

REPORT

DATE: August 8, 2011

TO: Performance Measures Subcommittee
Plans and Programs Technical Advisory Committee (P&P TAC)

FROM: Naresh Amatya, SCAG
Tarek Hatata, System Metrics Group

SUBJECT: Recommended Performance Measurement Framework

This memorandum represents a recommended performance measurement framework for the 2012 SCAG RTP/SCS. The recommendations contained in this memo were developed through a deliberate process that considered several factors, including the following.

1. SCAG has a relatively long history of using performance measures (PM) in developing our Regional Transportation Plan, starting with the 1998 RTP. So, our goal is to build on the past success and refine/expand on the PMs adopted in the 2008 RTP to meet our expanding policy objectives. The 2008 RTP measures are attached for reference as Attachment A. For the 2012 RTP, we started by presenting a draft memo that suggested expanded PMs to the P&P TAC on May 10, 2011. This memorandum is attached for reference purposes as Attachment B. The formation of this subcommittee was the result of discussion at that meeting.
2. Subsequently, SCAG received feedback from a number of stakeholders, including written comments from the following:
 - American Lung Association
 - GWCCOG (Nancy Pfeffer)
 - SBCCOG (Wally Siembab)
 - NRDC and Move LA (Gloria Ohland)
 - SANBAG (Ty Schuiling)
 - OCTA (Gregory R. Nord)
 - Safe Route to School (Jessica Meaney)

The feedback was summarized, distributed and discussed during the Performance Measures Subcommittee meeting held at SCAG on May 31, 2011. The summary of these comments is also attached as Attachment C for reference purposes. The discussions and feedback at the PM Subcommittee meeting and subsequent outreach to additional stakeholders as well as internal deliberations helped further shape the recommendations contained in this memo.

3. SCAG also reviewed and considered relevant work such as the statewide effort on ‘Smart Mobility Framework’, Caltrans led ‘Transportation System Performance Measures Prototype Report’, performance measures adopted by other MPOs in California, including SANDAG and MTC.

Building Blocks

Performance Measures section in the RTP is just one area where the potential impacts and benefits of the proposed actions contained in the RTP will be described. The full range of impacts and the outcomes of the proposed actions must be reviewed in the total context of the RTP, including Environmental Justice analysis, Financial Analysis, and the Program Environmental Impact Report (PEIR), neither of which are included as part of this recommendation.

The recommended framework was developed based on the following building blocks:

1. Some measures should be addressed as part of the transportation sector/system description (now and in the future) rather than transportation performance measures. For instance, several stakeholders recommended using mode share as a performance measure. Clearly, SCAG agrees that this measure is important and that the RTP/SCS should aim to increase transit and non-motorized mode shares. Success in increasing these mode shares would be reflected in a number of transportation performance measures such as mobility/accessibility, and reliability related measures. SCAG recommends a market description section with specific measures that describe the current and future transportation market as per Attachment D.
2. Some measures should be addressed as part of the investment allocations descriptions in the RTP/SCS rather than transportation performance measures. For instance, some stakeholders recommended using percent of funding used for reducing private vehicle use, or percent of funding used for transit and non-motorized transportation. Again, SCAG agrees that it needs to clearly communicate how transportation funds will be used. SCAG currently provides this information under the finance section of the RTP/SCS and recommends that we continue to do so as per Attachment E.
3. Some measures may be more appropriate to use for regular monitoring and reporting (i.e., measure annually or bi-annually) than for evaluating RTP/SCS alternatives as can be seen in our recommendations simply because such measures may represent outcomes that may only be indirectly related to the actions proposed in the RTP or because tools, methodology or data may be inadequate to credibly forecast such measures at present. Attachment F presents all the outcome measures and identifies which ones are recommended for monitoring only at this point.
4. To the extent possible, there should be a defensible way to forecast any performance measures to be used in the 2012 RTP/SCS so they can be computed for different alternatives and communicated in the final document. Most of the measures will be outputs of the SCAG travel demand model. Some may be computed off-model or using other models but should be technically defensible nevertheless.

5. Additional detail may be required for the different measures used for each outcome in previous RTPs. For instance, in previous RTPs, the accessibility outcome was reflected by the measure “percent of PM work trips completed within 45 minutes”. The feedback we received included: “include travel time distribution for both work and non-work trips by mode”. Certainly, this can be done and the challenge will be how to present it in a succinct manner and how much of this has to be in the main document versus the technical appendices.
6. Core performance outcomes proposed should be directly related to the actions proposed by the RTP. So, as an extreme example, while improving education is a worthwhile societal goal, none of the actions proposed in the RTP relates directly to changing the quality of education.
7. A new outcome, “location efficiency” is proposed as an additional outcome category with several performance measures that reflect the impact of improved land use and transportation coordination in support of SCS required under SB 375.
8. The final performance measures should be linked to the RTP/SCS goals. Therefore, previous goals will need to be updated as well once the measures are finalized.

Recommended Outcomes and Performance Measures

The recommended measures are divided into three categories recommended for inclusion in the RTP/SCS. However, it is understood that these measures should not be considered completely independent. Clearly, land use strategies can and do impact transportation performance. Conversely, transportation expenditures can encourage and complement land use strategies.

A. Sector/System Description Measures

System description measures would be reported for the entire Region and would be reported for:

- Base year (2008), horizon year (2035) and other interim years as needed
- Peak versus off peak periods
- Work versus non-work trip purposes

The system measures (or indicators) for person movement would include:

- Population
- Travel demand (number of daily trips)
- Mode Shares (transit, non-motorized, single occupant vehicles, high occupancy vehicles)
- Vehicle miles traveled by facility type (freeways, arterials)
- Other (as needed and available)

Similar measures (or indicators) can be reported for the goods movement sector and would include:

- Number of average daily truck trips
- Number of average number of freight train trips
- Volume of trade at the ports (in twenty foot equivalents and tonnage for non-container trade)
- Truck miles traveled by facility type (freeways, arterials)
- Other (as needed and available)

Readers of the RTP/SCS will be able to understand the transportation market and projected changes to the market by 2035. Market measures could be presented first, or after the land use and transportation measures discussed later.

