


Alameda Countywide Transportation Plan Update

Evaluation Process and Outcomes Example




presented to
Technical Advisory Working Group

presented by
Cambridge Systematics, Inc.

July 2011

Transportation leadership you can trust.



Agenda

- Describe the evaluation process
 - » Adopted Vision and Goals
 - » Performance Measures
 - » Screening & scenario evaluations
 - » Example of project & program evaluation process
- Identify next steps in the evaluation process

Evaluation Process

Adopted Vision and Goals Guiding the CWTP

- **Foundation for all analysis performed for the CWTP Update**
 - » Vision and Goals – adopted January 2011
- **Vision**
 - » “Alameda County will be served by a premier transportation system that supports a vibrant and livable Alameda County through a connected and integrated multimodal transportation system promoting sustainability, access, public health and economic opportunities.”

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Evaluation Process

Adopted Vision and Goals Guiding the CWTP

- **Goals for the transportation system – adopted January 2011**
 1. Multimodal
 2. Accessible, Affordable and Equitable for people of all ages, incomes, abilities and geographies
 3. Integrated with land use patterns and local decision making
 4. Connected across the county, within and across the network of streets, highways, transit, bicycle and pedestrian routes
 5. Reliable and Efficient
 6. Cost Effective
 7. Well Maintained
 8. Safe
 9. Supportive of a Healthy and Clean Environment

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Evaluation Process

Evaluation Process Differs from the Past

- **Adopted goals do not include congestion maintenance**
 - » Results may be different from expectations without congestion maintenance as a goal
- **Evaluation conducted on a countywide basis**
- **Each goal was attributed performance measures to evaluate how projects, programs, and packages of projects and programs met goals**
- **Performance measures adopted in March 2011**

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Evaluation Process

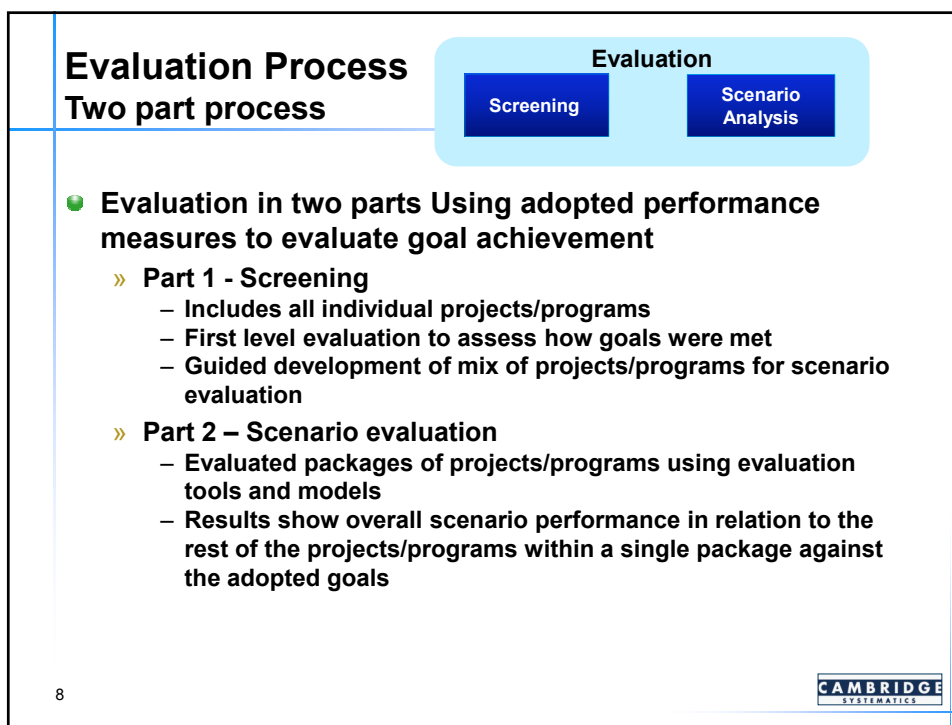
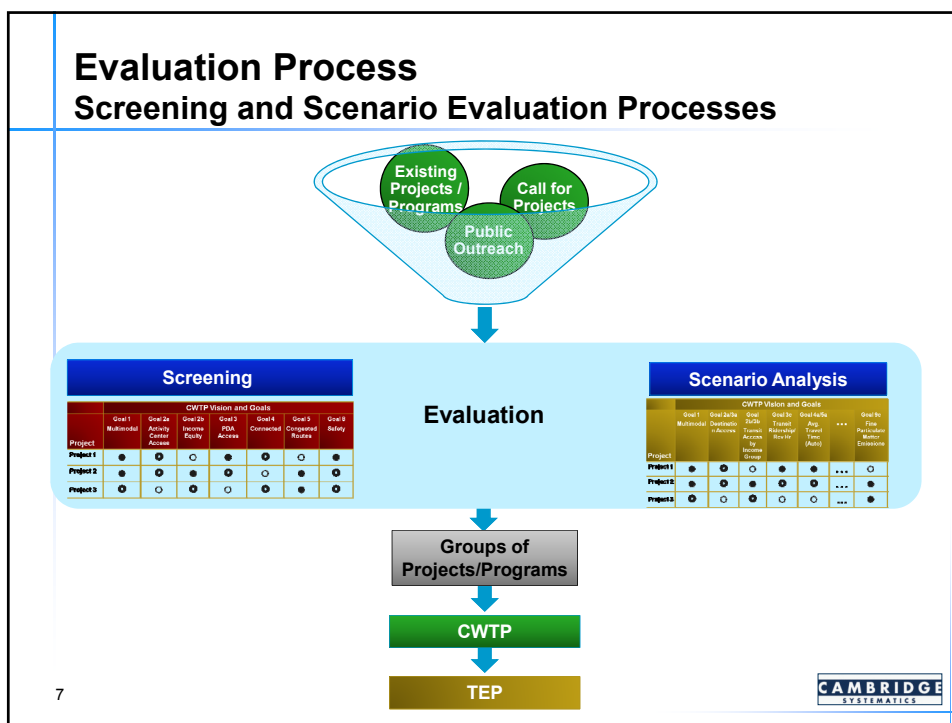
Defensible Evaluation Tools to Support the CWTP

- » **Objective screening**
- » **Performance-based process to evaluate scenarios**
- » **Objective project grouping**
- » **State-of-the-practice tools applied to support the planning process**
- » **Tools to inform and support decision-making, not to replace decision-making**
- » **Provide credible data to decision-makers**



