects and programs was intended to be easy to understand, qualitative in nature, and logical and consistent across all subregions. The evaluation methodology shown in Table 1-1 represents a collaborative effort spanning many months, and incorporates input from subregional representatives across the County.

Projects and programs were evaluated based on submitted project descriptions and attributes, and the potential of these to address subregional goals related to the Countywide Mobility Matrix Themes reported in Section 2.2.

Table 1-1. Evaluation Methodology

To Achieve the following score in a single theme:	Project must meet the corresponding criterion:
● HIGH BENEFIT	■ Significantly benefits one or more theme goals or metrics on a <u>subregional</u> scale
◐ MEDIUM BENEFIT	■ Significantly benefits one or more theme goals or metrics on a <u>corridor or activity center</u> scale
◔ LOW BENEFIT	■ Addresses one or more theme goals or metrics on a <u>limited/localized</u> scale (e.g., at a single intersection)
○ NEUTRAL BENEFIT	■ Has no cumulative positive or negative impact on theme goals or metrics
▬ NEGATIVE IMPACT	■ Results in cumulative negative impact on one or more theme goals or metrics

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3.0 PROJECT CATEGORIZATION METHODOLOGY OVERVIEW

This document outlines the approach for categorizing the potential implementation timeframes for projects and programs submitted for consideration in the subregional Mobility Matrices.

3.1 Background & Context

The Mobility Matrices are intended as a preliminary input into Metro's forthcoming Long Range Transportation Plan (LRTP) process. The Mobility Matrix effort has involved collecting improvement projects and defining subregional improvement programs, defining subregional goals and objectives, analysis of baseline conditions, and a high-level evaluation of programs submitted for consideration. This document outlines the approach for categorizing the projects and programs into short-, mid- and long-term implementation timeframes.

The Mobility Matrix process does not involve any prioritization. Rather, the Mobility Matrix project/program categorization process is intended as an informational tool for use by subregions.

3.2 Categorization Timeframes

A 20-plus timeframe was used as the basis for categorizing projects. As shown below, three timeframes were developed into which projects and programs could be categorized, with breakpoints at the ten and twenty year timeframes. The timeframes correspond to when the projects are completed and in operation.

Short-Term
0-10 years
(2015-2024)
Projects can be in completed and in operation in less than 10 years.
Mid-Term
11-20 years
(2025-2034)
Projects can be completed and in operation in 11 to 20 years.
Long-Term
20+ years
(After 2035)
Projects can be completed and in operation in more than 20 years.

3.3 Categorization Factors

Projects and programs were categorized into the three different timeframes based on a number of factors, including their readiness, need, funding availability or potential, and phasing, as described below:

- **Project Readiness** – What initial steps have been completed to-date or are in progress for the project or program – environmental documentation,

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project study report, alternatives analysis, feasibility study, engineering, inclusion in an approved plan or document, etc? What steps are needed before the project can be implemented? If a project has a number of these steps in progress or completed, it can more appropriately be placed in the short- or mid-term categories. A project with little or no progress to-date is more likely to be placed in the mid- or long-term categories.

- **Project Need** – Does the project or program serve a known deficiency, immediate need, or transportation problem that exists today (e.g., bottleneck, safety, etc.)? If the need is immediate, a project can more appropriately be placed in the short-term category. Projects fulfilling future needs (for example, in support of a major development planned 15 years from now) will likely fall into the mid- or long-term categories

- **Project Funding** – Has any funding been identified to date for the project or program? What is the overall project cost and in what timeframe will funding potentially be available? Projects with some funding available will be easier to categorize as short-term, as well as projects with lower cost values. Projects with large funding gaps or large cost estimates may need to be categorized as mid- or long-term to reserve the funding needed for implementation.

- **Project Phasing** – Is the project or program single or multi-phased? Are there other phases or projects/programs that need to be completed first

before this project or program or next phase can move forward? Many programs or large projects will likely cover more than one timeframe.

3.4   Categorization Process

Metro, Mobility Matrix consultants, PDT members, cities and other stakeholders worked collaboratively to determine project implementation timeframes. For projects or programs located in only one jurisdiction, that jurisdiction was given the first opportunity to define a feasible timeframe for its projects and programs. Subregional projects were categorized in conjunction with affected jurisdictions, and any conflicts between category suggestions by the affected jurisdictions were discussed and determined as a group. Project categorizations will be approved as part of the Final Subregional Mobility Matrix Report.

