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**The SACOG Project Performance Assessment Tool: Shaping the Research
Agenda**

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Shaping the Research Agenda**

by

Kyle Robert Smith

Report

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Abstract

The SACOG Project Performance Assessment Tool: Shaping the Research Agenda

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Performance measurement plays a crucial role in regional transportation planning. It can provide a framework through which decision makers and the general public can assess the current and forecasted performance of proposed transportation investments in light of regional goals. Recent federal legislation under the FAST Act has prompted a renewed emphasis on performance measurement in regional transportation planning agencies throughout the country. Metropolitan Planning Organizations (MPOs) are the statutorily obligated entities responsible for regional transportation planning in the United States. As a result, MPOs throughout the country are working to strengthen their performance based planning processes. Although a growing number of MPOs are implementing performance measures, very few include economic vitality measures in their project selection and prioritization processes.

The Sacramento Area Council of Governments (SACOG) serves as the MPO for the California Capitol region and is actively working to include performance measures in regional planning processes. As part of that effort, SACOG began implementing a Project Performance

Assessment (PPA) Tool that includes project-level assessment of economic performance to support project selection and prioritization in the 2018 Flexible Funding Round. Funding Rounds are the primary mechanism in which SACOG uses to allocate transportation investments. As SACOG gains experience with its PPA Tool, it continues to work to tailor the tools performance measures for identifying proposed transportation projects that best support regional goals.

In the context of these ongoing PPA Tool refinements, this report examines potential performance measures that SACOG could feasibly incorporate into the tool to assess long-term economic benefit within the region, recognizing the importance of sustaining its urban, suburban, and rural economies. First, I will examine how SACOG uses the PPA tool to allocate funds within the Regional Program of the 2018 Funding Round in order to better understand the current use of performance measurement in project level decision making.

Second, I identify the landscape of economic performance measures identified in previous literature, as well as those currently being implemented in MPOs around the country and evaluate performance measures based on six previously identified properties of good performance measures. Good performance measures should have the following characteristics: (1) they must be appropriate and reflect identified goals or objectives; (2) they must be measurable in an objective manner; (3) they should capture the appropriate information to enable comparisons spatial or temporal dimensions; (4) they should be realistic and implementable without excessive effort, cost, or time; (5) they must be defensible and provide clear and concise information to decision making processes, and; (6) they must be forecastable to determine reliable future levels of performance using available data and tools.

Finally, this report identifies a series of performance measures that could be included future iterations of the PPA Tool. Specifically, identified performance measures can be used to better inform decision makers and the general public of the potential economic impacts of specific transportation investments.

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Chapter 1: Performance Measurement Background and Issue Identification

Performance measurement plays a crucial role in regional transportation planning. It can provide a framework through which decision makers and the general public can assess proposed transportation investments based on current and forecasted performance towards regional goals. This report aims to evaluate how performance measurement can be used to understand how individual transportation projects support local and regional economic vitality. Specifically, this report is designed to identify specific performance measures that can be implemented in the Project Performance Assessment (PPA) Tool developed by the Sacramento Area Council of Governments (SACOG). The research looks at how Metropolitan Planning Organizations (MPOs) can use performance measures to inform the prioritization and selection of transportation investments in a technically-driven, transparent manner. Additionally, performance measures identified through previous research or practice are evaluated based on established characteristics of good performance measures for potential inclusion into future iterations of the PPA Tool.

This report will examine how SACOG is using a project level performance measurement tool, the PPA tool, to help make strategic choices when allocating competitive funds to projects. In addition, this report will analyze performance measures of long term economic benefit for possible inclusion in future iterations of the PPA tool using a multifaceted approach informed by previous research and current practice.

One focus of this report is to examine how the PPA Tool and project specific performance assessments are used in the Regional Program, the largest of SACOG's competitive funding programs. In the 2018 Funding Round, the SACOG Board dedicated more than \$100 million of federal, state, and regional investment towards funding transportation investments under the Regional Program.

A second focus of this report is to review of both existing academic literature performance measurement as well as a review of performance measurement best practices amongst peer MPOs identified by SACOG. The literature review will target recent academic literature to examine the

efficacy of using performance measures to inform funding decisions. I base my review of possible measures on a variety of qualitative factors including; how well the indicator measures the long term economic benefits of transportation investments; how well the performance outcomes could measure progress towards regional goals in the MTP/SCS, and; the availability of required data to support the implementation of identified measures into SACOG's PPA tool. The peer MPO best practices review identifies performance assessment programs utilized at a variety of peer MPOs identified by the SACOG Board to identify potential performance measures currently being implemented in project level performance measurement programs. The best practices review is targeted in a similar manner to the literature review and attempts to identify possible measures based on the same factors.

The third and key focus is to evaluate whether and how future iterations of the PPA tool should include specific performance measures of economic benefit identified in research or in practice. I will develop a matrix based to evaluate performance measures for potential inclusion in future iterations of the PPA Tool, drawing on established properties of good performance measures (Sinha & Labi, 2007): appropriateness, measurability, dimensionality, realistic, defensible, and foreseeable (Sinha & Labi, 2007). I apply an emphasis on the implementation of identified performance measures at a regional and local level to measure project level performance.

WHAT IS PERFORMANCE MEASUREMENT?

Performance measurement, as it relates to transportation planning represents a qualitative and quantitative analysis of how well transportation actions achieve the desired outcome (Sinha & Labi, 2007). Performance measurement can be used at a number of stages in the transportation planning process and at many organizational levels. Government agencies at all organizational levels can use performance measures to assess systemwide plans and programs, or to determine the best treatment for a specific transportation project (Poister, 1997). In addition, performance measurement can be used to help transportation planners and decision makers focus plans and investment towards projects that help achieve identified goals (NCHRP, 2010).

Linking performance measures to identified goals and objectives is a key aspect of successful performance measurement, and generally follows a hierarchy of desired system outcomes illustrated in Figure 1. Under this hierarchy, broad, overall goals and more targeted goals are developed to describe what transportation investments and activities are supposed to achieve. Objectives are specific statements geared towards achieving identified goals, and performance measures can be identified as an objective stated in measurable terms (Sinha & Labi, 2007). For a goal of enhanced transportation mobility, an objective could be to reduce travel time and the performance measure could relate to travel time delay or roadway congestion. Performance criterion and standards are used to describe and distinguish a desired state from an undesired state (Sinha & Labi, 2007). For the same example, the performance criterion could be the average travel time added due to congestion and performance standards could be set to define acceptable or unacceptable levels of roadway congestion.

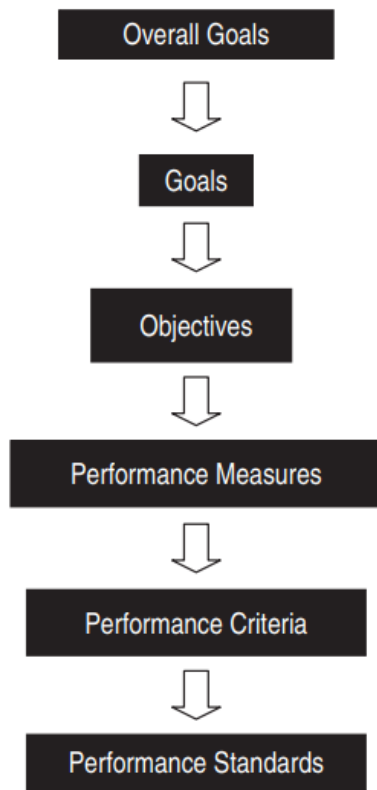


Figure 1: Performance Measurement Hierarchy (Sinha & Labi, 2007)

System Level Performance Measurement

System level performance measurement can be used to understand how well transportation systems are achieving overall transportation goals and help inform planning decisions and priority setting. At this level, performance measurement is used to evaluate conditions or operations for the overall transportation system. System level performance measures can be used to determine how different policies can achieve identified objectives, or to illustrate overall system performance or operation. Many of the federally mandated performance measurement described in the following pages can be considered system level performance measurement. For example, system performance measures related to safety could include the rate of serious injuries on a regional or statewide transportation network. System level performance measurement does not measure project or treatment specific impacts to the entire transportation system. It is important to recognize that individual transportation project impacts may not be reflected in system level performance measurement.

Project Performance Measurement

Local and regional governments can use project level performance measurement to better evaluate projects, especially given competition for finite funding sources. At this level, performance measurement is used in project selection and prioritization decisions to estimate the regional impacts of individual transportation projects or investments. This type of performance-based planning can be used to efficiently allocate limited funds across the entire network and estimate performance impacts across different projects or investment strategies (Sinha & Labi, 2007). Additionally, project level performance measurement can help measure progress towards adopted goals and visions while increasing transparency during a heightened demand for public accountability. Federal guidance suggests this type of project level performance measurement provides the best opportunity to ensure projects that support identified goals are selected (EPA, 2011). Project level performance planning involves using an estimation of regional travel demand

to evaluate the systemwide performance impacts of individual projects, alternative funding levels, or varying project selection and prioritization strategies.

Performance measurement has been implemented at state DOTs (Poister, 1997), as well as local and regional governments to varying degrees (Pickrell & Neumann, 2000), but many of the performance-based planning tools implemented at MPOs have been better targeted towards systemwide performance measurement. Linking performance measurement to project level decision making is less common. Although MPOs throughout the country have been utilizing performance based planning for many years, as of 2017, fewer than one-third of MPOs utilized it to evaluate specific projects for regional funding (Transportation for America, 2017).

Planners throughout the country understand the need to better evaluate specific transportation investments when faced with greater competition for finite funding sources and increasing calls for government transparency and accountability. Specifically, project level performance measurement systems can be used to assess progress and assist with decision making in many contexts (Sinha & Labi, 2007). One crucial place MPOs can implement performance measurement is during the project prioritization and funding allocation phase.

PERFORMANCE BASED PLANNING AND FEDERAL POLICY

In the United States, regional transportation planning is conducted by MPOs. MPOs are federally-mandated, multi-agency decision-making bodies for metropolitan areas with an urbanized population of at least 50,000 residents responsible for the “development and operation of an integrated, intermodal transportation system that facilitates the efficient, economic movement of people and goods” (23 CFR 450 §450.300 et seq., 1993). In addition, MPOs provide a forum for all jurisdictions within a metropolitan area to work together to plan regional infrastructure systems that will serve diverse constituencies throughout large geographical regions.

The Federal government is responsible for allocating federal funds to local governments for a variety of transportation projects and programs through MPOs, and MPOs have varying degrees of discretion in prioritizing and selecting projects for funding. MPOs are statutorily

obligated under Federal law to conduct a variety of duties related to regional transportation planning, including involving the public in transportation decision-making, developing long range plans for surface transportation, and prioritizing projects to receive federal aid (23 CFR 450 §450.300 et seq., 1993). MPOs serve a crucial regional governance role because they are more locally-focused than state or federal transportation departments, but more regionally-minded than municipalities and local governments.

MPOs can be traced back to federal efforts during the 1950s and 1960s to strengthen housing and transportation planning functions across communities nationwide. It wasn't until 1991 when Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) that federal regulators began discussions to implement performance based planning in order to properly evaluate projects and funding priorities. ISTEA and subsequent legislation are congressional activities to appropriate funding for transportation system investment to achieve national goals. By the turn of the century, research found that performance based planning had been implemented at state DOTs to varying degrees, but primarily targeted towards achieving systematic or organizational goals (Poister, 1997).

In 2008, the National Surface Transportation Infrastructure Financing Commission documented the need for performance assessment and recommended the implementation of performance objectives to assess transportation needs. The Commission specifically noted that transportation decision-making should be based more on measures of performance outcomes to achieve more intelligent investments and better system operations (National Surface Transportation Infrastructure Financing Commission, 2008). In 2012, Congress passed and President Obama signed the Moving Ahead for Progress in the 21st Century (MAP-21) Act into law. MAP-21 required the use of performance measurement in federal transportation planning to guide the [Nation's surface transportation] system growth and development (Federal Highway Administration, 2018). MAP-21 marked the first federal requirements for states and MPOs to use quantitative measures in transportation planning, and following legislation maintained the same

requirements. Under MAP-21, state Departments of Transportation (DOTs) and MPOs are required to establish performance measures and report progress in seven areas that support national goals. The national goal areas and performance measures as of 2019 are identified in Figure 2.

| FHWA Goal | Federal Performance Area | Performance Measure |
|-----------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------|
| Safety | Fatalities and Serious Injuries | Number of fatalities |
| | | Fatality rate (per 100 million vehicle miles traveled) |
| | | Number of serious injuries |
| | | Serious injury rate (per 100 million vehicle miles traveled) |
| | | Number of non-motorized fatalities and non-motorized serious injuries |
| Infrastructure Condition | Pavement Condition | Percentage of pavements on the Interstate System in Good condition |
| | | Percentage of pavements on the Interstate System in Poor condition |
| | | Percentage of pavements on the non-InterstateNHS in Good condition |
| | | Percentage of pavements on the non-InterstateNHS in Poor condition |
| | Bridge Condition | Percentage of NHS bridges classified as in Good condition |
| | | Percentage of NHS bridges classified as in Poor condition |
| Performance of the NHS, Freight, and CMAQ Measures | Performance of the National Highway | Percent of person miles traveled on the Interstate System that are reliable |
| | | Percent of person miles traveled on the non-InterstateNHS that are reliable |
| | Freight Movement /Economic Vitality | Truck Travel Time Reliability Index |
| | | |
| | Congestion Reduction | Annual hours of peak-hour excessive delay per capita |
| | | Percent of non-single-occupant vehicle travel |
| | Environmental Sustainability | On-Road Mobile Source Emissions reduction |

Figure 2: Federal Performance Measures (U.S. DOT, 2019)

Under MAP-21, MPOs are required to implement performance measurement that supports national transportation goals, and use performance measurement to assess regional planning goals as well as transportation investments (Handy & Sciara, 2017). Since the passage of MAP-21, performance measurement has evolved from simply reporting data at the state DOT level to strategically setting targets and selecting performance measures to help shape decisions (NCHRP, 2010). In 2015, Congress passed and President Obama signed the Fixing America’s Surface Transportation (FAST) Act into law. The Fast Act was another congressional action aimed at funding transportation infrastructure investment that achieves national transportation system goals. The FAST Act reinforced the use of performance measurement outlined under MAP-21, and laid

out a larger set of planning factors which should be reflected in Regional Transportation Plans (RTPs), including supporting economic vitality. Figure 3 shows the ten planning factors identified under the FAST Act.