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Evaluation Process

Performance Measure Evaluation Tools

- **Model used to assess transportation impacts of scenarios (multimodal, land use)**
- **Model outputs used to assess scenario impacts (performance measures, GHG emissions analysis, maintenance conditions)**
- **GIS used to support screening and scenario analysis**
- **Sketch planning models used to evaluate GHG, maintenance, cost effectiveness and safety**
- **Projects and Programs separately evaluated**




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Evaluation Process

Performance Measures - Projects


<u>Goal</u>	<u>Screening Measure</u>	<u>Scenario Measure</u>
1. Multimodal	<ul style="list-style-type: none"> • Number of passenger and freight modes directly improved or affected by the investment 	<ul style="list-style-type: none"> • Percent of all trips made by alternative modes (bicycling, walking, or transit)
2. Accessible, Affordable, & Equitable	<ul style="list-style-type: none"> • Number of activity centers & transit hubs within ½ mi of the investment • Number of traffic analysis zones (TAZs) with above-average proportion of low-income households that are intersected by an investment 	<ul style="list-style-type: none"> • Share of households, by income group, within a given travel time to activity centers • Share of households, by income group, geographically close to frequent transit service
3. Integrated w/ Land Use Patterns & Local Decision-Making	<ul style="list-style-type: none"> • Number of PDAs intersected by an investment 	<ul style="list-style-type: none"> • Share of households, by income group, geographically close to frequent transit service • Transit ridership per revenue hour



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Evaluation Process Performance Measures - Projects		
<u>Goal</u>	<u>Screening Measure</u>	<u>Scenario Measure</u>
4. Connected	<ul style="list-style-type: none"> Ability to complete or improve a link in the regional transportation system 	<ul style="list-style-type: none"> Average travel time (auto, carpool, truck, transit) Ratio of peak to off-peak travel time
5. Reliable & Efficient	<ul style="list-style-type: none"> Located on an identified Congestion Management Plan route Located on a route with above average heavy trucks 	<ul style="list-style-type: none"> Average travel time (auto, carpool, truck, transit) Ratio of peak to off-peak travel time
6. Cost Effective	<ul style="list-style-type: none"> Reflected in grouping process, which groups investments based on performance measure evaluation and cost 	<ul style="list-style-type: none"> Reflected in grouping process, which groups investments based on performance measure evaluation and cost

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Evaluation Process Performance Measures - Projects		
<u>Goal</u>	<u>Screening Measure</u>	<u>Scenario Measure</u>
7. Well Maintained	<ul style="list-style-type: none"> This measure was only used for Program evaluation 	<ul style="list-style-type: none"> Percent of roads, by facility type, in excellent, good, low or failing condition Estimating the remaining service life remaining for all transit assets
8. Safe	<ul style="list-style-type: none"> Number of freeways and arterial roadways with fatal crash rates above the statewide average ("safety areas") that the investment overlaps 	<ul style="list-style-type: none"> Collision-related injuries and fatalities for all modes
9. Clean & Healthy Environment	<ul style="list-style-type: none"> This measure was only used for Program evaluation 	<ul style="list-style-type: none"> Average daily travel time for bicycle and pedestrian trips Per-capita CO₂ emissions from cars and light-duty trucks Per-capita fine particle emissions from cars and light-duty trucks

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Evaluation Process

Screening Evaluation for Projects and Programs

- **Screening**
 - » Includes CWTP/RTP Call for projects and programs
 - » Excludes committed projects
 - » Includes capital projects, programmatic projects, programs
- **Programs evaluated based on best practices research and program descriptions**
- **Every goal not represented in screening capital projects**
 - » Data not available for objective analysis
 - » Scenario evaluation used for those performance measures
- **Projects & programs scored, then rated high, medium or low**

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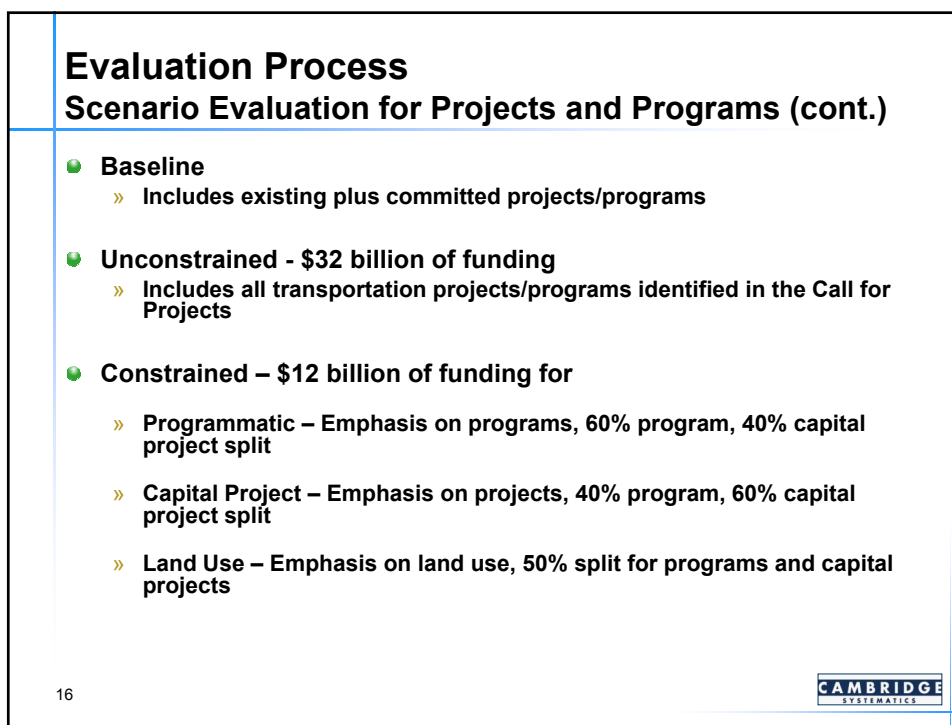
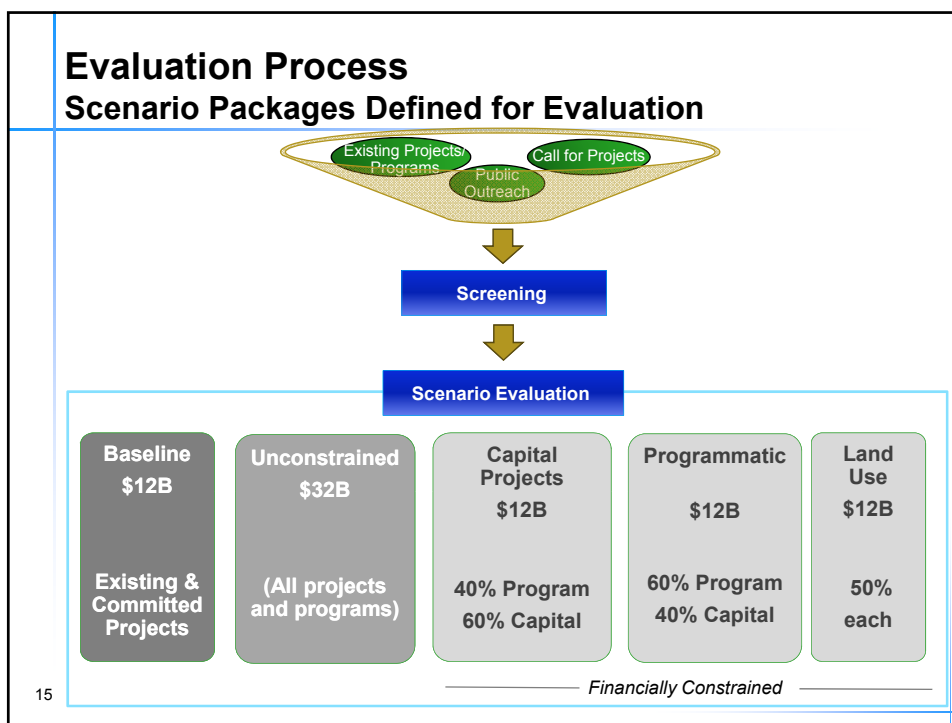
Evaluation Process