4.0 COST ESTIMATION METHODOLOGY OVERVIEW

This section outlines the context and approach for estimating rough order-of-magnitude capital cost estimate ranges for transportation projects and programs included in the subregional Mobility Matrices.

4.1 Purpose

The Mobility Matrices are intended as preliminary input into Metro's forthcoming Long Range Transportation Plan (LRTP) update process. The Mobility Matrix effort has involved collecting transportation improvement projects and defining subregional improvement programs, defining subregional goals and objectives, analysis of baseline conditions, and a high-level screening evaluation of transportation programs submitted for consideration. The purpose of this document is to outline the approach for preparing rough order-of-magnitude capital cost estimates, not including vehicles, operating, maintenance and financing cost, for the unfunded transportation projects and programs in each subregion.

Some projects and programs on the Mobility Matrix lists contained capital cost estimates, while others did not. Furthermore, some projects submitted by stakeholder jurisdictions had defined scope and limits, while other projects were less defined or programmatic in nature.

Due to variations in project scope and available cost data, costs estimated for use in the Mobility Matrix are not intended to be used for future project-level planning. Rather, the cost ranges developed via this process constitute a high-level, rough order-of-magnitude planning range for short-, mid-, and long-term subregional funding needs for the Mobility Matrix effort only. More detailed analysis will be conducted in the LRTP process, which may necessitate refinement of project/program and associated cost estimates.

4.2 Capital Cost Estimation Methodology

This section explains the process by which consistent transportation improvement project cost minimum/maximum range estimates were developed at the program level.

This section explains the process by which consistent transportation improvement project cost minimum/maximum range estimates were developed at the program level.

4.2.1 Major Transit Project Cost Estimates Developed by Metro

Metro's Cost Estimating Department provided parametric unit cost estimates for major transit projects such as bus rapid transit, light rail transit, heavy rail transit, and maintenance and operations facilities, based on Metro historical project costs.

4.2.2 Major Freeway Project Cost Estimates Developed by Caltrans

The California Department of Transportation (Caltrans) provided unit cost estimates for major freeway and highway projects. If Caltrans did not provide highway/freeway project cost estimates, they were left blank for the purposes of the Mobility Matrix.

4.2.3 Projects With Cost Estimates Provided by Jurisdictions

If available, jurisdictions submitted cost estimates for their transportation improvement projects and programs. For some, jurisdictions submitted specific cost estimates, while for others, jurisdictions submitted minimum and maximum cost estimate ranges. Given the high-level planning nature of the Mobility Matrix process, and in the interest of subregional consistency, a minimum/maximum cost range was developed for each project or program:

- **Capital projects** submitted with minimum/maximum cost ranges were left unchanged. Projects submitted with specific cost estimates were expanded to a minimum (20 percent below specific estimate) and maximum (20 percent above specific estimate) cost range.

- **Program ongoing** costs were assumed to continue throughout the Mobility Matrix categorization periods, or throughout the short, medium and long term period, if duration was unknown. Again, cost estimates were adjusted to include a minimum range (20 percent below) and

maximum range (20 percent above) around each annual cost estimate.

4.2.4 Projects or Programs Without Cost Estimates

Projects or programs submitted without costs were assigned cost estimates based on per-unit or per-mile industry standard factors by project or program type, or on the average per-unit or per-mile costs of comparable projects/programs with cost information submitted for consideration in the Mobility Matrix. The following methods were used to develop these placeholder cost estimates:

- **Using Comparable Mobility Matrix Project Costs**

First, Mobility Matrix projects or programs with similar characteristics were sorted by type, and average costs were calculated based on per mile or per unit costs. For any projects or programs with similar characteristics, these average per mile and per unit costs were applied. This estimate was expanded to a minimum (20 percent below) and maximum (20 percent above) cost range.

- **Using Research Literature**

In some cases, industry standard cost estimates were available in research literature on a per-mile or per-unit basis. If no comparable costs were submitted through the Mobility Matrix project or program lists, these studies were utilized to develop cost estimates. Specific cost estimates were expanded to a minimum (20 percent below) and maximum (20 percent above) cost range.

- **Estimating Remaining Project Costs by Project Type**

For remaining projects, the average total cost of other projects in the same program was used to approximate project cost.

