Caltrans Transportation Equity Index (EQI)
User Guide

Summer 2026

Director's Office of
Equity & Tribal Affairs (ETA)

Contents

Introduction

The California Department of Transportation (Caltrans) is committed to achieving transportation equity through policies, programs, and investments that address the needs of underserved and historically marginalized communities. To operationalize Caltrans' commitment to equity, the department developed the Caltrans Transportation Equity Index (EQI).

1-1 What is the EQI?

The EQI is a statewide geospatial screening tool designed to identify communities experiencing significant transportation-related inequities. It integrates socioeconomic and transportation-specific indicators to highlight areas where residents experience a greater share of burdens and fewer benefits from the state's transportation system.

A defining feature of the EQI is its high level of geographic precision. Rather than relying on larger units like Census tracts, the EQI uses Census block–level data, enabling a more granular, neighborhood-scale analysis. This approach is critical because transportation conditions—such as access to transit or exposure to roadway impacts—can vary widely within larger geographic areas. By capturing these variations, the EQI provides a more accurate picture of how transportation systems affect communities on the ground.
The EQI includes only spatially significant indicators, meaning variables whose distribution is meaningfully tied to location and the structure of the transportation system. These indicators are not evenly distributed across the state and therefore help identify where disadvantaged populations are concentrated. Using thresholds based on these indicators ensures that the areas identified by the EQI represent communities with a higher share of transportation-related burdens.

Central to the EQI's purpose is identifying transportation-based priority populations to support more equitable planning and investment decisions. While some important equity factors may not be spatially clustered and are therefore not included in the EQI, they can still inform other decision-making processes. Overall, the EQI serves as a targeted, data-driven tool to guide investments and policies toward communities most impacted by transportation inequities.

1-2 Purpose of the EQI User Guide

The EQI User Guide provides practical guidance for understanding and using the EQI. It is designed to help users navigate the EQI, interpret the data, and apply insights to inform transportation planning, programming, and project delivery.

The following guidance is intended for a wide range of users, including Caltrans staff, partner agencies, and stakeholders, regardless of prior experience with geographic information systems (GIS) or data analysis. By focusing on when, why, and how to use the EQI, this guide supports consistent, transparent, and equity-informed decision-making. It provides step-by-step examples, practical tips, and additional resources to

help users integrate the EQI into their everyday work to advance equitable transportation outcomes.

1-3 Key Terms and Concepts

The EQI is specifically designed to evaluate transportation-related burdens and access gaps. Unlike broader mapping tools (e.g., CalEnviroScreen, Healthy Places Index), EQI focuses exclusively on transportation-attributable conditions.

This guide begins with an explanation of key terms and concepts to establish a shared understanding of EQI terminology. This helps users interpret the tool consistently and apply it more effectively in their work. This section is designed to be a quick reference that users can return to as needed.

Transportation Burdens

Negative impacts caused by the transportation system, such as traffic exposure, safety risks (e.g., crashes), and limited mobility options.

Transportation Benefits

Positive outcomes generated by the transportation system, such as access to destinations (e.g., jobs, services, opportunities) and safe, reliable mobility options.

Multimodal Access

Access to destinations using multiple transportation modes (e.g., transit, walking, biking, driving).

Access Gaps

Differences in how easily people can reach key destinations.

Spatial Granularity

The level of spatial detail or size of spatial units that are used for analysis. EQI emphasizes small-scale, block-level analysis. Given the nature of transportation indicators, this level of granularity is necessary because an indicator can have significant variance within a larger geography.

Spatially Significant

Data that does not have a uniform distribution throughout a geographic area. Transportation-specific indicators included in the EQI are spatially significant in that their status is largely a function of their spatial relationship to the transportation system (e.g., areas further away from public transit have lower multimodal access to destinations).

Spatial Distribution

How indicators vary geographically.

Indicators

Individual variables used to measure conditions (e.g., income, crashes, transit access).

Thresholds and Screening Criteria
Defined cutoffs used to determine whether a location meets the criteria for certain socioeconomic or transportation-related conditions.

Data Normalization / Standardization
Processes used to make different indicators comparable across locations.

Overlay Analysis
Combining multiple data layers (e.g., demographics, traffic exposure, access to destinations) to identify areas of compounded disadvantage.

2. Getting Started with the EQI

2-1 Why the EQI Matters

Many tools exist to evaluate various impacts of the built environment that potentially burden communities. These tools typically consider a wide range of factors that are not explicitly focused on burdens caused or exacerbated by the transportation system. Caltrans aims to bridge this gap with the development and implementation of the EQI, with the intention of addressing and mitigating inequities exacerbated by the transportation system.

The EQI contributes to the advancement of spatial analysis tools and methods by using Census blocks instead of larger geographies (such as tracts), thereby enabling a more granular level of analysis. Given the nature of the EQI's transportation indicators, this level of granularity is necessary, as an indicator can have significant variance within a larger geography, such as a neighborhood. This granular design allows the EQI to assess neighborhood-scale impacts of transportation. Additionally, the EQI only includes variables with spatial significance, meaning their distribution across the state is directly related to the spatial nature of the state's transportation system.

The EQI is intended to support:

- **Equity-focused planning and investment,** by identifying communities in need of improved transportation access and safety.
- **Transparent decision-making**, by documenting equity considerations in project justification and funding prioritization.
- **Community engagement strategies**, by identifying populations with the greatest need for outreach and partnership.

2-2 Who Should Use EQI

The EQI is a publicly available tool that provides a transparent, data-driven approach to identifying and understanding transportation-related disparities across California. It offers consistent, spatially detailed insights that can be used to highlight areas with higher concentrations of transportation burdens and needs. The EQI is intended for use by

Caltrans staff to support policies, planning, project development, and decision-making processes.

The EQI is also designed to support partner agencies, regional organizations, and other stakeholders who may voluntarily use the tool to analyze community conditions, inform local and regional planning efforts, and evaluate the effectiveness of transportation projects, programs, and strategies over time.

2-3 When to Use EQI

The EQI was designed to assess specific transportation-related equity issues. The EQI should be integrated throughout the transportation lifecycle, including:

- **Early Planning**: Analyze EQI data to inform corridor studies, modal plans, and needs assessments through Project Nomination and TPSIS.
- **Project Initiation and PID Phases**: Identify whether a project serves an underserved community under SB 960.
- **Funding Applications**: Demonstrate equity considerations when applying for state and federal discretionary grant programs.
- **Public Engagement**: Target outreach efforts to communities identified as high need according to the EQI.
- **Performance Monitoring**: Use EQI to track investments and outcomes over time.

While the EQI is tailored to analyze specific transportation-related equity issues, other tools remain valuable for assessing the non-transportation burdens that transportation projects may exacerbate.

3. How to Use the EQI

3-1 Overview of EQI Indicators

The EQI consists of four components, each intended to identify and address specific transportation-related equity issues. Census blocks are the geographic unit of measurement used in the EQI. All indicators are either measured at the block level or interpolated to the block level from the block group level. The four components of the EQI are represented as distinct screens within the EQI as follows:

A. Underserved Communities
B. Traffic Exposure
C. Access to Destinations
D. Transportation-Based Priority Populations

For a detailed explanation of the calculations used for each of these screens, see the **Caltrans Transportation Equity Index (EQI) Version 1.0 Documentation**

A. Underserved Communities Screen
This screen identifies communities that are historically underserved based on two criteria:

- **Low-income status** (consistent with AB 1550 and SB 535 criteria)
- **Tribal land status** (as recognized under SB 535)

Purpose: This screen provides a consistent definition of underserved communities and serves as the primary identifier of underserved communities for SB 960[1] compliance.

B. Traffic Exposure Screen
This screen identifies underserved communities experiencing transportation-related burdens. It evaluates traffic proximity and volume, and crash exposure. These metrics are explained in greater detail below.