Scenario Evaluation for Projects and Programs

- **Scenario Evaluation**
 - » Projects and programs from the Screening
 - » Modeling uses scenarios composed of capital projects, programmatic projects, and programs to generate measureable, objective evaluation results
 - » Scenarios represent different investment priorities
- **Programs evaluated in models based on assumed funding levels**
- **Projects evaluated using evaluation tools and associated performance measures**
- **Projects & programs scored, then rated high, medium or low**

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Evaluation Process

Grouping for Projects and Programs

- A process was developed to create a framework to group projects/programs by performance value relative to estimated project cost
- Groups not interpreted as “good” or “bad” projects
- Groups provide a way to identify projects that offer similar performance value

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Evaluation Process

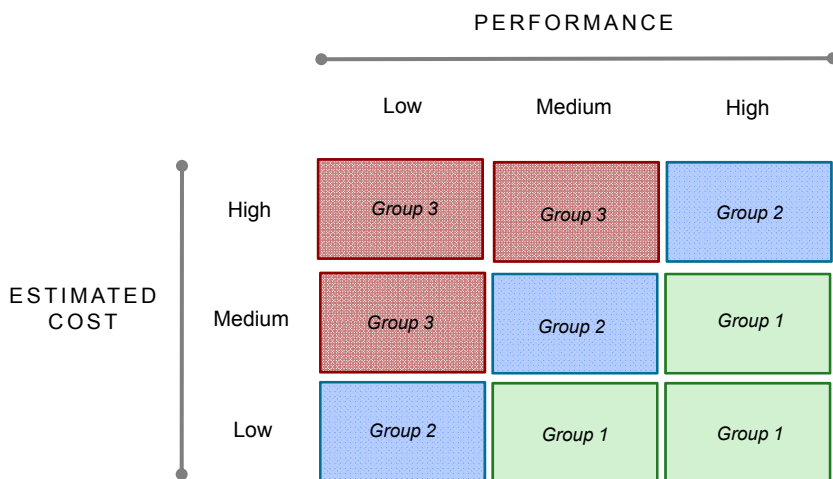
Grouping Projects/programs (continued)

- Score by performance measure in screening and scenario evaluation
- Assign relative high, medium and low values
- Average performance measures such that each of the 9 goals has one performance value
- Sum the values to determine total score for each project and program
- Compare to cost
- Group projects and programs using logical thresholds

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Evaluation Process Grouping Projects/programs (continued)



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Evaluation Process Other Factors to Create CWTP

- Limited available funding
- Create both “Constrained” and “Vision” project and program packages
- Combine projects and program investments
- Meet CWTP Vision and Goals
- Projects and programs may be funded in part by TEP

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Evaluation Process

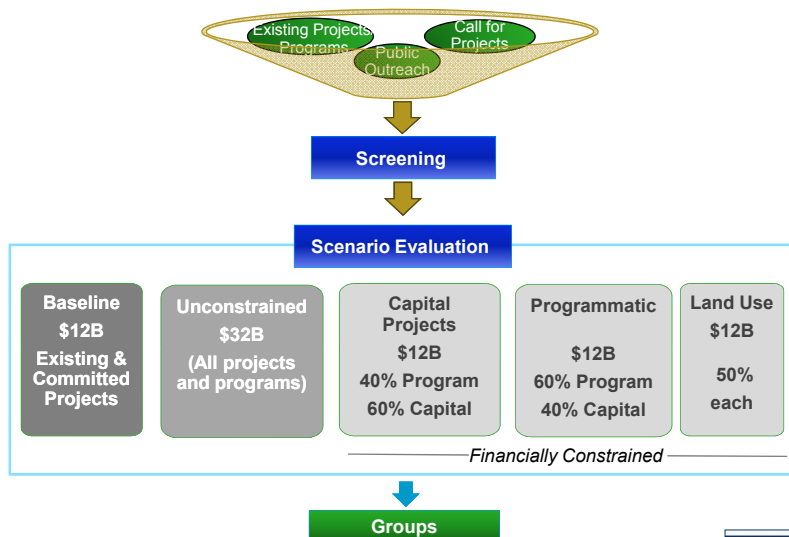
Other Factors to Create CWTP (continued)

- For the draft CWTP, the following projects and programs should also be considered:
 - » “Low Hanging Fruit” – high performing, low cost: produce immediate results
 - » Prior process with established consensus
 - » Leverage high performing projects and programs or have other synergistic benefit
 - » Leverage committed funds – allow for project completion
 - » Support accepted investment strategy
 - » Meet other criteria that have traditionally been important to the county, such as maintenance/fix-it-first and congestion relief

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Evaluation Examples

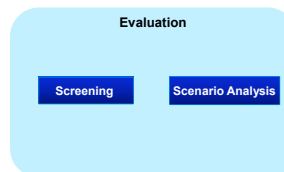
Projects and Programs



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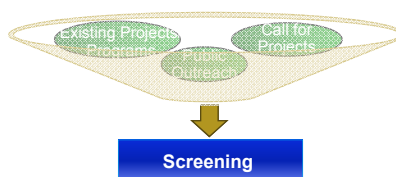
Evaluation Process Examples Project and Program

