

# APPENDIX D: PERFORMANCE-BASED EVALUATION FRAMEWORK

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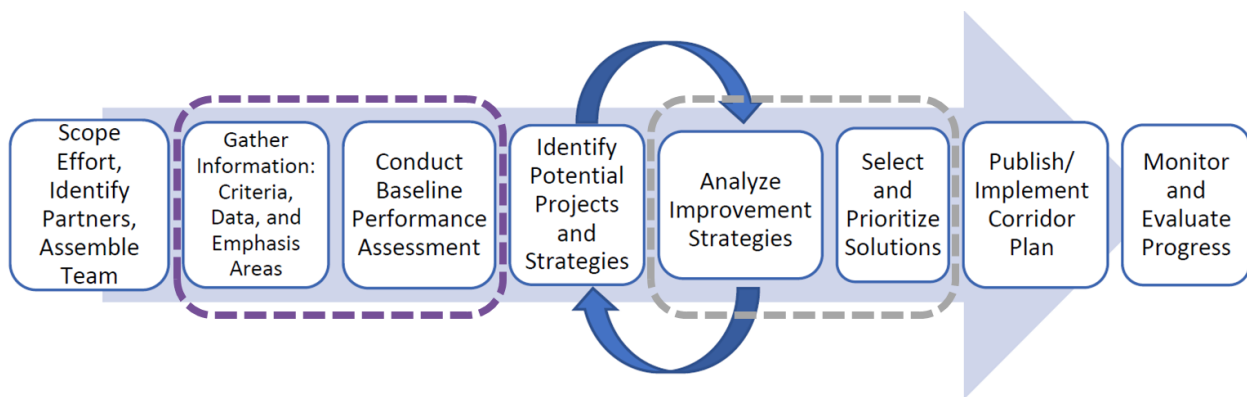
## Kumeyaay Corridor

# Introduction & Summary

This memo summarizes the development and recommended performance-based evaluation framework for the Kumeyaay Corridor Comprehensive Multimodal Corridor Plan (CMCP). For consistency with other CMCP documents, the Kumeyaay Corridor began with pre-approved regional performance evaluation measures<sup>1</sup> as a starting point.

This is an early step in the corridor planning process and forms an important foundation for alternatives assessment as the CMCP evolves. **Figure 1** shows the Caltrans CMCP process steps; in dashed outline are where the performance evaluation framework begins (at left) and continues through project and solution<sup>2</sup> prioritization and selection.

Figure 1: Corridor Planning Steps per Caltrans Process Guide (2020)



The focus of this memo is to identify the robust evaluation framework that would apply to the developed Kumeyaay Corridor scenarios. Related – and coming earlier in the process – is a simplified and more qualitative adaptation of the framework that will be used for screening the numerous potential solutions, where the blue iterative loop is shown in Figure 1. That is described at the end of the memo.

The corridor scenario evaluation framework is intended to be as objective and transparent as possible, as well as comprehensive, sufficiently robust, and explicitly tied to corridor, region, and state strategic direction. As the framework seeks to reflect strategic priorities, it exists within a complex regional policy landscape.

The approach draws on the Caltrans CMCP guidance, experience from other CMCPs, as well as best practices in performance management, measurement, and analytics. The plan's findings must ultimately reflect community engagement and withstand stakeholder scrutiny, so performance data must be recent, methods must be sound and grounded in best practices, and results must be presented visually and clearly.

- Section 2 of this memo presents the evaluation framework, fundamentally a decision matrix, which is the culmination of the work to understand and align objectives and strategy, compile and prioritize

<sup>1</sup> This list of measures available here (internal to SANDAG)

<sup>2</sup> "Solution" is used here for consistency with Caltrans guidance and encompasses projects, actions, activities, services, improvements, etc. that address identified issues and needs

desired outcomes and corridor performance measures, and provide a functional and accessible decision tool.

- Section 3 steps through the development approach that ties vision and goals through to high quality measures. This includes a graphical organization depiction and a Measure Catalog that will continue to be updated and refined during the baseline evaluation and solutions screening coming next.
- Section 4 summarizes the next steps for the baseline performance assessment, further refining the measures and framework, and adaptation of the framework for streamlined project screening.

## Evaluation Framework

The Kumeyaay Corridor evaluation framework was developed to be consistent with state and regional policies and performance goals. The measures within this framework include those provided by SANDAG generated through the regional activity-based model (ABM)<sup>3</sup>, Caltrans Emission Factors (CT-EMFAC), and Geographic Information Systems (GIS).

This framework will be applied to baseline conditions and to the several corridor scenarios to be developed. Separately, but closely related, a streamlined, qualitative version will be utilized throughout *solution* screening and sketch planning. The full scenario evaluation has more objective and quantitative metrics, while sketch planning is more qualitative but spans many potential solutions. Refer to the Evaluation and Next Steps section for more about the screening approach.

This Section introduces and summarizes the evaluation framework, while its *development* is detailed further in the Measure Development section of this memo, and Evaluation and Next Steps section returns to the matrix with identified measures for the corridor.

The evaluation framework also follows Caltrans' Corridor Planning Process Guide (2020) and is formed in part by corridor-specific needs. The following figure is an example of an initial draft depiction of a framework results summary. Full evaluation of multiple scenarios generates values for numerous measures that are then rolled up into five categories. The shading and icons are to provide at-a-glance indications of relative results.

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<sup>3</sup> SANDAG ABM2+ version 14.2.2 has been used for CMCP modeling; the Kumeyaay Corridor will use ABM2+ version 14.3.0

Figure 2: Summary View of Evaluation Framework

Scenario	Description	Accessibility	Efficiency	Air Quality	Multimodal	Safety	Combined
Base	2016 model baseline	○	○	○	○	○	○
Do-nothing	No-build network & DS ##	●	○	●	○	●	●
1) Scenario #1 Title	Concise summary of projects and improvements	○	●	●	○	○	●
2) Scenario #2 Title	Concise summary of projects and improvements	●	●	○	●	○	●
3) Scenario #3 Title	Concise summary of projects and improvements	●	○	●	○	●	●
4) Scenario #4 Title	Concise summary of projects and improvements	○	●	●	●	○	●
5) Scenario #5 Title	Concise summary of projects and improvements	○	○	●	●	○	●
6) Scenario #6 Title	Concise summary of projects and improvements	●	●	●	●	○	●

●	Highest Positive Impact
●	Strong Impact
○	Moderate Impact
○	Minimal Positive Impact
○	No or Unlikely Benefit

The five performance measure categories shown reflect a combination of multiple desired outcomes and associated performance measures. This summary view shows aggregated results of a fabricated analysis along a five-level scale.