B-1. Traffic Proximity and Volume
Traffic proximity and volume are assessed using Bureau of Transportation Statistics Highway Performance Monitoring System (HPMS) data, which include nationwide road networks and Average Annual Daily Traffic (AADT) counts for cars and trucks. To better reflect differences in PM2.5 emissions, truck traffic is weighed more heavily than car traffic in the analysis. A spatial workflow is used to calculate block-level exposure by buffering road segments at multiple distances, intersecting them with Census blocks, and identifying the highest truck-weighted traffic values per route, while summing exposures where blocks were influenced by multiple roadways.

[1] . Bill Text - SB-960 Transportation: planning: complete streets facilities: transit priority facilities.

The resulting exposure values were then processed to create distance-based exposure bands and inverse-distance decay weighting was applied, giving greater emphasis to traffic sources closer to each block. The final output produced a cumulative, distance-weighted traffic exposure score for each Census block, which was converted to a percentile rank, with blocks above the 80th percentile screened for inclusion in the EQI.

B-2. Crash Exposure

Crash exposure for the EQI is calculated using data from the Transportation Injury Mapping System (TIMS), developed by the UC Berkeley Safe Transportation Research and Education Center, based on records from the Statewide Integrated Traffic Records System maintained by the California Highway Patrol. The analysis uses the most recent five-year period of non-provisional data and includes only crashes involving injuries or fatalities, excluding property-damage-only incidents.

Each crash is weighted according to the highest injury severity level using factors from the Caltrans Cal-Benefit-Cost model to reflect relative societal costs. Crashes on closed-access highway segments—identified using State Highway System bicycle access status—are excluded due to their limited relevance to surrounding communities, while crashes on local roads, main street highway segments, and ramps are retained. Processed and weighted crashes are spatially aggregated to Census blocks using a 250-foot buffer to ensure crashes along shared road boundaries are attributed to adjacent blocks. A density score is calculated for each block based on the total weighted crashes per square mile, and percentile ranks are assigned, with blocks at or above the 80th percentile screened for inclusion.

Purpose: This screen identifies underserved communities disproportionately burdened by traffic-related pollution, noise, and safety risks.

C. Access to Destinations Screen

The EQI includes three multimodal access-to-destinations indicators calculated at the Census block level using internal Caltrans tools and methods. These include transit access, bicycle access, and pedestrian access

Each indicator measures relative access by comparing travel time–weighted access by a given mode to a reference condition (i.e., transit compared to congested auto travel, low-stress versus high-stress bicycle travel, and pedestrian network access compared to straight-line access). Transit access focuses on regional trips to both work and non-work destinations, while bicycle and pedestrian access focus on more localized, non-work trips.

Blocks that fall below established ratio thresholds for any indicator are screened as having poor relative access. Accessibility calculations are performed using the Conveyal platform, which applies routing and time-based decay functions to estimate the number

of reachable destinations from grid-based origin points. Results are exported as raster files and aggregated to Census blocks to produce final accessibility scores for screening.

Purpose: This screen identifies underserved communities with limited multimodal transportation access and poor connectivity to jobs and non-work destinations.

D. Transportation-Based Priority Populations Screen
This composite screen identifies underserved communities that face high traffic exposure and have poor multimodal access to destinations.

Purpose: These blocks represent communities that are most burdened and least served by the transportation system.

3-2 Interpreting EQI Data

When reviewing EQI data, it is important to interpret the indicators collectively to understand the overall transportation context of a location. Higher percentile values for indicators such as traffic proximity and crash exposure represent higher relative burdens compared with other Census blocks statewide, meaning the area may experience greater traffic impacts or safety concerns. Lower ratio values for access indicators—such as pedestrian, bicycle, or transit access—indicate poorer relative connectivity to destinations, suggesting that residents may face barriers when trying to reach jobs, services, or daily needs using those modes.

Areas that are flagged by multiple EQI screens (for example, both the Traffic Exposure Screen and the Access to Destinations Screen) may indicate overlapping transportation challenges, where communities experience both higher burdens and lower benefits from the transportation system. These overlapping conditions can signal locations where transportation improvements may have the greatest potential to address cumulative disadvantage. However, if a block appears in only one screen, it may still experience significant challenges related to safety or limited access.

It is also important to recognize that the EQI functions as a screening and planning support tool, designed to highlight potential areas of concern using statewide datasets and standardized metrics. EQI results should therefore be used alongside other planning inputs, including local knowledge, field observations, and direct community engagement, to fully understand community needs and to inform equitable transportation planning decisions.

3-3 Step-by-Step Guidance: Identifying Underserved Communities

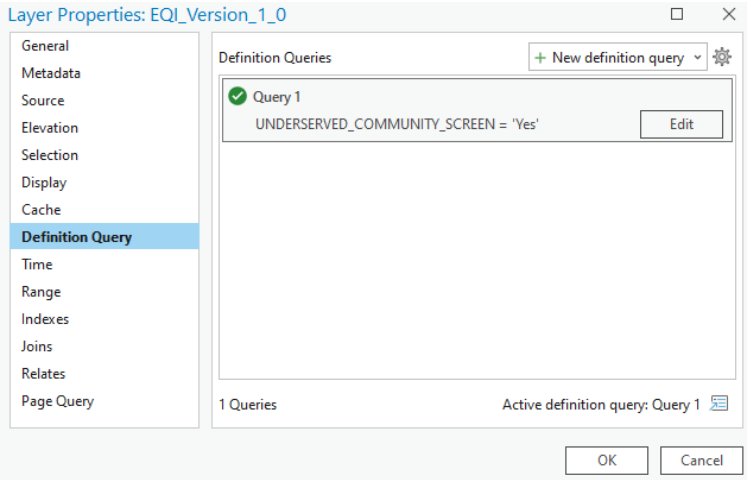
1- Download EQI Version 1.0 spatial data here. If you have a Caltrans ArcGIS Online account, enter your username and password to access the data download link. If you do not have a Caltrans ArcGIS Online account, click the 'Sign into your account on ArcGIS Online' link to sign in with a non-Caltrans account. You can create a free account here.

2- The spatial data is in a zipped ESRI file geodatabase, which can be opened in ArcGIS or ArcGIS Pro, or with other spatial analysis software packages.

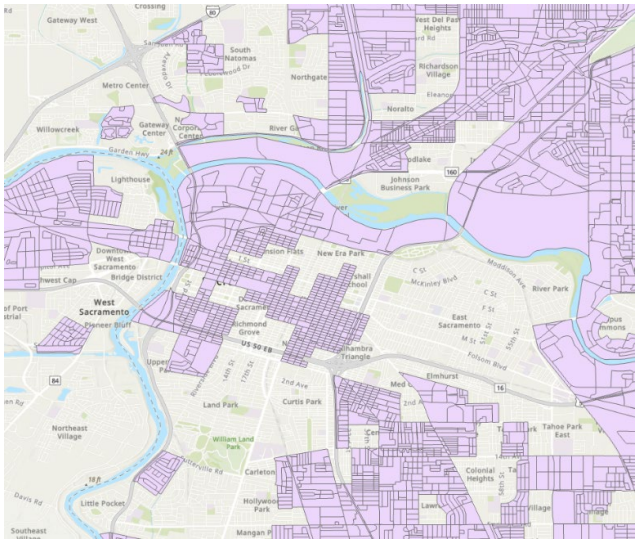
3- Open the data in ArcGIS Pro or other spatial analysis software package.

4- Query the data to only show the Underserved Communities layer using the following steps: Right-click on the EQI_Version_1_0 layer in the Contents pane, then click on Properties, then Definition Query. Apply the following query to the data: UNDERSERVED_COMMUNITY_SCREEN = 'Yes.'

An example of queried data is included on the next page.

