



Cal-B/C Training Module 10

Additional Information

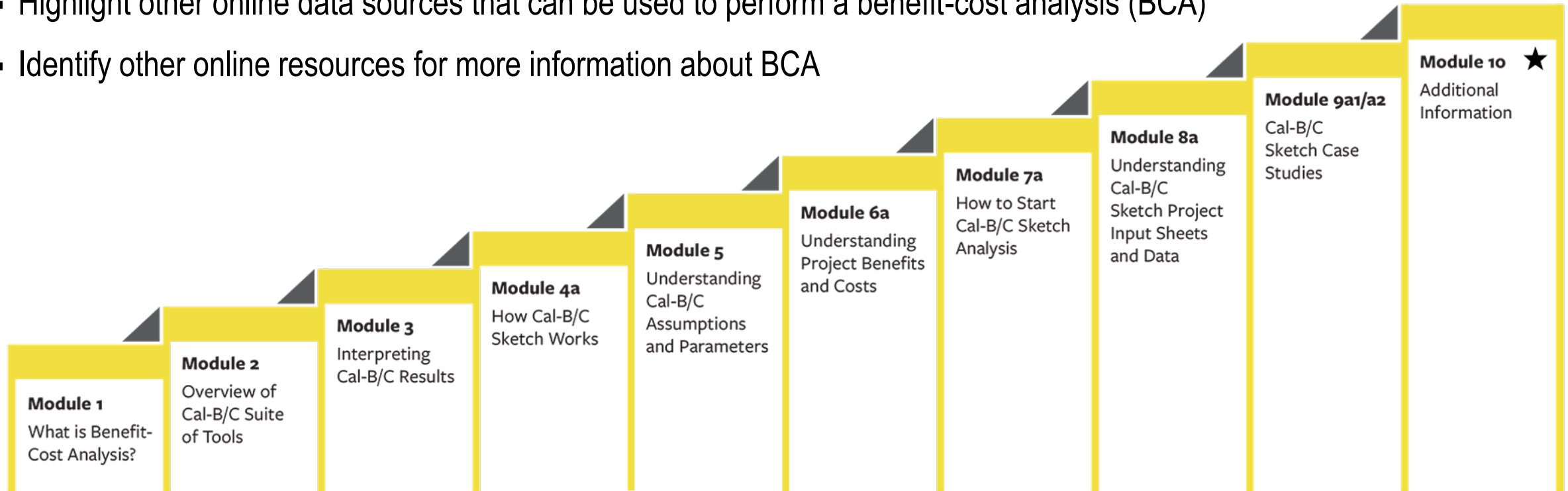


01

About This Module

This module will...

- Briefly summarize Cal-B/C User's Guides and information
- Describe supplemental and historical Cal-B/C technical documentation
- Highlight other online data sources that can be used to perform a benefit-cost analysis (BCA)
- Identify other online resources for more information about BCA



★ *This module is covered in this presentation*

Previous Modules...

- **Module 1** provided a basic introduction on benefit-cost analysis (BCA) and a general overview of how to conduct a BCA
- **Module 2** described the Cal-B/C suite of tools, discussed the types of projects that can be evaluated, and provided guidance on which tools to use for various project types
- **Module 3** presented the Cal-B/C results page, detailed what each output measure means, and explained how they are calculated
- **Modules 4a-e** explained how the Cal-B/C tools work and walked through how to use each tool
- **Module 5** highlighted the information in the Parameters worksheet and discussed key assumptions used by Cal-B/C
- **Modules 6a-e** provided detailed information on how Cal-B/C calculates benefits
- **Module 7a-e** presented the 1-2-3 approach to starting a Cal-B/C analysis
- **Modules 8a-e** discussed potential data sources that can be used in a Cal-B/C analysis
- **Modules 9a-e** provided case studies using Cal-B/C tools