The selection and definition of the measures contributing to each of the categories are explained as part of the development process documented throughout Section 3.0 (3.1 to 3.5) of this memo. To reiterate, the primary sources of measures are those provided by SANDAG for consistency with model output and measures used among other CMCPs. Additional measures were reviewed from various other sources. The measure collection was assessed for alignment with regional and corridor goals, overlaps and gaps, and feasibility of use (e.g., clearly defined and with data available).

With stakeholder input and review, a prioritized set of performance measures were identified and categorized into five areas. The five summary categories are:

- **Accessibility** is central to the SANDAG goal, “Access to Affordable, Reliable, and Safe Mobility Options for Everyone,” and includes many measures such as transit proximity, access to jobs and education, active transportation facilities and usage, and non-auto travel.
  - In this initial pass, the Accessibility category comprises around 20 measures, not including specific drilldowns, e.g., access to Tier 1 jobs within 30 minutes vs within 45 minutes
- **Efficiency** primarily gauges the goal for “Efficient Movement of People and Goods,” and includes state of repair, travel times and distances, delay, reliability, and resiliency.
  - Comprises ten measures in this initial draft
- **Air Quality** addresses the goal, “Healthier Air & Reduced Greenhouse Gas (GHG) Emissions Regionwide,” and measures PM2.5 exposure, on-road smog forming pollutants, contributors to GHG, and proximate resident population exposed to roadways (four measures).

- **Multimodal** captures person trips, short trips, transit ridership, and mode share (four measures). Mode share is further divided by single-occupant vehicle (SOV), vehicles with two or more occupants (Occ2), vehicles with three or more occupants (Occ3), transit, bicycling, and walking.
- **Safety** relates both to individual safety and public health and includes measures of fatalities, serious injuries, and incidents involving vulnerable road users (VRUs) (three measures).

## Measure Development

The evaluation framework rests on high quality measures and includes only the **most relevant and feasible quantifications of evidence for outcomes strongly linked to a goal**. This begins with confirming strategic direction and goals and working toward well-defined desired outcomes to be measured.

## Strategic Alignment

The connection from strategic direction (e.g., “vision” and “goals” as used in the 2021 Regional Plan) to measures is explicitly linked via a cascade through well-established corridor objectives or policy areas provided by SANDAG. Further, in coordination with other tasks underway for the Kumeyaay Corridor, the defined needs and issues are addressed by one or several potential solutions (see footnote 2). The solutions involve inputs, resources, activities, processes, etc. and lead to “outputs” that ultimately drive improved “outcomes.” Each decomposition step increases specificity and measurability, such that desired outcomes are very measurable. **Figure 3** depicts this cascade.

Figure 3: The Alignment Cascade



The measures in turn have multiple subparts, e.g., travel time as an aggregate measure may have drilldowns by mode, time of day, and so on.

### **SANDAG 2021 Regional Plan**

A starting point for the Kumeyaay Corridor performance evaluation approach development are the vision and set of three goals in SANDAG’s Regional Plan (2021), which the Kumeyaay Corridor team adapts and augments for the CMCP.<sup>4</sup>

**Vision:** A fast, fair, and clean transportation system and a resilient region

- Goals:**
1. The efficient movement of people and goods
  2. Access to affordable, reliable, and safe mobility options for everyone
  3. Healthier air and reduced greenhouse gas (GHG) emissions regionwide

<sup>4</sup> <https://sdforward.com/mobility-planning/2021-regional-plan>

SANDAG's shorthand for these three goals are "fast," "fair," and "clean," respectively. The Regional Plan also lays out important context in the "5 Big Moves" – Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets, and Next Operating System (Next OS) – which are critical touchpoints during project screening and throughout the corridor planning process.

Further, the Regional Plan outlines three areas of priority measures, which are carried forward and reflected in the performance evaluation matrix:

1. Access to Basic Needs: the ability of people to use various modes of transportation to access shopping, open space, and healthcare.
2. Access to Opportunities via Transit: the ability of people to access regional employment centers and higher education via transit.
3. GHG Emissions: the degree to which the 2021 Regional Plan meets state-mandated targets for reducing GHG emissions.

### **Other Guidance**

#### *Caltrans Corridor Planning Process Guide (2020)<sup>5</sup>*

This guide states, "The corridor plans and recommended projects should strive to meet local, regional, statewide goals for a safe, sustainable, integrated, and effective transportation system that positively impacts all Californians." In addition, the guidance lists a variety of measures and data to consider including mobility, congestion, accessibility, reliability, economic development, job creation and retention, air quality and GHG reduction, and efficient land use, seamless, resilient, multimodal, and so on.

#### *Regional Transportation Planning (RTP) Guidelines (2017)<sup>6</sup>*

In addition to the reminder about the Federally required measures related to safety, infrastructure, congestion, reliability, freight, sustainability, and better project delivery, the Guidelines stipulate consideration of the following eleven objectives:

- Preserve transportation infrastructure
- Improve mobility and accessibility
- Reduce GHG and improve air quality
- Improve public health, e.g., increase physical activity
- Conserve land and natural resources
- Encourage sustainable land use patterns
- Increase supply of affordable housing
- Improve jobs and housing balance
- Improve mobility and accessibility for low-income and disadvantaged communities
- Support economic development
- Increase safety and security of the transportation system for motorized and non-motorized users

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<sup>5</sup> <https://dot.ca.gov/programs/transportation-planning/multi-modal-system-planning/system-planning/corridor-planning-process-guide>

<sup>6</sup> <https://dot.ca.gov/programs/transportation-planning/regional-planning/federal-state-planning-program/2017-rtp-guidelines-for-mpos>

## Other References

- California Transportation Commission (CTC) 2018 Multimodal Corridor Plan Guidelines<sup>7</sup>
- California Transportation Plan<sup>8</sup>
- Caltrans Smart Mobility Framework<sup>9</sup>
- Caltrans Strategic Management Plan<sup>10</sup>
- Caltrans Planning for Operations Strategic Work Plan<sup>11</sup>
- Climate Action Plan for Transportation Infrastructure (CAPTI)<sup>12</sup>
- California Strategic Highway Safety Plan (SHSP)<sup>13</sup>
- Other CMCPs

Taken together, there are numerous potential goals, objectives, or policy areas for consideration. All are important, some may be higher priority than others, and the development of this framework illustrates interrelatedness.