For example, if 15 out of 20 pedestrian program projects have cost estimates that total $15 million, the remaining five pedestrian improvement projects were assumed to have similar average costs ($1 million per project). In this example, if the original value of the 15 known projects was $15 million, the assumed cost of the full program of 20 projects would be $20 million.

4.2.5 Program Level Estimates

Cost ranges developed through this process are for high-level planning purposes only, and should not be used in project-specific planning. In the interest of consistency, project-level cost estimates were rolled-up to the program level and not reported at the project-specific level.

4.2.6 All Project Costs Are in Year 2015 Dollars

For consistency, all estimated project and program costs are in year 2015 dollars, as this is the base year of the 2009 Long Range Transportation Plan update process. Project cost estimates from prior years were escalated to year 2015 dollars at a three-percent annual rate.

4.2.7 Metro Cost Estimating Department Reviewed Major Cost Estimates

As a final step to ensure consistency with Metro's cost estimating processes, the Metro Cost Estimating Department provided a high-level review of transit cost estimates to ensure consultant estimates were consistent with Metro practices.

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ID	Project Description	Jurisdiction	Mobility — •Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	Safety — •Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	Sustainability — •Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	Economy — •Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	Accessibility — •Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	State of Good Repair — •Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding	Categorization Timeframe Short 1-10 yrs	Mid 11-20 yrs	Long 21+ yrs
Arterials											
Widening Programs/Projects											
A1	PCH Intersection Improvements	Malibu, Caltrans	●	◐	○	◔	○	◔	X		
A2	PCH lane width and shoulder widening	Malibu, Caltrans	◐	◐	○	◔	◔	◐	X		
A3	Agoura Hills: Widen Canwood St. 1400' ft west of Kanan Rd to Station 89	Agoura Hills	●	○	○	○	○	◔	X		
A4	Agoura Hills General Plan arterial improvements	Agoura Hills	●	○	○	○	○	◔	X		
A5	Calabasas General Plan arterial improvements	Calabasas	●	◐	○	○	○	◔	X	X	
A6	Malibu: Malibu Canyon Rd widening	Malibu	●	○	○	◔	○	◔		X	
A7	PCH and Paradise Cove vehicle underpassing expansion	Malibu, Caltrans	◐	◐	○	◔	◐	◔	X		
State of Good Repair Programs/Projects											
A8	State of Good Repair/Safety Projects for bridges, sidewalks, curbs, parkways, guardrails, shoulders throughout region	Subregional	◐	◐	◔	◔	○	●	X	X	X
A9	Las Virgenes Road Shoulder Safety Improvement: From Lost Hills to Mulholland Highway, guard rails replacements and passing lane	Calabasas	◐	◐	◔	◔	○	●	X		
A10	Mulholland Highway Phase IV: Declaration Ave to Old Topanga Canyon Rd; road safety and intersection improvements	Calabasas	◐	◐	◔	◔	○	●	X		
A11	Mulholland Highway Shoulder Safety Improvement: Old Topanga Canyon Rd to City Limits; passing lanes and sight distance improvements at intersections	Calabasas	◐	◐	◔	◔	○	●	X		
A12	Reconstruct Malibu Hills Rd	Calabasas	◐	◐	◔	◔	○	●	X		
TSM Programs											
A13	Traffic Signal Improvements: real-time signal control/incident management	Subregional	◐	◔	○	◔	○	○	X		
A14	Citywide signal synchronization and control center in Agoura Hills and Westlake Village	Agoura Hills, Westlake Village	◐	○	○	○	○	○	X		

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High Benefit ●   Medium Benefit ◐   Low Benefit ◔   No Benefit/Neutral ○   Negative Impact —