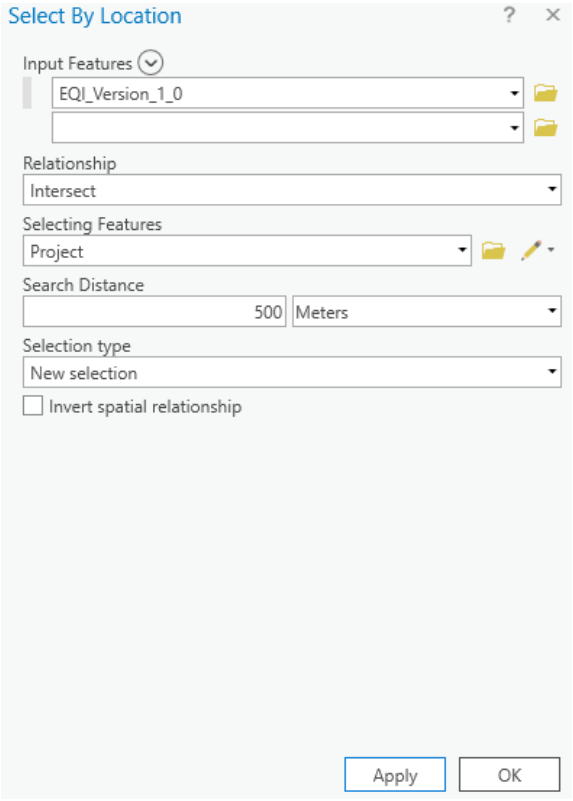


An example of queried data in Sacramento, CA:

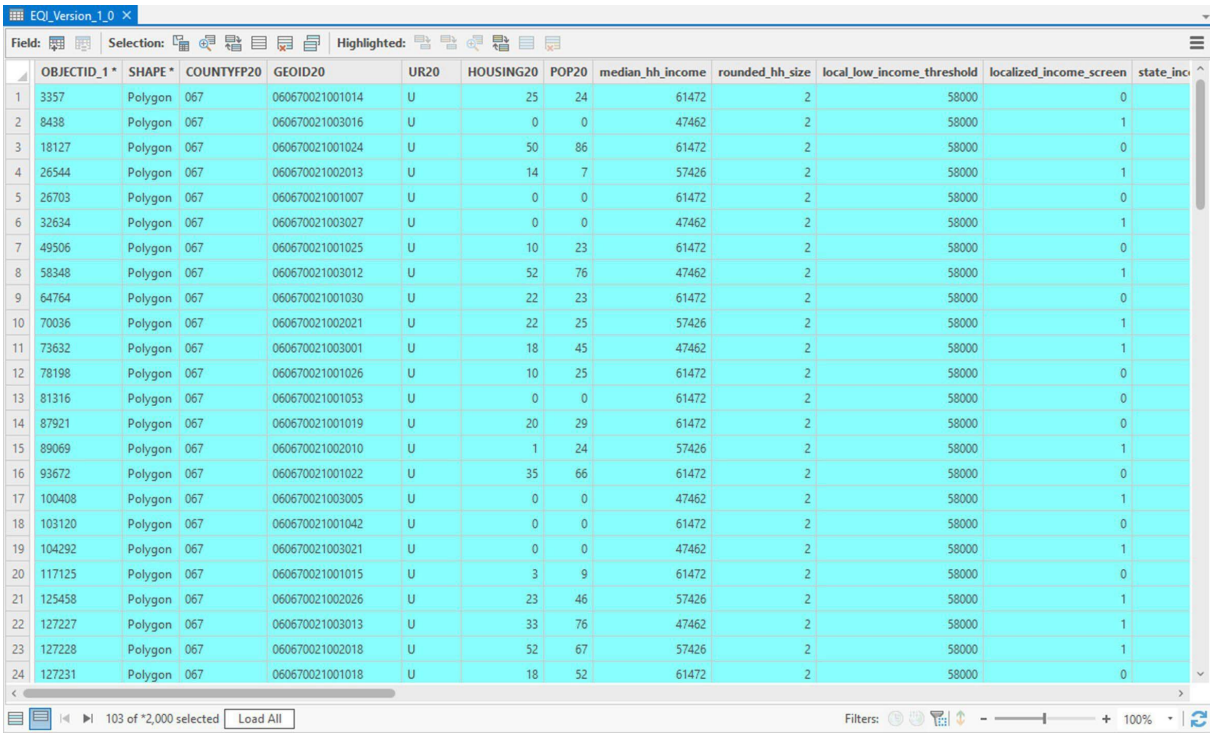


5- Add the project as a new layer. On the map tab, click on Select by Location and input the following parameters:
Input Feature: EQI_Version_1_0
Relationship: Intersect
Selecting Feature: Project
Search Distance: 500 meters
Selection type: New selection

The output should show all Census blocks within 500 meters of the project location.



6- The highlighted blocks represent EQI SB 960-screened blocks. Right click on the EQI layer and click on the Attribute Table to display a table of all Census blocks that have been screened. The table will show general information about the blocks (e.g., number of people and housing units) as well as all EQI indicators. These indicators can be used to better understand what transportation issues are currently present in communities surrounding the project.



EQI_Version_1_0

Field: Selection: Highlighted:

	OBJECTID_1 *	SHAPE *	COUNTYFP20	GEOID20	UR20	HOUSING20	POP20	median_hh_income	rounded_hh_size	local_low_income_threshold	localized_income_screen	state_inc
1	3357	Polygon	067	060670021001014	U	25	24	61472	2	58000	0	
2	8438	Polygon	067	060670021003016	U	0	0	47462	2	58000	1	
3	18127	Polygon	067	060670021001024	U	50	86	61472	2	58000	0	
4	26544	Polygon	067	060670021002013	U	14	7	57426	2	58000	1	
5	26703	Polygon	067	060670021001007	U	0	0	61472	2	58000	0	
6	32634	Polygon	067	060670021003027	U	0	0	47462	2	58000	1	
7	49506	Polygon	067	060670021001025	U	10	23	61472	2	58000	0	
8	58348	Polygon	067	060670021003012	U	52	76	47462	2	58000	1	
9	64764	Polygon	067	060670021001030	U	22	23	61472	2	58000	0	
10	70036	Polygon	067	060670021002021	U	22	25	57426	2	58000	1	
11	73632	Polygon	067	060670021003001	U	18	45	47462	2	58000	1	
12	78198	Polygon	067	060670021001026	U	10	25	61472	2	58000	0	
13	81316	Polygon	067	060670021001053	U	0	0	61472	2	58000	0	
14	87921	Polygon	067	060670021001019	U	20	29	61472	2	58000	0	
15	89069	Polygon	067	060670021002010	U	1	24	57426	2	58000	1	
16	93672	Polygon	067	060670021001022	U	35	66	61472	2	58000	0	
17	100408	Polygon	067	060670021003005	U	0	0	47462	2	58000	1	
18	103120	Polygon	067	060670021001042	U	0	0	61472	2	58000	0	
19	104292	Polygon	067	060670021003021	U	0	0	47462	2	58000	1	
20	117125	Polygon	067	060670021001015	U	3	9	61472	2	58000	0	
21	125458	Polygon	067	060670021002026	U	23	46	57426	2	58000	1	
22	127227	Polygon	067	060670021003013	U	33	76	47462	2	58000	1	
23	127228	Polygon	067	060670021002018	U	52	67	57426	2	58000	1	
24	127231	Polygon	067	060670021001018	U	18	52	61472	2	58000	0	

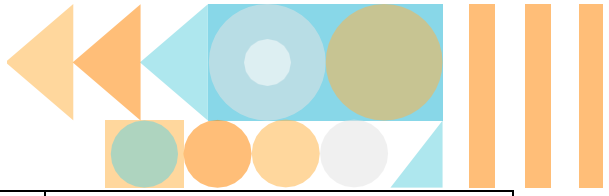
103 of *2,000 selected Load All Filters: 100%

Note: If any portion of the project falls within a 500-meter buffer of an underserved community identified through the EQI, outreach to that community is required to ensure compliance with SB 960. The law also allows for the use of regional definitions of underserved communities, provided they were developed through a stakeholder engagement process as part of the regularly scheduled four-year adoption cycle of a Regional Transportation Plan (RTP) by a Metropolitan Planning Organization (MPO) or Regional Transportation Planning Agency (RTPA).