FAST Act Metropolitan Long Range Transportation Planning Factors











| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency. |  Enhance the integration and connectivity of the transportation system, across and between modes, people and freight. |
|  Increase the safety of the transportation system for motorized and non-motorized users. |  Promote efficient system management and operation. |
|  Increase the security of the transportation system for motorized and non-motorized users. |  Emphasize the preservation of the existing transportation system. |
|  Increase the accessibility and mobility of people and for freight. |  Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation. |
|  Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns. |  Enhance travel and tourism. |

Figure 3: Fast Act Planning Factors (Grossman, 2018)

Although Congress develops transportation funding legislation and performance based planning requirements, federal agencies are responsible for developing specific performance measures to measure progress towards national transportation goals. In 2017, the federal government published the last in a series of three Notices of Public Rulemaking which establish a set of 19 performance measures, as required by MAP-21, for state departments of transportation (DOTs) and MPOs to use to better inform their transportation planning and programming decision making (82 CFR 5970, 2017).

By defining performance measures for state and regional transportation planning, the federal government uses system information to prioritize transportation investments and direct resources towards projects that realize national performance goals. Although not all planning factors required by the FAST Act are reflected in agency rulemaking regarding performance measurement requirements, previous research has suggested “they may be an indication of future

requirements if similar elements continue to be important to Congress in long range transportation planning” (Grossman, 2018).

As a result of federal legislation, performance-based planning has been incorporated into all the large MPOs in California and continues to help local and regional governments throughout the state invest resources more efficiently. In 2017, the California Department of Transportation (Caltrans) updated the statewide guidance for MPOs which included requirements for MPOs to incorporate performance management into regional planning processes to comply with federal requirements under MAP-21 and the FAST Act. The state guidance outlines a series of Federal goals outlined in previous legislation and State goals which MPOs are encouraged to use in order to develop performance measures that reflect a regional vision for the future. One of the primary goals identified in the state guidance is to promote economic vitality, and this goal is carried into regional goals and visions at MPOs throughout the state (Caltrans, 2017).

REGIONAL TRANSPORTATION PLANNING IN THE CALIFORNIA CAPITOL REGION

In order to fund projects which achieve the vision of the statewide travel plan, the State of California allocates millions of federal and state dollars of planning funds through the State Transportation Improvement Program (STIP). The STIP is a five-year statewide capital improvement program of transportation projects, funded with revenues from the Transportation Investment Fund and other state and federal funding sources. The California Transportation Commission (CTC) develops fund estimates and conducts STIP programming rounds generally every two years. The 2018 STIP included more than \$440 million in transportation investments (California Transportation Commission, 2018). Each STIP includes two core programs; projects proposed by regional agencies in their Regional Transportation Improvement Programs (RTIPs), and large-scale projects proposed by Caltrans at in its Interregional Transportation Improvement Program (ITIP) (California Transportation Commission, 2018). The chart in Figure 4 attempts to provide a simple diagram of this very complex process.

Regional Transportation Planning and Programming Process

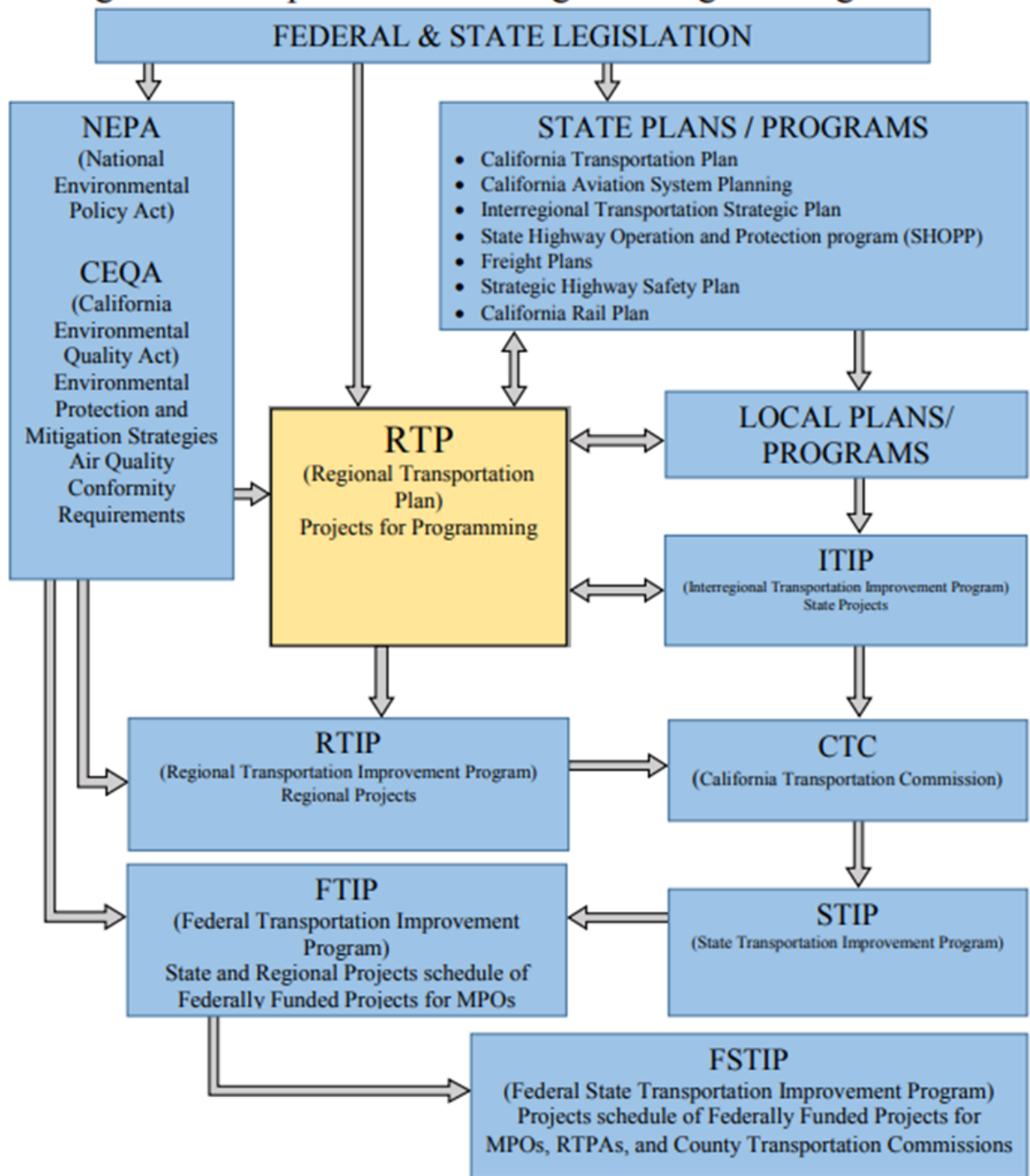


Figure 4: Regional Transportation Planning and Programming Process (CTC, 2018)

Similar to the state-level process, transportation planning at the regional level begins with an adopted regional vision and goals in the RTP and reflected in the RTIP. The RTIP is a list of regional transportation projects developed by the MPO that are then prioritized and selected for federal and state transportation funding. Projects are required to be on an RTIP in order to receive state or federal transportation funding (Caltrans, 2017). SACOG, along with many of the larger MPOs in California call their RTIP a Metropolitan Transportation Improvement Program (MTIP). Similarly, the regional long range RTP is called a Metropolitan Transportation Plan (MTP). This and all following sections will adopt the SACOG nomenclature, rather than any previously used federal nomenclature.

The selection and prioritization of projects for funding is known as “programming”. The programming process commits funding received from various sources towards transportation projects on specific timelines (Caltrans, 2017). Although transportation projects must be on the MTIP to receive funding, limited funding streams do not allow for all projects on the MTIP to be funded. MPOs rely on funding streams tied to specific local, state, and federal programs to implement the MTIP, and generally have little discretion over how those funds can be spent (Handy & Sciara, 2017). Discretion in funding decisions can vary widely across the country depending on state and local funding regulatory frameworks.

As the MPO for the region, SACOG is responsible for programming local, state and federal funding to implement transportation projects listed on the MTIP that realize the performance benefits of the MTP. SACOG’s 2016 MTP foresees funding more than \$35 billion in transportation investments over a 20-year planning horizon. The large majority of investments are dedicated to state and federal transportation programs including road and highway maintenance and rehabilitation, road and highway capital improvements, transit operations and service expansion, and bicycle and pedestrian improvements. Only a small portion of funding is reserved for competitive regional funding programs in which the MPO has greater discretion over project selection. Figure 5 illustrates funding estimates identified in the 2016 MTP (SACOG, 2016).

SACOG 2016 MTP Funding Estimates

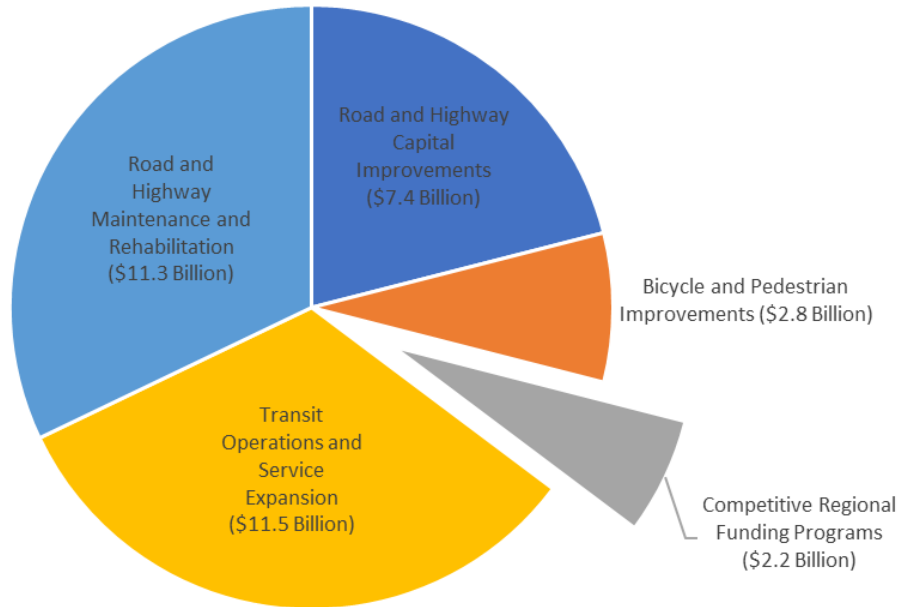


Figure 5: 2016 SACOG MTP Funding Estimates

SACOG conducts flexible funding rounds to program competitive local, state, or federal funds to specific transportation projects on the MTIP. Fund allocation in any given funding round is based on available apportionments of regional Congestion Mitigation and Air Quality (CMAQ), Regional Surface Transportation Program (RSTP), State Transportation Improvement Program (STIP), Active Transportation Program (ATP), and other SACOG managed funds (SACOG, 2016). The 2018 Funding round saw apportionments of over \$130 million, reflecting approximately two years' worth of competitive regional funding outlined by the MTP.

The overall selection of projects across all programs is dependent on specific program requirements and funding availabilities during a given year and SACOG allocates available funds during funding rounds generally occur every two to three years. The 2018 Flexible Funding Round consisted of a series of competitive funding awards across five programs: (1) the Regional Program; (2) the Community Design program; (3) Air Quality Transportation Control Measures (4) Next Generation Transportation Demand Management, and; (5) the Green Region program.

The funding round is one of SACOG’s most impactful tools to implement the MTP/SCS, as it is the primary funding mechanism for local transportation construction projects (SACOG, 2018 Regional Program Final Framework, 2018). Programs involved in SACOG’s 2018 Funding Round as well as their respective funding sources are shown in Figure 6.

| 2018 SACOG Funding Round Programs | | | | | |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Regional Program | Community Design | Air Quality Transportation Control Measure | Next Generation Transportation Demand Management | Green Region |
| Goals | MTP/SCS Implementation Fund cost effective transportation projects with demonstrated performance benefits | Placemaking Fund implementation of the Sacramento Region Blueprint through improvements in public right-of-way | Air Quality Improvement Fund Spare the Air Program that targets emission reductions from the transportation sector <i>Administered by SMAQMD</i> | Reduce single occupant vehicle trips Fund programs that encourage people to bike, walk, ride transit, carpool, vanpool and telework to reduce car trips and miles | Emissions reductions through increased electrification of vehicles Fund programs that move region towards a zero emission future, and better align regional partners for state resources |
| Existing or New Program? | Existing: merges regional/local and bike & ped | Existing | Existing | Substantial revision and continuation of existing TDM Program | New |
| Competitive? | Yes | Yes | No | Blend | Blend |
| Board Action | May 2018 Approved program | April 2018 Approved program | April 2018 Approved budget | April 2018 Approved plan | April 2018 Approved plan |
| Timeline | May 21 Call for projects July 19 applications due | May 3 Call for projects June 29 applications due | Program funded through 2024 | Summer 2018 Release applications | Timeline under development |
| Fund Sources | Project dependent: STIP, RSTP, CMAQ | | CMAQ | CMAQ | Project dependent |

Figure 6: SACOG Funding Round Programs (SACOG, 2018)

Prior to the 2018 Flexible Funding Round, SACOG developed the Project Performance Assessment (PPA) tool to better inform funding decisions by providing a “consistent, transparent baseline to measure performance for transportation projects across the region” (SACOG, PPA Technical Documentation, 2018). The tool allows SACOG to use network-level performance measurement in project screening and selection. As of 2019, SACOG only uses the PPA tool to evaluate projects applying for competitive regional funding programs illustrated in Figures 5 and 6. Development of the tool coincides with the federal and state emphasis on performance-based planning and federal requirements under the FAST Act for MPOs to incorporate performance-

based approach to transportation planning and programming. The PPA tool links performance measurement with network-level decision making to help the SACOG board ensure that competitive regional funding is prioritized towards projects which most align with regional goals are selected for investment (SACOG, 2018 Regional Program Final Framework, 2018). In 2005, SACOG identified a set of 6 goals or guiding principles that guide the MTP and subsequent transportation investments un the MTIP, and those guiding principles have carried into the most recent iteration of the MTP. Figure 7 illustrates the guiding principles SACOG uses to guide transportation planning and investment.