B. Funding/Expenditure Description Measures

Every RTP includes a detailed description of funding allocation by transportation modes and revenue projections by funding sources over the plan period. Previous RTPs viewed funding allocations as policy issues and not as “performance measures”. However, several stakeholders recommended using specific measures to communicate to the public where the transportation dollars are being expended. While we still believe this is a policy decision that will have impact on all performance measures, we recommend including the following in the finance section of the RTP/SCS:

- Total funding by funding category
- Total expenditures by expenditure category, including modal expenditures
- Breakdown of capital expansion versus operations and maintenance funding by category

C. RTP/SCS Performance Outcomes and Measures

This section represents the core of our Performance Outcomes and Measures recommendation. We recommend expanding on the performance measures adopted in the 2008 RTP to include 8 performance outcomes and associated measures with some modifications as follows:

- Location Efficiency – This outcome should be added to the RTP/SCS and will reflect the degree to which improved land use and transportation coordination measures impact residents. The measures or metrics proposed to describe this outcome include:
 - Median distance for work and non-work trips
 - Share of growth in transit priority areas
 - Land consumption
 - % of commute trips less than 10 miles (captures location compactness)
 - Percent households located less than 500 feet from high volume arterials that are regionally significant and State Highways

- Percent households experiencing more than 65 Db of noise
- Percent of population within ½ mile (or within 10 minutes' walk) of a high frequency transit stop (frequency of 15 minutes or less)

In addition, several measures are proposed for monitoring purposes, including:

- Percent of income spent on housing and transportation
- Percent of residents within ½ mile walk to parks and open space
- Percent of acres of parks/open space for every 1,000 residents
- Annual household water consumption
- Annual cost of household transportation

Finally, SCAG needs to conduct further research on a couple of suggested measures:

- Percent of existing and new below market housing
 - Daily amount of work and non-work trip related to physical activity
- Mobility/Accessibility (combined as opposed to separated) – This outcome, as in the 1998 California Transportation Plan (CTP) is defined as “*Reaching desired destinations with relative ease within a reasonable time, with reasonable choices.*” The measures/indicators recommended for this outcome are:
- Travel time distribution for transit, single occupant vehicles, high occupancy vehicles for both work and non-work trips
 - Person Movement Delay by facility type (Mixed Flow, HOV, Arterials)
 - Highway non-recurrent delay for mixed flow and high occupancy lanes (this measure cannot be forecasted, but it is important to report it for current conditions)
 - Truck delay by facility (Highway, Arterial)
 - Person delay per capita

Note that it is likely not possible to project/forecast any of these measures by ethnicity or income group.

- Reliability – This outcome is defined as “*Providing reasonable and dependable levels of service by mode.*” In a way, this is an “on-time” performance outcome. This outcome is very difficult, if not impossible to project/forecast. However, it has been included in past RTPs to emphasize its importance. The performance measure is “variability of travel time” for the auto mode. For transit, it is on-time performance. This measure should be monitored over time to ensure improved reliability over time or at least it does not get any worst.
- Safety and Health (Health added to safety) – This outcome is also very difficult to project/forecast. Total number of accidents is generally used as the performance

measure/indicator. It can and has been partially projected by using mode specific accident rates (e.g., for highways, arterials, transit). This approach is again recommended for the 2012 RTP/SCS. However, it is important to note that this approach does not take into account safety improvements for each mode. It just reflects the changes based on modal or facility shifts. Also note it is not possible to project/forecast this measure by ethnicity or income group. Finally, this measure can be reported historically by month and by mode (including for non-motorized transportation). But it cannot be projected at this level of detail. Feedback also recommended adding the following specific health measures:

- Pre-mature deaths due to PM2.5
- Asthma incidence and exacerbations
- Number of CO hotspots in Transit Priority Areas

Our research to date suggests that SCAG has no capacity and will need assistance to compute and present such measures. For instance, we contacted MTC since they include one of these measures (pre-mature deaths due to PM2.5). Their feedback is shown below and indicates that the Air District can estimate the premature deaths based on outputs from the regional travel demand model. SCAG needs to analyze these tools and potentially include them in future RTPs. In the meantime, these measures can be monitored.

From MTC: In preparing the Bay Area 2010 Clean Air Plan, the Air District developed a Multi-Pollutant Evaluation Methodology (MPEM) tool to estimate how reductions in emissions of various air pollutants impact key health outcomes such as premature mortality, cardiovascular disease, and asthma.¹ MPEM can be used to estimate how changes in emissions of direct tailpipe emissions of PM2.5, as well as NOx emissions that contribute to formation of ammonium nitrate, will impact premature mortality. MTC will apply EMFAC2007 emissions factors to estimates of future VMT and speeds from the regional travel model to develop estimates of direct PM2.5 and NOx emissions for the various investment and land use scenarios analyzed for the SCS/RTP. The Air District will input the emissions data provided by MTC into the MPEM to compare how the emissions for each scenario would impact premature mortality related to PM. MPEM model output will be adjusted based on population forecasts for 2005 and 2035 to reflect additional premature deaths due to increased Bay Area population.

- Productivity – This outcome is defined as “percent utilization of capacity”. For highways, it reflects the aggregation of vehicles per hour per lane and the loss of this capacity during severe congestion. It is therefore reported as “lost lane miles”. Highway productivity can be improved by investing in less expensive operational

¹ For further information, see the MPEM Technical Document available at <http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans/Resources-and-Technical-Docs.aspx>.

strategies (not expansion). For transit, the utilization is reflected by the percent of seat miles occupied measure. Transit productivity can be improved by tailoring service to demand and land use policies. Some feedback suggested we should distinguish between peak and off-peak transit utilization. Unfortunately, we do not have the data. SCAG has traditionally used the National Transit Database and complemented it with operator specific data.