- Present the entire evaluation process for an example project and program
 - » Screening
 - » Scenario evaluation
- Project example
 - » I-880 Northbound HOV/HOT Lane Extension (north of Hacienda to Hegenberger)
- Program example
 - » Transportation and Land Use (PDA) Program #9



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Project Evaluation Example Project Screening



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Project Evaluation Example Project Screening – Step 1

- I-880 NB HOV/HOT Lane Extension
- Project Description Submitted to CWTP/RTP

“Extend the existing northbound I-880 HOV lane from north of Hacienda Avenue to Hegenberger. The first phase, funded through the Central County Freeway Study LATIP, would extend from north of Hacienda to north of Davis in Planning Area 2. The second phase would continue the extension to Hegenberger in Planning Area 1. Both phases would be converted to HOT lanes. Phase 1 includes two additional LATIP projects that would be done concurrently with the HOV/HOT lane extension: Washington Avenue Interchange improvements and bridge widening and I-238 Northbound Connector Project.”

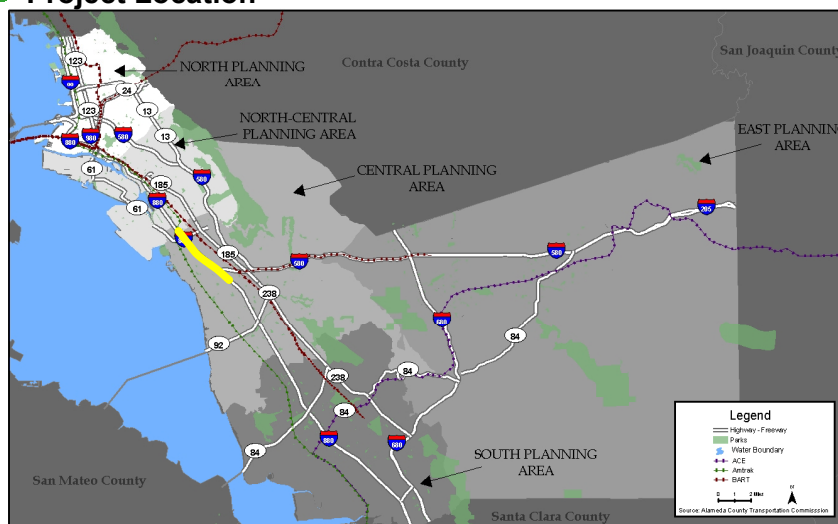
Estimated Cost: \$276 Million

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Project Evaluation Example Project Screening – Step 2

- Project Location



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Project Evaluation Example Project Screening – Step 3

● Initial Screening Performance Measures by Goal

- » Goal 2 has two separate measures
- » Goals 7 (Well Maintained) and 9 (Healthy Environment) are not evaluated in this phase due to data availability
- » Performance measures equally weighted
- » Project Totals capped at 10 in some measures to avoid skewing of results

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension							

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Project Evaluation Example Project Screening – Step 3.1

● Goal 1 Multimodal

- » Project description analysis
- » Number of passenger and freight modes directly improved or affected by the investment (Total 1-10)

Passenger Modes

- ✓ Auto
- ✓ Transit – Bus
- Transit – Rapid
- Transit - Hvy Rail
- Transit- LRT
- Air
- Water
- Walk
- Bicycle

Freight Modes

- Freight - Truck
- Freight - Rail
- Freight - Marine
- Freight - Air

Total Modes = 2

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Project Evaluation Example

Project Screening – Step 3.1

● Goal 1 Multimodal (continued)

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2						

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Project Evaluation Example

Project Screening – Step 3.3

● Goal 2 Accessible, Affordable & Equitable

» GIS Analysis

» Part A: Number of activity centers & transit hubs within ½ mile of the investment (Total 1-10)

- Activity centers: 31
- Transit stops and local bus routes: 0
- Access adjustment (Standard) = 1
- Total (31 x 1) = 31
- Adjusted Total (capped) 10

● Access Adjustment to account for number of exits and mode of travel

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Project Evaluation Example

Project Screening – Step 3.3

- **Goal 2 Accessible, Affordable & Equitable (cont.)**

- » **Part B: Number of traffic analysis zones (TAZs) with above-County-average proportion of low-income households that are intersected by an investment**

- » **Low income defined as share of household income categories 1 and 2 (less than \$45K per year)**

- TAZs: 18
- Access Adjustment: 1
- Total: (18 x 1) = 18
- Adjusted Total (capped): 10

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Project Evaluation Example

Project Screening – Step 3.3

- **Goal 2 Accessible, Affordable & Equitable (continued)**

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10				

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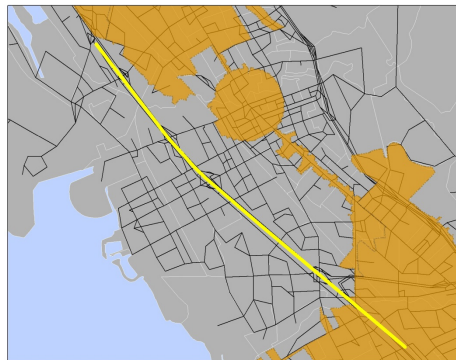
Project Evaluation Example Project Screening – Step 3.4

● Goal 3 Integrated with Land Use

» GIS Analysis

» Number of PDAs intersected by an investment

- Number of PDAs: 2
- Access Adjustment: 1
- Total: $(2 \times 1) = 2$



- Priority Development Area (PDA)
- Project Location
- Transportation Network

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Project Evaluation Example Project Screening – Step 3.4

● Goal 3 Integrated with Land Use (continued)

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10	2			

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Project Evaluation Example Project Screening – Step 3.5

● Goal 4 Connected

- » Project location analysis and Alameda CTC input
- » Ability to complete or improve a link in the regional transportation system
- » Completes link in the regional transportation network
 - (Yes, Partial, No)
 - Competes link: Yes
 - Total: 10

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Project Evaluation Example Project Screening – Step 3.5

● Goal 4 Connected (continued)

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10	2	10		

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Project Evaluation Example Project Screening – Step 3.6

● Goal 5 Reliable and Efficient

- » GIS Analysis
- » Located on an identified Congestion Management Plan route (Yes / No)
 - Located on CMP: Yes
 - Total: 10
- » Located on a route with above-County-average heavy truck volumes (Yes / No)
 - High Truck Share: No
 - Total: 0
- » Total (adjusted for equal measure weight)
 - Total combined value: 5