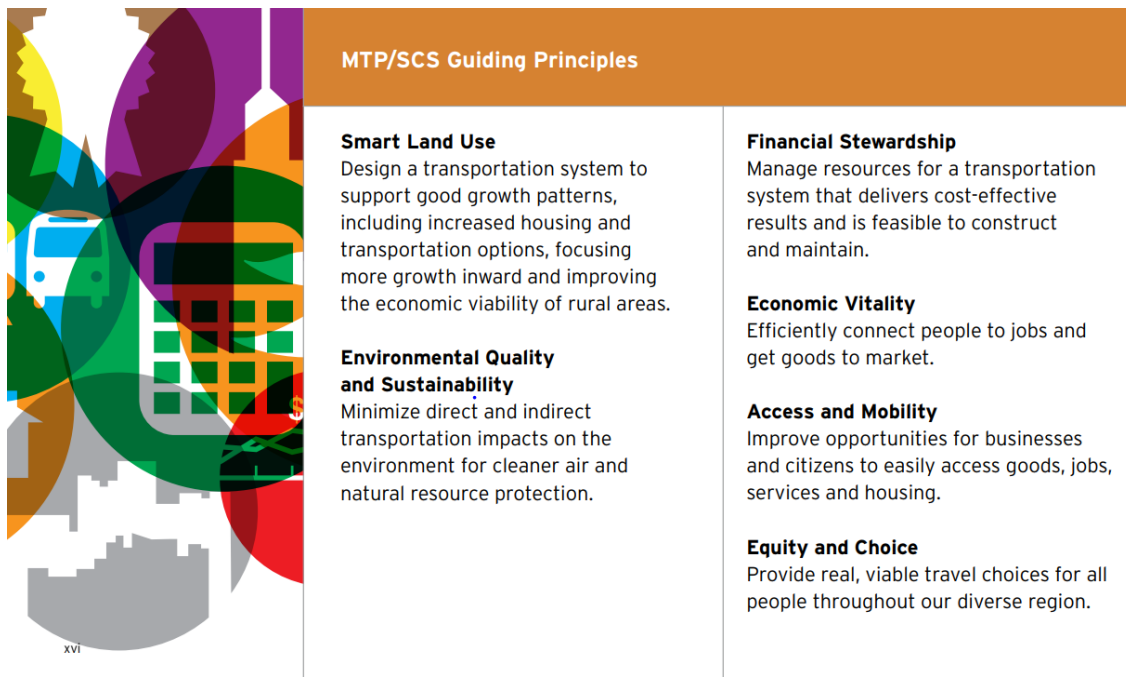


Figure 7: SACOG MTP Guiding Principles (SACOG, 2016)

The PPA Tool was first implemented during the 2018 Funding Round and each Program within the Funding Round utilized the tool differently to measure different performance outcomes based on the goals and priorities of the program. The implementation and use of the PPA Tool is covered in Chapter 2 of this report.

The Regional Program was the only program in which project sponsors were required to submit their performance assessment as part of the project selection process. SACOG uses seven identified performance outcomes to analyze candidate transportation projects against regional goals in the MTP (SACOG, PPA Technical Documentation, 2018). By linking performance measurement to Regional Program funding decisions, SACOG seeks to promote effective and efficient use of limited state and federal funding resources to both develop and maintain the regional transportation network and provide regional benefits.

PERFORMANCE MEASUREMENT AND ECONOMIC VITALITY

Regional economic vitality relies in large part on transportation networks. The movement of people and goods is the base of economic performance and transportation investments can be an integral part of improving productivity and increasing a region's attractiveness to businesses and residents (EPA, 2011). As a result, most transportation investments are geared towards producing transportation infrastructure to retain or attract businesses and investment (Sinha & Labi, 2007).

Performance measurement of economic vitality can be conceptualized in a variety of ways depending on regional goals and priorities. MAP-21 and ensuing federal legislation have set a national goal to support regional economic development, but no performance areas or measures have been identified through federal rulemaking as of 2019. In California, similar goals surrounding economic vitality are included in the statewide transportation plan including supporting transportation choices to enhance economic activity (Caltrans, 2016). Economic vitality performance measures are not required or identified by state guidance, but Caltrans suggests MPOs establish performance measures appropriate to the region including those surrounding jobs and housing balance, land use patterns, and economic development (Caltrans, 2017).

Regional transportation goals surrounding economic vitality can vary greatly due to the unique sets of needs and opportunities of regions throughout the country. As a result, there is no

singular approach or set of performance measures that is used to measure how transportation investments can affect economic vitality. Performance measures surrounding economic vitality include those that measure transportation accessibility and reliability factors, the costs of using transportation networks, job and income growth, and land use changes (Cambridge Systematics, 2000). Additional research highlights the relationship between economic development and land use and suggest performance measures related to business sales, income, and proportion of agricultural, industrial, or commercial land areas to measure economic vitality (Sinha & Labi, 2007). The variation in regional goals and performance measures surrounding economic vitality can make it difficult for MPOs to identify measures that help achieve regional goals.

Performance measures surrounding economic development can also be difficult to measure because the relationships between transportation, land use, and the economy are difficult or impossible to conclusively quantify. Although transportation and the economy are inextricably linked, it is difficult to gauge the impact of specific transportation impacts on overall regional economic growth (Cambridge Systematics, 2000). Further, economic impacts in one area may not actually realize regional economic benefit because benefits may simply shift from one area to another (Sinha & Labi, 2007). Despite the challenges, it is important for MPOs to develop and implement measures of economic performance to identify projects that support transportation system goals relating to economic vitality.

SCOPE OF WORK

In my Professional Report, I examine how SACOG uses the PPA tool to allocate funds within the Regional Program of the 2018 Funding Round and identify additional measures to provide data and context for future SACOG funding rounds. As of 2019, the PPA Tool is only used for the Regional, Community Design, and Green Region programs. Each program uses the PPA Tool slightly differently to evaluate a how well a proposed project supports regional and programmatic goals. I chose to target my research towards the Regional Program because it is SACOG's largest competitive program, and the SACOG Board recommended spending 85 percent

of all competitive funding in the 2018 Funding Round to the Regional Program. The Regional Program is also the primary program designed to fund cost-effective transportation projects that realize all of the guiding principles of the MTP, other programs are more targeted towards community design or enhancing regional transportation planning capacity. Finally, the Regional Program is the only program in which project applicants are required to incorporate performance measures from the PPA tool in funding applications, other programs do not use the PPA Tool or use other performance measurement techniques. I further refine my research to target performance measures that could support economic vitality and demonstrate the long-term economic benefit of a transportation project or facility within the region – one of SACOG’s guiding principles and the PPA Tool’s identified performance outcomes.

This report emphasizes two key topics: (1) a background and description of the PPA tool and how SACOG utilizes it to inform funding decisions and (2) an identification of possible measures to include in future versions of the PPA tool to better pair effective and efficient transportation investment with regional goals. The first section includes a discussion of the PPA tool’s purpose and operation, as well as a brief analysis to underline the need for additional performance measures. This section discusses how the PPA tool is applied to project applications within the funding round, as well as how PPA results are used to inform funding decisions. This discussion is based on publicly available documentation regarding the development and implementation of the PPA tool as well as the author’s reflections as a member of the Technical Advisory and Review committees for the 2018 Regional and Community Design Programs. The first section also analyzes current performance measures based on previously identified properties of good performance measures outlined by Sinha and Labi (2007). These observations help identify where additional measures can be best implemented in future iterations of the PPA to better inform funding decisions moving forward.

Second, this report identifies additional measures that are both effective and implementable for SACOG and member jurisdictions to inform funding transportation projects that provide

regional benefit and implement the MTP/SCS. One performance outcome - to provide long-term economic benefit within the region, recognizing the importance of sustaining urban, suburban, and rural economies – is identified as a research focus and will use a framework based on previously identified properties of good performance measures (Sinha & Labi, 2007). This report studies the economic impacts of transportation investments because transportation projects are the key to many local redevelopment initiatives and efficient investments lead to stronger, better planned communities. In addition, this outcome measures progress towards regional, state, and federal goals to increase economic vitality, and can help decision-makers identify projects that best support economic development in local communities. In order to further narrow the landscape of potential performance measures, this report specifically targets those measures that can be feasibly incorporated given data and resource constraints of SACOG and member jurisdictions for potential inclusion in future iterations of the PPA tool.

Three potential performance measures identified in through the evaluation in this report are recommended for implementation into future iterations of the PPA Tool: (1) the percent change in multimodal jobs accessibility; (2) the change in employment and housing density, and: (3) the proportion of acres projected for land use conformity.

Chapter 2: The Project Performance Assessment Tool

This chapter introduces the PPA tool, a project level performance measurement tool developed by SACOG in response to the recent federal framework to increase the use of performance-based planning at MPOs throughout the country. In order to consider how to incorporate metrics reflecting economic vitality into the tool, this chapter provides a background and contextual description of the PPA Tool itself, discusses how its performance measurement results are used in regional transportation decision making, and considers the need for additional performance measures to bolster project level performance assessments.

BACKGROUND AND CONTEXTUAL DESCRIPTION OF THE PPA TOOL

The PPA tool incorporates a variety of local and regional data sets SACOG maintains to provide targeted information, context, and performance measurement to determine how project level transportation investments affect regional outcomes. The PPA tool was first implemented before the 2018 Flexible Funding Round, and the Regional Program uses the PPA Tool to align a series of performance measures to guide investment and provide emphasis for the selection and prioritization of projects. Seven Performance outcomes and a cross-cutting equity measure, outlined in Figure 8, were approved by the SACOG Board and together make up the selection criteria that transportation projects are evaluated upon (SACOG, 2018 Regional Program Final Framework, 2018).

Project-level performance assessments developed with the PPA tool are meant to make the project selection process more transparent and reduce the application burden on project sponsors. The PPA tool works by creating a spatial buffer around a proposed transportation investment using Geographic Information Systems (GIS) in order to generate a series of outputs to better understand the current conditions within the area as well as forecasted conditions surrounding the project area. Project-specific outputs are then compared with regional and community-specific metrics to evaluate projects relative to size, scope, and location (SACOG, 2018 Regional Program Final

Framework, 2018). A critical characteristic of the PPA tool is that it provides regional and community averages on each indicator as a benchmark to measure project performance.

Projects submitted to the 2018 Regional Program are evaluated against projects in one of five broad land use categorizations, or community types, as outlined in the MTP/SCS; established, corridor, developing, rural residential, and agricultural/other. In addition, projects are generally compared across one of six broad project types: (1) bike and pedestrian; (2) road and highway capacity; (3) maintenance and rehabilitation; (4) programs and planning; (5) transit, and; (6) system operations and ITS (SACOG, 2018 Regional Program Final Framework, 2018). Essentially, project applicants draw a line along the proposed project's centerline using a web-based GIS interface, submit some pieces of project-specific information, and run the tool to generate a project-specific performance assessment.

The PPA Tool draws on project and regional data, existing infrastructure and neighborhood characteristics to estimate how a proposed transportation investment affects specific Performance outcomes using a series of performance measures. Data inputs to the PPA tool are required at two levels. Project-specific inputs generally must be submitted by the project applicants and include the type of project, specific roadway segment data such as project type, estimated average daily traffic (AADT), speed limits, and pavement condition index (PCI). Regional data inputs come from a variety of sources. Parcel-based land use data and integrated land use-transportation data are based off of current land use and transportation system spatial information, as well as planned future conditions under the MTP. Regional transportation network information includes spatial and temporal information surrounding the transportation network. Specific examples include the General Transit Feed Specification (GTFS) data to reflect transit information and the Transportation Injury Mapping System. (TIMS) to reflect safety information. The regional travel demand model uses transportation system, demographic information, and survey data to model how people travel along the transportation network and forecast future conditions under the MTP (SACOG, PPA Technical Documentation, 2018). One important aspect of the PPA tool is that it

does not require local governments to gather substantial information and data to demonstrate project performance, so the administrative and technical burden for local transportation agencies to utilize performance measurement in local decisions is substantially reduced.

The PPA Tool reports baseline and forecasted future conditions for a variety of Performance metrics. Individual Performance Indicators link to performance outcome in the Regional Program, and community and regional averages are calculated for each. (See Figure 8) In this way, the tool suggests whether or not a project supports the goals of the MTP/SCS.

| Project Performance Assessment (PPA) Tool Averages by Community Type | | | | | | | | |
|----------------------------------------------------------------------|-----------------------------------------------|---------------------------|------------------|------------------|------------------|-------------------|------------------|------------------|
| Outcome | Metric | A supportive score is*... | Established | Corridor | Developing | Rural Residential | Ag/Other | Regional Average |
| Outcome #1 - Reduce VMT | VMT/Capita | Lower | 17.5 | 13.5 | 21.7 | 28.8 | 31.1 | 18.3 |
| | Net Jobs (EMP) + Dwelling Units (DU) per acre | Higher | 6.1 | 16.8 | 2.2 | 0.3 | 0.4 | 3.1 |
| | Change VMT/ capita | Lower/Negative values | -6.4% | -11.1% | -7.6% | -2.0% | -1.9% | -6.4% |
| | Net Density Increase | Higher | 16% | 31% | 152% | 10% | 0% | 31% |
| Outcome #2 - Reduce Congestion | Buffer area CVMT/VMT | Higher | 4.6% | 5.44% | 5.0% | 0.85% | 3.0% | 4.1% |
| | % growth DU + EMP | Higher | 24% | 57% | 313% | 12% | 0% | 40% |
| Outcome #3 - Increase Multimodal | 3- or 4-way intersections per acre | Higher | 0.11 | 0.16 | 0.02 | 0.01 | 0.00 | 0.03 |
| | Bike lanes + paths/ total road mileage | Higher | 17.4% | 22.5% | 10.2% | 1.7% | 1.6% | 9.7% |
| | AADT | Context | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table |
| | Posted Speed Limit | Context | na | na | na | na | na | na |
| | Transit vehicle stops per acre | Higher | 0.19 | 1.21 | 0.00 | 0.00 | 0.00 | 0.06 |
| T/B/W future mode share | Higher | 12% | 29% | 7% | 3% | 4% | 13% | |
| Outcome #4 - Support Economy | Transit + Drive Job Access | Higher | 410,933 | 527,887 | 266,223 | 181,067 | 164,173 | 403,102 |
| | 2012 K-university enrollment per net acre | Higher | 1.1 | 3.1 | 0.2 | 0.0 | 0.0 | 0.21 |
| | % Emp growth | Higher | 41% | 49% | 290% | 18% | 0% | 49% |
| | % Ag Acres current | Higher | 5% | 4% | 55% | 15% | 48% | 41% |
| % Change in Ag Acres | Higher/No change | -20% | -60% | -13% | -1% | 0% | -1% | |
| Outcome #5 - Freight | % Commercial VMT | Higher | 17% | 42% | 14% | 11% | 17% | 19% |
| | Commercial CVMT/ Commercial VMT | Higher | 4% | 3% | 4% | 3% | 1% | 4% |
| | % Industrial Jobs | Higher | 18% | 8% | 30% | 20% | 37% | 16% |
| Outcome #6 - Safety | Total Collisions/ 1 million VMT | Higher | 0.72 | 0.90 | 0.42 | 0.53 | 0.40 | 0.70 |
| | % Fatal Collisions (All Roads) | Higher | 1.7% | 1.3% | 3.4% | 3.6% | 4.6% | 2.0% |
| | % Bike/Ped Collisions | Higher | 14% | 18% | 7% | 4% | 3% | 14% |
| Outcome #7 - Maintenance | PCI | Lower | na | na | na | na | na | na |
| | AADT | Higher | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table | Volume Ref Table |
| | Complete Street Potential Index | Context | relative | relative | relative | relative | relative | relative |
| Equity | LIHM Population | Higher | na | na | na | na | na | na |
| | % LIHM Population | Higher | 31% | 56% | 14% | 6% | 11% | 30% |

Figure 8: PPA Guidance Table (SACOG, PPA Technical Documentation, 2018)

Proposed transportation investments are compared by community type to determine whether a project supports regional transportation goals. The proposed project's community type is defined based on the project location and the corresponding MTP/SCS community type identification. The PPA tool compares a project's score for a specific indicator against the average score of other areas within the same community type. Performance scores are binary: projects either are supportive of regional goals or not, but can vary widely as to the degree of performance. Performance Indicators are relative by design so that project specific outcomes are assessed relative to size. By relating projects by community type and how a project affects a particular outcome, decisionmakers can better compare projects across the region using standardized metrics.