- Environmental Quality – This outcome is defined as “*Helping to maintain and enhance the quality of the natural and human environment*”. This outcome could include many measures. However, it is recommended to use tons of pollutants (e.g., CO, NO_x, PM₁₀, and PM_{2.5}), green-house gas emissions, and meeting other federal and state air quality standards, most importantly conformity. Some feedback suggested that air quality attainment should be considered as part of the RTP/SCS development since attainment thresholds are much more challenging than conformity metrics. This recommendation may be included as part of the alternative development. Moreover, the RTP/SCS can probably discuss the challenges of air quality attainment requirements without necessarily adding additional performance measures.
- Economic Well Being – This outcome is defined as “*Contributing to the Region’s economic growth*”. Measures/indicators are “contribution to Gross Regional Product and employment”. In addition, “jobs supported by transportation investments” should be included. Again, as with previous outcomes, it is not possible to project these measures by ethnicity or income groups.
- Investment Effectiveness – This outcome is defined as “*Maximizing the current and future benefits from public and private transportation investments.*” The measure recommended and used in the past is benefit/cost.

Although some feedback recommended eliminating this measure, it is an important measure to ensure that scarce public funds are used as productively as possible. Other feedback suggested that this measure favors highway investment because auto operating costs may not be included in the same manner as transit operating costs. In fact, all costs and benefits are included for all incremental modal investments being evaluated. The benefits will include the increase or reduction of vehicle operating costs resulting from the project/investment (based on overall VMT impacts). A highway project that increases VMT will include a dis-benefit related to increasing vehicle operating costs. A transit project that reduces VMT will include a benefit of reducing vehicle operating costs.

- System Sustainability – This outcome reflects the cost per capita of preserving the multi-modal system to current conditions. It is also possible to estimate the cost for preserving the system to a state of good repair.

Attachment A – 2008 RTP Performance Measures

TABLE 4 PERFORMANCE MEASURES

Performance Measure	Measure(s)	Definition	Performance Target	Performance Outcome Summary
Mobility	Speed Delay	Speed – experienced by travelers regardless of mode Delay – excess travel time resulting from the difference between a reference speed and actual speed Delay per capita can be used as a supplemental measure to account for population growth impacts on delay.	Improvement over Base Year	Between the Baseline and Plan scenarios: <ul style="list-style-type: none"> • Speed increases by 8 percent • Total daily person delay decreases by 16 percent • Daily delay per capita decreases by 16 percent
Accessibility	Percent PM peak period work trips within 45 minutes of home Distribution of work trip travel times		Improvement over Base Year	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Accessibility increases by 2 percent
Reliability	Percent variation in travel time	Day-to-day change in travel times experienced by travelers. Variability results from accidents, weather, road closures, system problems and other non-recurrent conditions.	Improvement over Base Year	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Percent variation decreases in both the AM and PM peak periods by approximately 10 percent
Productivity	Percent capacity utilized during peak conditions	Transportation infrastructure capacity and services provided. Roadway Capacity – vehicles per hour per lane by type of facility Transit Capacity – seating capacity by mode	Improvement over Base Year	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Lost lane-miles decreases in both the AM and PM peak periods by 20 percent
Safety	Accident rates	Measured in accidents per million vehicle-miles by mode for: <ul style="list-style-type: none"> • Fatalities • Injuries • Property 	“0” for all accident types and modes	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Fatalities, injuries, and property damage per million persons decrease by at least 4 percent
Sustainability	Total cost per capita to sustain system performance at Base Year levels	Focus is on overall performance, including infrastructure condition. Preservation measure is a subset of sustainability.	Improvement over Base Year	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Reliability, productivity, safety, and preservation improve
Preservation	Maintenance cost per capita to preserve system at Base Year conditions	Focus is on infrastructure condition. Subset of sustainability.	Improvement over Base Year	Between the Base Year and Plan scenarios: <ul style="list-style-type: none"> • Percent of lane-miles requiring rehabilitation decreases by 14 percent • Percent of bridges requiring rehabilitation decreases by 45 percent
Cost-Effectiveness	Benefit-to-Cost (B/C) Ratio	Ratio of benefits of travel alternatives to the costs of travel including infrastructure, maintenance, travel time, environmental, accident, and vehicle operating costs. This can be used to evaluate impacts of mode split changes resulting from RTP investments.	Improvement over Base Year	The Plan provides \$2.21 return for every \$1.00 invested.
Environmental	Emissions generated by travel	Measured/forecast emissions include CO, NOX, PM2.5, PM10, SOX, and VOC. CO2 as secondary measure to reflect greenhouse gas emissions.	Meet SIP Emission Budgets & Transportation Conformity requirements	The conformity analysis indicates a positive conformity finding for the Draft Plan based on the draft emission budgets received by the Air Resources Board and the other required tests. The formal conformity finding will be based on the finalized emission budgets analyzed in comparison to the RTP as prepared for adoption.
Environmental Justice	Distribution of benefits and costs Accessibility Environmental Emissions Noise	Share of net benefits and costs by mode, household income, race/ethnicity: <ul style="list-style-type: none"> • RTP expenditures • Taxes paid (e.g., income, sales & use, gas) • Access to jobs (see “Accessibility”) • Travel time savings by mode • Environmental impacts from PEIR 	Equitable distribution of benefits and costs	The Plan results in no disproportionate negative impacts on the grounds of income, race, color, or national origin.

**Attachment B – Memo and Draft Measures
Presented to the P&P TAC on May 10, 2011**

REPORT

DATE: April 13, 2011

TO: Plans and Programs Technical Advisory Committee

FROM: Naresh Amatya, Manager of Transportation Planning
Jacob Lieb, Manager of Environmental and Assessment Services
Mark Butala, Manager of Comprehensive Planning

SUBJECT: 2012 RTP/SCS Alternatives and Performance Measures

EXECUTIVE SUMMARY:

Staff will present and prompt discussion on the development of plan alternatives and performance measures for the 2012 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS). This is a follow-up to a preliminary discussion held at the March PPTAC meeting, and proceeds the anticipated presentation of a staff proposal at the May meeting.

BACKGROUND:

Objectives – SCAG is developing alternatives and performance measures for the purpose of narrowing down/refining options and promoting public dialogue and discussion leading to decision making on the 2012 RTP/SCS. The alternative scenarios should bound the set of reasonable or realistic choices facing the region for this plan update, and performance measures should capture the anticipated performance such that each alternative can be compared across a range of policy outcomes of interest to the region.