Figure 4: Various Goals from Plans & Guidance



Lastly, in addition, or in lieu of, this list, the Kumeyaay Corridor stakeholders may bring forth other corridor-specific goals or objectives not already captured in the performance framework. The framework will evolve as community and partner agency engagement and the planning process proceeds.

<sup>7</sup> <https://catc.ca.gov/-/media/ctc-media/documents/120518-approved-cmcp-guidelines-a11y.pdf>

<sup>8</sup> <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/state-planning-equity-and-engagement/california-transportation-plan>

<sup>9</sup> <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/active-transportation-and-complete-streets/smart-mobility-framework>

<sup>10</sup> <https://dot.ca.gov/-/media/dot-media/programs/sustainability/documents/caltrans-strategic-mgmt-plan-033015-a11y.pdf>

<sup>11</sup> <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/system-planning/systemplanning/caltrans-p4ops-strategic-work-plan-2018-a11y.pdf>

<sup>12</sup> CAPTI finalized July 2021, <https://calsta.ca.gov/subject-areas/climate-action-plan>

<sup>13</sup> SHSP updated May 2022, <https://dot.ca.gov/programs/safety-programs/shsp>

## Measure Identification & Sources

In concert with a top-down, strategic approach, there are many measures already existing and defined for this corridor performance framework. Two essential sources are the list of measures provided by SANDAG that are largely furnished via the ABM, and a list of about 30 measures that have been utilized for previous work and other CMCPs. A condensed summary of these two sources is repeated here:

- Accessibility Investment
- Active Transportation Facilities
- Air Quality (GHG, PM2.5, Smog)
- Bicycle & Pedestrian Travel
- Bike Facilities & Lanes
- Freight Congestion
- Jobs Proximity (e.g., distance to Tier 2, time to Tier 1 and Tier 2)
- Mobility Zone Residents & Jobs
- Mode Share
- Person-Hours Traveled
- Person Throughput
- Person-Trips
- Planning Time Index
- Residents & Tier 2 Jobs
- Short Trips
- System Completeness
- Transit Proximity (Multifamily Population or Housing)
- Transit Proximity
- Transit Ridership
- Transportation Physical Activity
- Travel Time
- Trip Distance
- Vehicle Miles Traveled (VMT)

All of these are cataloged in more detail, which is explained further in Section 3.3 below.

Next, SANDAG's Regional Plan includes a list of measures (indicators), which are shown here in Figure 5 on the next page. From this list, many are already covered by the measures on hand from SANDAG, and others are not applicable to a corridor evaluation framework (e.g., diversity of energy supply).



Figure 5: SANDAG Regional Plan Performance Indicators (2021)

**Table 3.1  
Performance Indicators for the  
2021 Regional Plan**

INDICATOR	DATA SOURCE
<b>Healthy Environment</b>	
<b>Air quality</b>	San Diego County Air Pollution Control District
<b>Beach widths</b>	SANDAG Regional Beach Monitoring Program Annual Report
<b>Habitat conserved within designated preserve areas</b>	U.S. Fish and Wildlife Service Annual Monitoring Report, Conserved Lands Database, local jurisdictions
<b>Energy and Water</b>	
<b>Water consumption</b>	San Diego County Water Authority
<b>Diversity of water supply</b>	San Diego County Water Authority annual reports
<b>Impaired waterbodies</b>	San Diego Regional Water Quality Control Board
<b>Diversity of energy supply and use</b>	San Diego Gas & Electric Power Content Label
<b>Electric and natural gas consumption by sector</b>	California Energy Commission
<b>Housing</b>	
<b>Share of new housing units and jobs located in Smart Growth Opportunity Areas</b>	Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics Workplace Area Characteristics
<b>Housing units permitted by income category – NEW</b>	Local government annual housing progress reports
<b>Percentage of households with housing costs greater than 35% of income</b>	American Community Survey
<b>Annual income needed to afford fair market rent</b>	National Low-Income Housing Coalition

Appendix E includes additional information on performance monitoring for the 2021 Regional Plan.

INDICATOR	DATA SOURCE
<b>Quality of Life</b>	
<b>Unemployment – NEW</b>	California State Employment Development Department
<b>Social equity – NEW</b>	California Office of Environmental Health Hazard Assessment CalEnviroScreen
<b>Telework – NEW</b>	Annual SANDAG Telework Survey
<b>Homelessness – NEW</b>	San Diego Regional Task Force on Homelessness
<b>Drug use – NEW</b>	Criminal Justice (CJ) Clearinghouse annual Substance Abuse Monitoring reports
<b>Crime</b>	CJ Clearinghouse Annual Crime Report
<b>Real per capita income, compared with California and the United States</b>	U.S. Bureau of Economic Analysis
<b>Regional poverty rate, compared with California and the United States</b>	American Community Survey
<b>Transportation Planning</b>	
<b>Fatalities/serious injuries (total and per vehicle mile traveled)</b>	California Highway Patrol Statewide Integrated Traffic Records System, and National Highway Traffic Safety Administration Fatality Analysis Reporting System
<b>Travel time to jobs</b>	American Community Survey
<b>Travel times and volumes for all modes</b>	Caltrans Performance Measurement System
<b>Commute mode share</b>	American Community Survey
<b>Bike lane miles – NEW</b>	SANDAG and local jurisdictions
<b>Annual transit ridership – NEW</b>	Annual boardings data from Metropolitan Transit System (MTS), North County Transit District (NCTD), and SANDAG
<b>Annual transit boardings</b>	Annual boardings data from MTS, NCTD, and SANDAG
<b>Border wait times</b>	U.S. Customs and Border Protection
<b>Vehicle miles traveled</b>	Caltrans Performance Measurement System

Examples of measures from the Regional Plan already included in Kumeyaay performance measures include items such as bike lane miles, VMT, air quality, and commute mode share. On the other hand, an example unique to the Regional Plan that may be included is a measure of access to basic needs such as medical, recreational, and retail destinations (this is detailed in the Plan appendices).

### Measure Considerations Tied to Grant Funding

Keeping in mind the importance of competing for grant funding, it is helpful to crosscheck whether grant evaluation criteria are reflected in the performance framework.

Two prominent examples are California's Solutions for Congested Corridors Program (SCCP or referred to simply as SB 1)<sup>14</sup> and the influx of competitive (discretionary) grant funding available under the current Bipartisan Infrastructure Law (BIL). First, SCCP has eight specific criteria, which – apart from project-specific funding or timelines – are integrated into the Kumeyaay Corridor evaluation framework.

