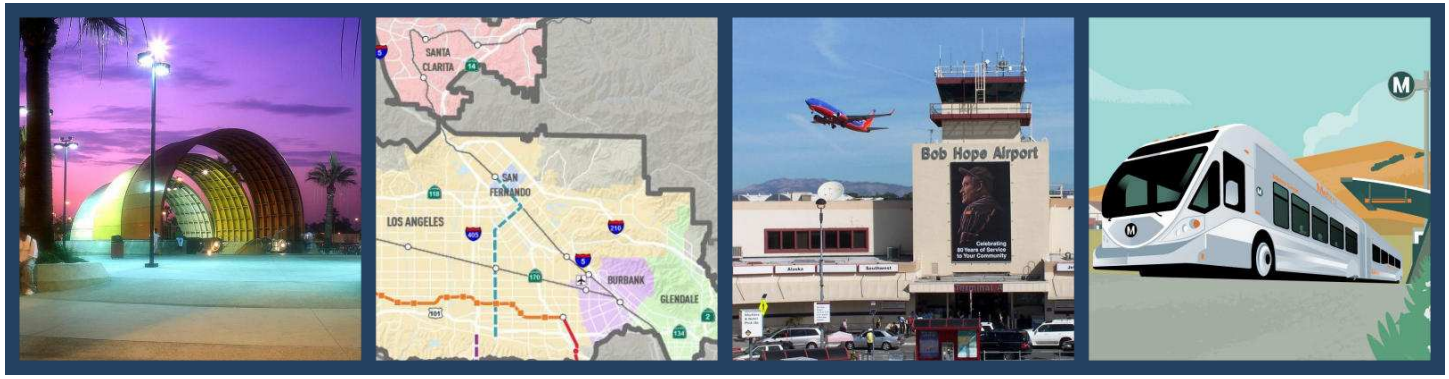

SUBREGIONAL MOBILITY MATRIX

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

Appendix C – Methodologies – Final

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

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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 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

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,

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.