Staff are encouraged to verify whether their MPO or RTPA has adopted a regional definition of underserved communities and to compare it with the EQI to ensure outreach efforts are as inclusive as possible. Here you can find a list of MPOs and a map showing MPOs and RTPAs.
For more information refer to SB960 Underserved Communities Guidance.

The following table provides an example of the information captured in the Attribute Table with a description of each data point and an explanation for how to interpret the results:

Column Header	Content	Description	Result	Interpretation
COUNTYFP20	County Code	County code.	113	Identifies the county in which the Census block is located.
GEOID20	GEOID	Census Bureau GEOID code.	061130105012018	Identifies the specific Census block.
UR20	Urban/Rural Classification	Urban or rural classification of the Census block.	R	The Census block is classified as rural.
HOUSING20	Housing Units	Number of housing units in the Census block.	0	There are zero housing units in this Census block.
POP20	Population	Number of residents in the Census block.	0	There are zero residents in this Census block.
median_hh_income	Median Household Income	Median household income of the Census block's parent block group, from the 2021 ACS.	30,950	This value represents the median household income for the parent block group.
rounded_hh_size	Average Household Size (rounded)	Rounded household income of the Census block's parent block group, from the 2021 American Community Survey.	2	This value represents the rounded average household income for the parent block group.
local_low_income_threshold	Local Low-Income Threshold	2021 HUD low-income threshold, based on the block's county and average household size.	59,200	The local low-income threshold for this block is $59,200. This threshold is used to evaluate low-income status for the Census block.
crash_percentile_local	Crash Exposure Percentile	Percentile ranking of crash exposure relative to other Census blocks statewide.	0.74	The Census block has greater crash exposure than 74% of Census blocks in the state. The threshold for high crash exposure is 0.8. This block is not considered to have high crash exposure.
traffic_proximity_and_volume_percentile	Traffic Proximity and Volume Percentile	Percentile ranking of traffic proximity and volume relative to other Census blocks statewide.	0.95	The Census block has greater traffic proximity and volume than 95% of Census blocks in the state; values greater than 0.8 indicate high exposure. This block is considered to have high traffic proximity and volume.
PED_RATIO	Pedestrian Access Ratio (Non-Work Destinations)	Ratio measuring pedestrian access to non-work destinations. The pedestrian indicator measures the	0.48	Census blocks with a ratio below 0.6 are screened as having relatively poor pedestrian access to destinations. The value for this



		ratio of pedestrian access to destinations to "ideal" access to destinations, where crows-fly calculations are used to calculate travel times instead of the actual network.		Census block is below the 0.6 threshold, indicating poor pedestrian access to destinations.
BIKE_RATIO	Bike Access Ratio (Non-Work Destinations)	Ratio measuring bicycle access to non-work destinations. The bicycle indicator measures the ratio of bicycle access to destinations on the low-stress network to bicycle access on the high-stress network.	0.75	Census blocks with a ratio less than 0.6 are considered to have relatively poor low-stress bicycle access to destinations. The value for this Census block exceeds the 0.6 threshold, indicating good bicycle access to destinations.
TRANSIT_RATIO_JOBS	Transit Access Ratio (Jobs)	Ratio measuring transit access to work destinations. The transit indicator measures the ratio of transit access to destinations to congested auto access to destinations.	0.03	Census blocks with a ratio less than 0.12 are screened for inclusion as having poor relative transit access to destinations. The value is below the 0.12 threshold, indicating poor transit access to work destinations.
TRANSIT_RATIO_POIs	Transit Access Ratio (Non-Work Destinations)	Ratio measuring transit access to non-work destinations. The transit indicator measures the ratio of transit access to destinations to congested auto access to destinations.	0.02	Census blocks with a ratio less than 0.12 are screened for inclusion as having poor relative transit access to destinations. The value is below the 0.12 threshold, indicating poor transit access to non-work destinations.
TRIBAL_LAND_INDICATOR	Tribal Land Indicator	Indicates whether the Census block is on Tribal land.	No	The Census block is not within, nor does it intersect with Tribal land.
LOW_INCOME_INDICATOR	Low-Income Indicator	Indicates whether the Census block is identified as low income.	Yes	Median household income is below the local low-income threshold.
UNDERSERVED_COMMUNITY_SCREEN	Underserved Community Screen	Indicates whether the Census block is identified as an underserved community.	Yes	The Census block meets the criteria for the low-income indicator and the Tribal land indicator. This Census block is therefore identified as an underserved community.

TRAFFIC_EXPOSURE_SCREEN	Traffic Exposure Screen	Indicates whether the Census block experiences high traffic exposure.	Yes	This Census block experiences high traffic proximity, volume, and/or crash exposure.
ACCESS_TO_DESTINATIONS_SCREEN	Access to Destinations Screen	Indicates whether the Census block has limited/poor access to destinations.	Yes	This Census block has poor/limited pedestrian, bike, and or transit access to destinations.
TBPP_SCREEN	Transportation-Based Priority Populations Screen	Indicates whether the Census block meets all criteria related to transportation burdens.	Yes	This Census block is identified as an underserved community that experiences high traffic exposure and poor multimodal access. This Census block is therefore identified as a transportation-based priority population.

Based on the results shown in the table above for a hypothetical project location, the following examples illustrate potential planning recommendations:

- **Implement Traffic Safety and Exposure Reduction Measures**
  Evaluate corridor safety improvements along nearby high-volume roadways (e.g., speed management, traffic calming, roadway redesign, landscaping buffers, or access management) to reduce community exposure to heavy traffic and improve overall safety.
- **Improve Pedestrian Network Connectivity**
  Develop or upgrade sidewalks, safe crossings, lighting, and intersection improvements to address the low pedestrian access ratio and improve safe walking connections to nearby destinations and transit stops.
- **Enhance Transit Accessibility**
  Coordinate with local transit providers to evaluate options for improving service coverage or connectivity, such as additional stops, schedule adjustments, first/last-mile connections, or demand-responsive transit services to improve access to jobs and key destinations.
- **Preserve and Expand Low-Stress Bicycle Infrastructure**
  Maintain existing favorable bicycle conditions and expand low-stress bicycle facilities (e.g., separated bike lanes, multi-use paths, or traffic-calmed routes) to strengthen active transportation connectivity to nearby destinations.
- **Prioritize Investments Serving Underserved Communities**
  Since the surrounding block group is identified as low-income and screened under transportation-based priority populations, prioritize transportation investments that improve mobility, safety, and access for nearby underserved residents.
- **Evaluate Future Land Use and Transportation Integration**
  If development or transportation projects are planned near this block, incorporate multimodal access improvements and traffic mitigation measures early in the planning process to avoid increasing traffic burdens while improving access to regional opportunities.

3-4 Step-by-Step Guidance: Identifying Community Needs

To identify needs:

1. **Determine Underserved Community Status**
   Determine whether the block is identified as an underserved community based on the EQI demographic data, including low-income status and Tribal land status. This step helps identify whether the area includes populations that may face systemic transportation disadvantages and should be prioritized in planning and investment decisions.
2. **Review Traffic Exposure Indicators**
   Examine the traffic proximity and volume percentile as well as the crash exposure percentile to understand whether the block experiences elevated exposure to nearby high-traffic roadways and crash rates. High values indicate that the block is located near corridors with significant vehicle volumes and high crashes, which may contribute to environmental, safety, or quality-of-life concerns for surrounding communities.
3. **Review Access to Destinations Indicators**
   Assess the pedestrian, bicycle, and transit access ratios to evaluate how effectively the transportation network connects the block to jobs and key destinations. Low ratios indicate that the available transportation options do not provide access comparable to ideal or alternative travel conditions, highlighting potential gaps in the multimodal network.
4. **Assess Transportation-Based Priority Populations Status**
   Determine whether the block is screened as a Transportation-Based Priority Population, which indicates that it is both an underserved community and experiences high traffic exposure and/or poor multimodal access. The Transportation-Based Priority Populations designation highlights locations where transportation burdens and access limitations intersect. This is where transportation improvements may provide the greatest equity and mobility benefits.