THE PPA TOOL AND REGIONAL TRANSPORTATION DECISION MAKING

The project-specific performance assessments generated by the PPA Tool are not the only deciding factor in regional investment decisions. Rather, the PPA Tool adds many pieces of project-specific and regional information to help inform decisions as part of the total evaluation criteria and selection process. Performance assessments add a quantitative approach to SACOG's regional decision making framework, provide transparency to regional planning and programming activities, and can reduce the strain on local agencies when applying for regional, state, and federal funding programs.

Project applicants to SACOG's 2018 Regional Program were required to prepare and submit a project-level performance assessment using the PPA tool as part of every funding application. The project-specific performance assessments generated through the PPA Tool are only one aspect of the total project evaluation, and are intended to provide data, context, and information to project applications (SACOG, 2018 Regional Program Final Framework, 2018). Although the PPA Tool has performance measures across seven performance outcomes, project applicants are required to select and address three performance outcomes which best express a project's performance in their project application. Project applicants are only required to address three performance outcomes because it is generally recognized that not all projects are intended to

address all transportation outcomes. Performance Indicators for each of the three performance outcomes chosen must be addressed in the application narrative, and project applicants demonstrate how project design elements enhance or respond to the performance assessment. Project applicants are invited to include their own data to complement or inform the results performance assessment (SACOG, PPA Technical Documentation, 2018).

The PPA Tool uses two sets of economic vitality-focused Performance Indicators, to measure the long term economic benefit of either urban or rural economies. (See Figure 9) For projects identified as serving urban areas, performance measures focus on fast growing employment areas and accessibility to employment and educational training opportunities. For projects in rural areas, economic vitality measures focus on fast growing employment areas, too, and also how a project supports the local and regional agricultural economy now and into the future. The application narrative must address either set of performance measures and demonstrate how project design elements support local economic development goals or strategies through prosperity, place-based, or sector-specific approaches (SACOG, 2018 Regional Program Final Framework, 2018).

| Question | Indicator | Score supportive of outcome |
|-------------------------------------------------------------------------------------|--------------------------------|------------------------------------|
| To what extent does the project support job accessibility? | Transit + drive job access | Higher |
| To what extent does the project support accessibility to educational facilities? | K – university enrollment | Higher |
| Does the project serve a fast growing employment area? | % employment growth | Higher |
| To what extent does the project support the agricultural economy? | % of current ag acres | Higher |
| Does the project serve an area projected in the MTP/SCS to stay in agriculture use? | % change in agricultural acres | Higher (0% change most supportive) |

Figure 9: Indicators to Provide Long Term Economic Benefit (SACOG, 2018)

Before projects can proceed through the selection process, applications are screened for a variety of conditions. First, projects must be currently listed on the MTP/SCS with a few exemptions, as required under state and federal law. Second, projects must provide a minimum of 11.47% match in non-federal funds under federal funding requirements. Third, projects must be eligible for funding sources that make up the 2018 Regional Program including CMAQ, STIP, etc. Fourth, SACOG requires project construction to be scheduled within seven years, and preliminary design and analysis scheduled within three years. Finally, SACOG requires projects demonstrate that local funding be available by the time funds are requested, and the local agency demonstrate the financial capacity to undertake the proposed project. The screening process is designed to ensure only those projects that actually eligible for state and federal funding are selected for development, and to leverage regional funding for projects that can be completed in the near term (SACOG, 2018 Regional Program Final Framework, 2018).

Project applications that pass the screening process and submit a complete application are eligible for the project selection process. The project selection process consists of four stages; a pre-application engineering and technical review, an application performance review, preliminary project recommendations, and final draft recommendations.

The pre-application engineering and technical review process focuses on the eligibility, deliverability, and cost-effectiveness of project applications. Project applicants to the Regional Program must submit a pre-application letter describing the project and basic budget and cost estimates. A team of engineers and other technical professionals drawn from throughout the region are selected to serve on the engineering review committee. Prospective members are selected based on their willingness to serve on the committee and specific subject matter expertise relating to project types eligible for funding in the program. Review committee members do not review project applications from agencies in which they work, or otherwise may have conflicts of interest. Members of the committee review the engineering and technical aspects of project pre-application letters to determine which funding programs each project may be eligible for, whether the proposed

project can meet performance and budget deadlines outlined in the project application and 2018 Regional Program requirements, and to identify any foreseeable concerns or performance outcomes the project raises. If the proposed project is determined to be eligible for the Regional Program, a full project application is then submitted to SACOG.

The application performance review working group reviews and evaluates project applications according to an iterative process that considers the review committee analysis, the project level performance assessment developed with the PPA Tool, narrative responses to questions on the funding application, and the project application as a whole. Working group members consist of subject matter experts across a variety of fields from SACOG and member agencies, and are selected in a similar manner to the review committee. Members are selected to review and evaluate a set of project applications based on their subject-area expertise and any conflicts of interest that may arise. Project applications are reviewed based on the three out of seven possible performance outcomes that project applicants identified to best fit their project. Members of the working group review and evaluate project applications to determine whether project cost and deliverability estimates are believable and equivalent to standards for similar projects, the project sponsor has proven experience demonstrating technical and administrative capacity to manage the proposed project, and how well the project supports regional goals identified in the 2018 Regional Program (SACOG, 2018 Regional Program Final Framework, 2018).

Preliminary project funding recommendations are developed by SACOG staff and management, and are based primarily on the recommendations and prioritized project list from the working group. The working group recommendations and project prioritization are the result of an iterative process that uses qualitative and quantitative methods to assess and rank projects against the performance outcomes identified in the Regional Program and the pool of candidate projects. The first step of the process involves working group members evaluating both the data and narrative components of each of the three selected performance outcomes using a nine-point

performance range including coequal high, medium, and low categories. Following individual evaluations, members of the working group meet on several occasions and collectively evaluate project applications based on the same criteria and rank and prioritize submitted projects. For projects selected and prioritized for funding, applicants are invited to send a team of planners, engineers, and administrators to be interviewed by the working group to present a detailed project proposal and respond to questions to ensure the project meets the requirements of the Regional Program and state and federal funding programs.

The preliminary project funding recommendations developed by the working group are then sent to SACOG management and staff to ensure the compilation of selected projects support the goals and priorities identified in the Regional Program. SACOG recommendations are then combined with project recommendations across the various funding programs to create the final draft funding recommendations for the 2018 Flexible Funding Round, which are then sent to the SACOG Board for approval.

THE NEED FOR ADDITIONAL MEASURES OF ECONOMIC BENEFIT

Recall that Federal requirements under MAP-21 and the FAST Act require MPOs to evaluate the performance of their transportation investments against a series of transportation goals. (See Figure 2) Although there is a long history of regional performance measurement in the areas of safety and infrastructure condition, that is not the case in the areas of economic vitality and prosperity (Transportation for America, 2017). National- and state-level established policy goals of economic vitality and competitiveness tie directly into regional funding priorities and project level performance measurement in the Sacramento region. The fourth of seven performance outcomes identified in the Regional Program is “to provide long-term economic benefit within the region, recognizing the importance of sustaining both urban and rural economies” (SACOG, 2018 Regional Program Final Framework, 2018). The performance measures currently implemented in the PPA Tool provide accurate information for project applicants to respond to their respective questions, but the implementation of additional measures

could help better evaluate the long term economic benefit of proposed transportation projects across the region.

There are currently five performance measures designed to measure long term economic benefit performance outcomes included in the PPA Tool, divided across two broad land use types. The PPA Tool measures performance of projects in urban areas using three performance indicators: (1) the total transit and automobile job accessibility surrounding the proposed project site; (2) the total kindergarten through university enrollment per net acre surrounding the project site, and (3) the projected change in employment growth surrounding the project site. The long term economic performance of projects in rural areas are also measured using three performance indicators: (1) the share of land currently in agricultural use surrounding the project site; (2) the projected change in agricultural land use surrounding the project site, and (3) the change in employment growth surrounding the project site.

Although the funding round has ended, the process to implement and improve the PPA Tool is ongoing. Recognizing the ongoing nature of performance measurement, SACOG staff began discussions to implement additional measures into future iterations of the PPA Tool in order to better inform future project selection and programming decisions. This report responds to those discussions and identifies additional measures that are both effective measurement tools of long term economic benefit and implementable in the PPA Tool. In addition, this report adds to the existing literature surrounding performance measures to measure project-level economic benefit and how MPOs can target measure choice towards regional goals.

Transportation projects are the key to many local planning and redevelopment initiatives throughout the region, and projected economic impacts typically drive project investment decisions. In order to make efficient investment decisions that achieve regional goals, decision makers need the best information available regarding proposed projects' potential economic benefit. The performance measures of economic benefit currently implemented in the PPA Tool

may not provide a thorough analysis of economic changes, may be too closely related, and may not highlight the distinctions between urban, suburban, and rural economies.

Chapter 3: Literature Review

There are two primary tasks performed in order to identify potential performance measures for inclusion into future iterations of the PPA Tool; a literature review and set of peer MPO case studies. The development and implementation of performance measurement tools is well documented in recent literature and encompasses many general regional goals and performance metrics that support federal transportation goals under MAP-21 and ensuing legislation. Included in this literature is research looking into specific performance measures that can be used to measure the long term economic impact of transportation investments across diverse communities.

PERFORMANCE MEASUREMENT AND DECISION MAKING IN THE UNITED STATES

Performance measurement has long been involved in federal transportation funding and decision making in the United States. State and federal transportation planning agencies have invested substantial resources into developing performance management systems to better manage changing transportation networks (Poister, 1997). By the turn of the century, many state DOTs had begun implementing performance based planning at the systemwide level to link agency goals and objectives with performance measures (Pickrell & Neumann, 2000). MPOs throughout the country also took the initiative and began developing performance measurement tools to address state and federal performance areas. A study of four MPOs, including SACOG, suggested that MPOs should develop performance measures for all regional planning goals, not just traditional system performance measures; should clearly match chosen performance measures to regional goals; and should link performance measures to travel demand models to be successful (Handy S. , 2008).

Since the passage of MAP-21, many MPOs have begun transitioning to performance planning that may or may not meet state or federal requirements. A recent survey found the vast majority of MPOs are using performance measurement in some fashion to link planning and regional goals (Kramer *et al.*, 2017). Although MPOs have begun, many MPOs have not implemented performance measurement requirements identified by MAP-21. Another survey found most MPOs had established performance measures relating to areas of safety, but

performance measures in other areas were implemented less often. Further, only a small percentage of MPOs surveyed across the country had adopted and implemented all 19 of the performance measures required under MAP-21 at the time of the report (Grossman, 2018). While many MPOs may be developing performance measurement tools, there is still much progress to be made regarding using it to meaningfully aid decision making. Grossman suggests data coordination and information sharing between MPOs and at all levels of transportation planning could encourage more efficient and effective performance measurement (2018). In addition, previous research suggests performance measures linked to travel demand models will carry the most weight in transportation decision making in the future (Handy S. , 2008).

Although many federal performance based planning requirements are aimed at system level performance measurement, previous research has suggested that project level performance measurement can be used to help prioritize projects to achieve targeted goals while providing clarity and transparency to funding decisions (Sinha & Labi, 2007). Early research discussed the importance of using performance measurement to guide resource allocation decisions and report performance to external audiences, but warned against using performance measurement to replace decision making or absolve decision makers of the responsibilities behind funding decisions (Poister, 1997). Pickrell and Neumann suggest that although “performance measurement among transportation agencies varies in every conceivable way” (2000). Still, it can provide clarity and accountability to funding decisions, improve internal and external communication, and result in transportation projects that reflect agency goals and objectives (Pickrell & Neumann, 2000). A National Cooperative Highway Research Program (NCHRP) Report provides more detailed information on how state DOTs and MPOs can use a performance-based approach to prioritizing projects that achieve state and federal transportation goals (NCHRP, 2010). While performance measurement can and should be used to inform the overall transportation decision making process, decisions should not be based solely on projected performance. Previous research suggests overreliance on performance measurement does not necessarily lead to better results and could

shift the responsibility for funding decisions away from decisionmakers (Pickrell & Neumann, 2000).

Project selection and prioritization decisions, especially in the face of limited funding streams, are inherently politically sensitive. While performance measurement could increase transparency and accountability, mismatched goals and overly technical performance measures can introduce new challenges or erode the public trust in agency decisions and actions (Grossman, 2018). Furthermore, research has suggested that decisionmakers may be reluctant to implement performance based planning out of concern of losing control over large tranches of discretionary spending (Pickrell & Neumann, 2000). Similarly, agencies may exhibit a desire to make subjective or political decisions regarding transportation investment and performance measurement can be seen as a threat which limits decisionmakers' flexibility (NCHRP, 2010). The political difficulties of transportation funding decisions are generally unavoidable. As a result, it is important that performance measurement be used to inform the decision making process rather than replace it.

Despite the identified importance, many MPOs may not use performance measures to inform regional funding decisions. A recent survey found most MPOs self-report linking performance measures to regional goals and prioritization criteria in some way, but was specifically noted as an item of improvement moving ahead (Grossman, 2018). A similar review of staffing and organizational structures at MPOs found approximately 34 percent have established performance measures for their TIP generally, and highlighted one example of an MPO using performance measurement as a method for prioritizing projects for inclusion in the TIP (Kramer, et al., 2017). Although many MPOs may link performance measures to prioritization criteria, fewer than one third use them to evaluate specific projects to inform funding decisions (Transportation for America, 2017). In addition to the regional evaluation and selection process, performance measurement can be helpful in receiving state and federal grant support for transportation projects, thereby reducing the technical and administrative burden on local and regional planning agencies (EPA, 2011). As a result, tools and techniques that can help MPOs use performance measurement

to help prioritize and select projects that help achieve regional and federal goals can prove immensely helpful to MPOs around the country.

PERFORMANCE MEASUREMENT RELATING TO REGIONAL ECONOMIC VITALITY

Economic vitality is an important issue for all regions and has been a driving force for transportation investment for some time. Despite substantial resource investment, a study of statewide DOTs found few agencies historically used performance measures regarding economic vitality (Poister, 1997). In 2011, research that evaluated regional performance measurement tying transportation investment choices to economic growth found that many states do not have adequate performance measures of economic vitality (Pew Center on the States, 2011). Under MAP-21, the federal government reaffirmed longstanding goals of improving regional economic vitality through transportation infrastructure investments, but no performance measures required under MAP-21 address these goals aside from freight performance.