Past Practice – In past plan cycles, SCAG has used various types of alternatives, generally reflecting the emphasis area of the plan. For example, the 2001 RTP alternatives were built around various aviation scenarios, and the 2004 RTP featured alternatives built around growth and land use variations. SCAG has generally varied only one component of the plan. In other words, alternative have not, in prior cycles, varied both land use and transportation components. Further, performance measures in the RTP have generally focused on transportation-specific issues such as congestion and mobility.

Rationale for New Approaches – Regional planning practice has evolved over the past several years such that a focus on multiple policy objectives, over and above traditional transportation measures, is now commonplace. This trend is underscored in California by the inclusion of the Sustainable Communities Strategy which codifies the integration of transportation and land use components of the RTP. Further, guidance from statewide sources including the California Transportation Commission and the Regional Targets Advisory Committee urge a more inclusive view of performance measures for regional transportation planning. Finally, and most notably, it is incumbent on SCAG to develop plan alternatives and performance measures that reflect the range of choices and policy concerns for the Regional Council and for participants in the RTP process.

Range of Transportation Investment Options – Our fundamental premise in developing transportation alternatives is that we are not starting from scratch. The adopted 2008 RTP with its most recent amendment (#4) is our launching point for developing alternative transportation scenarios. Key elements of transportation alternatives that may influence outcomes (benefits and impacts) are capital projects (such as

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highway and transit expansion projects), policy considerations (eg. transit fare rates, toll rates, carpool lane occupancy requirements etc.), and planning assumptions (such as auto operating costs etc.). We will consider all of these elements in developing alternative transportation scenarios. Broad investment categories we will consider in developing alternatives include Roadway improvements, Transit and High Speed Rail, Goods Movement System, Bicycle and Pedestrian Network, Congestion Pricing Strategies, Transportation Demand Management (TDM), Transportation System Management (TSM), Transportation System Preservation. We envision developing alternative scenarios with a varying range of investment levels for each of these investment categories respecting local commitments as well as limitations placed by ‘color of money’ issue and fund transfer limitations between counties.

Land Use Scenario Options - The passage of SB 375 will place a greater emphasis on land use policy than was required in previous RTP cycles. Similar to transportation investment options, we envision developing alternative land use scenarios with a varying range of policy emphasis. The foundation of any scenario will be based on the local input that has been collected over the past 18 to 24 months. Additional scenarios will test land use policy assumptions expected to vary in effect on per capita VMT and GHG emissions.

Discussions and Feedback to Date – Staff has had preliminary discussions with both the Subregional Coordinators group and with the PPTAC as a prelude to this item. Feedback at those prior meetings was generally favorable regarding the use of “blended” alternatives and a broader range of performance measures. Members of the groups suggested various performance measures that staff is currently considering.

Likely components of proposed alternatives – As discussed with the PPTAC at the March meeting, staff envisions the following key concepts being integral to the alternatives and performance measures for the 2012 RTP.

- **Blended Alternatives** – Alternatives will vary both the land use and transportation inputs.
- **Themes** – Alternatives will be built around different emphasis areas such as integrating transportation and land use
- **Similar goals to prior cycles**- Past RTPs have included broadly framed goals around mobility, safety, preservation, sustainability and land use integration. Pending feedback from the Regional Council, we do not anticipate major changes to the goals from past cycles.
- **Categories of Performance Measures** – Performance measures will be used to quantify progress toward the goals, and to differentiate performance among alternatives. These measures will likely be broader than in past cycles, and are likely to include mobility, location efficiency, productivity, health and safety, environmental stewardship, social equity, economic prosperity, and investment efficiency. The precise measures to be used within each of these categories is still under development, but staff will be prepared to discuss some examples as part of the meeting discussion on April 13.
- **Similar structure to SB 375 target scenarios** – The alternatives will be assembled using the same or similar structure to the scenarios used for SB 375 target setting input to ARB. In other words, each alternative will include inputs from each of the components (land use, network, TDM, etc) that were used in the target setting exercise. The target scenario matrix is attached here as an illustration and reminder.

Scenarios and public dialogue – SCAG is currently in the process of procuring a consultant to assist in developing high level, schematic scenarios that will be featured in public workshops in the summer of 2011 leading up to the release of the draft RTP/SCS in November.

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Process and timeline– Subsequent to this discussion with the PPTAC, staff will finalize a proposed set of alternatives and performance measures for the 2012 RTP/SCS. This process could last through the end of June. Our goal is to present final alternatives for full evaluation to the PPTAC at their May meeting, and subsequently will be presented to the policy committees and Regional Council for approval. We will perform full evaluation of the alternatives and conduct required outreach between the months of July, August and September leading to refinement of alternatives towards selection of a preferred alternative (financially constrained as well as strategic portions of the 2012 RTP) by September in time to release a Draft 2012 RTP/SCS in November 2011.

ATTACHMENT:

2012 RTP/SCS Goals and Performance Categories Matrix
SB 375 Target Scenarios Matrix

Draft 2012 RTP/SCS Goals and Performance Categories: For Discussion Purposes Only

Goal							Performance Measure	Metric
Maximize mobility and accessibility for all people and goods in the region	Ensure travel safety and reliability for all people and goods in the region	Preserve and ensure a sustainable regional transportation system	Maximize the productivity of our transportation system	Protect the environment, improve air quality and promote energy efficiency	Encourage land use and growth patterns that complement our transportation investments	Maximize the security of the regional transportation system...		
x	x		x		x		Mobility	Speed
x	x		x		x		Mobility	Recurrent Delay
x	x		x		x		Mobility	Passenger Cars/Light Trucks
x	x		x		x		Mobility	Heavy-duty Trucks
x	x		x		x		Mobility	Total
x	x		x		x		Mobility	Per Capita
x	x		x		x		Mobility	Non-Recurrent Delay
x	x		x		x		Mobility	Estimated percent delay due to incidents
x	x		x		x		Mobility	Variability of travel time (see Reliability)
x	x		x		x		Mobility	Delay – total and per capita
	x						Reliability	Percent variation in travel time (auto and transit)
x					x		Accessibility	Percent of PM peak period work trips within 45 min of home (auto and transit)
x					x		Accessibility	Distribution of work trip travel times
x				x	x		Location Efficiency	Share of growth (e.g., population/jobs/housing) in transit priority areas