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Project Evaluation Example Project Screening – Step 3.6

● Goal 5: Reliable and Efficient (continued)

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10	2	10	5	

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Project Evaluation Example

Project Screening – Step 3.7

● Goal 8 Safe

- » GIS Analysis combined with State crash data
- » Number of freeways and arterial roadways with fatal crash rates above the statewide average (“safety areas”) that the investment overlaps
- » Does not apply to transit capital projects (heavy rail, rapid bus)
- » Weighted for a possible maximum of 10 (1 intersection = 5; more than 1 intersection = 10)
 - Total Number of “safety areas”: 1
 - Weighted total: 5

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Project Evaluation Example

Project Screening – Step 3.7

● Goal 8 Safe (continued)

RTP ID #	Projects & Programs	CWTP Vision and Goals						
		Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10	2	10	5	5

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Project Evaluation Example Project Screening – Step 4

- High, Medium and Low categories based on thresholds
- **Relative** performance measure values
 - » Equal measure weight and simplified presentation

○ Low : 1 0-3 0-3 0 0 0 0
 ● Mid : 2 4-7 4-7 1-2 5 5 5
 ● High : 3+ 8-10 8-10 3-10 10 10 10

CWTP Vision and Goals								
RTP ID #	Projects & Programs	Multimodal (Goal 1)	Activity Center Access (Goal 2)	Income Equity (Goal 2)	PDA Access (Goal 3)	Connected (Goal 4)	Reliable & Efficient (Goal 5)	Safe (Goal 8)
230088	I-880 Northbound HOV/HOT Lane Extension	2	10	10	2	10	5	5
		○	●	●	○	●	○	○

41 Legend High Medium Low
 ● ○ ○



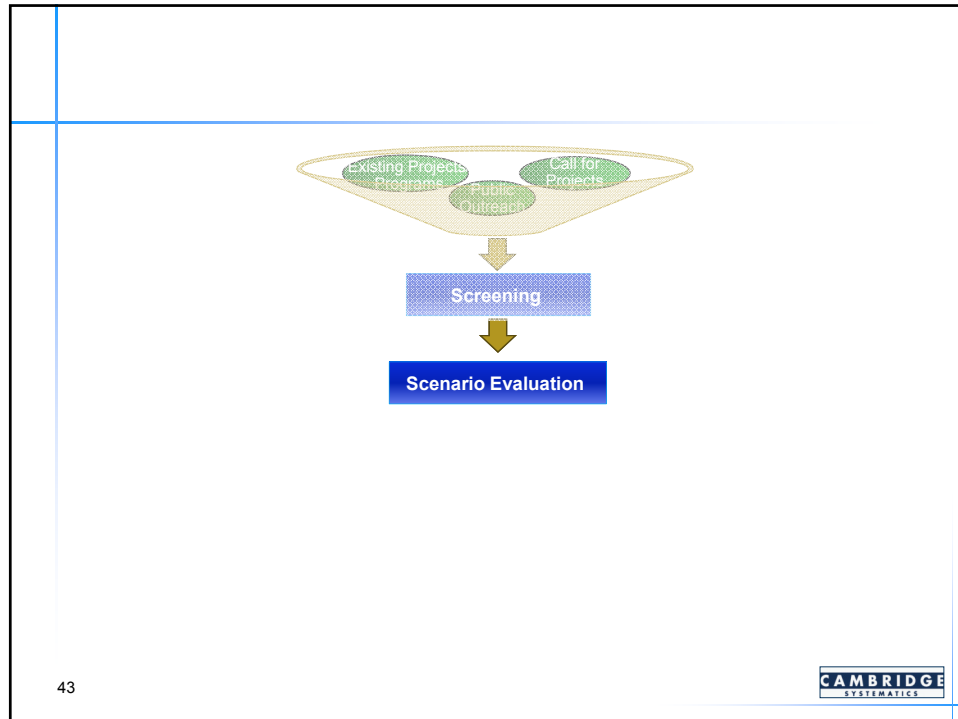
Program Evaluation Example Screening

- 9. Transportation and Land Use Program
- Screening Evaluation – Programs
 - » High, Medium and Low categories
 - » Relative to other programs
 - » Based on best practices and regional practices

CWTP Vision and Goals										
RTP ID #	Program Example	Goal 1 Multi-modal	Goal 2 Accessibility, Affordability & Equity	Goal 3 Integrated with Land Use	Goal 4 Connected	Goal 5 Reliable & Efficient	Goal 6 Cost Effective	Goal 7 Well Maintained	Goal 8 Safe	Goal 9 Healthy Environment
9	Transportation & Land Use	●	●	●	○	○	●	○	○	○

42 Legend High Medium Low
 ● ○ ○





Project Evaluation Example

Project Scenario Evaluation

- **15 performance measures applied**
- **Results ranked by scenario for each planning area**
 - » Performance results relative to other modeling scenarios
 - » 1 (lowest performance) to 4 (highest performance)
- **Project value combines assigned scenario values**
 - » Averaged ranked values for each project

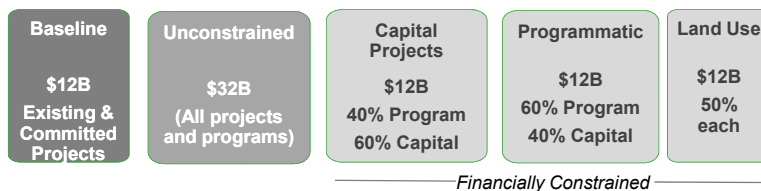
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Project Evaluation Example

Project Scenario Evaluation – Step 1

- Scenarios represent different mixes of projects and programs



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Project Evaluation Example

Project Scenario Evaluation – Step 2

- I-880 NB HOV/HOT Lane Extension
- Project is in the Central County planning area
- Project included in three scenarios
 - » Unconstrained
 - » Capital
 - » Land Use
- All projects in this geographic area, included in each of these scenarios receive same score

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Project Evaluation Example Project Scenario Evaluation – Step 2

Project or Program	Multimodal (Related to Goal 1)	Activity Center Access (Goals 2 & 3)	Transit Access by Income Group (Goals 2 & 3)	Transit Ridership per Revenue Hour (Goal 3)	Avg Travel Time – Auto (Goals 4 & 5)	Avg Travel Time – Carpool (Goals 4 & 5)	Avg Travel Time – Truck (Goals 4 & 5)	Avg Travel Time – Transit (Goals 4 & 5)	Ratio of Peak to Off-Peak Travel Time (Goals 4 & 5)
I-880 Northbound HOV/HOT Lane Extension									