Research has long suggested that MPOs need to develop performance measures for all regional planning goals, not just the federally mandated measures (Handy S. , 2008). Although many MPOs have implemented performance measurement in some fashion, few MPOs have established performance measurement in areas other than those required under MAP-21, including economic vitality (Kramer, et al., 2017). Still, the impacts of transportation projects on local and regional economies are increasingly being considered in the evaluation and selection of projects through the use of performance measures surrounding employment accessibility, tax revenues, or land use changes, among other metrics (Sinha & Labi, 2007). In addition to the regional evaluation and selection process, performance measurement of a project's impact on local and regional economic vitality can be helpful in receiving state and federal grant support for transportation projects because economic vitality is included in both state and federal transportation planning goals, illustrating specific project benefits can bolster project applications in competitive funding programs at all levels of government (EPA, 2011).

There has been a significant amount of published research over the last two decades relating to transportation performance measurement with some emphasis on the local and regional economic impacts of transportation projects. Compilations of general regional goals and corresponding good performance measures of economic benefit can be found in research conducted by Cambridge Systematics (2000), Pickrell and Neumann (2000), and Sinha and Labi (2007). Additionally, many authors have conducted targeted research on the small portion of MPOs who use performance measurement to track progress towards regional goals. National studies have been conducted identifying and assessing performance measurement at the regional level (Kramer, et al., 2017 and Grossman, 2018) which also include case study research conducted regarding MPOs who use case studies relating to economic vitality. Further case study research has been developed by the NCHRP (2010), EPA (2011), and FHWA (2013) analyzing how MPOs throughout the country use performance measurement, with some discussion regarding the economic benefit of transportation projects.

Figure 10 illustrates a preview of performance measures identified in previous research, and Chapter 5 contains a larger list of potential measures of economic benefit and vitality identified through previous research that will be evaluated in the next chapter of this report.

| Previously Identified Performance Indicators of Economic Vitality, Continued | | | | |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Performance Indicator | Description | Source/Reference | Measures long-term rural/urban economic benefit? | Data/Resource Requirements |
| Vacancy Rates | Measures indirect economic vitality and identifies potential growth opportunities | Transportation for America | Yes - Urban | Low - Relies on federal and statewide data sources and regional land use data |
| Tax Yield per Acre | Measures indirect economic vitality through regional real property revenues | Transportation for America | Yes - Rural/Urban | Medium - Relies on employer-level tax and business data, and regional travel demand models |

Figure 10: Selection of Previously Identified Performance Measures

The implementation of performance based planning tools is well documented in recent literature, but there is little research on how MPOs incorporate performance measurement into project level decision making. The lack of research could be linked to the lack of project level performance measurement at MPOs, or the technical, financial, and administrative requirements surrounding the development of transportation demand models and assessment tools. Although many MPOs may link performance measures to prioritization criteria, fewer than one third use them to evaluate specific projects to inform funding decisions (Transportation for America, 2017). Another survey of 183 MPOs found more than two-thirds responded a lack of funding and personnel prevented them from collecting and utilizing more quantitative data than required by federal transportation legislation, which includes measures surrounding economic vitality. Other MPOs noted they were unsure how to collect or use this kind of data which could reflect a lack of technical capacity at MPOs (Grossman, 2018). Significant research exists surrounding benefit cost assessments and the fiscal impacts of transportation investments over time, but there is a general lack of knowledge about how MPOs use performance measurement to understand the economic impacts of transportation projects. Identifying potential performance measures of economic benefit to help inform regional transportation decision making can help MPOs better target investments towards projects that achieve regional goals.

BENEFITS OF PROJECT LEVEL ECONOMIC PERFORMANCE MEASURES

Project level performance measurement can help MPOs evaluate the degree to which proposed transportation projects will achieve regional transportation goals. Sinha and Labi (2007) outline a variety of tangible benefits that can be realized through performance management including achieving policy goals, agency efficiency and effectiveness, and providing clarity and transparency to regional decision making. It is important to note that research suggests project level performance measurement should be used to help inform the project selection process rather than replace it (Pickrell & Neumann, 2000). In addition, the transparency of infrastructure investment and regional agency accountability are enhanced when transportation projects are

evaluated based on objective performance measures that can be adjusted as goals or policies shift (Sinha & Labi, 2007). Previous research has emphasized the importance of reporting performance measures to the public to improve transparency and reliability (Handy S. , 2008), but noted mismatched performance measures and priorities may complicate an agency's image (Grossman, 2018). Similarly, if performance measures are not clear and understandable they may result in a 'black box' approach to planning that does not necessarily link decisions to identified goals and priorities (Pickrell & Neumann, 2000). Ensuring project level performance measures align with regional goals can help the public better understand transportation investment decisions.

Most regional transportation infrastructure investments are targeted towards providing an effective and efficient transportation network to connect people and. Although there is a recent history of performance measurement in areas like safety and emissions reductions, that is not the case in areas like economic vitality. Federal performance measurement requirements target freight movement, and most state agencies are struggling to make linkages between performance measurement and economic vitality (Pew Center on the States, 2011). Still, MPOs throughout the country have responded that economic growth and competitiveness is one of the performance areas they are most interested in exploring (Transportation for America, 2017). Research has identified a variety of project level performance measures that could be used to measure impacts on regional economic growth including measures relating to job accessibility or density, tax revenues, or land use changes, among other metrics (Cambridge Systematics, 2000 and Sinha and Labi, 2007). Additional research has shown that there are significant benefits of aligning performance measures with regional goals including those related to economic vitality, but it may be difficult to conclusively link transportation investments with economic activity (Pickrell & Neumann, 2000). Although it may be difficult to develop performance measures that link transportation decisions with economic vitality, it is important for MPOs to continue implementing project level performance measurement of economic vitality into project selection and prioritization processes and decisions.

LIMITATIONS OF PROJECT LEVEL ECONOMIC PERFORMANCE MEASURES

Although project level performance measurement is becoming increasingly more commonplace among MPOs, significant implementation limitations remain. First, project level performance measurement tools are typically carried out using a regional travel demand model that assesses the impact of proposed transportation investments on the regional transportation system. MPOs require a significant level of technical capacity in order to gather the necessary data and develop and implement a model off which many performance measures could be based. A recent study found more than 25 percent of MPOs were unsure how to collect data, what data to collect, or how to analyze data, and more than half did not have enough personnel to implement performance measurement programs (Grossman, 2018). In a second study, a large number of MPOs cited a lack of data as an obstacle to developing and implementing performance measurement (Transportation for America, 2017). The administrative and financial capacities of MPOs can follow a similar fashion. Kramer et al. found many MPOs reported increased staff workloads and consultant costs related to the implementation of performance measurement tools; the large majority reported increases of between 0 and 20 percent (2017). As a result, many MPOs may not have the capacity or resources to develop and implement new project level performance measurement tools, especially beyond federal requirements. Recent research suggests reporting performance measures to the federal government takes added effort and many MPOs collect performance data but do not necessarily process or report it (Grossman, 2018). Capacity limitations are especially significant given that previous research has concluded that performance measures related to travel demand models will be the most important in future transportation planning processes (Handy S. , 2008).

Although some MPOs do have the technical and financial capacity to gather and analyze large quantities of data and information, developing measures that can inform project selection and prioritization decisions remains a difficult issue. Grossman found many MPOs lacked the political will to develop performance measurement tools or did not believe a data-driven approach

would improve their planning practices (2018). These findings could stem from the suggestions that decision makers may not want to relinquish decision making authority or power over public investment decisions. Despite the potential lack of political will, Transportation for America found that only three of 104 MPOs identified public resistance as a barrier to implementation (2017). Federal guidance, however, notes that the myriad stakeholders and agencies involved in project level transportation decision making can create challenges in developing agreement on common goals, performance measures, and metrics (Federal Highway Administration, 2018).

Another significant limitation to implementing project level performance measurement tools includes identifying accurate indicators of progress towards regional goals, specifically the goal of improving economic vitality by providing long term economic benefit. Although federal guidance has described the need to use performance measurement to evaluate the economic benefits of transportation investments and interpret those findings for decision makers and the general public (FHWA, 2013), few MPOs have implemented such measures (Kramer, et al., 2017 and Grossman, 2018). Research suggests the lack of implementation could be due to a lack of political will, or MPOs do not believe a data driven approach will improve transportation planning (Grossman, 2018). Research also suggests MPOs may not be implementing performance measures surrounding economic vitality because the federal government simply does not require them yet (Kramer, et al., 2017).

Perhaps the greatest impediment to the development and implementation of performance measures of economic vitality are the relatively complex relationships that exist between transportation infrastructure and the surrounding economic growth (Pew Center on the States, 2011). Economic benefit or vitality is also a confusing term to define, much less measure. There are myriad ways in which to interpret economic benefit and vitality which makes the evaluation of transportation projects in this performance area especially difficult (Cambridge Systematics, 2000). Despite the limitations, it is important for MPOs to continue implementing measures of economic performance into project level performance measurement tools.

Chapter 4: Peer MPO Best Practice Review

The case studies of project level performance measurement tools presented below represent a subset of SACOG's identified peer regions. Peer regions were selected based on their identification as a peer city in SACOG's 2018 Regional Peer Benchmarking Project, whether the MPO has implemented some sort of project level performance measurement program to help select and prioritize projects, the availability of information relating to regional performance measurement practices, and guidance from SACOG management and staff. This report studies the cases of 3 peer regions: (1) the Broward MPO; (2) the Nashville Area MPO (NAMPO), and; (3) the Oregon Metro.

BROWARD METROPOLITAN PLANNING ORGANIZATION

The Broward MPO serves as the MPO for the greater Ft. Lauderdale, Florida region, and is responsible for selecting and prioritizing projects that support the regional goals identified in the RTP. The Broward MPO has been implementing performance based planning since at least 2013, and currently uses performance measures to assess project performance and project delivery, provide information to support decisions, and demonstrate transparency and accountability to regional residents (Broward MPO, 2018).

As part of the regional performance based planning process, the Broward MPO has implemented a network level performance measurement system to evaluate and prioritize projects applying for regional funding under the regional TIP equivalent, the Multimodal Surface Transportation Priorities List (Broward MPO, 2018). Much of the performance measurement implemented in the Broward MPO is centered around planning factors identified under the FAST Act, but the region also uses performance measurement to evaluate projects based on statewide and regional goals. Project applications that pass an initial screening process, similar to that of SACOG, are then evaluated against a series of performance measures and corresponding metrics.

The Broward MPO uses three broad goals against which to measure network level performance and evaluate how well a given transportation project supports its goals. These include

moving people and goods, creating jobs, and strengthening communities. Job creation is the one goal used in Broward MPOs project selection process that can serve as a sufficient proxy for economic benefit for the case of this report. Figure 11 illustrates the connections between regional and federal transportation goals and identifies the movement of people and goods and job creation as supporting economic vitality. Broward MPO suggests the regional goal to move people and goods supports all ten FAST Act planning factors, while regional goals to create jobs and strengthen communities support some of the federal planning factors.
























| FAST Act Planning Factors | | 2045 MTP Goals | | |
|---------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | | GOAL 1 Move People and Goods | GOAL 2 Create Jobs | GOAL 3 Strengthen Communities |
| 1) | Support Economic Vitality |  |  | |
| 2) | Increase Safety |  | |  |
| 3) | Increase Security |  | |  |
| 4) | Increase Accessibility and Mobility of People and Freight |  |  |  |
| 5) | Improve Quality of Life, Environment, Energy Conservation, and Plan Consistency |  |  |  |
| 6) | Enhance Integration and Connectivity Across and Between Modes |  |  |  |
| 7) | Promote System Management and Operation |  | |  |
| 8) | Emphasize Preservation of the Existing System |  | | |
| 9) | Improve Resiliency and Reliability |  | |  |
| 10) | Enhance Travel and Tourism |  |  |  |

Figure 11: Broward MPO Regional Transportation Goals

Performance measures used to evaluate a transportation project’s potential job creation benefits are spread across four broad objectives and illustrated in Figure 12. Average travel times to the central business district, a regional cruise port, and the metropolitan airport measure how well a project maintains or reduces the average travel time to major regional economic centers. The Broward MPO uses the provision of transit service or reducing congestion to measure how well a proposed investment promotes new development, but the linkage between transit service or congestion is unclear. A cost function logarithm relating travel time, operation, and maintenance costs person- or vehicle-miles traveled was designed to evaluate how well a proposed project minimizes the overall cost of travel. Finally, public expenditure costs and community involvement in innovative approaches are used to measure how well a proposed project maximizes private investments in transportation service provision. Although performance measures associated with each factor are weighted equally, the Broward MPO can adjust the weight assigned to each measure in order to evaluate projects relative to specific objectives in any given planning year (Broward MPO, 2018).

| Objective | How Objective is Achieved (Measures of Effectiveness) |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maintain or reduce average travel time to major economic centers of the urban area | <ul style="list-style-type: none"> • Average travel time to Central Business Districts (CBD's), outlying business districts and major employment centers with more than 5,000 employees/square mile (No Build Alternative – Build Alternative) for all modes • Average in-vehicle travel time to Port Everglades (No Build Alternative – Build Alternative) • Average in-vehicle travel time to Fort Lauderdale/Hollywood International Airport (No Build Alternative – Build Alternative) |
| Promote new development | <ul style="list-style-type: none"> • Provide newly developing areas frequent transit service (20 minute or less headway) or 95% of highway lane miles in developing areas at Level-of-Service (LOS) C or better |
| Minimize the overall cost of travel | <ul style="list-style-type: none"> • $(\text{Travel time} * \text{value of time} + \text{operating cost} + \text{maintenance cost}) / (\text{person miles of travel} + \text{truck miles of travel})$. |
| Maximize private investments in transportation service provision | <ul style="list-style-type: none"> • Minimize net cost of public expenditures in project development • Increase community / public involvement via innovative approaches |

Figure 12: Broward MPO Selected Performance Measures (Broward MPO, 2018)

The Broward MPO is one of the few MPOs throughout the country currently utilizing project level performance measurement to inform project decisions relative to regional goals. The Broward MPO ties objective and subjective performance measures to a series of broad, measurable objectives applicable to each regional goal. For the purposes of this report, the most important performance measures are those relating to economic vitality and benefit. By using economic performance measures in project selection and prioritization processes and decisions, the Broward MPO is better able to evaluate the economic impact of funding decisions and make more informed decisions.