1. Safety
2. Congestion
3. Accessibility
4. Economic development, job creation, and retention
5. Air pollution and greenhouse gas emission reductions
6. Efficient land use
7. Level of matching funds
8. Timely project completion

Second, the BIL provides a wealth of funding as both formula and discretionary. Though the selection criteria for securing Federal funding is distinct, and itself varies, the mostly common set of criteria should be kept in mind. The Kumeyaay Corridor may have an opportunity to increase benefits sooner with additional Federal discretionary funds, thus the recommended improvements can be better positioned to pursue competitive grant opportunities if data and analyses from this corridor study can be readily utilized for grant applications. The largest transportation discretionary grant programs to date in 2022 generally include the following set of selection criteria:

- **Safety:** Significantly address known safety problems; US Department of Transportation's Safe System Approach; safer for motorized and non-motorized travel, VRUs, and communities
- **State of Good Repair:** Project is consistent with Transportation Asset Management (TAM) and other plans; addresses risk and vulnerabilities; extended life; reduced life-cycle or future operations and maintenance (O&M)
- **Environment:** Advances environmental sustainability, addressing climate change and related resiliency, greater energy efficiency, carbon and GHG reduction, environmental justice (EJ)
- **Economic Impact:** Strengthens economic competitiveness, growth opportunity, fiscal and economic impacts, improved freight movement, job creation; in the Federal Multimodal Project Discretionary Grant (MPGD) Program this had 10 specified sub-outcomes, e.g., freight movement, reduced mobility costs, productivity, jobs, workforce
- **Quality of Life:** Improves equity, access, and accessibility; reduces barriers and improves conditions for disadvantaged populations (e.g., designated Area of Persistent Poverty, Historically Disadvantaged Community, Opportunity Zones, Empowerment Zones, Promise Zones, Choice Neighborhoods)
- **Multimodal Mobility:** Improved mobility for all users, reduced delay, improved reliability, better multimodal and non-motorized options, community connectivity, greater access to opportunities

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<sup>14</sup> Refer to Road Repair Accountability Act of 2017 (SB 1), <https://catc.ca.gov/programs/sb1/solutions-for-congested-corridors-program>

- Collaboration: Project partnerships, stakeholder and community engagement, disadvantaged business enterprise (DBE) involvement, other contributors, and beneficiaries
- Innovation: Including technology, project delivery, and financing

Other sources of potential measures include:

- Caltrans RTP Guidelines (2017), mentioned previously
- Other recent CMCPs as examples
- Corridor-specific measures per the project team and corridor stakeholders, especially for desired outcomes not otherwise found in other sources

To reiterate, several measures are found across multiple sources, e.g., GHG reduction is common across SANDAG’s Regional Plan, the Federal measures, and model output. Conversely, some measures are added for consideration because of a lack of measure attached to a desired outcome, e.g., some related to risk and resiliency. Others are included to ensure maximum comparability across CMCPs, e.g., those that are part of the list of model output such as throughput, person trips, or commute time.

## Measure Catalog

All of the potential measures were compiled, assessed, and organized in two ways: one is the Measure Catalog, explained in this section; and the other is an Outcome Map, presented in Section 3.4.

A Measure Catalog is a comprehensive table of performance measures with several attributes, organizing items, and notes. This is indispensable during prioritization and ultimate selection of the performance measures for the CMCP evaluation framework. As measures are identified, the definitions of each measure are also captured here and subsequently refined. This is a living Excel file; though attached to this memo, it is a resource on the project SharePoint that is updated as needed.

The columns of information in the Catalog are:

<b>Sort</b>	for convenience, if helpful
<b>Category</b>	one of the five CATEGORIES (all caps) plus a general indication of policy / objective / topic drawn from various sources
<b>Measure</b>	the measure name
<b>Definition</b>	how is the measure defined, in brief
<b>Rel</b>	is this measure particularly <b>relevant</b> for performance?
<b>Fs</b>	if relevant, does it clearly tie to SANDAG’s <b>fast</b> strategic goal?
<b>Fr</b>	if relevant, does it clearly tie to SANDAG’s <b>fair</b> strategic goal?
<b>Cl</b>	if relevant, does it clearly tie to SANDAG’s <b>clean</b> strategic goal?
<b>Val</b>	is this measure particularly <b>valuable</b> for performance?

<b>Fea</b>	is this measure particularly <b>feasible</b> for performance?
<b>Pri</b>	prioritization recommendation (1-5 are currently carried forward)
<b>Ref</b>	reference ID to model-generated output list (SANDAG)
<b>Data</b>	the main data used and its source(s)
<b>Notes</b>	additional or clarifying remarks
<b>Source(s)</b>	measure origination, for reference / traceability

Figure 6 shows an excerpt of the Catalog just for a visual reference. Readers are referred to the Excel file for readability, detail, sorting, or filtering.