ID	Project Description	Jurisdiction	Mobility •Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	Safety •Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	Sustainability •Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	Economy •Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	Accessibility •Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	State of Good Repair •Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding	Categorization Timeframe Short 1-10 yrs	Mid 11-20 yrs	Long 21+ yrs
Arterials cont.											
TSM Programs cont.											
A15	Signal Synchronization and Adaptive timing upgrade on Calabasas Rd and Mulholland Highway	Calabasas	◐	○	○	○	○	○	X		
A16	PCH median enhancements from Corral Canyon Rd to Winding Way	Malibu, Caltrans	◐	◐	○	◔	○	◔	X		
A17	Westlake Village business park area improvements	Westlake Village	◐	○	○	◔	○	○		X	X
A18	PCH: Install CCTV & Communications System from Temescal Canyon Rd to Malibu Rd (Malibu Seafood) (PM 38.11-49.72)	Malibu, LA County, Caltrans	◐	◔	○	◔	○	◔	X		
A19	Regional: Upgrades to traffic signal system to bring to current standards and operational needs on various routes such as SR-1, SR-23, US-101	Subregional	◐	○	○	○	○	◔	X		
Highways											
Arterial Interchange Progams/Projects											
H1	US-101: Interchange improvements at Kanan Rd, including SB on-ramps and bridge improvements	Agoura Hills, Caltrans	●	◐	○	○	◔	◔	X		
H6	US-101: Interchange improvements at Palo Comado Rd. Widen bridge, construct bike lanes and sidewalks on both sides of street, signalize NB on/off-ramps	Agoura Hills, Caltrans	●	◐	○	○	◔	◔	X		
Freeway Corridor Projects											
H2	US-101: Add 2 lanes to existing roadway in each direction between SR-27 and the Ventura County Line; project widens roadway from 4 to 6 lanes, while aiming to minimize ROW acquisition and local circulation impacts	Subregional	●	—	○	◔	○	◔			X
H3	US-101: Add one lane to existing roadway in each direction between SR-27 and the Ventura County line; project widens roadway from 4 to 5 lanes, which could generally be accommodated by restriping within the existing roadway cross-section	Subregional	●	—	○	◔	○	◔			X
Soundwall Projects											
H4	US-101: Soundwall on Canwood west of Kanan	Agoura Hills, Caltrans	○	○	◐	○	○	○	X		
TSM											
H5	US-101: Upgrade Transportation Management System from SR-27 to Ventura County Line (PM 25.3-38.19)	Subregional	◐	◔	○	○	○	◔	X		

High Benefit ● Medium Benefit ◐ Low Benefit ◔ No Benefit/Neutral ○ Negative Impact —

ID	Project Description	Jurisdiction	Mobility ●Reduce regional traffic impacts ●Increase active transportation mode share ●Improve reliability ●Increase system efficiency	Safety ●Improve transit safety/security ●Improve bicycle and pedestrian safety ●Improve roadway safety	Sustainability ●Minimize environmental impact ●Improve Quality of Life ●Reduce GHG emissions	Economy ●Reduce goods movement impact ●Accommodate seasonal travel impact ●Reduce peak hour trips	Accessibility ●Improve First/Last Mile Connections ●Serve Transit Dependent Populations ●Improve regional transit connections	State of Good Repair ●Preserve Life of Facility or Equipment ●Reduce Goods Movement Impact ●Leverage state and federal funding	Categorization Timeframe Short 1-10 yrs	Mid 11-20 yrs	Long 21+ yrs
Active Transportation											
Bicycle/Pedestrian Programs/Projects											
B1	Las Virgenes Malibu COG Bike Plan Projects	Subregional	◐	◐	●	◐	◐	◔	X	X	
B2	Los Angeles County Bike Plan: Class 3 Bike Routes	Agoura Hills, Malibu, LA County	◐	◐	●	◐	◐	◔		X	
B6	Agoura Hills: bicycle/pedestrian/ equestrian improvements along Agoura Rd east of Cornell	Agoura Hills	◐	◐	●	○	◐	○	X		
B7	Calabasas Bicycle Master Plan	Calabasas	◐	◐	●	○	◐	◔	X		
B9	Bike routes on Encinal Canyon Rd and Latigo Canyon Rd	Malibu, LA County	◐	◐	●	◐	◐	◔		X	
B11	PCH bicycle improvements: upgrade from Class 3 to Class 2	Malibu, Caltrans	◐	◐	●	◐	◐	◔		X	
B13	PCH Safety Study: implement improvements included in study	Malibu, Caltrans	●	●	●	◐	◐	◔	X	X	
B14	Westlake Village: Class 2 bike lanes in business park area (La Baya, La Tienda, Via Rocas, Via Colinas)	Westlake Village	◐	◐	●	◔	◐	◔		X	
Pedestrian Safety Programs											
B3	Agoura Hills: US-101/Lewis Road pedestrian overpass improvemeents	Agoura Hills	○	●	◔	○	◐	○		X	
B4	Agoura Hills: sidewalk gap closure program	Agoura Hills	○	●	◔	○	◐	○	X	X	
B5	Agoura Hills: split multi-use trail on Driver Ave. near Palo Comado to separate modes	Agoura Hills	○	●	◔	○	○	○	X		
B8	Hidden Hills: improvements to gateway area at Long Valley Rd at US-101	Hidden Hills	○	●	◔	○	◐	○	X		
B10	PCH pedestrian overpass installation	Malibu, Caltrans	◐	●	◔	◐	◐	◔	X		
B12	PCH HAWK pedestrian crossing program (at 20356 PCH, 22523 PCH)	Malibu, Caltrans	◐	●	◔	◐	◐	◔	X		
B15	Westlake Village: Install sidewalks along - Lindero Canyon Rd - Thousand Oaks Blvd - Lakeview Canyon Rd - La Tienda Rd - Business Park area	Westlake Village	◔	●	◔	○	◐	○	X	X	