Draft 2012 RTP/SCS Goals and Performance Categories: For Discussion Purposes Only

x				x	x		Location Efficiency	<i>Average commute distance</i>
x				x	x		Location Efficiency	<i>Transit mode share</i>
x				x	x		Location Efficiency	<i>Non-motorized mode share</i>
			x				Productivity	<i>Lost lane-miles</i>
			x				Productivity	<i>Transit utilization</i>
							Health and Safety	<i>Access to parks/open space</i>
	x						Health and Safety	<i>Number of collisions per month</i>
	x						Health and Safety	<i>Accident rates (fatalities, injuries, and property) per million veh miles by mode</i>
		x		x	x		Environmental Stewardship	<i>Emissions of CO, NOx, PM2.5, PM10, SOx, and VOC</i>
		x		x	x		Environmental Stewardship	<i>CO2 emissions per capita</i>
		x		x	x		Environmental Stewardship	<i>Land consumption (land converted between non-urban & urban uses)</i>
		x		x	x		Environmental Stewardship	<i>Fuel consumption</i>
x		x		x			Social Equity	<i>[Results of EJ analysis (FW)]</i>
							Economic Prosperity	<i>Economic impacts (e.g., Gross Regional Product, total jobs)</i>
x							Investment Efficiency	<i>Benefit-to-Cost Ratio</i>
		x		x			Investment Efficiency	<i>Total cost per capita to sustain systems performance at Base Year levels</i>
		x					Investment Efficiency	<i>Maintenance cost per capita to preserve system at Base Year conditions</i>

Note: This list is draft and preliminary. It is subject to additions or deletions as deemed necessary by stakeholder input and/or additional technical analysis.

Attachment C – Summary of Stakeholder Comments

American Lung Association (ALA) Comments

OUTCOME - MEASURE	VALUE OF MEASURE	ALA RECOMMENDATION	ALA RECOMMENDED MEASURE
MOBILITY - Speed	Measure to evaluate reducing congestion; compared to posted/free flow speeds	Replace Goal should be to reduce, not increase speed for equity and environmental reasons	Share of urban road less than 30mph, share of residential road less than 20mph, restrict freeways to 55mph
MOBILITY - Recurrent and Non-Recurrent Delay, and RELIABILITY - Variability of Travel Time	Measure to evaluate reducing congestion; compared to posted/free flow speeds	Expand	(1) Travel time by mode for work and non-work trips in key corridors/communities (2) Percent of work and non-work trips taken by public transit, bicycle, walking, and carpooling (3) Number of minutes of physical activity through active transport (4) Percent of transportation budget dedicated to reducing private vehicle use
ACCESSIBILITY - Percent of Work Trips within 45 minutes	Measure to evaluate impacts on accessibility; PM work trips are used as a proxy for all accessibility	Suggest national metrics of 60 or 90 minutes	(1) Travel time by mode for work and non-work trips (2) Peak period mode share
LOCATION EFFICIENCY - Average Commute Distance	New Measure	Expand	(1) Median Distance for work and non-work trips (2) Percent of population within 1/2 mile (or 10 minutes walk) of a high frequency (every 10 minutes during peak periods) transit stop
LOCATION EFFICIENCY - Share of growth in transit priority areas	Land use policies/SB 375	Expand	(1) Share of growth in transit priority areas stratified by race/ethnicity, income and age (2) Percent of income spent on housing and transportation (3) Percent of existing and new below-market rental housing units in TOD areas
LOCATION EFFICIENCY - Transit mode share and non-motorized mode share	Reduced vehicular demand	Expand	(1) Stratifying mode share by income (2) percent of population within 1/2 mile (as previously recommended)
PRODUCTIVITY - Transit Utilization	Efficiency of transit service	No specific comment	
HEALTH AND SAFETY - Access to parks/open space		Expand	(1) proportion of residents within 1/2 mile walk to parks and open space stratified by income and race/ethnicity (2) number of acres of parks/open space for every 1,000 residents
HEALTH AND SAFETY - Accident rates		Expand	(1) Number of collisions/injuries per mode per month broken down by income level, race/ethnicity, and rural/urbanc context per capita, lane miles, block group, and daytime population
ENVIRONMENTAL STEWARDSHIP - CO, NOX, PM2.5, PM10, and VOC emissions		Expand	(1) Pre-mature mortality due to PM2.5 (2) Asthma incidence and exacerbations (3) Stratification of emissions metrics by race/ethnicity, income and proximity to roadways with high vehicle volume
ENVIRONMENTAL STEWARDSHIP - CO2 Emissions per capita	Required by SB 375	Agreed without change	
SOCIAL EQUITY (TBD)		Expand	(1) Include in all measures, not just EJ
ECONOMIC PROSPERITY	Gross Regional Product, Total Jobs	Expand	(1) Total jobs stratified by income, race/ethnicity, education and benefits provided (2) Percentage of jobs provided to local residents during major housing, business, and retail development and redevelopment projects