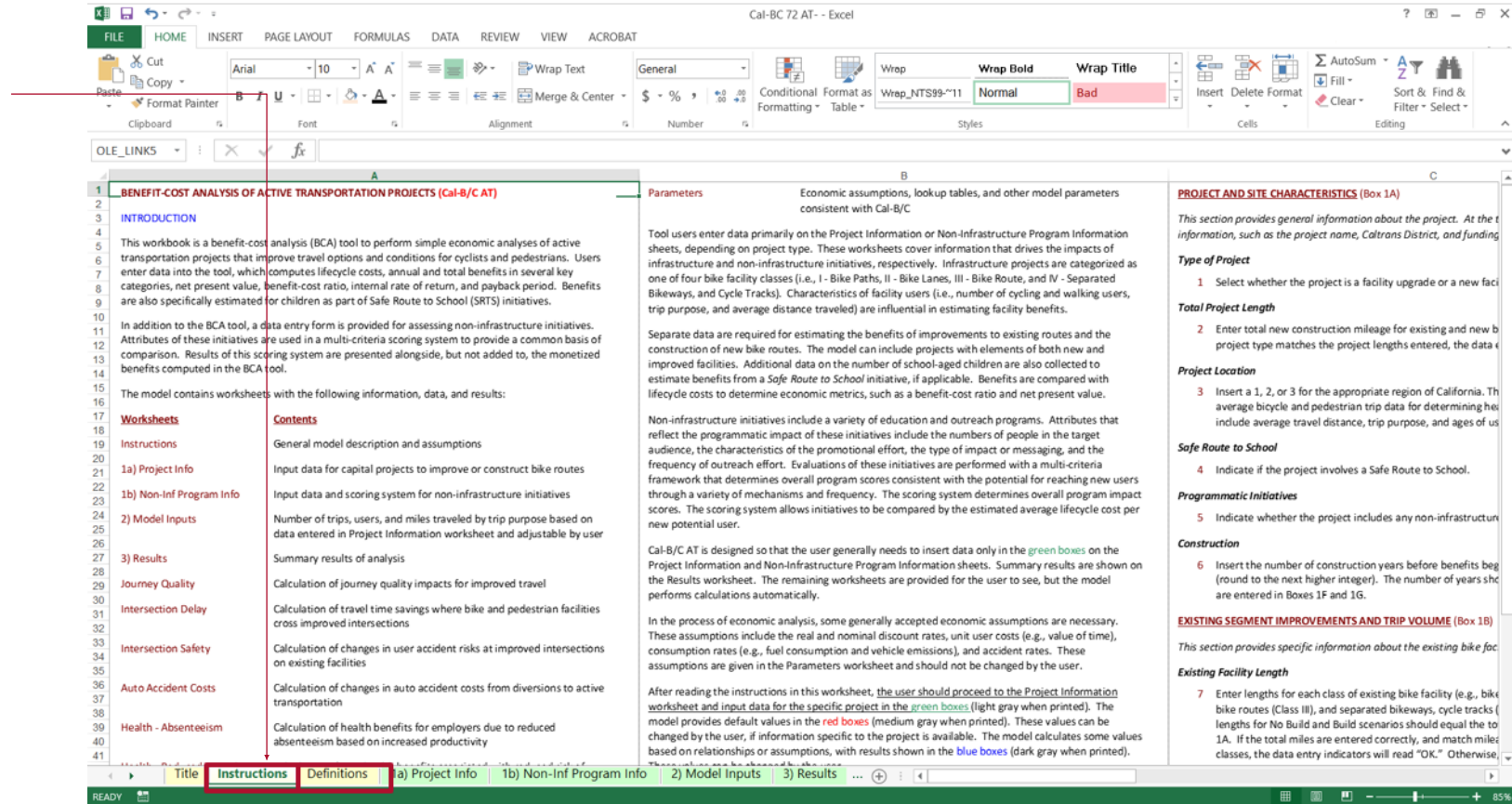
02

Additional Cal-B/C Tool Resources

Cal-B/C Tool Information

- The Instructions Worksheet in each Cal-B/C tool provides a quick source for information
- This worksheet is designed to print as a convenient reference booklet
- Cal-B/C AT (Active Transportation) also has a Definitions Worksheet that defines key terms