NASHVILLE AREA METROPOLITAN PLANNING ORGANIZATION

The Nashville Area MPO serves the greater Middle Tennessee region, and is responsible for selecting and prioritizing projects that support the regional goals identified in the RTP. The region has been implementing performance based planning since the passage of MAP-21, but only recently began implementing project level performance management as part of the project selection and prioritization process, having developed a 100-point scoring process to inform the region's 2040 RTP. The suite of objectives that comprise NAMPO's project evaluation factors are centered around planning factors identified under MAP-21, but the region also uses performance measurement to evaluate projects based on regional goals that support federal transportation policy. NAMPO's project level performance measurement evaluation is used to score and prioritize projects applying for funding under the TIP based on how well they support regional goals. One of the four broad regional goals related to NAMPO's project evaluation and scoring criteria is to "enhance economic competitiveness by improving private sector performance," which can serve as a sufficient proxy for economic benefit for the case of this report (NAMPO, 2016). Figure 13 attempts to illustrate the alignment of regional goals with MAP-21 planning factors.

| 2040 RTP Goal | Applicable MAP-21 Factors |
|--------------------------------------------------------------------------|---------------------------|
| Maintain a Safe and Reliable Transportation System for People and Goods | 1, 2, 3, 7, 8 |
| Help Local Communities Grow in a Healthy and Sustainable Way | 1,2, 4, 5, 6, 7 |
| Enhance Economic Competitiveness by Improving Private Sector Performance | 1, 4, 5, 6 |
| Spend Public Funds Wisely by Ensuring a Return on Investment | 1, 5 |

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase the accessibility and mobility options available to people and for freight.
5. Protect and enhance the environment, promotes energy conservation, and improves quality of life, and promotes consistency between transportation improvements and state and local planned growth and economic development patterns
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

Figure 13: NAMPO RTP Goals (NAMPO, 2016)

NAMPOs measures and evaluates project performance against eight general planning factors aligned with regional goals, federal goals under MAP-21, and the MPOs guiding principles. These include: (1) system preservation and enhancement; (2) quality growth, sustainable land development, and economic prosperity; (3) expansion of multi-modal options; (4) roadway congestion management (5) safety and security; (6) freight and goods movement; (7) health and environment, and; (8) project support and history (NAMPO, 2016). As in other regional project selection processes, Nashville project applications that pass an initial screening process are evaluated against a series of performance measures that correspond to identified regional planning factors. Each planning factor is assigned a different weight in order to emphasize specific focus areas identified by the MPO’s Technical Coordinating Committee (See Figure 14). In the 2016 iteration of the project level performance measurement tool, safety was the most heavily weighted planning factor and quality growth is the second most important planning factor. Although weights are fixed in this case, NAMPO has the ability to adjust the weighting of each planning factor in the future to reflect the transportation network and evolving regional goals and visions.

| | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|------------------|--------------|-----|
| NAME: | SUMMARY | | | | | | | | | | | |
| AGENCY: | MPO TCC | | | | | | | | | | | |
| INSTRUCTIONS: For each combination, please choose the factor that you think deserves more weight in the RTP project evaluation process. | | | | | | | | | | | | |
| | | B. Quality Growth C. Multi-Modal Options D. Congestion Management E. Safety & Security F. Freight & Goods Movement G. Health & Environment H. Project History | | | | | | | | | | |
| | | | | | | | | | | COUNT | SHARE | |
| A. System Preservation | | | | | | | | | | A | 91 | 13% |
| B. Quality Growth | | | | | | | | | | B | 105 | 15% |
| C. Multi-Modal Options | | | | | | | | | | C | 98 | 14% |
| D. Congestion Management | | | | | | | | | | D | 93 | 13% |
| E. Safety & Security | | | | | | | | | | E | 139 | 20% |
| F. Freight & Goods Movement | | | | | | | | | | F | 41 | 6% |
| G. Health & Environment | | | | | | | | | | G | 93 | 13% |
| H. Project History | | | | | | | | | | H | 40 | 6% |
| | | | | | | | | | | 25 | 700 | |
| Please return to skipper@nashvillempo.org by February 20, 2015 | | | | | | | | | | Reviewers | Total Count | |

Figure 14: NAMPO Project Evaluation Factor Weights (NAMPO, 2016)

NAMPO brings together quantitative and qualitative performance indicators to measure how well a proposed project supports a series of planning factors heavily influenced by federal guidance. Performance measures relating to quality growth and by extension economic prosperity are illustrated in Figure 15. Although each performance measure is unweighted, the maximum score for each performance measure is variable, resulting in measures with more weight than others. Through developing and implementing performance measurement into the regional project selection and prioritization process and broader transportation planning framework, NAMPO and its’ member agencies can make better informed funding decisions and provide quantitative and qualitative support for proposed transportation investments. Although NAMPO’s project level performance framework does not specifically highlight economic vitality as a planning factor, the identified dimension of potential quality growth includes performance measures relating to economic vitality. Regional economic vitality measures-identified in NAMPO’s framework as quality growth-are measured across four performance measures in addition to a staff qualitative

analysis. Proposed projects can score up to 15 points in the quality growth category out of a 100-point total project evaluation score.

Household and employment density surrounding the proposed project site are designed to measure whether the project is located near existing population and employment centers. This measurement includes the total number of housing and employment opportunities surrounding the project area, but does not identify forecasted future conditions to better understand specific investment impacts. Whether the proposed project is located within municipal or urban growth boundaries are binary measures designed to differentiate between projects in areas identified for growth. Although not necessarily a direct measure of economic vitality, location-based performance measures can be used to target investment in areas targeted for development. Whether projects include streetscaping or curb and gutter improvements is an additional binary measure relating to whether project conforms with regional network design goals that support quality growth. This measure also does not relate directly to economic vitality, but can prioritize funding towards projects that conform to regional planning and design guidance. A final staff qualitative performance analysis is also conducted to complete the scoring process, and is based on a general analysis of how well the proposed project can achieve regional growth and economic goals (NAMPO, 2016). Only the first two performance measures in this assessment relate directly to economic vitality while the other two pertain to project location.

Quality Growth – 15 pts

- **Project is located near existing population & employment centers**
- **Project is located within municipal boundaries**
- **Project is located within urban growth boundaries**
- **Project includes streetscaping/ curb and gutter improvements**
- **Staff qualitative analysis**

Quality Growth (max 15) = [2010 HH density (up to 5 pts) + 2010 employment density (up to 5 pts) + municipal boundary (up to 2 pts) + urban growth boundary (up to 2 pts)] x 2040 urban density ratio

Figure 15: NAMPO Quality Growth Performance Measures (NAMPO, 2016)

OREGON METRO

Oregon Metro (Metro) serves the greater Portland region, and is responsible for selecting and prioritizing projects that support the regional goals identified in the LRTP. Metro has been a leader in performance measurement among MPOs for many years through the development of a regional performance dashboard representing systemwide performance (Cambridge Systematics, 2000). Only recently, however did Metro begin implementing project performance measurement in project selection and prioritization processes. A project performance evaluation pilot program similar to NAMPO was first implemented during the region's 2018 RTP update process (Metro, 2018). The project level evaluation pilot utilizes a 100-point scoring system across ten project criteria to allow regional decision makers and local jurisdictions to make better informed project selection decisions, and provide insight as to how transportation projects impact the region (Metro, 2017). During at least the pilot phase, project level performance evaluations are to serve an informational role only and not be used to determine final project selections in the RTP. Although program information does not explain why performance evaluations do not play a more prominent role, Metro may want to be able to address technical or political concerns surrounding performance measurement before linking project level evaluations with funding decisions. Furthermore, the project evaluation was not conducted for every project submitted by local agencies. Despite the current limited use of Metro's project level performance evaluation, the tool can serve as a good case study for economic performance measures.

Metro initially developed the performance evaluation framework to address performance related requirements under the FAST Act and enhance performance based planning throughout the region. Metro evaluates project performance against ten project criteria aligned with regional goals and objectives. One of the performance criteria in Metro's evaluation is the extent to which projects support jobs and regional economic development (Metro, 2018). In addition, performance measures relating to access to opportunity and regional center support could prove useful in evaluating the local and regional economic benefit of transportation investments. Each of the ten

project criteria carry equal weight, but performance measures within each project criteria may be given different weights. An additional bonus criterion focusing on transportation resilience is also included in the scoring evaluation. As noted previously, the pilot program was not applied to all projects in the 2018 RTP. Instead, large projects and projects of importance selected by local jurisdictions were evaluated in order to test and refine the evaluation tool for future iterations (Metro, 2017).

Performance measures that evaluate a transportation project’s potential job creation and regional economic development benefits are used to measure accessibility to job concentrations, targeted industries, or priority land uses. Performance measures of job creation and economic development and project scoring criteria are illustrated in Figure 16.

| | | | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Points | Purpose: Improve access to areas of high job concentration. How well does the project improve access to jobs (e.g., census tracts with large job concentrations)? ²⁶ | | |
| | Choose one | 4 | The project improves access to an area with a high number of jobs per square mile (>35,000 jobs). |
| | | 3 | The project improves access to an area with a moderate number of jobs per square mile (10,001-35,000 jobs). |
| | | 1 | The project improves access to an area with a base threshold of 2,001 jobs per square mile. |
| | Purpose: Improve access to targeted industries. How well does the project support job retention, expansion or revitalization efforts by improving access to targeted industries (e.g., census tracts with large job concentrations of target industries), including vehicle, transit, biking and walking? ²⁷ | | |
| | Choose one | 3 | Project provides new or substantially improved access to an area with a high number of jobs per square mile (>1,700 jobs) in regional target industries. ²⁸ |
| | | 2 | Project provides new or substantially improved access to an area with a moderate number of jobs per square mile (501-1,700 jobs) in regional target industries OR a high number of jobs per square mile (>1,700 jobs) in local/other target industries. ²⁹ |
| | | 1 | Project provides improved access to an area with at least 251 jobs per square mile in regional target industries OR a moderate number of jobs per square mile (500-1,700 jobs) in local/other target industries. |
| | Purpose: Improve access to priority industrial lands. How well does the project support job retention, expansion or revitalization efforts by improving access to regional priority industrial lands or improve market readiness and redevelopment potential of Tier 1, Tier 2 or Tier 3 regional industrial sites and areas? | | |
| | Choose one | 3 | Project improves access to Title 4 Regionally Significant Industrial Areas OR other state or regional priority industrial sites. ³⁰ |
| 2 | | Project improves access to Title 4 Industrial Areas. ³¹ | |
| 1 | | Project improves access to Title 4 Employment Areas. ³² | |

Figure 16: Oregon Metro Economic Development Performance Measures (Metro, 2017)

Job accessibility in census tracts surrounding the proposed project site measures how well it might improve access to areas of high concentration based on three categories of job concentration. Job accessibility across six identified industries measures how well a project supports access to local or regional target industries; Metro highlights the clean technology, computers and electronics, software and media, metals and machinery, athletic and outdoor, and health science and technology industries as regional target industries. Scoring for this metric also includes three categories of job concentration, each with different metrics for local and regional target industries. Performance measures surrounding employment density are used to measure how well a project supports economic vitality while also prioritizing funding towards projects that achieve regional goals surrounding compact development and future growth. Finally, accessibility to identified regional industrial and employment areas measures how well a project supports development of ‘shovel-ready’ lands identified by Metro and other regional partners. Specifically, this performance measure helps measure how well transportation projects support economic vitality of industrial lands while prioritizing efficient investment towards projects that are ready for development.

Metro has long been a leader in performance measurement amongst MPOs, and the development of a new project level performance evaluation framework demonstrates the region’s continued focus on performance based planning. Metro’s project evaluation framework emphasizes the linkages between land use and transportation in evaluating how well a proposed project supports regional goals. Although not yet fully implemented into the region’s project selection and prioritization decision making framework, Metro expects to use the project evaluation framework for all projects in the next RTP (Metro, 2017). By implementing project level performance measurement into the regional performance based planning framework, Metro is better able to align project level funding decisions with regional performance goals surrounding economic vitality.

ECONOMIC PERFORMANCE MEASUREMENT AMONGST PEER REGIONS

Federal requirements under MAP-21 and the FAST Act have instilled a renewed focus towards performance based planning at MPOs, and many regions have taken the initiative to develop and implement new performance measurement systems. No single approach for project assessment to inform the project selection and prioritization process is universally adopted by identified peer MPOs. With many regions developing new project-specific performance evaluation frameworks, it is advantageous to look to peer MPOs for guidance and lessons learned.

The nature and degree to which SACOG's peer MPOs implement project level performance measurement relating to economic benefit and vitality can vary substantially. While the Portland and Broward regions utilize data intensive travel demand models to forecast future performance, the Nashville relies more heavily on current data and regionally identified general growth rates. All regions relate economic vitality to job accessibility to some degree. Fort Lauderdale measures travel time to growth centers while both Nashville and Portland measure jobs within a specified geographical area. These findings are consistent with previous research finding many agencies have their own unique set of metrics for specific regional goals and priorities (Grossman, 2018). There is no perfect measure or set of measures to understand how a project will contribute to local and regional economic growth, but many MPOs continue to work to develop performance measures to inform regional funding decisions.

Chapter 5: Performance Measure Evaluation

This chapter presents a framework for evaluating the performance measures for economic vitality that have been identified in the literature or peer case analyses. The aim is to identify measures for economic vitality that are effective and implementable for SACOG's PPA Tool. This evaluation framework draws on the properties of good performance measures identified by Sinha and Labi (2007) and echoed by other studies (Cambridge Systematics, 2000) and federal guidance (FHWA, 2013). This is a normative framework intended to highlight the strengths and weaknesses of candidate measures. The performance measures identified here do not represent an exhaustive list of potential measures but serve rather a starting point for considering additional measures for the PPA Tool. Indicator selection requires further discussions with SACOG technical advisory groups, member jurisdictions, and the public.

A FRAMEWORK FOR PERFORMANCE MEASURE EVALUATION

The evaluation framework for previously identified performance measures is two-fold. First, the framework provides information about the performance measures and a qualitative rating for the overall data and resource requirements required to implement the measure in SACOG's PPA Tool. Second, the framework compares performance measures against the six properties of good performance measures identified by Sinha and Labi (2007):

- (1) Appropriateness
- (2) Measurability
- (3) Dimensionality
- (4) Realistic
- (5) Defensible
- (6) Forecastable

The first step of the framework documents performance measures relevant for evaluating the economic impacts of transportation investments and identified in research or in practice. Identified performance measures are preliminarily evaluated as to whether they can evaluate a

proposed project's performance towards SACOG's adopted regional and programmatic goals, specifically with respect to "long-term economic benefit within the region, recognizing the importance of sustaining both urban and rural economies" (SACOG, 2018 Regional Program Final Framework, 2018). Only those performance measures that support SACOG regional and programmatic goals will be evaluated further. Next, the data and resource requirements to implement identified performance measures are evaluated, with special consideration given to those performance measures for which SACOG currently has, or can easily access, requisite data and resources.

Data and resources required to run the PPA Tool are discussed in Chapter 2 of this report, and include land use, transportation network, and travel demand data (SACOG, PPA Technical Documentation, 2018). At the time of this report, SACOG managed a variety of regional datasets and spatial information on an open data portal in addition to those utilized by the PPA Tool. Datasets and spatial information available on the open data portal surrounding potential performance measures of economic vitality include parcel based land use, employment, and tax revenue information, jurisdiction specific business and tax revenue information, and transportation infrastructure and network information. Although SACOG manages a vast compendium of relevant information, examples of information that may not be available include business-specific earnings information or other proprietary data.