Figure 6: Excerpt Example of Kumeyaay Corridor Measure Catalog

Sort	Category	Measure	Definition	Rel	Fs	Fr	Cl	Val	Fea	Pri	Ref	Data	Notes	Source(s)
1	ACCESSIBILITY	Active Transportation Facilities	miles of active transportation improvements added	✓	✓	✓	✓	✓	✓	2			activity / lead metric	May '22 list a
2	ACCESSIBILITY	Bike Facilities & Lanes	Lane-miles of protected and separated bike facilities, number and %increase	✓	✓	✓	✓	✓	✓	2			activity / lead metric; SANDAG and local jurisdictions	May '22 list a; '21 Regional Plan
3	ACCESSIBILITY	System Completeness	top origin-destination (OD) pairs connected by multiple modal options	✓	✓	✓				3			On initial list, to be discussed	May '22 list a; Federal
4	ACCESSIBILITY; Active transportation and micromobility	Bicycle & Pedestrian Travel	average daily bicycle and pedestrian miles traveled	✓	✓	✓	✓	✓	✓	1	07.01	ABM, Wiki	Origin or destination inside study areas; Daily; All networks; From trip list for each mode; sum trip distance for bike, walk, and walk to / from transit (counted as walk)	May '22 list b; template
5	ACCESSIBILITY; Active transportation and micromobility	Transportation Physical Activity	percent of population engaged in 20 minutes or more of transportation-related physical activity	✓	✓	✓	✓	✓	✓	1	07.02	ABM, Wiki	Residents of study areas; Daily; All networks; Measure is based on purposeful trips and do not include recreational activities; Examples include walking or biking to or from a transit stop or walking to a shop	May '22 list b; template
6	ACCESSIBILITY; Economic development & goods movement; Social equity; Efficient movement of people and goods; Access to affordable, reliable, and safe mobility options	Access to Education	percent of residents that can access higher education institutions w/ 30-min and 45-min, by subpopulation	✓	✓			✓	✓	2	02.01.03 02.01.06	Model	by study area, low income, non-low income, minority, non-minority, senior, non-senior; alternative measure focuses on transit specifically	'21 Regional Plan; template
7	ACCESSIBILITY; Economic development & goods movement; Social equity; Efficient movement of people and goods; Access to affordable, reliable, and safe mobility options	Access to Jobs (Tier 1 Jobs)	percent of residents that can access higher education institutions w/ 30-min and 45-min, by subpopulation	✓	✓			✓	✓	2	02.01.01 02.01.04	Model	by study area, low income, non-low income, minority, non-minority, senior, non-senior; alternative measure focuses on transit specifically	'21 Regional Plan; template
8	ACCESSIBILITY; Economic development & goods movement; Social equity; Efficient movement of people and goods; Access to affordable, reliable, and safe mobility options	Access to Jobs (Tier 2 Jobs)	percent of residents that can access higher education institutions w/ 30-min and 45-min, by subpopulation	✓	✓			✓	✓	2	02.01.02 02.01.05	Model	by study area, low income, non-low income, minority, non-minority, senior, non-senior; alternative measure focuses on transit specifically	'21 Regional Plan; template
9	ACCESSIBILITY; Economic Development and Goods Movement	Jobs Proximity, NC Tier 2 (Distance)	number and percent of NC Tier 2 jobs within 1/2 mile from high-frequency and/or high quality transportation services	✓	✓			✓	✓	2			need to define NC	May '22 list a
10	ACCESSIBILITY; Economic Development and Goods Movement	Mobility Zone Residents & Jobs	number and percent of jobs and residents within mobility zones	✓	✓			✓	✓	2				May '22 list a
11	ACCESSIBILITY; Economic Development and Goods Movement	Residents & Tier 2 Jobs	number of new residents & Tier 2 jobs within corridor (Opportunity)	✓	✓			✓	✓	2				May '22 list a
12	ACCESSIBILITY; Efficient movement of people and goods; Access to affordable, reliable, and safe mobility options; Healthier air and reduced GHG emissions	Access to Basic Needs (Medical)	percent of residents that can access medical facilities within 30 minutes (transit)	✓	✓					5				'21 Regional Plan
13	ACCESSIBILITY; Efficient movement of people and goods; Access to affordable, reliable, and safe mobility options; Healthier air and reduced GHG emissions	Access to Basic Needs (Parks)	percent of residents that can access parks within 15 minutes, by walk, bike, transit	✓	✓					5				'21 Regional Plan

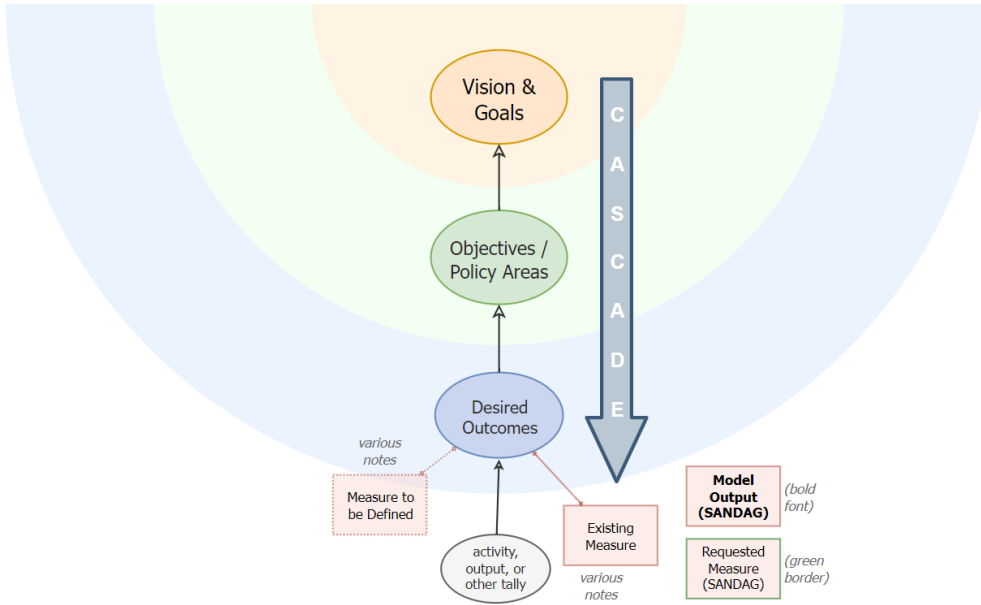
## Outcome Map

The second fundamental organizing tool is an “Outcome Map” which is a concentric circle depiction of the strategy cascade.<sup>15</sup> A guide to this is shown in **Figure 7**. The top level is in the center, each ring moving outward represents the cascade. Items in the ovals are generally written in outcome-oriented language – e.g., “Bicycle Facilities are Widely Available” – then the *solutions* (developed separately in other Tasks) are what drive the *outcomes*, for which the *measures* furnish the objective evidence.

<sup>15</sup> Credit for the concentric depiction – “Results Map” – to Stacey Barr, an Australia-based performance measurement expert