4. Navigating the EQI Web Map

4-1 Web Map Interface

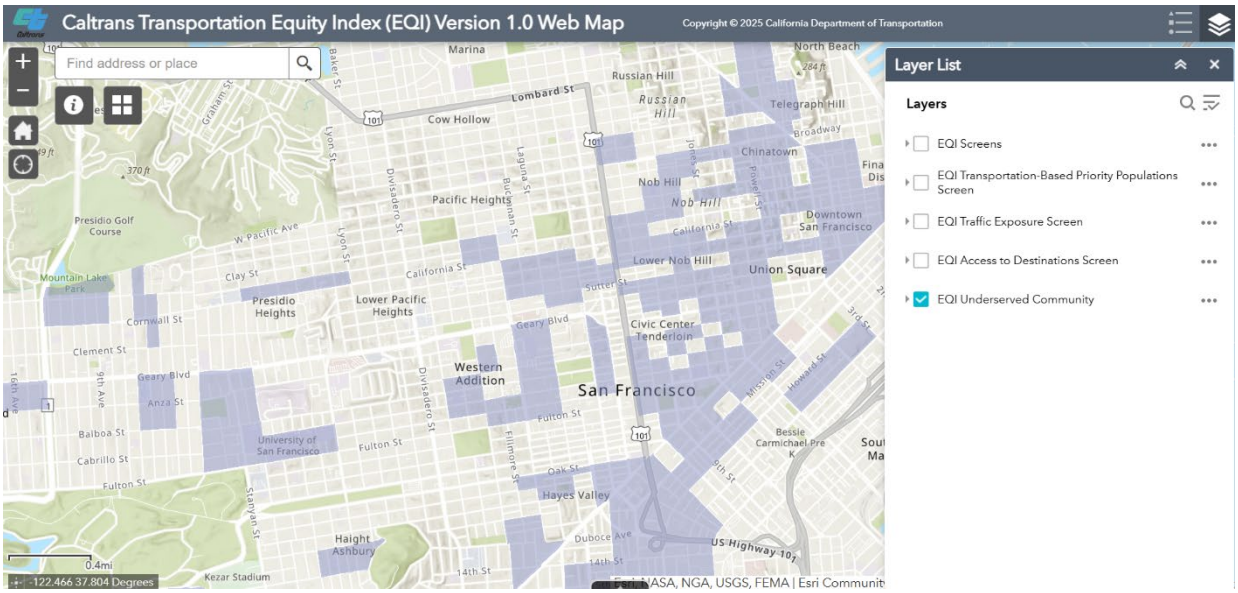
The EQI web map displays screening results at the Census block level, offering detailed, localized insight into community conditions. Users can toggle individual EQI layers (e.g., traffic exposure, access to destinations) on or off to focus on specific indicators and use the legend to interpret how communities are categorized across different screens. By clicking on a Census block on the map, users can view a pop-up box with detailed indicator information for that location. Built-in links throughout the map provide additional EQI guidance, documentation, and supporting resources.

4-2 Map Layers and Controls

The EQI web map includes a range of interactive controls that allow users to explore and customize the data. Users can toggle individual EQI layers on and off to compare different indicators, such as traffic exposure or access to destinations. Multiple basemap options are available (e.g., Blueprint, Charted Territory Map, Streets, …) to provide additional geographic context. Users can also click on individual Census blocks to open a pop-up with a summary of indicator data for that location. Additional tools, such as zoom, search, and reset functions, make it easy to navigate the map and focus on specific areas of interest.

If the user needs to identify underserved communities:

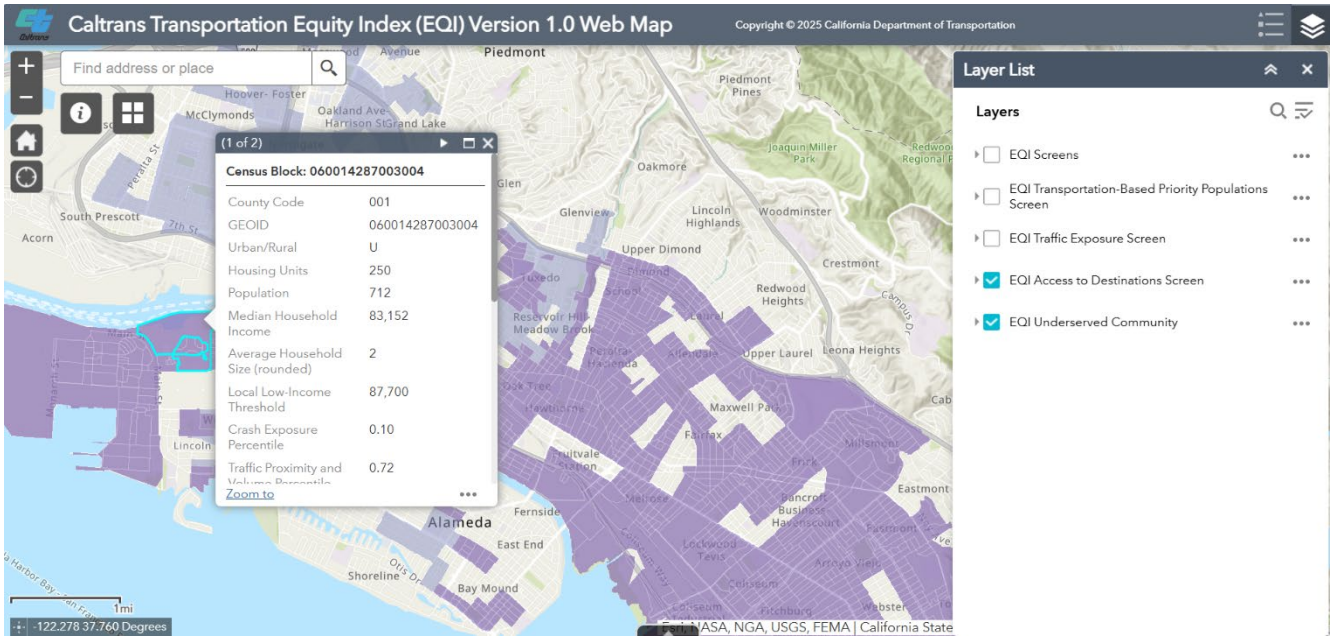
1. Open the EQI web map here.
2. Click the **Layer List** icon in the top right corner.
3. Turn on the **EQI Underserved Community** layer.



4. View the map to see which Census blocks are classified as underserved.
    - A Census block is considered an underserved community if it meets either **income** or **Tribal** criteria.
5. Click on any Census block to open a pop-up with additional details for that location.

If the user is looking for information about specific transportation conditions within underserved areas:

1. Turn on the **EQI Underserved Community** layer.
2. In the Layer List, turn on one or more **transportation indicator layers** (e.g., traffic exposure, access to destinations).
3. Use the legend to interpret how each indicator is displayed.
4. Compare layers visually to understand how transportation conditions overlap with underserved communities.
5. Click on individual Census blocks to view detailed indicator data in the pop-up box.