The first step of this evaluation is qualitative in nature and based on information and descriptions in each measure's reference or source material. The delineation between whether the indicator measures economic benefits depends primarily on the targeted land use, industrial, or socioeconomic characteristics of the measure. Generally, indicators that measure performance surrounding jobs and employment, tax revenue generation, business opportunities, or land use characteristics of the MTP can be determined to measure some aspect of economic vitality. Performance measures can be industry- or land use-specific, highlighting the distinction between urban and rural economies. Although indicators identified as measuring economic performance in

one land use category may also measure performance in the other, the primary focus of the measure is identified.

The data and resource requirements for each performance measure are categorized as high, medium, or low, reflecting the data and resources available in the PPA Tool and SACOG. In general, performance measures currently used in the PPA Tool during the 2018 Flexible Funding Round have low requirements. Measures that require data and resources currently available at SACOG, but not yet incorporated in the PPA Tool are categorized as having medium implementation requirements. Finally, performance measures that require new data and information currently unavailable at SACOG are categorized as having high resource requirements.

The second step includes a normative evaluation of specific performance measures' properties based on previously identified properties of good performance management. A performance measure's appropriateness refers to how well measurements reflect regional goals or objectives and whether its reporting leads to better informed decisions. Performance measures should also be relatively easy to measure in an objective manner, and require minimal time and financial resource investment while providing reliable and accurate results. The dimensionality of a particular performance measure relates to the ability to measure performance at the appropriate temporal and regional scales, and address the perspectives of relevant stakeholders. For instance, performance measures that cannot be forecasted through the planning horizon of the MTP would not have appropriate dimensionality. Performance measures must also be realistic and defensible; it should be possible to collect data and evaluate project level performance with minimal resource investment their findings communicated clearly to decision makers and the general public. Finally, performance measures should be forecastable and able to determine future conditions using current and developing tools (Sinha & Labi, 2007).

Research has suggested that the total suite of performance measures be comprehensive to measure progress towards goals (Cambridge Systematics, 2000), but the number of measures

should be limited in order to provide a manageable and meaningful analysis (Pickrell & Neumann, 2000). As a result, the entire suite of identified performance measures must be evaluated together to ensure performance outputs provide clear and relevant information regarding the economic impact of a proposed project. Still, it may be difficult to develop a suite of performance measures that can be used to achieve regional goals. It is important for that all future performance measure adoption and implementation be conducted through a collaborative effort with local and regional stakeholders.

Normative evaluations of good performance measures are qualitative in nature across six properties of good performance measures identified by Sinha and Labi (2007). Federal guidance is also considered when evaluating performance measures, with many consideration factors aligning directly with each of the six properties of good performance measures. Although potential measures are not evaluated directly to federal guidance, it is used to inform the categorizations of each of each measure. The six properties upon which performance measures are evaluated, and additional factors to consider are defined in Figure 17. In this step of the evaluation, each performance measure receives a categorization of high, medium, or low relating to how well the measure responds to each property of good performance measures and corresponding or relating federal guidance.

| Normative Performance Indicator Evaluation Criteria | | | |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Properties of Good Performance Measures | Definition (Sinha and Labi, 2007, p. 24-25) | FHWA Performance Indicators Factors to Consider | Definition (FHWA, 2013, p. 40-42) |
| Appropriateness | The performance measure should be an adequate reflection of at least one goal or objective of the transportation system action | Is the measure meaningful for the types of services or area? | The performance measure should play a role in decision-making and relate clearly to goals established in a performance-based planning process |
| Measurability | It should be possible (and easy) to measure the performance measure in an objective manner and to generate the performance measure levels with available analytical tools and resources. | Improvement direction is clear. | Agencies should make the preferred direction clear in their publications, as well as provide justification for why this is preferred |
| Dimensionability | The performance measure should be able to capture the required level of each dimension associated with the evaluation problem. | Is the measure meaningful for the types of services or area? | It is important to make sure that a measure is meaningful to the area or system to which it is applied. |
| Realistic | It should be possible to collect, generate or extract reliable data relating to the performance measure without excessive effort, cost, or time. | Are data available? | The feasibility and practicality to collect, store, analyze data and report performance information for the selected measures |
| Defensible | The performance measure should be clear and concise so that the manner of assessing and interpreting its levels can be communicated effectively within a circle of decision makers and to the stakeholders and general public | Is it clear? | Is the measure understandable to policy makers, transportation professionals, and the public? |
| Forecastable | For planning purposes, it should be possible to determine the levels of the performance measure reliably at a future time using existing forecasting tools | Can it be forecasted? | Are there realistic methods to compare future alternative projects, investment approaches, or strategies using the measure? |
| | | Is the measure something the agency and its investments can influence? | It is important that policy and investment decisions can influence the selected performance measure. |

Figure 17: Normative Performance Measure Evaluation Criteria (Sinha and Labi, 2007 and FHWA, 2013)

A performance measure's appropriateness is categorized according to whether it reflects SACOG's regional and programmatic goals, and plays a role in decision-making. A high categorization reflects indicators that measure long-term economic benefit within the region, recognizing the importance of sustaining both urban and rural economies and is meaningful to regional decision making. Measurability and realism are categorized in a similar manner to the previous data and resource requirements evaluation, with special consideration given to measures that can support regional goals and policy direction and can be feasibly implemented into the PPA Tool. Dimensionality is categorized according to each potential measure's ability to measure project-specific economic impacts. Defensibility is categorized as how clear and effective the measurements are to decision makers and the general public. A high defensibility categorization reflects performance measures relating to areas of historical public importance like property values (Sinha & Labi, 2007). Finally, the extent to which performance measures are categorized as forecastable depends on whether existing forecasting tools like the regional travel demand model can provide reliable measures of future performance (Sinha and Labi, 2007 and FHWA, 2013). Potential measures identified as possessing properties of good performance measures, and that support SACOG's regional and programmatic goals will be selected for recommendation into future iterations of the PPA Tool. In addition to the identified properties of good performance measures, the entire suite of recommended performance measures will be evaluated to ensure the PPA Tool provides comprehensive and manageable project-level performance assessments.

Performance measures, evaluation findings, and additional measure implementations identified in this report should be reviewed and discussed by SACOG, relevant stakeholders, and the general public to ensure the normative framework identified in this report conforms with the regional vision and identified goals for transportation infrastructure investment.

ORGANIZATIONAL EVALUATION OF POTENTIAL MEASURES OF ECONOMIC GROWTH

All potential performance measures relating to economic benefit and vitality evaluated in this report were identified in a review of relevant literature, cited in recent research, or

implemented project level performance measurement systems at peer MPOs. A total of 30 potential performance measures of economic growth were identified across all sources and their organizational structure and preliminary evaluations are illustrated in Figure 18. In this first step of the evaluation framework, performance measures are preliminarily evaluated as to whether they can be feasibly incorporated into the PPA Tool based on whether they support economic vitality goals of the Regional Program and general data and resource requirements.

| Previously Identified Performance Indicators of Economic Vitality | | | | |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Performance Indicator | Description | Source/Reference | Measures long-term rural/urban economic benefit? | Data/Resource Requirements |
| Average in-vehicle travel time to major economic centers | Measures indirect economic vitality through multimodal business access | Broward MPO | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Provide frequent transit service uncongested lane miles | Measures indirect economic vitality through multimodal business access | Broward MPO | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Cost of overall travel | Measures direct economic vitality by identifying household transportation costs | Broward MPO | Yes - Rural/Urban | Medium - Require regional travel demand models and economic forecasts |
| Total Job accessibility within 30 minutes | Measures indirect economic vitality through multimodal business access | Broward MPO | Yes - Rural/Urban | Medium - Require regional travel demand models and economic forecasts |
| Housing and jobs accessibility within 0.5 miles of transit stops with frequent travel service | Measures indirect economic vitality through multimodal business access | Caltrans | Yes - Urban | Low - Relies on regional travel demand model and land use data |
| Travel time to jobs | Measures indirect economic vitality through multimodal business access | Caltrans | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Travel distance to jobs | Measures indirect economic vitality through multimodal business access | Caltrans | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Project improves one or more of the following: walkability/bikeability or liveability within the immediate vicinity | Measures indirect economic vitality through land use and design | Caltrans | No - Prioritizes bike/walk improvements (may support economic vitality) | Low - Relies on project application review |
| Regional truck VMT per unit of regional economic activity/output | Measures direct economic impact of transportation infrastructure | Cambridge Systematics | Yes - Urban | Medium - Require regional travel demand models and economic forecasts |
| Percent of (industry) employers who have relocated for transportation purposes | Measures support for direct economic vitality of the regional industries | Cambridge Systematics | Yes - Rural/Urban | High - Relies on employer travel surveys which may require significant resources. |
| Number of (industry) establishments per business density | Measures indirect economic vitality of regional industries compared to others | Cambridge Systematics | Yes - Rural/Urban | Low - Can use readily acquired from federal and state data sources |
| Percent of employers that cite difficulty in accessing desired labor supply due to transportation | Measures indirect disbenefits of current transportation system | Cambridge Systematics | No - Identifies current need for investments | High - Relies on employer travel surveys and interviews, very difficult to project future conditions |
| Property or Sales Tax Increases | Measures indirect economic vitality through regional tax revenues | EPA | Yes - Rural/Urban | Medium - Relies on employer-level tax and business data, and regional travel demand models |

Figure 18: Identified Performance Measures of Economic Benefit

| Performance Indicator | Description | Source/Reference | Measures long-term rural/urban economic benefit? | Data/Resource Requirements |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Combined transportation and housing costs as a percentage of median income | Measures direct economic vitality by identifying household transportation costs | EPA | Yes - Rural/Urban | High - Relies on individual travel surveys and interviews, very difficult to project future conditions |
| Industry site access for business development | Measures indirect economic vitality and identifies potential growth opportunities | EPA | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Job density per square mile | Measures indirect economic vitality and job accessibility through geography | Metro | Yes - Urban | Low - Relies on regional travel demand model and land use data |
| Development of underperforming or identified development areas | Measures indirect economic vitality and identifies potential growth opportunities | Metro | Yes - Urban | Low - Relies on regional travel demand model and land use data |
| Targeted industry job density | Measures indirect economic vitality and job accessibility through geography | Metro | Yes - Rural/Urban | Low - Relies on regional travel demand model and land use data |
| Location near population and employment centers | Measures indirect economic vitality and job accessibility through geography | NAMPO | Yes - Urban | Low - Relies on regional travel demand model and land use data |
| Project includes streetscaping or curb/gutter improvements | Measures indirect economic vitality through land use and design | NAMPO | No - Measures design features | Low - Relies on project application review |
| Growth in population compared with acres developed | Measures indirect economic vitality through density and land use efficiency | SACOG | Yes - Rural/Urban | Low - Relies on federal and statewide data sources and regional land use data |
| Farmland acres developed – total and per capita | Measures indirect economic vitality of agricultural lands through land use and density | SACOG | Yes - Rural | Low - Relies on federal and statewide data sources and regional land use data |
| Percentage of wholesale and retail sales occurring in significant economic centers served by unrestricted market artery routes | Measures the direct economic vitality of selected geographies served by the network | Sinha and Labi | Yes - Urban | Medium - Relies on employer-level tax and business data, and regional travel demand models |
| Jobs created or supported (directly or indirectly) | Measures indirect economic vitality through area employment | Sinha and Labi | Yes - Rural/Urban | Medium - Require regional travel demand models and economic forecasts |
| Changes in land-use ratios (residential, industrial, commercial, and agricultural) | Measures land use patterns and progress towards regional goals | Sinha and Labi | Yes - Rural/Urban | Low - Relies on regional land use data and plans |
| Percentage of region's unemployed or poor who cite transportation access as a principal barrier to seeking employment | Measures indirect disbenefits of current transportation system on targeted populations | Sinha and Labi | No - Identifies current need for investments | High - Relies on targeted individual travel surveys and interviews, very difficult to project future conditions |

Figure 18: Identified Performance Measures of Economic Benefit (cont.)

| Previously Identified Performance Indicators of Economic Vitality, Continued | | | | |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Performance Indicator | Description | Source/Reference | Measures long-term rural/urban economic benefit? | Data/Resource Requirements |
| Vacancy Rates | Measures indirect economic vitality and identifies potential growth opportunities | Transportation for America | Yes - Urban | Low - Relies on federal and statewide data sources and regional land use data |
| Tax Yield per Acre | Measures indirect economic vitality through regional real property revenues | Transportation for America | Yes - Rural/Urban | Medium - Relies on employer-level tax and business data, and regional travel demand models |
| Housing + Transportation Household | Measures direct economic vitality by identifying household transportation costs | Transportation for America | Yes - Rural/Urban | High - Relies on individual travel surveys and interviews, very difficult to project future conditions |

Figure 18: Identified Performance Measures of Economic Benefit (cont.)

NORMATIVE EVALUATION OF POTENTIAL MEASURES OF ECONOMIC GROWTH

Potential performance measures which were found to measure long term economic benefit were selected for the second step of this evaluation framework. Additionally, some measures were evaluated together, as they measured the same or similar measures or objectives. Most identified performance measures can be adjusted to scale, or to target populations, industries, or geographies of special consideration.

A total of 10 potential performance measures of economic growth were identified across all sources and their normative evaluations are illustrated in Figure 19. In this second step of the evaluation framework, performance measures are evaluated in a normative context against previously identified properties of good performance measures. In order to develop a more comprehensive understanding of identified performance measures, a more detailed discussion of the benefits and disadvantages of each performance measure or group of measures is presented following the summary table.

Three performance measures that have been evaluated to be good performance measures and support regional goals may be selected for recommendation into future iterations of the PPA Tool. All recommended performance measures will then be evaluated as a whole to ensure the

entire suite of performance measures provides comprehensive and manageable information to make better informed project selection and prioritization decisions.

| Identified Performance Indicator Normative Evaluation | | | | | | |
|--------------------------------------------------------------------|------------------------|----------------------|-------------------------|------------------|-------------------|---------------------|
| Performance Measure | Appropriateness | Measurability | Dimensionability | Realistic | Defensible | Forecastable |
| Accessibility to Target Geographies | Low | High | High | High | Medium | High |
| Overall Cost of Travel | Medium | Low | Medium | Medium | High | Low |
| Employment Accessibility* | High | High | High | High | High | High |
| Housing and Employment Accessibility* | High | High | High | High | High | High |
| Employment Density | Medium | High | Medium | High | High | High |
| Housing and Employment Density | Medium | High | Medium | High | High | High |
| Jobs Created or Supported* | High | Medium | High | Medium | Medium | Medium |
| Changes in Land-Use Ratios* | Medium | High | Medium | High | High | High |
| Tax Revenue per Geographic Area | Low | Medium | Low | Medium | High | Medium |
| Vacancy Rates | Low | High | Low | Medium | Medium | Low |
| * Denotes Performance Indicator Areas Recommendations for PPA Tool | | | | | | |

Figure 19: Performance Measure Normative Evaluation

POTENTIAL PERFORMANCE MEASURE BENEFITS AND DISADVANTAGES

This section provides a discussion of some of the benefits and disadvantages of each performance measure area identified in previous literature or case study reviews. A more collaborative discussion of performance measures should occur before tool implementation.