Cal-B/C AT Instructions Worksheet



Cal-B/C Additional Resources

- The primary resource for Cal-B/C is the Caltrans Transportation Economics Branch (TEB) website:
- <https://dot.ca.gov/programs/transportation-planning/economics-data-management/transportation-economics>
- You can also contact TEB directly with specific questions at:
eab@dot.ca.gov
- Subsequent slides summarize key supporting documentation that can be used to help you complete your BCA

Caltrans Transportation Economics Branch Website

Transportation Economics

Overview:

The Transportation Economics Branch provides transportation decision makers with expert research, analysis and legislative information to ensure productive and efficient use of public resources. The branch conducts economic analyses such as performing benefit-cost, economic impact and estimating motorist value of time. In addition, the branch publishes a county socioeconomic forecast and an overview of transportation funding in California. The branch assists Caltrans's Headquarters and district offices as well as entities such as the California State Transportation Agency, the California Transportation Commission, and external stakeholders. The Transportation Economics Branch can be reached at eab@dot.ca.gov.

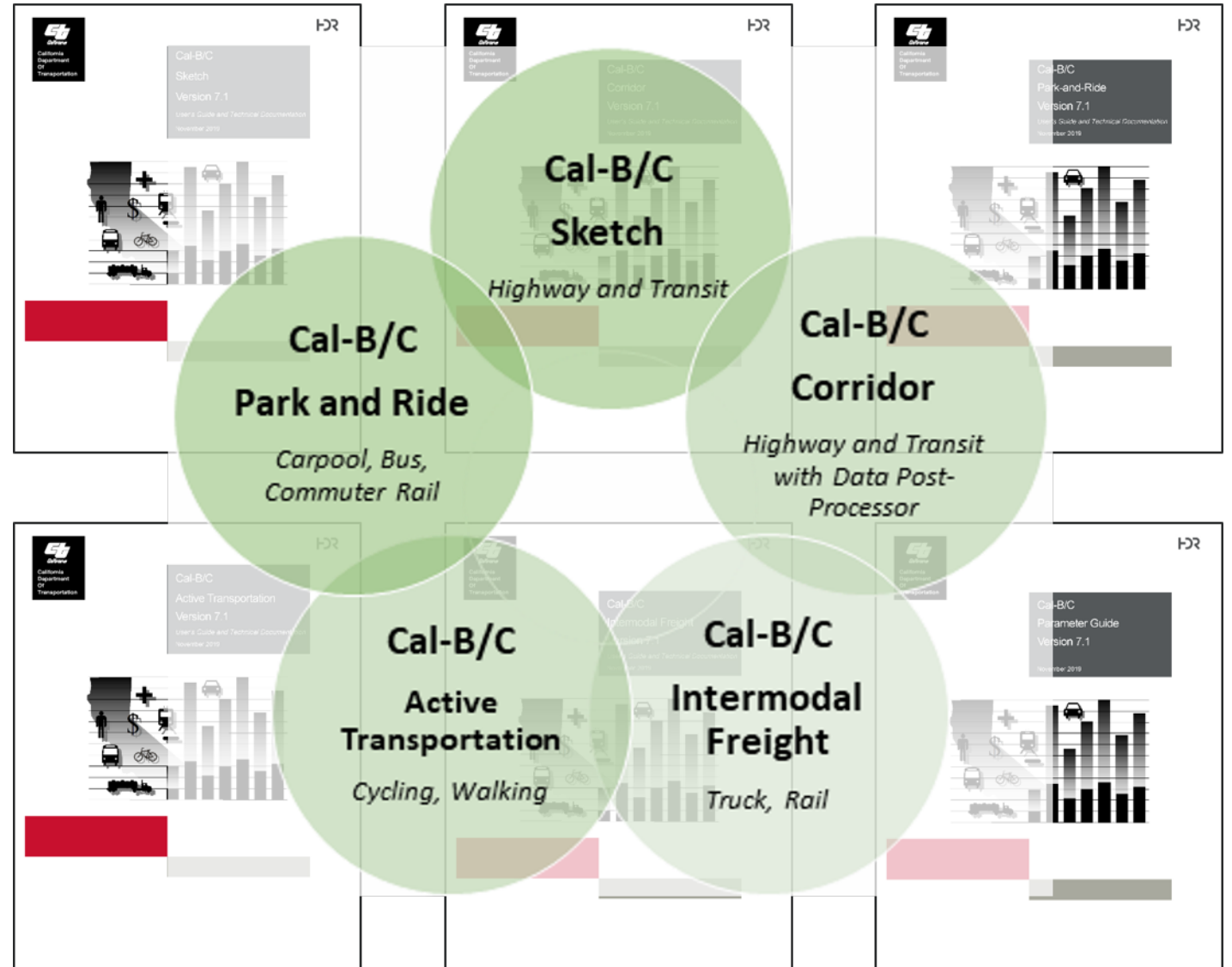
The California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C)