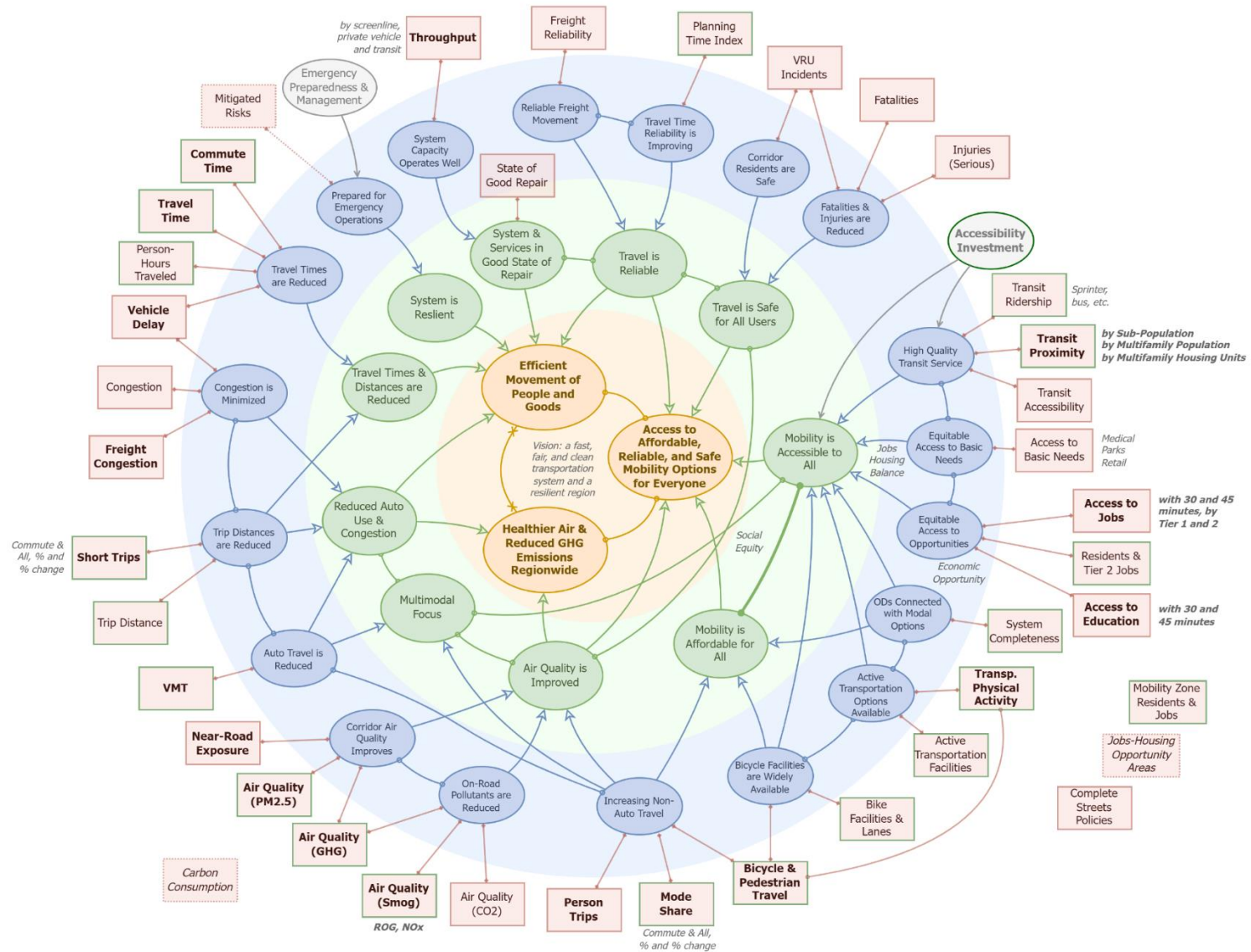
At the center in light orange are the top-level strategic goals – fast, fair, and clean – to align with the 2021 Regional Plan. Each ring outward contains entries in ovals that must connect (align) with one or more items toward the center. The team works to get these outcomes identified *before* defining measures. The measures (in light red boxes) are then attached to outcomes. Other ovals in light gray are optionally shown to indicate solutions (activities, outputs, etc. as distinct from outcomes).

Figure 7: Guide to the Outcome Map



**Figure 8** on the following page displays the full Outcome Map as of the preparation of this memo. It includes compiled measures to date, not all of which may ultimately be carried forward into the evaluation matrix.

Figure 8: Kumeyaay Corridor Outcome Map





## Prioritization

Next, the focus shifts to winnowing and prioritizing the measures themselves. Consider the following definition of an effective performance measure, with three key defining characteristics, the first of which is relevancy. As measures in the Outcome Map are connected to desired outcomes, they are already likely good candidates for relevancy.

Figure 9: Assessing Measure Quality

<b>Effective Measures</b> <i>The most relevant and feasible quantification of evidence for outcomes strongly linked to strategy</i>		
<b>Relevant</b> <ul style="list-style-type: none"> <li>✓ strong link to strategy or goals</li> <li>✓ objective evidence for result or outcome</li> <li>✓ drives improving behavior and is used in decision-making</li> </ul>	<b>Valuable</b> <ul style="list-style-type: none"> <li>✓ cost of measuring does not outweigh its value</li> <li>✓ ownership assigned to who can explain the result <i>and</i> influence the outcome</li> <li>✓ manage unintended consequences</li> </ul>	<b>Feasible</b> <ul style="list-style-type: none"> <li>✓ must be well-defined, specific, and accurate</li> <li>✓ quantifiable and based on available data and processes</li> <li>✓ updated frequently enough to detect signals indicating a change in performance</li> </ul>

A question to ask about relevancy is, if this were not measured, would the decisions be altered? To be valuable, how well does the measure help understand a desired outcome? Feasibility here primarily depends on clarity and data availability. Further, an uninfluenceable metric is not helpful in a corridor planning context, e.g., if no corridor options meaningfully affect wetland habitat (positively or negatively), it need not be included. **Table 1** shows four examples with a note for each.

Table 1: Measure Assessment Examples

Measure Assessment Examples									
Measure	Relevant	“	”	“	”	“	”	Valuable	Feasible
<b>Access to Education</b>	✓				✓			✓	✓
	Relevant, aligned with Goal #2, valuable, and readily feasible via model output								
<b>Mode Share</b> by trip type and six modes	✓		✓		✓		✓	✓	✓
	This is a fundamentally important measure that checks all the boxes, tied to multiple objectives, informative, and available from model outputs								
<b>Person-Hours Traveled</b>			✓						
	Sensible at first glance but unhelpful; goes up if trips increase and shift to local non-motorized activity; or a (non-delay) increase as an indicator of improved economic activity and access to destinations								
<b>Energy Diversity</b>							✓		
	From the 2021 Regional Plan, potentially related to Goal #3 but not relevant for corridor scenarios, nor valuable for screening / selection, and low feasibility for corridor context								

## Evaluation & Next Steps

### Evaluation Matrix

The scenario evaluation matrix was introduced and summarized in the Evaluation Framework section on page 3. **Figure 10** below shows the approximate regions of the Outcome Map that correspond to the five categories of Accessibility, Efficiency, Air Quality, Multimodal, and Safety.