Geographic Accessibility

Geographic accessibility reflects the relative convenience of specific geographies of concern or regional focus like central business districts or regional centers. Metrics can include travel distance or travel time, and can be adapted to account for industry-specific or social and environmental considerations. Data and resources required to implement this measure include spatial transportation and parcel information generally available at the regional, state and federal level and include population and employment spatial data and network information regarded identified geographies. The interpretation of targeted geographies, populations, and industries can differ, as well as the spatial and modal definitions of accessibility (EPA, 2011). In addition, geographic accessibility may not accurately reflect the transportation needs of people and businesses throughout the region.

Travel Costs

Travel costs reveal the actual economic impact of using the transportation network at the household level, and provides a simple, easy to understand outcome reflecting financial accessibility of the transportation system. Data and information required to implement travel cost performance measures may be difficult or expensive to ascertain. In order to be accurate, travel costs should include financial costs, opportunity costs of travel time, and the social and environmental externalities related to travel. As a result, actual travel costs are difficult to measure on a household scale for project-level geographies and could require significant technical and financial resources to develop and implement household travel surveys. Furthermore, the scale of transportation investment may not reflect regional travel costs because increases in transportation supply do not always lead to decreased travel costs (Sinha and Labi, 2007).

Jobs and Housing Accessibility

Job and housing accessibility reflect the relative ease with which individuals can access employment and population centers on the transportation system. Accessibility metrics can vary

widely, but may include time and distance to destinations via multiple travel modes and the amount of employment or housing opportunities within a given time frame, among others. General jobs and housing accessibility does not necessarily provide much information about the community profile or employment that actually exists in a project area, but travel demand models and micro area analysis can help create better assessments. Data and information for this measure require a regional travel demand model that reflect current and future travel patterns as well as individual employment and housing characteristics (Sinha and Labi, 2007). Many MPOs, including SACOG employ these types of travel demand models, and adopting more narrow metrics can inform more targeted analyses of specific employment or housing types.

Employment accessibility is one of the most important performance measures of economic vitality because it measures the relative ease of reaching economic opportunities. Most of the research and regional practice identified in this report agree that accessibility metrics should be included in decision making processes. As a result, relative measures of changes in multimodal job accessibility should be included in future iterations of the PPA Tool.

Jobs and Housing Density

Job and housing density reveals the attractiveness of an area through concentrations of people and employment centers and provides context to the economic and social fabric of an area. Metrics for this measure can include changes in the jobs-housing balance or target specific job or housing types. Spatial population and business data are readily available at the regional, state, and federal level, and density computations are relatively simple in nature. Similar to accessibility, density does not reveal much about the quality of employment or income characteristics of local populations, but adopting narrow metrics like middle-wage jobs density, for example could begin to address this issue. In addition, density measures reveal job and housing volumes in space, but do not reveal travel characteristics surrounding population and employment.

Jobs and housing density measures the relative concentration of people and economic activity in an area and is a crucial performance measure of economic vitality. Many regions use

density measures to inform transportation decisions in part because it is generally understood that density is a large factor in regional economic performance.

Job Creation or Support

Job creation or support reveals the attractiveness of an area for economic development and the tendency for businesses to locate there through the number of jobs. Metrics for this measure can include the changes in job availability or the share of regional or industry-specific employment in a project area. Data required for this measure is readily available at regional, state, and federal levels, but employment support may be more difficult to monitor without long-term individual or household employment information (Cambridge Systematics, 2000). Similar to other measures, analysis of specific employment type and pay information require more narrow performance metrics, and more detailed employment data and information which may be proprietary or difficult to develop.

Land Use Changes

Land use changes relate to the total mix of residential, commercial, industrial, and other land uses near a project site which can provide valuable information and context to decision makers and the general public. Metrics for this measure provide information regarding land use intensity and resource consumption to and can highlight the differences between urban, suburban, and rural economies. Land use metrics could include current and future conformance with identified regional plans thereby highlighting areas of nonconformance or supportive of adopted plans. Changes in acreage or proportions of different land use types could show how the regional economy changes over time. Data and information required for these performance metrics are readily accessible at the local and regional level, and much of an MPO's work revolves around the intersection of planning and land use. As a result, land use change measures can provide clear and concise information to decision makers and the general public in a format they are generally used to.

Land use is a key aspect of economic activity and regional land use goals reflect a normative vision of long-term economic growth. Significant research identifies the linkages between compatible land use and enhanced economic activity and many MPOs include land use performance measures in transportation decision making. As a result, land use change is another important performance measure of economic vitality that should be included in future iterations of the PPA Tool.

Tax Revenue and Vacancy Rates

Tax revenue changes and vacancy rates are two ways to express the gross economic use of land throughout the region, or to target underperforming areas for development. Metrics can include the total or changes in property and sales tax revenues, property value changes over time, and vacancy rates, among others. Property valuation and taxation information are usually readily available at the county and state level, and information is usually standardized to comply with state and federal regulations (Cambridge Systematics, 2000). Property information may be inconsistent over time or inaccurate based on the length of time between property valuation or sale. In addition, tax revenues or vacancy rates may not indicate the economic vitality of an area or provide information about individual businesses or properties when assessing a project's impact.

ECONOMIC PERFORMANCE MEASURE IDENTIFICATION

Three performance measures have been identified through this evaluation which could be implemented into future iterations of the PPA Tool.

1. The change in multimodal jobs accessibility;
2. The change in jobs and housing density, and;
3. Projected land use changes

The PPA Tool could implement performance measures that examine the employment accessibility, housing and employment densities, and land use changes in order to present a clear and concise picture of how well proposed transportation projects might support long term

economic benefit throughout the region. Data and information required to implement these measures is already available at SACOG, and can easily be employed in future iterations of the PPA Tool. These performance measures and corresponding metrics addressed in the next section could be used to either augment or replace performance measures currently utilized within the PPA Tool.

Chapter 6: Discussion and Recommendations

This report was developed in order to identify potential additional measures of long term economic benefit for inclusion into future iterations of SACOG's project level performance assessment framework, the PPA Tool. An analysis of economic performance measures involved in project level performance measurement identified in research or in practice informed the evaluation and identification of three performance measures that could be implemented in future iterations of the PPA Tool.

ECONOMIC PERFORMANCE MEASUREMENT RESEARCH AND PRACTICE

The literature review, case study analysis, and performance measure evaluation included in this report are intended to guide the implementation of additional performance measures of economic benefit in proposed project performance assessments. Although the review and analysis presented here is meant to be applied specifically to SACOG and their PPA Tool, the evaluative framework utilized in this report can be used to inform measure identification and choice at MPOs generally. Thirty potential performance measures were identified in research and practice to be effective measures of economic vitality and categorized based on the way those indicators can be used to measure long term economic benefit. Ten performance measure categories were then evaluated against six properties of good performance measures identified in previous research and one of SACOG's previously identified regional goals.

The results of the evaluative framework utilized in this report provide targeted information upon which SACOG staff and management can use to inform future iterations of the PPA Tool. Three specific performance measures and metrics have been chosen because they support regional and programmatic goals, can be feasibly implemented into future iterations of the PPA Tool, and demonstrate identified characteristics of good performance measures:

1. The change in multimodal jobs accessibility;
2. The change in jobs and housing density, and;
3. Projected land use changes

Identified performance measures can be used in a similar fashion to performance measures currently implemented within the PPA Tool. Each of the three identified measures are relative in nature so project scores can be assessed relative to size, so projects that serve large populations are not necessarily prioritized. Performance measure scores can be used to demonstrate the need for, or potential benefit of a project. Project scores can generally be evaluated as supportive of long term economic benefit when scores for each measure are higher than place type or regional averages or targets, which must be developed prior to implementation. On the other hand, project scores with low scores can generally be evaluated as serving an underperforming area in need of investment and redevelopment. For instance, projects in areas with no change in job accessibility or jobs and housing density may be considered as underperforming and the project narrative could describe the need for public investment to catalyze change.

PPA TOOL PERFORMANCE MEASURE IDENTIFICATION

Each of the three performance measures identified for potential implementation into future iterations of the PPA Tool are identified and defined below. These descriptions provide initial information and provide the foundation for further review and discussions between SACOG staff, member jurisdictions, relevant stakeholders, and the general public to ensure performance measures and project evaluation criteria support regional and programmatic goals.

Percent Change in Multimodal Jobs Accessibility

This indicator can be used to measure how many jobs can be reached on the transportation network in the area surrounding the project site. Areas with high job accessibility indicate high levels of economic vitality and long term economic growth with a variety of accessible economic opportunities. Areas with high job accessibility, or areas with jobs that are growing more acceptable can be assumed to have high economic benefit compared to areas with low job accessibility. Project applicants and decision makers can use this this indicator to measure how well the proposed project supports jobs and economic activity that is served by the transportation

network. Conversely, areas with low employment accessibility would indicate limited economic investment in a given area.

As an alternative, this indicator can be used to measure the change in specific employment types or income levels if regional or programmatic goals signal targeted policy action. For instance, employment opportunities that offer a living wage can be measured to highlight areas that can support equitable employment solutions. Another alternative could be measuring transit and active transportation accessibility to jobs to identify compact, high employment areas. Similarly, travel time accessibility could be measured to target areas with low congestion for future development. Transportation network and travel demand data required to implement this performance measure currently exists within the PPA Tool framework, but some technical effort and resources may be required to implement and update transit and active transportation travel networks as needed.

As of 2019, the PPA Tool included a performance measure for multimodal accessibility but could be adjusted to provide more nuanced information to decisionmakers. The performance measure includes the total number of jobs availability within 30 minutes of driving or 45 minutes of transit access (SACOG, PPA Technical Documentation, 2018). The 2016 MTP measures job accessibility using 30 minute transit travel time, however (SACOG, 2016). Future iterations of the PPA should adjust the multimodal accessibility performance measure to include jobs accessibility within 30 minutes of transit rather than 45 minutes to better reflect regional recommended transit thresholds identified in the MTP.

Percent Change in Housing and Employment Density

This indicator can be used to measure how the places where people work and live change over time. High housing and employment densities are indicative of efficient land use patterns and long term economic benefit. Areas with high jobs and housing density, or areas that are growing denser over time, can be assumed to have higher economic vitality than areas with low jobs and housing density, or reductions in employment or housing opportunities. Project applicants and

decision makers can use project performance results from this indicator to measure the land use efficiency and the overall long term economic benefit. As a result, projects with high scores in this area would indicate support for fast growing local economies as compared to similar areas. Conversely, areas with decreasing housing and employment density would indicate disinvestment in an area, signaling more well-rounded policy action may be needed.

As an alternative, this indicator can be used to measure the change in specific housing or employment types if regional or programmatic goals signal targeted policy action. For instance, affordable housing density can be measured to illuminate housing equity characteristics surrounding proposed project. Similarly, agricultural employment can be measured to better highlight the distinction between rural and urban economies and articulate specific portions of the local economy. Parcel level housing and jobs information required to implement this performance measure currently exists within the PPA Tool framework and minimal effort would be required to develop project level assessments.

Future iterations of the PPA Tool can use performance measures relating to changes in housing and jobs density instead of the change in employment growth to better measure economic vitality and align transportation investments with regional goals. Measuring changes in housing and jobs density incorporates changes in total employment while also incorporating the importance of residential land use in economic growth. In addition, this performance measure can help guide investments towards projects that support regional and programmatic goals of reducing VMT per capita, increasing transportation choice options, and focusing growth inward.

Proportion of Acres Projected for Land Use Conformity

This indicator can be used to measure how well land use throughout the region conforms to adopted plans now and into the future. Land use that conforms with local and regional planning indicates effective development patterns and sufficient infrastructure and investment exists to support long term economic benefit. Areas with high land use conformity, or high land use conversion if necessary, can be assumed to have higher economic vitality than areas with

nonconforming land uses. This performance measure can be related to the highest and best uses of land or other identified regional priorities including agricultural or open space conservation. Project applicants and decision makers can use this results from this indicator to measure the land use efficiency and support for general long term economic benefit. As a result, projects with high scores in this area would indicate support for efficient land use as compared to similar areas. Conversely, areas with large areas of nonconforming land uses could indicate the need for substantial investment to redevelop the area.

As an alternative, this indicator can be used to measure the change in specific land use categories if regional or programmatic goals signal targeted policy action. For instance, the PPA Tool currently measures the agricultural land conversion surrounding project sites that support the agricultural economy; a similar method could be presented for high-density residential or commercial lands, or other regionally important land uses to highlight the distinctions between urban, suburban, and rural communities. Similarly, natural or open space conversion can be measured to highlight growth-inducing projects and articulate specific environmental or social considerations. Parcel level land use data required to implement this performance measure currently exists within the PPA Tool framework and minimal to no effort would be required to develop project level assessments.

As of 2019, the PPA Tool included a performance measure for land use change-the change in total agricultural acres surrounding project sites-but is only used for projects supporting agricultural economies. This performance measure could be adjusted to better support agricultural economies as well as the general regional economy. Rather than simply measuring projected change in total agricultural lands, this performance measure could be adjusted to measure changes in specific farmland designations including prime agricultural lands, agricultural lands of statewide or local importance, and unique farmland, among others identified in the MTP. Additionally, land use conformity measures could be expanded to include all land uses identified in the MTP. For example, reductions in industrial land use can have negative impacts on industrial economies in a

similar fashion to land use reductions on agricultural economies. As a result, this performance could be incorporated into the evaluation of all projects to measure impacts to the broader regional economy.

LIMITATIONS AND FUTURE WORK

Limitations of this report include those pertaining to research and practice in addition to previously identified limitations of general performance measure evaluation. Although many MPOs are developing project level performance assessment tools, few include measures relating to economic vitality. Perhaps as a result, the landscape of research surrounding project level economic performance measures is sparse. Renewed federal emphasis under the FAST Act could spur increased adoption and analysis of these types of measures. There are opportunities abound for future work to identify and evaluate economic performance measures, specifically how they support various regional goals. Although the criteria applied here led the dismissal of a large number of performance measures, it is possible that some measures identified but not selected in this report are worthwhile. Most notably, measures not selected for further evaluation in this report could be addressed in future work to ensure a more thorough evaluation of potential performance measures. This report recommends three performance measures to better align the PPA Tool with regional goals at SACOG. Future work could adapt the evaluation framework presented here to help MPOs throughout the country match performance measures to various regional goals.

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