5. Applying the Analytical Tool (Beta)

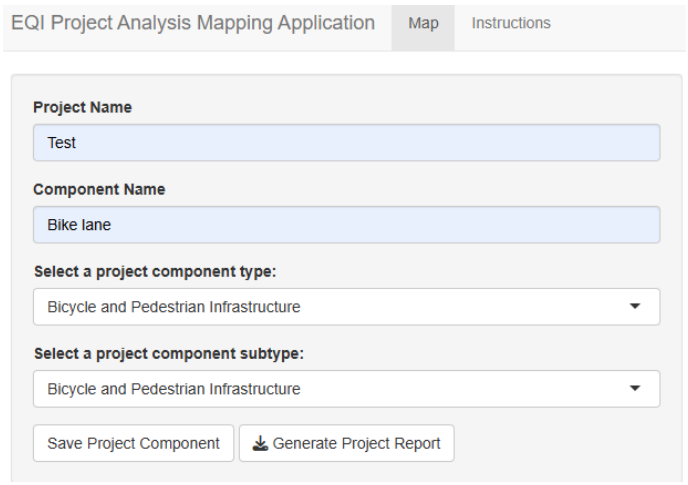
5-1 Overview of the Analytical Tool, Key Features and Capabilities

The EQI Analytical Tool is an interactive mapping application that allows planners to visualize and analyze EQI layers in relation to project locations. The tool generates a standardized report that summarizes baseline transportation and equity conditions for a selected area, helping users understand how a selected project type/activity category in a location performs across the various EQI screens. It also allows users to select an anchor asset or activity category and evaluate how that investment may influence each EQI screen, providing insight into potential benefits or burdens associated with a project.

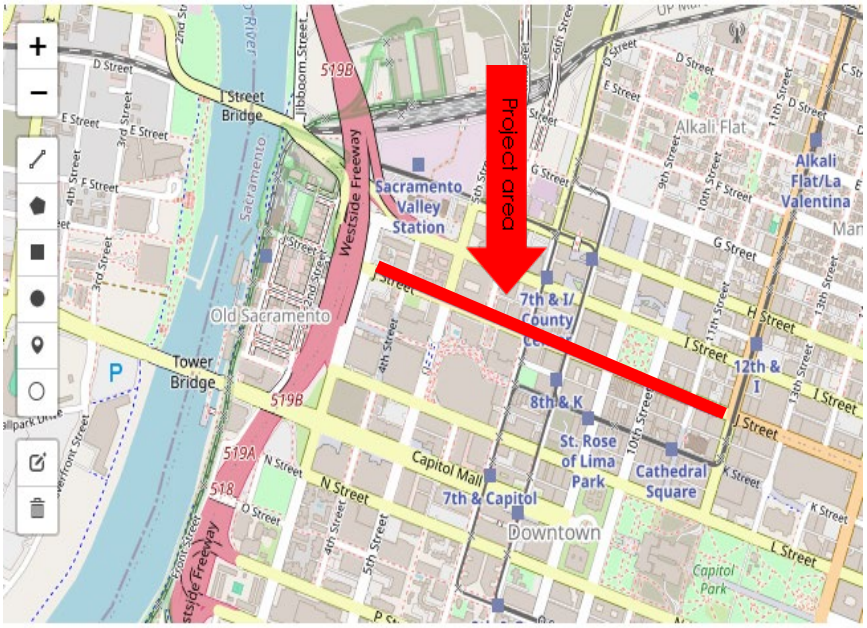
By combining spatial visualization with automated reporting, the tool supports planners in identifying priority areas, documenting existing conditions, and considering how proposed transportation investments may affect communities.

5-2 How to use the Tool:

1. Open the EQI Analytical Tool and input the project name and component name (e.g., bike lane, pavement). Select the project component type from the drop-down menu. This field includes all project activity categories based on the asset management tool data. See the example below:



2. Locate the project area by zooming in on the map to the right. Using the map toolbar, draw the project area using one of the available tools: line, polygon, rectangle, circle, marker, or circle marker. Click the save button. In the example below, the highlighted red line illustrates a hypothetical project drawn using the line tool:



Bike lane Spatial analysis completed

3. Select "Generate Project Report" to download the report.
4. Open the excel file. Select your project component from the drop-down menu in cell "E2". In the example below, the selected project component is "Bike lane."

A	B	C	D	E	F	I	J	K

Select Project Component >>> Bike lane

Category	Indicator	Result	Description	Baseline Conditions	Expected Project Impact
Underserved Community	Median Household Income	$17,331	The population-weighted median household income in the project area is $17,331. The minimum median household income in the project area is $12,903. The maximum median household income in the project area is $32,650.		
	Demographic Overlay	Yes	The project component intersects the EQI's Demographic Overlay, meaning that it is located in a low-income community (per the AB-1550 definition) and/or a tribal land area.		↑
Traffic Exposure	Traffic Exposure Screen	Yes	The project component intersects the EQI's Traffic Exposure Screen, meaning that it is located in an area that is low-income and highly-burdened by either traffic proximity and volume and/or crash exposure.	✗	
	Traffic Proximity and Volume	0.80	The project component is located in an area with a population-weighted traffic proximity and volume percentile of .8, meaning that the traffic burden in the project area is greater than 80% of all Census blocks in the state. The minimum traffic proximity and volume percentile in the project area is .57 and the maximum is .98.	✗	→
	Crash Exposure	0.83	The project component is located in an area with a population-weighted traffic exposure percentile of .83, meaning that the crash exposure in the project area is greater than 83% of all Census blocks in the state. The minimum crash exposure percentile in the project area is .48 and the maximum is .98.	✗	↑

5. Interpret the results

   a. Summarize key mobility needs such as safe pedestrian crossings, transit frequency, or bicycle access based on the information in column "D," "E," and "I" which show the baseline conditions of the project location categorized by the EQI indicators.

   b. Identify and describe how your project can enhance access, mobility, and health outcomes—such as installing new bus stops or improving sidewalks—based on the anticipated impacts listed in column K.
   Use the following guide when interpreting column K:
      - **Upward Arrow (↑):** Positive Impact
      - **Downward Arrow (↓):** Negative Impact
      - **Horizontal Arrow (→):** Neutral Impact

5-3 Beta Considerations and Known Limitations

The EQI Analytical Tool is currently in a beta phase and is intended to support exploratory analysis, planning insights, and early-stage decision support. As such, users should be aware that functionality, output, and underlying data may continue to evolve as the tool is refined and improved.

While the tool provides standardized reporting and interactive spatial analysis of EQI layers, results are intended for informational and screening purposes only and should not be interpreted as final determinations or regulatory findings. Outputs reflect the most current available data at the time of use and may not capture real-time conditions or localized nuances that are not represented in the underlying datasets.
In addition, the EQI Analytical Tool is designed to assess spatial relationships between transportation investments and equity conditions, but it does not evaluate all possible social, economic, or environmental factors that may influence project outcomes. Certain indicators may be more suitable for regional or comparative analysis rather than site-specific conclusions.

Users should also note that model assumptions, indicator thresholds, and weighting approaches may be updated over time as methodology is refined. As a result, output from different versions of the tool may not be directly comparable. Despite these limitations, the tool provides a consistent and transparent framework for identifying potential equity considerations and supporting more informed transportation planning and engagement efforts.

6. Resources and Support

For more information about the EQI, users can refer to the Caltrans resources provided in this section.

6-1 EQI Version 1.0 Technical Documentation

This documentation provides a comprehensive overview of the Equity Index (EQI), including its purpose, design, and methodological framework. It outlines the selection of spatially significant indicators, the rationale for using Census block–level data to capture neighborhood-scale variation, and the processes used to calculate and aggregate EQI scores. The document also explains how thresholds are applied to identify transportation-based priority populations, ensuring that the index highlights areas with concentrated burdens rather than broadly distributed conditions. By detailing the indicators, data sources, and calculation methods, this documentation promotes transparency, consistency, and reproducibility, supporting the EQI's role as a tool for informing equitable, data-driven transportation planning and decision-making.

6-2 Downloading the EQI Spatial Data

Download EQI Version 1.0 spatial data here. If you have a Caltrans ArcGIS Online account, enter your username and password to access the data download link. If you do not have a Caltrans ArcGIS Online account, click the 'Sign into your account on ArcGIS Online' link to sign in with a non-Caltrans account. You can create a free account here.