Figure 10: Outcome Map Showing Category Regions



Each measure contributing to a category will be calculated (where possible, or given a value corresponding to a qualitative assessment) for each scenario. For aggregating to the category, each measure is normalized for averaging to a category result. A separate weighting exercise could be introduced later if desired. This result will also be visually depicted as shown in the example in Figure 2 earlier, or in the example shown below in **Figure 11**, which shows the matrix with the Efficiency and Air Quality categories expanded for illustration.

Figure 11: Evaluation Matrix (expanded example)

Scenario	Description	Accessibility	Efficiency										Air Quality				Multimodal	Safety	Combined		
			AGGREGATE	State of Good Repair	Vehicle-Miles Traveled (VMT)	Freight Congestion	Commute Time	Trip Distance	Mitigated Risks	Throughput	Vehicle Delay	Travel Time	Planning Time Index	AGGREGATE	Air Quality (PM2.5)	Air Quality (Smog)				Air Quality (GHG)	Near-Road Exposure
Base	2016 model baseline	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	○	○	○
Do-nothing	No-build network & DS ##	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	○	○	○
1) Scenario #1 Title	Concise summary of projects and improvements	●	##	##	##	##	##	##	##	##	##	##	●	##	##	##	##	○	○	●	●
2) Scenario #2 Title	Concise summary of projects and improvements	●	##	##	##	##	##	##	##	##	##	##	●	##	##	##	##	●	○	●	●
3) Scenario #3 Title	Concise summary of projects and improvements	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	●	○	○
4) Scenario #4 Title	Concise summary of projects and improvements	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	●	○	○
5) Scenario #5 Title	Concise summary of projects and improvements	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	○	○	○
6) Scenario #6 Title	Concise summary of projects and improvements	○	##	##	##	##	##	##	##	##	##	##	○	##	##	##	##	○	○	○	○
	Normalizer	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Here is a summary list of the measures included in the matrix. Additionally information on each will continue to be maintained in the accompanying Measure Catalog (Excel file).

**Accessibility**

- Bicycle & Pedestrian Travel
- Transportation Physical Activity
- Transit Proximity (Multifam Pop)
- Transit Proximity (Multifamily)
- Accessibility Investment
- Transit Proximity (Population)
- Active Transportation Facilities
- Bike Facilities & Lanes
- System Completeness
- Access to Education
- Access to Jobs (Tier 1 Jobs)
- Access to Jobs (Tier 2 Jobs)

- Jobs Proximity, NC Tier 2 (Distance)
- Mobility Zone Residents & Jobs
- Residents & Tier 2 Jobs
- Access to Basic Needs (Medical)
- Access to Basic Needs (Parks)
- Access to Basic Needs (Retail)
- Jobs Proximity, Tier 1 & 2 (Time)
- Jobs-Housing Opportunity Areas

**Efficiency**

- State of Good Repair
- Vehicle-Miles Traveled (VMT)
- Freight Congestion
- Commute Time
- Trip Distance

- Mitigated Risks
- Throughput
- Vehicle Delay
- Travel Time
- Planning Time Index

**Air Quality**

- Air Quality: PM2.5
- Air Quality: Smog
- Air Quality: GHG
- Near-Road Exposure

**Multimodal**

- Person Trips
- Mode Share
- Short Trips
- Transit Ridership

**Safety**

- Fatalities
- Injuries (Serious)
- VRU Incidents

## Baseline Performance Assessment

The baseline performance assessment is important for understanding the existing system performance and identifying existing issues in the corridor. As part of this assessment, the team will rely on data from two primary data sources – the SANDAG ABM and LOCUS. The team will rely on the defined set of performance measures that can be drawn from these data sources, combined with measures informed by other sources, to set the baseline for subsequent evaluation and to identify potential issues and diagnose their causes.

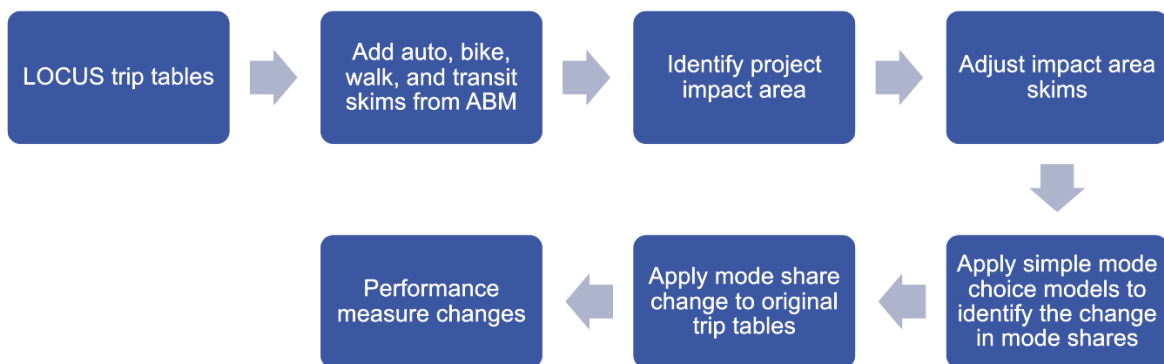
The baseline performance assessment will build upon the existing conditions analysis that is being delivered as part of Task 3.2 of the Kumeyaay Corridor CMCP. A baseline performance assessment will also be conducted for the future baseline using the future no-build model scenario. This will allow the team to compare performance measures across future scenario alternatives and the baseline and quantify the impacts of different solutions.

## Project Screening

As the next process step gets underway in Task 4 to identify, develop, and screen potential solutions (projects, strategies, actions, etc.), a simplified form of the performance evaluation framework will be applied along with the team’s sketch planning tool. As development continues during the timing of this memo, more description and information about the sketch planning tool will be available as the project progresses.<sup>16</sup>

This tool will help with the project screening due to external constraints placed on SANDAG transportation modeling staff. Using simplified modeling methodologies, the tool will be able to provide coarse metrics, similar to SANDAG ABM. A streamlined approach is essential given there are potentially hundreds of candidates to screen during this phase. A simplified summary of the sketch planning tool process is shown in **Figure 12**.