Cal-B/C is a suite of Excel workbooks developed by Caltrans's Transportation Economics Branch to provide decision-makers with the ability to assess the benefits and costs of transportation projects associated with the highway system. Cal-B/C is continuously updated to ensure that it aligns with current transportation benefit-cost findings and practices. Cal-B/C consists of five modules: 1) Cal-B/C Sketch, 2) Cal-B/C Active Transportation (AT), 3) Cal-B/C Park and Ride (PnR), 4) Cal-B/C Corridor, and 5) Cal-B/C Intermodal Freight (IF). The Cal-B/C Sketch model is periodically modified to comply with the U.S. Department of Transportation's "Benefit-Cost Analysis Guidance for Discretionary Grant Programs".

```
graph TD; A((Cal-B/C Sketch  
Highway and Transit)) --- B((Cal-B/C Corridor  
Highway and Transit with Data Post-Processor)); A --- C((Cal-B/C Intermodal Freight  
Truck, Rail)); A --- D((Cal-B/C Active Transportation  
Cycling, Walking)); A --- E((Cal-B/C Park and Ride  
Carpool, Bus, Commuter Rail));
```

Cal-B/C Tool User's Guides and Technical Documentation

- User's Guides for each of the 5 Cal-B/C tools are on the Caltrans TEB Cal-B/C website
- Parameter Guide presents assumptions and explanations of default calculations
- Each User's Guide is structured to provide:
 - Overview of Cal-B/C and the specific Cal-B/C tool
 - User requirements and skills needed to use Cal-B/C
 - Computer system and operating requirements
 - Details on each tool worksheet
 - One or more sample projects
 - Additional technical information
- Note that the latest user guides are for Version 7.1, while the latest tools are Version 7.2



Cal-B/C Sketch Guide

- Updated November 2019
- Analyzes projects using basic travel demand and operational inputs
 - Can estimate impacts of induced demand
- Uses sketch planning methods to assess:
 - Highway Capacity Expansions
 - Transit Capacity Expansions
 - Highway Operational Improvements
 - Transportation Management Systems (TMS)
- Four categories of benefits
 - Travel Time
 - Vehicle Operating Costs
 - Emissions
 - Collisions



Cal-B/C Corridor Guide

- Updated in 2019
- Post processor to calculate benefits using modeled data from micro-simulation and travel demand models
- Cal-B/C Corridor:
 - Can calculate impacts of induced demand
 - Allows the user to specify the number of model and safety groups (e.g., from one to 500 groups)
 - Period of analysis from two to 50 years
- Four categories of benefits
 - Travel Time
 - Vehicle Operating Costs
 - Emissions
 - Collisions