6-3 Technical Information Sessions

Users can access recordings and materials from our EQI information sessions here under Archived.

6-4 Identifying Underserved Communities with the EQI | Fact Sheet

This factsheet provides guidance on implementing the requirements of Senate Bill 960 (SB 960), signed into law in September 2024, which directs the California Department of Transportation (Caltrans) to establish a definition of "underserved communities" to support inclusive engagement in the planning and delivery of complete streets projects funded through the State Highway Operation and Protection Program (SHOPP). In June 2025, Caltrans issued a memorandum identifying the Underserved Communities layer of the Equity Index (EQI) as the primary tool for this purpose. This document outlines the screening instructions for applying the EQI Underserved Communities layer, including how it should be used to consistently identify priority areas and inform outreach and decision-making processes in alignment with SB 960 requirements.

6-5 Caltrans Engagement Resources

Caltrans Engagement Portal

The Caltrans Engagement Portal provides a new, accessible platform for connecting with Caltrans on the plans, programs, and projects that shape California's transportation system. The portal offers information about initiatives that impact communities across the state, along with opportunities to share input that can help inform decision-making. Designed to support transparent and inclusive engagement, the platform makes participation more accessible and consistent. Over time, additional projects and initiatives will be added, establishing the Caltrans Engagement Portal as a central, evolving hub for public engagement and collaboration.

Statewide Engagement Playbook

The Statewide Engagement Playbook is a comprehensive guide developed to support meaningful and equitable community engagement throughout the planning and project delivery processes. The Statewide Engagement Playbook is designed to guide staff on how, and when appropriate, to provide communities meaningful opportunities to shape transportation projects, ensure that their opinions are actively sought and respected, and that their feedback is incorporated into decision-making.

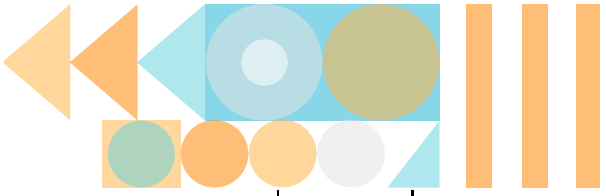
6-6 Contact Us

For questions or technical support, contact: **CaltransEQI@dot.ca.gov**

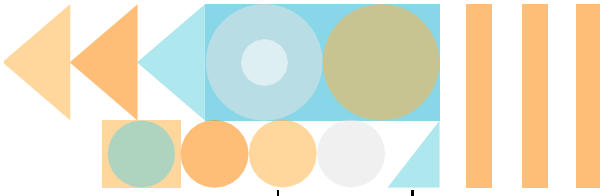
7. Appendices

7-1 Data Dictionary

TABLE_NAME	FIELD_NAME	FIELD_DESCRIPTION	FIELD_DESCRIPTION_AUTHORITY	FIELD_TYPE
EQI	OBJECTID_1	ArcGIS OBJECTID field	Caltrans	OBJECTID
EQI	COUNTYFP20	2020 Census county FIPS code	U.S. Census Bureau	TEXT
EQI	GEOID20	Census block identifier; a concatenation of 2020 Census state FIPS code, 2020 Census county FIPS code, 2020 Census tract code, and 2020 Census block number	U.S. Census Bureau	TEXT
EQI	UR20	2020 Census urban/rural indicator	U.S. Census Bureau	TEXT
EQI	HOUSING20	2020 Census housing unit count	U.S. Census Bureau	DOUBLE
EQI	POP20	2020 Census population count	U.S. Census Bureau	DOUBLE
EQI	median_hh_income	2021 median household income of Census block group that the block is within (ACS 5-year estimates table B19013)	Caltrans	DOUBLE
EQI	rounded_hh_size	2021 average household size of the Census block group that the block is within (ACS 5-year estimates table B25010)	Caltrans	LONG
EQI	local_low_income_threshold	Localized county low income threshold derived from the 2021 HCD State Income Limits by County dataset and average household size	Caltrans	LONG
EQI	localized_income_screen	Binary indicator (1 or 0) if the localized low-income threshold is met	Caltrans	LONG
EQI	state_income_screen	Binary indicator (1 or 0) if the state low-income threshold is met. The state income threshold is 80% of the statewide median household income	Caltrans	LONG
EQI	income_screen	Binary indicator (1 or 0) if either the localized or state low-income threshold is met	Caltrans	LONG
EQI	crash_score_local	Severity-weighted crash score only for crashes occuring on non-controlled access facilities	Caltrans	DOUBLE



EQI	crash_density_local	The crash_score_local value divided by the area of the block in square miles.	Caltrans	DOUBLE
EQI	crash_percentile_local	The percentile rank value of the crash_density_local value.	Caltrans	DOUBLE
EQI	weighted_aadt_score	Inverse-distance and truck-weighted traffic proximity and volume score	Caltrans	DOUBLE
EQI	traffic_proximity_and_volume_percentile	The percentile rank value of the weighted aadt score	Caltrans	DOUBLE
EQI	PED_RATIO	Ratio of travel time-weighted pedestrian access to non-work destinations to travel time-weighted crows fly network access to non-work destinations	Caltrans	DOUBLE
EQI	BIKE_RATIO	Ratio of travel time-weighted bicycle access to non-work destinations on the low-stress network to travel time-weighted bicycle access to non-work destinations on the high-stress network	Caltrans	DOUBLE
EQI	TRANSIT_RATIO_JOBS	Ratio of travel time-weighted transit access to jobs to travel time-weighted congested auto access to jobs	Caltrans	DOUBLE
EQI	TRANSIT_RATIO_POIs	Ratio of travel time-weighted transit access to POIs (points of interest/non-work destinations) to travel time-weighted congested auto access to POIs	Caltrans	DOUBLE
EQI	SCREEN	Highest level EQI screening scenario of the Census block	Caltrans	TEXT
EQI	TRIBAL_LAND_INDICATOR	Binary indicator 'Yes' or 'No' if the block intersects or is contained within a Tribal Land	Caltrans	TEXT
EQI	LOW_INCOME_INDICATOR	Binary indicator 'Yes' or 'No' if the block meets the EQI low-income indicator criteria	Caltrans	TEXT
EQI	DEMOGRAPHIC_OVERLAY_SCREEN	Binary indicator 'Yes' or 'No' if the block meets the EQI Demographic Overlay criteria	Caltrans	TEXT



EQI	TRAFFIC_EXPOSURE_SCREEN	Binary indicator 'Yes' or 'No' if the block meets the EQI Traffic Exposure Screen criteria	Caltrans	TEXT
EQI	ACCESS_TO_DESTINATIONS_SCREEN	Binary indicator 'Yes' or 'No' if the block meets the EQI Access to Destinations Screen criteria	Caltrans	TEXT
EQI	TBPP_SCREEN	Binary indicator 'Yes' or 'No' if the block meets the EQI Transportation-Based Priority Populations Screen criteria	Caltrans	TEXT

7-2 Frequently Asked Questions (FAQ)

What is the EQI?

The EQI is a statewide geospatial screening tool designed to identify communities experiencing significant transportation-related inequities. It integrates socioeconomic and transportation-specific indicators to highlight areas where residents experience a greater share of burdens and fewer benefits from the state's transportation system.

How will the EQI be used?

The EQI is being applied across multiple Caltrans programs and initiatives to support more consistent, data-informed equity considerations in planning, investment, and engagement. Key use cases include:

Planning & Project Development
The EQI is integrated into early-stage planning tools, such as the Transportation Planning Scoping Information Sheet (TPSIS) and pre-planning checklists, to ensure equity is considered from the outset of project development.

Investment & Program Decision-Making
The EQI is used in programs like the Caltrans System Investment Strategy (CSIS) and SB 1 to inform funding decisions, prioritize projects, and align investments with equity goals, including future SHOPP cycles.