Figure 12: Sketch Planning Tool Process Overview

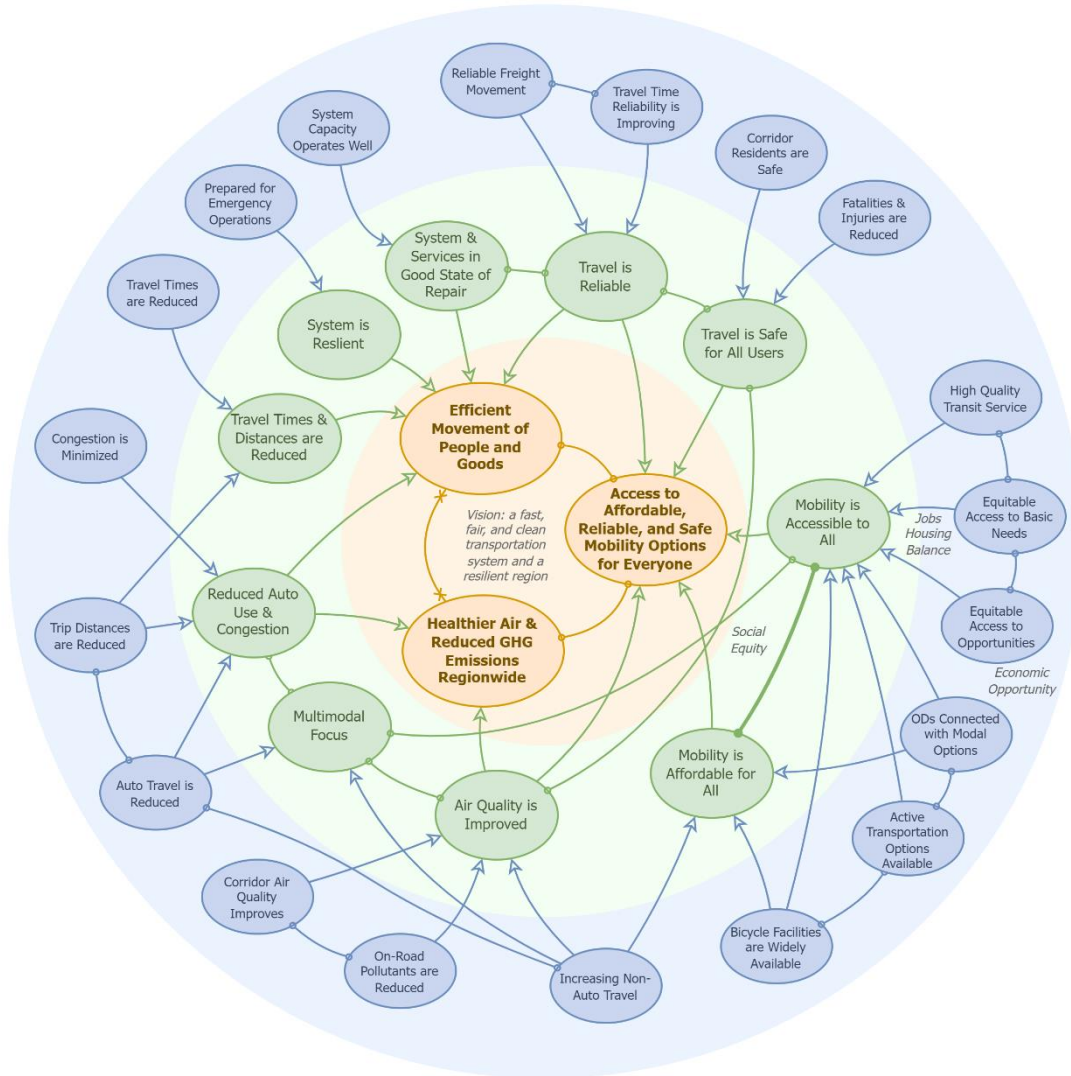


For screening, the set of desired outcomes is used as a guide instead of the specific measures. These are the items in the blue ring of the Outcome Map, and are repeated below in **Figure 13**.

<sup>16</sup> For example, see the slides ([link](#), available within SANDAG) presented 10/12/2022

With allowance for more qualitative and sometimes subjective assessment, a simpler scale is utilized during this sketch phase. Some values will still be quantitative, particularly those from the sketch tool. Those include commute time, travel time, person-hours traveled, transit trips, person trips, bike and walk trips, VMT, and mode share.

Figure 13: Outcome Map for Solution Screening



These are brought together into a manageable subset of items for solution screening, which will then be tracked in a conventional spreadsheet. An example of what a summary view may look like is shown in **Figure 14**.

Figure 14: Sketch Screening Matrix

ID	Solution	Combined	Cost	Timeline	Goal 1	Goal 2	Goal 3	Accessibility					Efficiency					Air Quality		Multimodal			Safety						
								Transit Service	Access to Basic Needs	Access to Opportunities	Active Transportation Options	Bicycle Facilities	AGGREGATE	Congestion	VMT	Travel & Commute Times	Emergency Preparedness	Person Trips & Person-Hours Traveled	Freight Movement	Travel Time Reliability	AGGREGATE	On-Road Pollutants	Corridor Air Quality	AGGREGATE	Mode Share (Non-Auto, Transit, Bike, Walk)	ODs Connected with Model Options	Trip Distances	AGGREGATE	Fatalities & Injuries
1	Project A	○	\$	L	✓	✓	✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○
2	Project B	○	\$\$	M			✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
3	Project C	○	\$\$\$	M	✓	✓		↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	↑	↑	↑	↑	○	
4	Project D	○	\$	S	✓			↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
5	Project E	○	\$	L		✓	✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
6	Project F	○	\$\$	M			✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
7	Project G	○	\$\$\$	S	✓	✓		↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
8	Project I	○	\$\$	S	✓			↓	↓	↑	↑	↑	○	↓	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
9	Project J	○	\$	L		✓	✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
10	Project K	○	\$	S			✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
11	Project L	○	\$	M	✓			↑	↓	↑	↑	↑	○	↓	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	
12	Project M	○	\$\$	M	✓		✓	↑	↓	↑	↑	↑	○	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	↑	↑	↑	↑	○	
13	Project N	○	\$\$\$	L		✓		↑	↓	↑	↑	↑	○	↑	↓	↑	↑	↑	↑	↑	↑	↑	○	↑	↑	↑	↑	○	
14	Project O	○	\$	S	✓			↓	↓	↑	↑	↑	○	↑	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	○	

### Formulating Scenarios

The various candidate solutions may comprise potentially hundreds of projects and other strategies. As these are screened, the Project Development Team will collaborate to formulate alternative scenarios to be fully evaluated.

In addition to the baseline and no-build, scenario evaluation includes analysis of data from the ABM, population of the summary matrix of performance measures presented in this memo, considerations of estimated costs and resource constraints, and an outlined phased implementation over the short-, medium-, and long-term.