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High Benefit ● Medium Benefit ◐ Low Benefit ◔ No Benefit/Neutral ○ Negative Impact ▬

ID	Project Description	Jurisdiction	Mobility — •Reduce regional traffic impacts •Increase active transportation mode share •Improve reliability •Increase system efficiency	Safety — •Improve transit safety/security •Improve bicycle and pedestrian safety •Improve roadway safety	Sustainability — •Minimize environmental impact •Improve Quality of Life •Reduce GHG emissions	Economy — •Reduce goods movement impact •Accommodate seasonal travel impact •Reduce peak hour trips	Accessibility — •Improve First/Last Mile Connections •Serve Transit Dependent Populations •Improve regional transit connections	State of Good Repair — •Preserve Life of Facility or Equipment •Reduce Goods Movement Impact •Leverage state and federal funding	Short 1-10 yrs	Mid 11-20 yrs	Long 21+ yrs
Active Transportation cont.											
Sustainability Programs											
B16	Electric Vehicle charging stations in Public Parking Structures (potentially including photovoltaic panels)	Subregional	○	○	●	○	○	○	X	X	
B17	Regional Green Streets program (runoff/stormwater improvements)	Subregional	○	◔	●	◔	○	◔	X	X	
TDM Programs											
B18	Regional: TDM programs to reduce trips	Subregional	◑	○	●	●	◑	○	X	X	X
Park and Ride Projects/Programs											
B19	Agoura Hills: construct park-and-ride lot at Reyes Adobe Rd and Canwood St	Agoura Hills	◔	○	◑	◑	◑	◔	X		
B20	Regional parking structures near key activity/transit centers in Malibu, Agoura Hills, and Westlake Village	Agoura Hills, Malibu, Westlake Village	◔	○	◑	◔	◑	○		X	
Transit											
Seasonal Transit Program											
T1	Enhancement of seasonal shuttle program from Las Virgenes area to Malibu	Agoura Hills, Malibu	●	◔	◑	◑	●	○		X	
T4	Malibu: seasonal shuttle program to connect Malibu and Westside	Malibu	●	◔	◑	◑	●	○	X		
Bus Programs											
T2	Calabasas transit fleet replacement	Calabasas	○	○	◑	○	○	○	X		
T3	Malibu: bus stop improvements (31 stops not included in current program)	Malibu, Caltrans	◑	●	◑	◔	●	○	X		
T6	Improved year-round regional transit connection between Malibu and Santa Monica along PCH through shorter headways and other operational improvements	Malibu, Caltrans	●	○	●	◔	●	○	X	X	
T7	Improved regional transit connection between Las Virgenes area, Thousand Oaks and SFV along US-101 corridor through shorter headways and other improvements	Subregional	●	○	◑	◔	●	○	X	X	
Transit Center Projects											
T5	Agoura Hills Transit Center (exact location TBD, likely Agoura Village area)	Agoura Hills	◔	◔	◑	○	●	○	X		

*   "Jurisdiction" may refer to the lead project sponsor, the jurisdiction where the project exists, or the agency that proposed the addition of the project. Projects without specific jurisictions were sourced from other planning documents (e.g. Metro Long Range Transportation Plan and others) where no lead or proposing agency was listed.

Changes since 3/4/15 (Version Presented to LVMCOG TAC)

H6: new project added at request of Agoura Hills

H1: revised timeframe categorization from "Mid" to "Short", at request of Agoura Hills

March 11, 2015

High Benefit ●   Medium Benefit ◑   Low Benefit ◔   No Benefit/Neutral ○   Negative Impact —