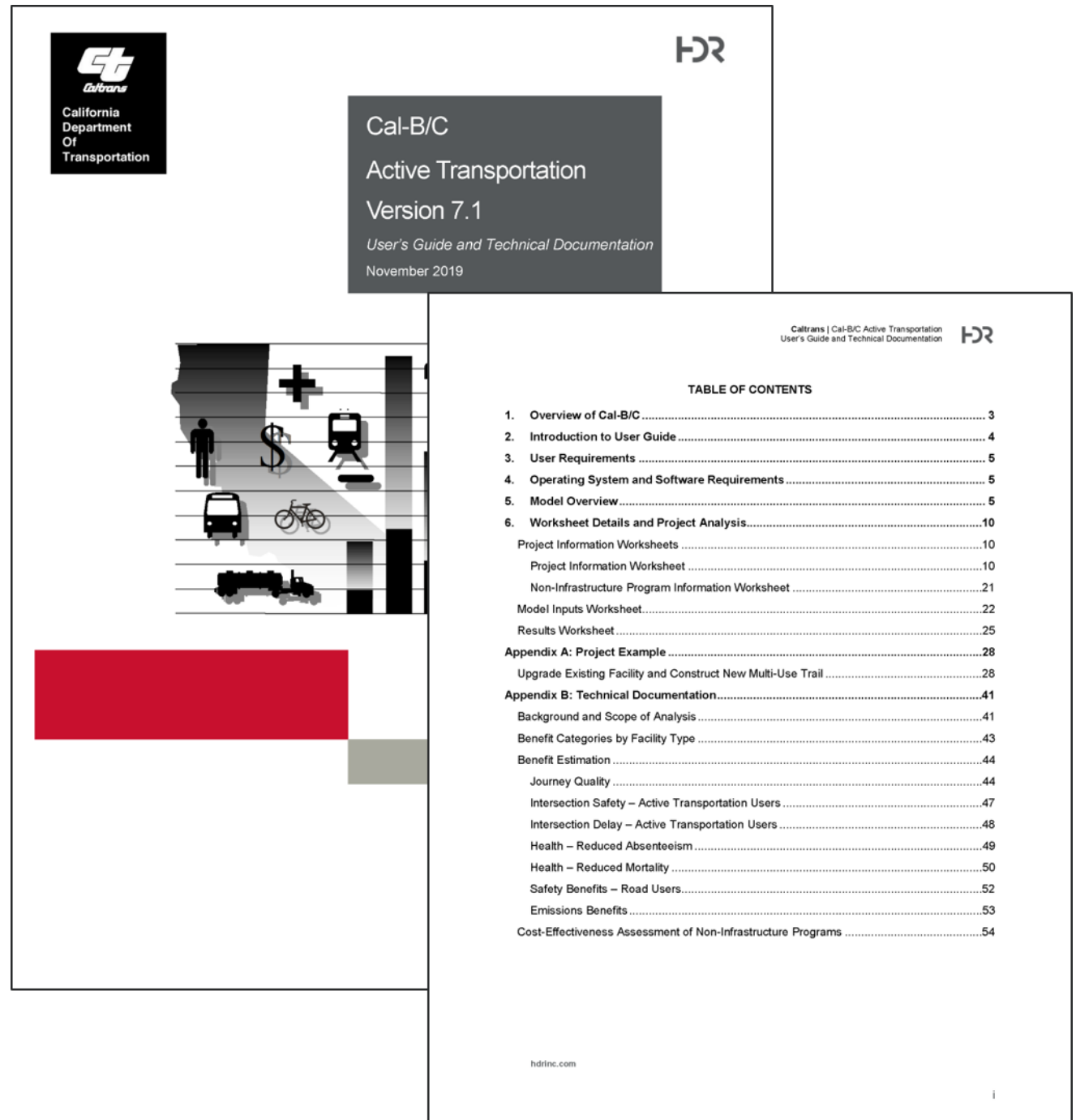
Cal-B/C Park & Ride (PnR) Guide

- Updated in 2019
- Cal-B/C PnR:
 - Evaluates new facilities, lot expansions, leased lots
 - Accounts for lot users who change from:
 - Autos to express bus or to carpool/vanpool
 - Local bus to express bus
 - A more distant lot to the new, closer lot
 - Allows up to 9 user destinations to be evaluated
- Four categories of benefits:
 - Travel time
 - Vehicle operations
 - Collisions
 - Emissions