NRDC, MOVE LA Comments

OUTCOME - MEASURE	VALUE OF MEASURE	NRDC, MOVE LA	NRDC, MOVE LA RECOMMENDED MEASURE
LOCATION EFFICIENCY (referred to as Land Use Performance) - Land Consumption	Reduced sprawl	Agreed without Change	
LOCATION EFFICIENCY (referred to as Land Use Performance) - Additional Measures	(1) Ability to live close to work and shorten commutes (2) "Compactness" of new greenfields developments	Add	(1)Jobs/housing fit by subregion (2) Intersection density in new development areas
MOBILITY (referred to as Road Performance) - Daily Delay per Household	Congestion impacts	Expand	(1) add VMT per household
Accessibility (referred to as Transportation System Performance) - Distribution of Work Trip Travel Times	Reflects traveler experience	Expand	(1) add Non-work trip travel time distribution (2) add Transit vs. Auto travel time in Transit Corridors
PRODUCTIVITY (referred to as Road Performance) - Lost Lane Miles	Efficiency of highway system	Modify	(1) Use vehicles per lane per hour, freeway & arterial
LOCATION EFFICIENCY (referred to as Transit Performance) - Transit Mode Share	Market Demand	Expand	(1) Provide work trips and non-work trips mode share (2) Weekday Transit non-work transit trips
PRODUCTIVITY (referred to as Transit Performance) - Transit passengers per seat mile	Transit Efficiency/Productivity	Expand	(1) Transit passengers per seat mile peak and off-peak (2) Transit operating cost per passenger
LOCATION EFFICIENCY (referred to as Walk and Bike Performance) - Non Motorized Mode Share	Market Demand	Expand	(1) Walk & bike mode split for non-work trips (2) households w/15 min walk to transit (3) % of jobs within 15 min. walk of transit
LOCATION EFFICIENCY (referred to as Demand Management Performance) - Non Motorized Mode Share	Reduces vehicular demand and improves health	Add	(1) Carpool mode split for work and non-work trips (2) Carpool/Drive alone cost ratio (time+parking+oper.cost)
HEALTH and SAFETY - Accident Rates		Expand	(1) Walk & bike fatalities & injuries
ENVIRONMENTAL STEWARDSHIP (referred to as Resource Conservation Performance) - Fuel Consumption	Relates to environment and proportional to GHG emissions	Expand	(1) Household water consumption annual (2) Household energy use annual (transp.+space heating)
ECONOMIC STEWARDSHIP (referred to as Economic Performance) - GDP, JOBS	Regional vitality	Modify	(1) include work trip travel distribution by mode (2) include Heavy Duty Truck Travel Delay
ENVIRONMENTAL STEWARDSHIP (referred to as Clean Air Performance) - Emissions	Health	Expand	(1) Number of CO hotspots in Transit Priority Areas
ENVIRONMENTAL STEWARDSHIP (referred to as Public Health Performance) - Emissions	Health	Expand	(1) Asthma increase from vehicle emissions (2) Early mortality from particulates (3) Daily walk + bike travel time per capita
RELIABILITY (referred to as Transportation System Performance)	On-Time Performance important to travelers and goods movement	Expand	(1) Add Travel Time Reliability Distribution
ADDITIONAL MEASURES RECOMMENDED	demand management performance	New	(1) Carpool mode split for work and non-work trips (2) Carpool/Drive alone cost ratio (time+parking+oper.cost)
ADDITIONAL MEASURES RECOMMENDED	system management performance	New	(1) % of arterials with timed signals (2) % of urban area freeway miles w/ peak hour V/C < 1.0
ADDITIONAL MEASURES RECOMMENDED	pricing measures	New	(1) Add Number of cities with priced parking
ADDITIONAL MEASURES RECOMMENDED	affordability performance	New	(1) Add Cost of household transportation annual (2) Add % income spent for transportation + housing (3) Add Housing cost vs. income distribution
ADDITIONAL MEASURES RECOMMENDED	land development performance	New	(1) Add Bike lanes per centerline mile on urban arterials
MEASURES NOT RECOMMENDED	SCAG Measures	Exclude	(1) Travel speed (2) % PM work trips <45 mins. (3) Commute Distance Distribution (4) Lost lane miles (?) (5) accidents per month (6) environmental justice analysis (7) Benefit/cost ratio for investments
MEASURES NOT RECOMMENDED	Health and Equity Measures (not sure which source)	Exclude	(1) Daily travel time per household (2) % Households <500 ft. from high-volume roadways (3) % Households >55Db noise (4) % Households w/ walk access to neighborhood svcs.

SANBAG (Ty Schuiling)

- 1) I noted at the P&P TAC meeting that "safety" is more appropriately combined with "security" than with "reliability." It could also stand alone, because security and traffic safety are two different issues as well.
- 2) I suggest that the words that appear in the May 10th document "Performance Measure" column are not measures but indicators (or in the 1998 CTP terminology, outcomes). The column entitled "metric" are the measures according to the 2004 RTP.
- 3) The table shows a "metric" entitled "variability of travel time" associated with mobility and another entitled "percent variation in travel time (auto and transit)" associated with reliability. This is a measure of reliability – is there a reason it appears with mobility as well? Isn't it preferable to
- 4) Access to parks: Is that a health issue, a safety issue, or both? How is that access to be measured?
- 5) Location efficiency: Share of growth in transit priority areas and transit mode share seem redundant, and I question the significance of mode shares as appropriate metrics.

OCTA (Gregory Nord)

I agree that the Performance Measure column is mislabeled. I believe these should be referred to as "Indicators" or "Objectives".

In regard to the Safety and Reliability goal, it appears that the "safety" element refers to accidents/non-recurring incidents, which have a significant impact on the reliability of the transportation system. Therefore, an argument can be made for keeping safety and reliability in the same goal.

The third goal includes "Sustainability", which in my mind refers to fiscal responsibility, environmental protection, as well as system preservation. With that said, I would like to consider consolidating the third goal with the fifth goal (Protect the environment, improve air quality and promote energy efficiency). They already share many of the items listed in the Performance Measure column, with the main difference being the "Location Efficiency" measures. Moreover, it seems to me that the Location Efficiency measures could currently apply to the third goal, since use of alternative modes and commute distance directly impact the amount of wear on the infrastructure.

SBCCOG (Wally Siembab)

1. There are many references to the "needs of the transportation system," but I have not seen the transportation system clearly defined.

It appears that the components include pure infrastructure (freeways and ramps, local streets, rail system), policies governing use of that infrastructure (HOV lanes, ramp meters, parking policies), and then services that run on the infrastructure (like transit). Is that accurate, are there more components? How about signage? Are private vehicles from autos to cycles part of the "system?" What about the energy source for vehicles? I suggest a solid definition plus comprehensive examples of what is in AND what is out will help focus the discussion.

2. There is a distinction between outcomes VS outputs and measures VS indicators. Examples are essential to understanding the distinctions and knowing which goes where in the RTP.