Pavement Condition (Goal 7)	Transit Vehicle Condition (Goal 7)	Crashes All Modes (Goal 8)	Avg Non-Motorized Travel Time (Goal 9)	GHG Emissions (Goal 9)	Fine Particle Emissions (Goal 9)

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Project Evaluation Example Project Scenario Evaluation – Step 3.1

● Goal 1 Multimodal

- » Based directly on model results
- » Percent of all trips made by alternative modes (bicycling, walking, or transit)
- » Three scenarios values used in Central County
 - Unconstrained = 4
 - Capital = 1
 - Land Use = 3
 - Average = 2.667

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	14.8%	13.2%	13.9%	14.3%
	4	1	2	3

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Project Evaluation Example Project Scenario Evaluation – Step 3.1

Project or Program	Multimodal (Related to Goal 1)	Activity Center Access (Goals 2 & 3)	Transit Access by Income Group (Goals 2 & 3)	Transit Ridership per Revenue Hour (Goal 3)	Avg Travel Time – Auto (Goals 4 & 5)	Avg Travel Time – Carpool (Goals 4 & 5)	Avg Travel Time – Truck (Goals 4 & 5)	Avg Travel Time – Transit (Goals 4 & 5)	Ratio of Peak to Off-Peak Travel Time (Goals 4 & 5)
I-880 Northbound HOV/HOT Lane Extension	2.667								

Pavement Condition (Goal 7)	Transit Vehicle Condition (Goal 7)	Crashes All Modes (Goal 8)	Avg Non-Motorized Travel Time (Goal 9)	GHG Emissions (Goal 9)	Fine Particle Emissions (Goal 9)

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Project Evaluation Example Project Scenario Evaluation – Step 3.2

● Goal 2 Accessibility, Affordability, Equitability

- » Based directly on model results
- » Part 2A/3A: Share of households, by income group within 30-minute transit ride and a 20-minute drive of at least one Employment Center during the peak period and a 0.5-mile walk of a Grade School
- » Modified for Evaluation: average of the share of households in the first two household income groups (less than \$45K) – difference from Baseline scenario
- » Average = 2.667

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	6.9%	-0.8%	1.6%	4.5%
	4	1	2	3

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Project Evaluation Example Project Scenario Evaluation – Step 3.3

● Goal 2 Accessibility, Affordability, Equitability

- » Based directly on model results
- » Part 2B/3B: Share of households, by income group, within ½ mile of transit service operating at less than or equal to 14 minute headways - difference from Baseline scenario
- » Equal results take the same ranked value
- » Average = 2.667

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	1.5%	-1.3%	1.5%	0.0%
	4	1	4	3

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Project Evaluation Example Project Scenario Evaluation – Step 3.3

● Goal 3 Integrated with Land Use

- » Based on model results and off-model analysis
- » Part 3C: Transit ridership per revenue hour
- » Important to view relative results between modeling scenarios rather than specific ridership and revenue hour values
- » Average = 2.667

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	44.4	47.9	47.6	48.3
	1	3	2	4

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Project Evaluation Example

Project Scenario Evaluation – Step 3.3

● Goal 4 Connected and Goal 5 Reliable & Efficient

- » Based on model results
- » Part 4A/5A: Average trip travel time – Automobiles
- » Average = 3

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	9060.25	8695.74	8917.13	8979.44
	4	3	1	2

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Project Evaluation Example

Project Scenario Evaluation – Step 3.4

● Goal 4 Connected and Goal 5 Reliable & Efficient

- » Based on model results
- » Part 4B/5B: Average travel time – Shared Ride
- » Average = 3

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	8314.02	7961.39	8173.775	8197.57
	4	3	1	2

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Project Evaluation Example

Project Scenario Evaluation – Step 3.5

● Goal 4 Connected and Goal 5 Reliable & Efficient

- » Based on model results
- » Part 4C/5C: Average travel time – Truck
- » Average = 3

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	7282.29	7012.95	7183.97	7225.80
	4	3	1	2

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Project Evaluation Example

Project Scenario Evaluation – Step 3.6

● Goal 4 Connected and Goal 5 Reliable & Efficient

- » Based on model results
- » Part 4C/5C: Average travel time – Transit
- » Average = 2.3

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	2735.58	2828.22	3349.47	2869.16
	4	3	1	2

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Project Evaluation Example Project Scenario Evaluation – Step 3.7

● Goal 7 Well-Maintained

- » Countywide Pavement Condition Index (PCI) modeling
- » Part 7A: Percent of roads, by facility type, in excellent, good, low or failing condition
- » Average = 2.3

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Excellent Condition	90.8	90.0	90.7	63.9
	4	2	3	1

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Project Evaluation Example Project Scenario Evaluation – Step 3.8

● Goal 7 Well-Maintained

- » Based on sketch planning tools
- » Part 7B: Percent remaining service life for bus transit assets
- » Average = 2.67

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Alameda County	42%	38%	40%	41%
	4	1	2	3

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Project Evaluation Example

Project Scenario Evaluation – Step 3.9

● Goal 8 Safety

- » Based on direct model results
- » Includes only incidents resulting in property damage
- » Annual collision-related injuries and fatalities for all modes
- » Average = 2.33

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Alameda County	13,360	13,473	13,418	13,444
	4	1	3	2

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Project Evaluation Example

Project Scenario Evaluation – Step 3.10

● Goal 9 Environment

- » Based on direct model results
- » Part 9A: Average daily travel time for bicycle and pedestrian trips
- » Average = 2.67

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Central County	20.68	22.27	21.84	21.03
	4	1	2	3

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Project Evaluation Example

Project Scenario Evaluation – Step 3.11

● Goal 9 Environment

- » Based on EMFAC modeling analysis
- » Part 9B: CO₂ (GHG) Emissions (tons)
- » Average = 2.33

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Alameda County	20,597	21,275	21,151	21,259
	4	1	3	2

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Project Evaluation Example

Project Scenario Evaluation – Step 3.12

● Goal 9 Environment

- » Based on EMFAC modeling analysis
- » Part 9C: PM_{2.5} Emissions (tons)
- » Average = 2.67

Alameda County Planning Area	Unconstrained	Capital Projects	Programmatic	Land Use
Alameda County	1.79	1.68	1.88	1.81
	3	4	2	1

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Project Evaluation Example Project Scenario Evaluation – Step 4