Cal-B/C Active Transportation Guide

- Updated in 2019
- Cal-B/C AT evaluates bicycle and pedestrian projects and programs
- Cal-B/C AT evaluates impacts for five benefit categories:
 - Journey Quality
 - Additional Delay Savings
 - Additional Safety Benefits
 - Health Benefits
 - Auto Collision Costs
 - Auto Emissions



Cal-B/C Intermodal Freight Guide

- The newest Cal-B/C Tool Introduced in 2019
- Analyzes intermodal freight, drayage, transloading, and terminal efficiency projects
- Assesses 3 types of benefit:
 - Shipper Costs
 - Collision
 - Emissions
- Calculates benefits for bulk/break bulk and container shipments by mode
- Captures benefits from loading/unloading of commodities.



Cal-B/C Parameter Guide

- Each Cal-B/C Tool has the same **Parameters** worksheet
- Guide provides latest information on each assumption used by Cal-B/C, including:
 - General Economic Values
 - Highway Operations
 - Benefits Parameters
 - Model-Specific Parameters
- Parameters and assumptions are explained in more detail in Module 5 (Understanding Cal-B/C Parameters)
- Updated every few years (Cal-B/C version 7.2 uses 2016 as base year for economic assumptions)
- Users can adjust parameters as necessary
 - Some parameters may require expert knowledge in order to make adjustments (e.g., locomotive emissions)



	Total Over 20 Years	Average Annual
Life-Cycle Costs (mil. \$)	\$21.5	
Life-Cycle Benefits (mil. \$)	\$102.2	
Net Present Value (mil. \$)	\$90.7	
Benefit / Cost Ratio:	4.75	
Rate of Return on Investment:	30.4%	
Payback Period:	3 years	

	Total Over 20 Years	Average Annual
ITEMIZED BENEFITS (mil. \$)		
Travel Time Savings	\$72.1	\$3.6
Veh. Op. Cost Savings	\$8.7	\$0.3
Accident Cost Savings	\$21.7	\$1.1
Emission Cost Savings	\$1.8	\$0.1
TOTAL BENEFITS	\$102.2	\$5.1
Person-Hours of Time Saved	7,692,786	384,639
Fatalities Avoided	1	0
Injuries Avoided	109	8
PDO Avoided	1,247	62

	Total Over 20 Years	Average Annual	Total Over 20 Years	Average Annual
EMISSIONS REDUCTION				
CO Emissions Saved	104	5	\$0.0	\$0.0
CO ₂ Emissions Saved	22,124	1,106	\$0.7	\$0.0
NO _x Emissions Saved	27	1	\$1.0	\$0.0
PM ₁₀ Emissions Saved	0.13	0.01	\$0.1	\$0.0
PM _{2.5} Emissions Saved	0.17	0.01		
SO _x Emissions Saved	0.23	0.01	\$0.0	\$0.0
VOC Emissions Saved	6.30	0.31	\$0.0	\$0.0

Should benefit-cost results include:

- 1) Induced Travel? (y/n) N Default = Y
- 2) Vehicle Operating Costs? (y/n) Y Default = Y
- 3) Accident Costs? (y/n) Y Default = Y
- 4) Vehicle Emissions? (y/n) Y Default = Y
Includes value for CO₂e