3. Why is being "mode neutral" important?

Ty answered this for me with the following: "Mode neutrality was important, and continues to be, because (for example) questions we're trying to answer should take the form "how can we most timely, safely, efficiently, affordably, reliably, cleanly get where we need to go?", not "how can we most timely, safely, efficiently, affordably, reliably, cleanly get where we need to go by bus?" Our performance measures shouldn't predetermine or assume a modal outcome." While I see that is the perspective, I'm not sure why performance measures shouldn't be developed per mode. I'm equally not sure why they should, I'm simply asking for explanation of this perspective.

4. The Draft table 2012 RTP/SCS Goals and Performance Categories is pretty schematic and I think needs more detail before it can serve as focus of the discussion. For example, Table 4 in the 2008 RTP Executive Summary has columns for definitions, targets and outcomes. Something similar should be added to your draft before earnest discussion begins.

5. The state of the art in "performance metrics" is apparently changing. For example, Caltrans is promoting "smart mobility" with its approach to performance; STARS is an attempt coming out of Portland to define a LEEDs-like certification system also with its own performance metrics. It would be useful if you would relate what we're doing and what the RTP has done in the past to the Caltrans Smart Mobility Framework. Should this RTP adopt it?

For example, the 2008 RTP includes the metric "speed" regardless of mode with a target of 8% increase over the baseline. The health consortium comments suggest that speed is unhealthy and unsafe – a direct conflict with the current metric. Smart Mobility talks about "speed suitability." Is If SCAG plans to use in any fashion the Caltrans "Smart Mobility Framework," an extensive presentation of it will be necessary.

Ideally responses to those 5 topics will be available in writing on the SCAG site at least 24 hours before the first subcommittee meeting. That way they can more effectively be presented and discussed at the meeting.

Then there are a number of additional issues about which I have questions -- but some of them may be informed by your responses to the first 5, so I am listing them separately.

6. Even the past goal statements may also need review. For example, maximizing mobility appears in conflict with protecting the environment – a more contemporary goal might be something more like optimize mobility, environmental protection and travel safety without falling below certain thresholds. Arguably the highest and best use of the extensive freeway system is for the movement freight and mission-critical employees – perhaps freight and passenger vehicles should have distinct goals and metrics.

7. The past RTPs involve concerns for reducing SOVs and VMT per capita – but those concerns do not have the same importance if the vehicles are BEV or generally ZEVs. Shouldn't these traditional concerns become more nuanced in 2012? Depending on the outcome of the mode neutrality discussion, perhaps all topics involving mode should be addressed through a more detailed list of mode choices.

8. Sub-regional planning has also been added to the equation for the first time. While today the sub-regional SCSs have amounted to sub-regions managing and interpreting their own data, the future will surely lead to distinct sub-regional strategies. Should metrics geared to each sub-regional strategy be accommodated or even encouraged? For example, the 2008 RTP defines accessibility as how well the transportation system performs in terms of providing people access to opportunities (jobs, education, medical care, etc.). The metric is % PM peak period work trips within 45 minutes of home, with the target of improvement over the base year. 2008 RTP Memorandum 17 says access to employment is a reasonable proxy for access to all opportunities. However, that is not accurate for the South Bay Cities and the 45 minute standard for the journey to work is not an access metric consistent with our strategy.

9. In addition to the 2008 RTP metrics, some form of performance metrics is embedded in the Sustainability Tool. Wouldn't it be useful for those implicit metrics to be made explicit in order to inform the discussion about the 2012 RTP's metrics? In other words, what are the variables in the Tool and what weight is each given by its coefficient?

10. At some point early in the process, I suggest SCAG staff make a detailed presentation of the "Target Scenarios Matrix" (listed as an attachment in the April 13 memo) and explain how (by what process) the performance measurements will be used with that matrix.

GWCCOG (Nancy Pfeffer)

Committee members come prepared to the first meeting. Ty and Wally, I believe, have both identified and shared past efforts that will be an essential foundation for the discussion, so it would be great if we can all get familiar with those.

Establish common terminology. I think it would help save time if we spent part of the first meeting establishing what some of the key terms mean (e.g., "indicator," "outcome", etc.) If committee members request these terms in advance it might help – I believe Wally has a few.

Agree on a timeline and goals. I'd suggest that a part of the first meeting also be devoted to a review of the RTP schedule, working back to when this subcommittee's recommendations will need to come forward. As part of this, we could also agree that given the time challenges, we will aim for a small but meaningful set of performance measures (maybe even agree on a target number of measures). My thought is for the group to set realistic expectations so we don't get derailed when (inevitable) disagreements arise.

Set the meeting schedule. Based on the foregoing discussion and to ensure we can meet our goals, we could set all the subcommittee meetings next week. Perhaps some can be conference calls instead of meetings.

Safe Routes to School

1. Allocating agency resources to ensure meaningful engagement and analysis of **active** Transportation Regional Strategies in the 2012 RTP (12% of all current trips)
2. Performance measures addressing **public health, safety and equity**

Attachment D – Recommended Sector/System Description Measures

Sector/System Description

Measures

Used to describe current and future market

Not outcome based measures

If influenced by policy, changes to market will reported first, and the impacts of these changes be presented through outcome based measures

Category

Population
Employment
Travel Demand

Measure

Total number of residents
Total number of employees
Number of daily person trips, peak and off-peak, work and non-work
Number of daily truck trips, peak and off-peak
Number of daily freight rail trains in and out of the Region
Vehicle Miles Traveled (VMT) by facility type
VMT by mode by vehicle type (cars, light trucks, heavy duty trucks)
VMT per household

Volume of port related trade
Percent of work and non-work trips for transit, non-motorized, single occupancy vehicles, high occupancy vehicles (car-pools)
Trip length distribution by mode

Relation to Last RTP

Discussed in RTP, can be segmented further based on socio-economic data
Discussed in RTP
Expanded from previous RTPs
Expanded from previous RTPs
Expanded from previous RTPs
Expanded from previous RTPs
Expanded from previous RTPs
Expanded from previous RTPs, Human Impact Partners suggested using per capita instead of per household
Expanded from previous RTPs
Expanded from previous RTPs
Originally suggested as the number of trips less than 3 miles and less than 1 mile by mode