Project or Program	Multimodal (Related to Goal 1)	Activity Center Access (Goals 2 & 3)	Transit Access by Income Group (Goals 2 & 3)	Transit Ridership per Revenue Hour (Goal 3)	Avg Travel Time – Auto (Goals 4 & 5)	Avg Travel Time – Carpool (Goals 4 & 5)	Avg Travel Time – Truck (Goals 4 & 5)	Avg Travel Time – Transit (Goals 4 & 5)	Ratio of Peak to Off-Peak Travel Time (Goals 4 & 5)
I-880 Northbound HOV/HOT Lane Extension	2.67	2.67	2.67	2.67	3.00	3.00	3.00	2.33	3.00
	○	○	●	○	●	●	●	●	●

Pavement Condition (Goal 7)	Transit Vehicle Condition (Goal 7)	Crashes All Modes (Goal 8)	Avg Non-Motorized Travel Time (Goal 9)	GHG Emissions (Goal 9)	Fine Particle Emissions (Goal 9)
2.67	2.67	2.33	2.67	2.33	2.67
●	●	●	○	○	○

Legend
 High
 ●
 Medium
 ○
 Low
 ○

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Project Evaluation Example Project Scenario Evaluation – Step 4

○ Low : 0-2.50 0-2.50 0-2.67 0-2.00 0-2.50 0-2.67 0-2.50 0-2.50 0-2.63
 ● Mid : 2.51-3.00 2.51-3.00 2.68-3.00 2.01-2.33 2.51-3.25 2.68-3.00 2.51-3.25 2.51-2.90 2.64-3.00
 ● High : 3.01-4 3.01-4 3.01-4 2.34-4 3.26-4 3.01-4 3.26-4 2.91-4 3.01-4

Project or Program	Multimodal (Related to Goal 1)	Activity Center Access (Goals 2 & 3)	Transit Access by Income Group (Goals 2 & 3)	Transit Ridership per Revenue Hour (Goal 3)	Avg Travel Time – Auto (Goals 4 & 5)	Avg Travel Time – Carpool (Goals 4 & 5)	Avg Travel Time – Truck (Goals 4 & 5)	Avg Travel Time – Transit (Goals 4 & 5)	Ratio of Peak to Off-Peak Travel Time (Goals 4 & 5)
I-880 Northbound HOV/HOT Lane Extension	2.67	2.67	2.67	2.67	3.00	3.00	3.00	2.33	3.00
	●	●	○	●	●	●	●	○	●

○ Low : 0-2.67 0-2.50 0-2.50 0-2.50 0-2.50 0-2.50
 ● Mid : 2.68-3.25 2.51-3.00 2.51-3.00 2.51-2.90 2.51-3.00 2.51-2.83
 ● High : 3.26-4 3.01-4 3.01-4 2.91-4 3.01-4 2.84-4

Pavement Condition (Goal 7)	Transit Vehicle Condition (Goal 7)	Crashes All Modes (Goal 8)	Avg Non-Motorized Travel Time (Goal 9)	GHG Emissions (Goal 9)	Fine Particle Emissions (Goal 9)
2.67	2.67	2.33	2.67	2.33	2.67
○	●	○	●	○	●

Legend
 High
 ●
 Medium
 ○
 Low
 ○

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Program Evaluation Example Scenario Evaluation

- Assemble scenario results
- Develop scenario ranking
- Identify relevant scenarios for programs
 - » Based on program funding by scenario
- Performance value for each program
- Relative performance for each program
 - » (High, Medium, Low)

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Project Evaluation Example Program Scenario Evaluation

Project or Program	Goal 1 Multimodal	Goal 2a/3a Destination Access	Goal 2b/3b Transit Access by Income Group	Goal 3c Transit Ridership per Rev. Hour	Goal 4a/5a Avg Travel Time – Auto	Goal 4b/5b Avg Travel Time – Carpool	Goal 4c/5c Avg – Truck	Goal 4d/5d Avg Travel Time – Transit	Goal 4e/5e Ratio of Peak to Off- Peak Travel Time
I-880 Northbound HOV/HOT Lane Extension	●	●	●	●	○	○	○	●	●

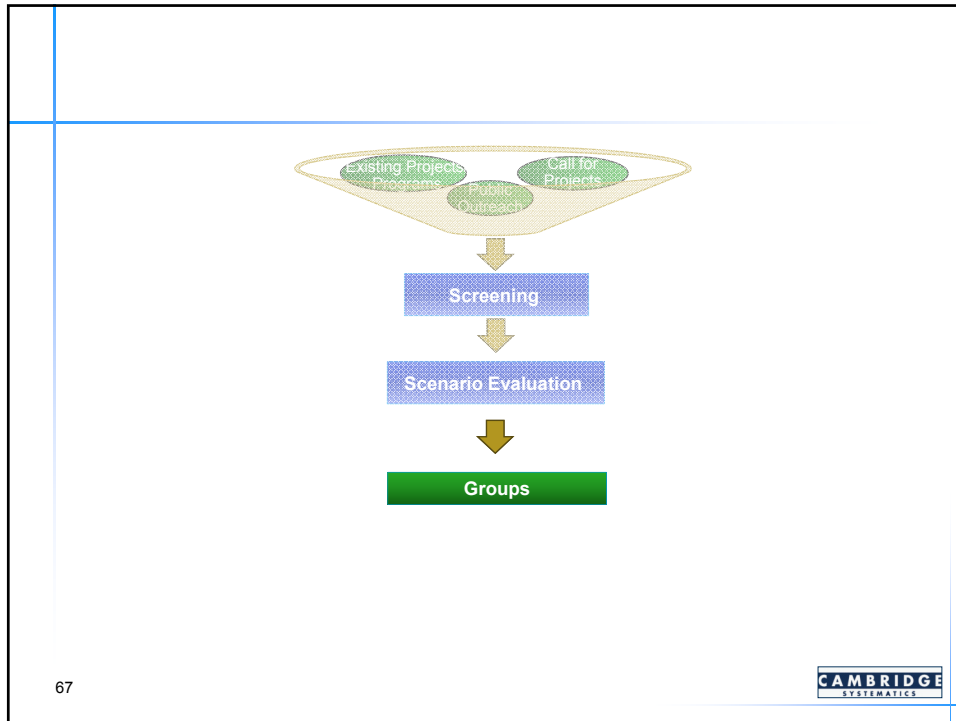
Legend

- High
●
- Medium
○
- Low
○

Goal 7a Pavement Condition	Goal 7b Transit Vehicle Condition	Goal 8 Crashes All Modes	Goal 9a Avg Non- Motorized Travel Time	Goal 9b GHG Emissions	Goal 9c Fine Particle Emissions
○	○	●	●	○	○