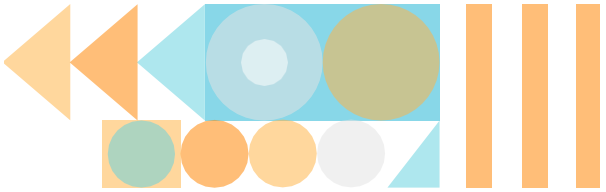
Safety Programs & Data Applications
The EQI is applied in safety efforts, such as Road Safety Infrastructure Plans (RSIPs) and emerging tools like the GenAI Vulnerable Road User (VRU) Safety Platform, which are used to guide more equitable safety outcomes.

Community Identification & Engagement
The EQI provides a consistent, statewide approach to defining and identifying underserved communities, therefore supporting more inclusive engagement and helping meet legislative requirements such as targeted engagement for projects with Complete Streets components as stipulated by SB 960.

Caltrans continues to explore additional applications of the tool and will advance new use cases, incorporate feedback from partners and staff, and embed the EQI more consistently into planning, programming, and project delivery processes.

Is the EQI intended for use by non-Caltrans entities?

While the EQI was primarily developed for use in Caltrans programs and processes, the tool is publicly available and broadly applicable to the work of other transportation-related entities in the state. Caltrans encourages the broader use/adoption of the EQI and staff are available to discuss how the tool can be best applied to a specific use case.



Why do we need the EQI, and why was it developed?

The Caltrans Equity Statement acknowledges that communities of color and under-served communities experienced fewer benefits and a greater share of negative impacts associated with our state's transportation system. Some of these disparities reflect a history of transportation decision-making, policy, processes, planning, design, and construction that "…quite literally put up barriers, divided communities, and amplified racial inequities, particularly in our Black and Brown neighborhoods."

Many tools exist to evaluate various impacts of the built environment that potentially burden communities. These tools typically consider a wide range of factors that are not explicitly focused on burdens caused or exacerbated by the transportation system. Caltrans aims to bridge this gap by developing the EQI to inform how to best address and mitigate inequities exacerbated by the transportation system.

What is the difference between the EQI and CalEnviroScreen?

CalEnviroScreen is a mapping tool that identifies environmental justice areas of concern at the census tract level. The tool utilizes several environmental burden indicators and population indicators to assess where environmental burdens are the most impactful to the populations that are most vulnerable to them.

The EQI is a screening tool that utilizes transportation-specific indicators to identify transportation-based priority populations at a census block level. The EQI identifies and assesses the severity of disadvantage from a narrower transportation perspective rather than a broader environmental justice perspective.

Will the EQI replace CalEnviroScreen or other screening tools?

The EQI will not replace other tools and can be used in partnership with tools like CalEnviroScreen, the Healthy Places Index, the Climate and Economic Justice Screening Tool, and others. Some tools are to be used on specific programs and projects outlined or defined by state and/or federal legislation. The EQI development team will work with internal and external partners on the use cases and specific policies where the EQI is applicable.

What are the indicators and data used in the EQI?

The EQI includes four components:

1. **Underserved community indicators** measure household income and Tribal land status.
2. **Traffic indicators** measure traffic proximity and volume, and crash exposure.
3. **Access-to-destinations indicators** measure access gaps in the transit, bicycle, and pedestrian networks.

4. **Transportation-based priority population indicators** measure communities that face the greatest burden and receive the fewest benefits from the transportation system.

The EQI relies on both publicly available and internally developed datasets, including:

- Household income data from the U.S. Census Bureau American Community Survey (ACS) 5-year estimates.
- Tribal lands data from the California Office of Environmental Health Hazard Assessment (OEHHA).
- Traffic proximity/volume data from Caltrans and the United States Department of Transportation (USDOT).
- Crash data from the California Highway Patrol and UC Berkeley Safe Transportation Research and Education Center (SafeTREC).
- Access-to-destinations data from Caltrans tools and analysis.

Are Tribal lands accounted for in the EQI?

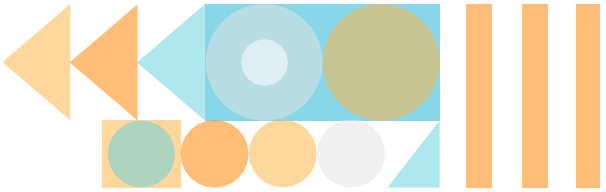
The EQI includes federally recognized Tribal lands in California as part of the Underserved Communities Screen. All Census blocks that are within or touch a federally recognized Tribal land are screened as underserved communities by default. A Tribe may establish that a particular area of land is under its control, even if not represented in the EQI as an underserved community, and request a consultation with the Caltrans EQI development team.

Why were specific indicators selected as opposed to others?

Central to the EQI's concept is the identification of transportation-based priority populations and the allocation of resources to said populations. The EQI only includes variables with spatial significance, meaning that their distribution across the state is spatially significant and has a nexus with transportation. The EQI also excludes indicators that cannot be measured at a granular scale. Many indicators are only available at the Census tract level (or at even less granular geographic scales), which makes them less useful for transportation analysis.

How does the EQI factor in rural geography?

EQI-screened areas are identified in both rural and urban parts across the state. The coverage of rural geographies is highly dependent on the specific EQI screen. The traffic exposure screen tends to represent more urbanized areas, as many of the highest traffic volumes occur in more urban areas such as Los Angeles. Conversely, many rural areas tend to have relatively poorer multimodal access to destinations, so they are more often represented on the access to destinations screen.



What are the objectives and intended outcome of the EQI?

The EQI is designed to support the following objectives:

- Increase awareness of transportation equity among Caltrans staff, transportation partners, and the public.
- Prioritize transportation projects based on net benefits to transportation-based priority populations.
- Foster greater collaboration, active participation, and public engagement with an equity lens across Caltrans' operations.
- Establish quantifiable, data-driven equity benchmarks to help form the foundation of future equity indicator research and metrics for analysis within Caltrans.
- Provide Caltrans with the tools necessary to adopt an equitable transportation methodology for project selection, program evaluation, and policy implementation.

The intended outcome of developing and implementing the EQI is to assess transportation equity at the Census block level and promote equitable outcomes in project planning, development, and design.

How can I download the EQI's spatial data?

The EQI spatial data can be downloaded as a zipped file geodatabase from ArcGIS Online:

1. Download the ArcGIS data by selecting this link.
2. If you have a Caltrans ArcGIS Online account, enter your username and password to access the data download link.
3. If you do not have a Caltrans ArcGIS Online account, click the Sign into your account on ArcGIS Online link below to sign in with a non-Caltrans account. You can create a free account here.

Why doesn't the EQI use a scoring system?

The EQI does not produce a composite score like the one generated by CalEnviroScreen. Instead, each EQI indicator functions similarly to an individual score, but these values are used solely for screening and are not combined into an overall index. In practice, this results in a similar application to CalEnviroScreen. CalEnviroScreen produces a composite score made up of its indicator scores, but that score is ultimately used for screening Census tracts, with those above the 75th percentile identified as DACs.

For any given EQI metric – for example, Traffic Proximity and Volume – the percentile value can also be viewed as a score. However, only Census blocks at or above the 80th percentile and meeting the demographic overlay criteria are screened as DACs. In short,

both tools are ultimately used to identify disadvantaged communities, but each produce continuous quantitative scores as well. Future versions of the EQI may include a composite quantitative score that incorporates all indicators.

What are the limitations of the EQI?

The EQI does not include indicators that cannot be measured at the appropriate level of spatial granularity to effectively assess transportation equity outcomes. The lack of certain indicators in the EQI does not imply that these transportation equity issues are less important or not a priority for Caltrans. Rather, there are many transportation equity indicators which are simply not well suited for a spatial analysis tool such as the EQI and should be addressed and analyzed through other methods.