Mode Shares

Attachment E – Recommended Investment Allocation Measures

Financial Measures

Used to describe funding and expenditures

Not outcome based measures

If influenced by policy (e.g., how funds get spent), changes to market will reported first, and the impacts of these changes be presented through outcome based m

Category

Funding

Expenditures

Measure

Total funds broken down by funding source

Total expenditures broken down by mode

Total expenditures broken down by type (capital, operations, preservation, maintenance)

Relation to Last RTP

presented in the finance section and technical appendices in previous RTPS

presented in the finance section and technical appendices in previous RTPS

Attachment F – Recommended Outcome Related Measures

Performance Outcome Measures

Used to report the impacts of decisions
 Impacts are from an aggregate user perspective
 Reflects many decisions, including market and finance impacts

OUTCOME	MEASURE/INDICATOR	Existing , Modified, or New	Used for RTP Alternatives	**Better Suited for Monitoring	Other	Discussion
Location Efficiency Reflects Land Use Strategy Effectiveness	Median Distance for work and non-work trips	New	Yes	No		2010 Census CTPP contains data for work trips only and is available onlt every ten years
	Percent of population within 1/2 mile (or 15 minutes walk) of a high frequency transit stop (frequency of 15 minutes or less)	New	No	Yes	Human Impact Partners suggest using 1/4 mile to local public transit and 1/2 mile to regional public transit	Details of local public transit may not be readily available. Is access to transit critical, or is access to jobs via transit more critical. In the past, SCAG reported on travel time for work trips by mode. This may be more appropriate since access to transit stations alone may not tell the whole story.
	Percent of jobs within 15 min. walk of transit	New	No	Need further Research		
	Percent of commute trips less than 10 miles long	New	Yes	yes	Measure captures location compactness	
	Share of growth in transit priority areas	New	Yes	Yes	Human Impact Partners suggest reporting both population and job growth	
	Percent of income spent on housing and transportation	New	No	Yes		
	Percent of existing and new below-market rental housing units in TOD area	New	No	Need further Research		
	Proportion of residents within 1/2 mile walk to parks and open space	New	No	Yes	Suggested to be reported as proportion of households that can walk or bike to meet at least 50 percent of their daily needs by Human Impact Partners. Needs are defined as: schools, parks, healthcare institutions, transit, restaurants, grocery stores, food markets, and childcare	
	Number of acres of parks/open space for every 1,000 residents	New	No	Yes		SCAG Open Space database
	Land Consumption	New	Yes	Yes		CA Farmland Mapping & Monitoring Program
	Jobs/housing fit by subregion	New	No	No		
	Intersection density in new development areas	New	No	No		
	Household water consumption annual	New	No	Yes		
	Household energy use annual (transp.+space heating)	New	No	Yes		include electricity, natural gas and vehicle fuel consumption
	Annual Cost of household transportation	New	No	Yes		
	Commute Distance Distribution	New	Yes	No		
	Percent Households <500 ft. from high-volume arterials that are regionally significant and State Highways	New	Yes	Yes		
	Percent Households >65Db noise	New	Yes	Yes		
	Percent Households w/ walk access to neighborhood services	New	No	No		
	Daily amount of work-trip and non-work trip related physical activity	New	No	Need further Research	Methodology proposed by Human Impact Partners using the ACS or the NHTS in conjunction with regional transportation surveys, if available	

OUTCOME	MEASURE/INDICATOR	Existing , Modified, or New	Used for RTP Alternatives	**Better Suited for Monitoring	Other	Discussion
Mobility/Accessibility	Travel time distribution for transit, SOV, HOV for both work and non-work trips	Expanded, used to be percent of work trips within 45 minutes	Yes	No	NA	May be difficult to show in RTP, need to review options to present in a simple manner.
	Person Movement Delay by facility type (Mixed Flow, HOV, Arterials)	Expanded to show SOV and HOV delay Estimate only	Yes	No	NA	NA
	Highway non-recurrent delay for mixed flow and high occupancy lanes		No	Yes		May be used for RTP goals
	Truck Delay by facility (Highway, Arterials)	Expanded to show by facility	Yes	No	NA	NA
	Person Delay per Capita	Expanded	Yes	No	NA	NA
Reliability	Variability of Travel Time	Existing	No	Yes	NA	Used in the past as a target for improving non-recurrent congestion
Safety and Health	Collision/Accident Rates by Severity by Mode	Expanded	Partial only	Yes	Methodology proposed by Human Impact Partners to forecast pedestrian injuries and fatalities, but has not been vetted by SCAG	Can only be projected due to facility and/or mode split changes.
	Pre-mature deaths due to PM 2.5	New	No	Yes	Methodology used at MTC was reviewed, but has not been vetted by SCAG	Not likely to change much among scenarios
	Asthma incidence and exacerbations	New	No	Yes	NA	Difficult to forecast
Productivity	Lost Lane Miles for Highways, percent seat miles utilized for transit	Existing	No	Yes	NA	Used in the past as a target for roadway maximizing flow and transit effectiveness; how to monitor lost lane miles?
Environmental Quality	Tons of pollutants and green house gas emissions	Expanded to included GHG emissions	Yes	Yes	NA	NA
	Number of CO Hotspots in transit priority areas	New	No	Yes	NA	Difficult to forecast
Economic Well Being	Contribution to Gross Regional Product	Existing	Partial only	No	NA	Economic Analysis can be very time consuming
	Jobs Supported by Transportation Investment	Existing	Partial only	No	NA	Economic Analysis can be very time consuming
	Jobs Supported by Improving Competitiveness	New	Partial only	No	NA	Economic Analysis can be very time consuming
Investment Effectiveness	Benefit/Cost Ratio	Existing	Yes	No	NA	Needed to show effectiveness of public funds
System Sustainability	Cost per capita to preserve multi-modal system to current and state of good repair conditions	Partial/New	yes	Yes		

**** While staff will make the best effort, all monitoring items are subject to further considerations with respect to, e.g., data frequency, cost, etc.**