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Project Evaluation Example Project Grouping – Step 1

- **High, Medium, Low Values**

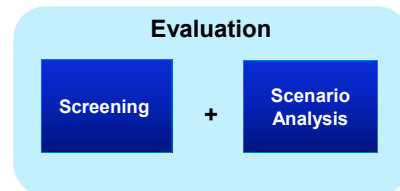
- » High = 10
- » Medium = 5
- » Low = 1

- **Project grouping**

- » One value for each of the 9 goals for both screening and scenario evaluation

- **Summed each goal to create composite value**

- **Used to evaluate performance-relative to-cost**



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Project Evaluation Example Project Grouping – Step 1

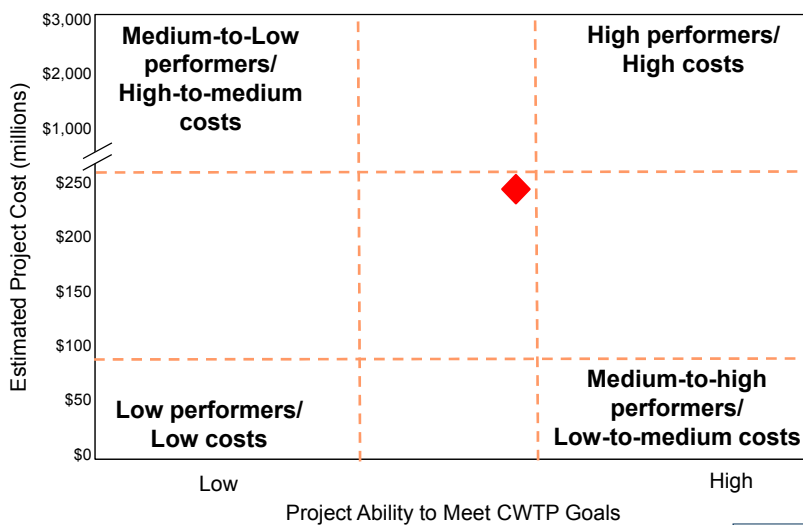
- I-880 NB HOV/HOT Lane Extension
- Total composite value = 37.9

CWTP Vision and Goals									
RTP ID #	Goal 1. Multi-modal	Goal 2. Accessible, Affordable & Equitable	Goal 3. Integrated w/Land Use	Goal 4. Connected	Goal 5. Reliable & Efficient	Goal 6. Cost Effective*	Goal 7. Well Maintained	Goal 8. Safe	Goal 9. Clean & Healthy Environment
Screening	1	10	5	10	5	--	--	5	--
Scenario	5	3	10	--	4.2	--	3.0	1	2.3
Composite (Average)	2.0	6.5	7.5	10.0	4.6		3.0	2.0	2.3

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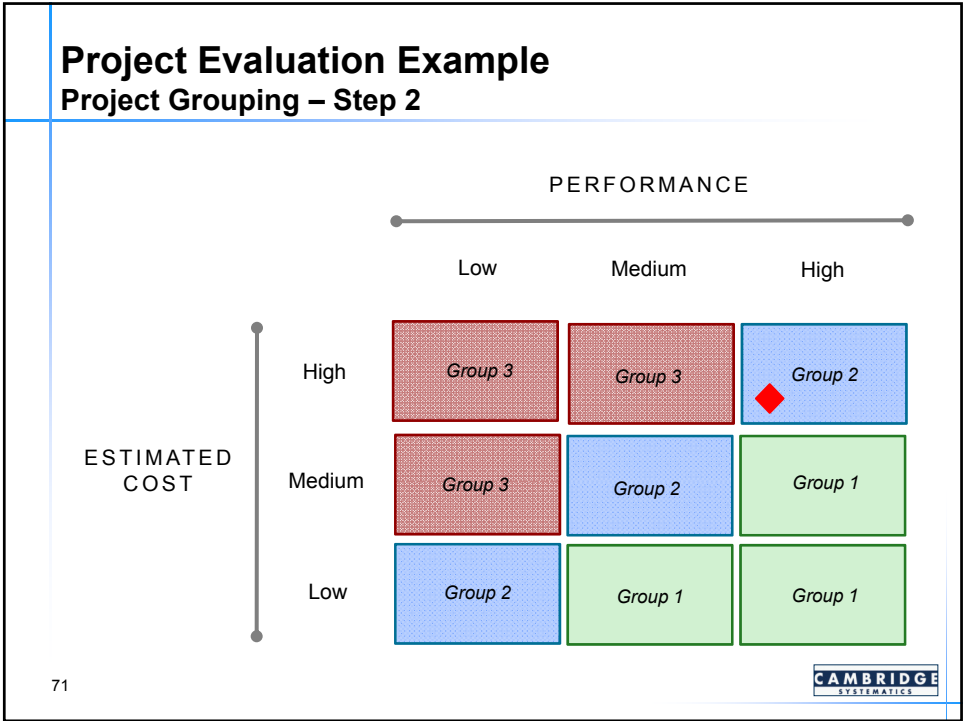


Project Evaluation Example Project Grouping – Step 2



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Other Factors to be Considered

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Other Factors to Consider Scenario Evaluation

- Assemble scenario results
- Develop scenario ranking
- Identify relevant scenarios for programs
 - » Based on program funding by scenario
- Performance value for each program
- Relative performance for each program
 - » (High, Medium, Low)

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Evaluation Process Other Factors to Create CWTP (continued)

- For the draft CWTP, the following projects and programs should also be considered:
 - » “Low Hanging Fruit” – high performing, low cost: produce immediate results
 - » Prior process with established consensus
 - » Leverage high performing projects and programs or have other synergistic benefit
 - » Leverage committed funds – allow for project completion
 - » Support accepted investment strategy
 - » Meet other criteria that have traditionally been important to the county, such as maintenance/fix-it-first and congestion relief

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Next Steps

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Next Steps On-going Tasks and Milestones

- **July:** Present CWTP evaluation outcomes
 - » July 21 - Presentation of results to all working group members
 - » July 28 - Presentation of results to Steering Committee
- **September:** First draft of CWTP and preliminary Transportation Expenditure Plan projects and program lists
- **October:** Conduct second evaluation of constrained list based on Steering Committee recommendations
- **September/October:** Second round of outreach and polling
- **November/December:** Present second draft CWTP and first draft TEP to Committees
- **December:** Present second draft CWTP and first draft TEP at Commission Retreat
- **January:** Commission approves draft plans

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Questions and Answers