The Parameter Guide provides detailed information on each assumption

PARAMETERS Worksheet is common to all Cal-B/C Tools

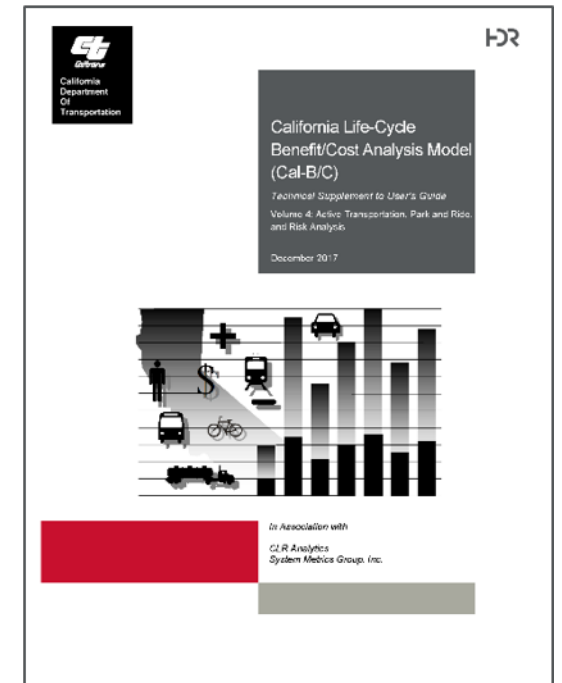
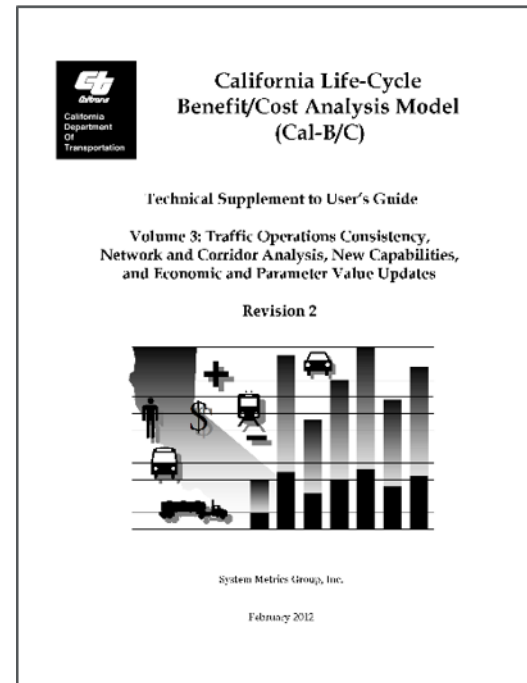
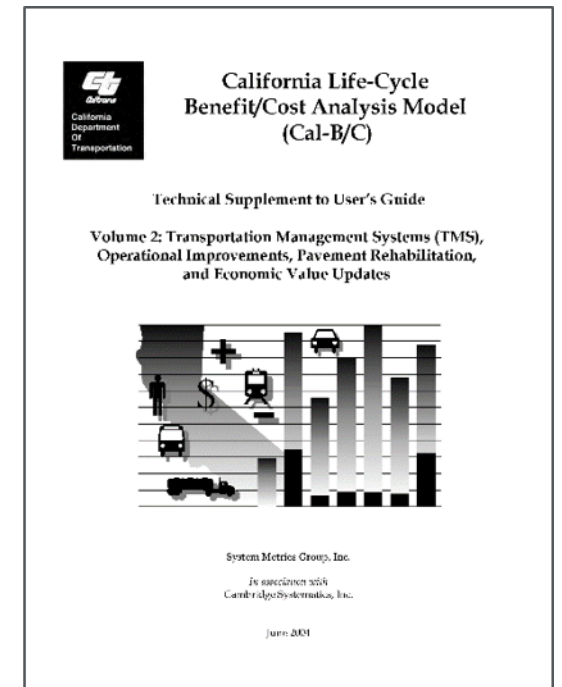
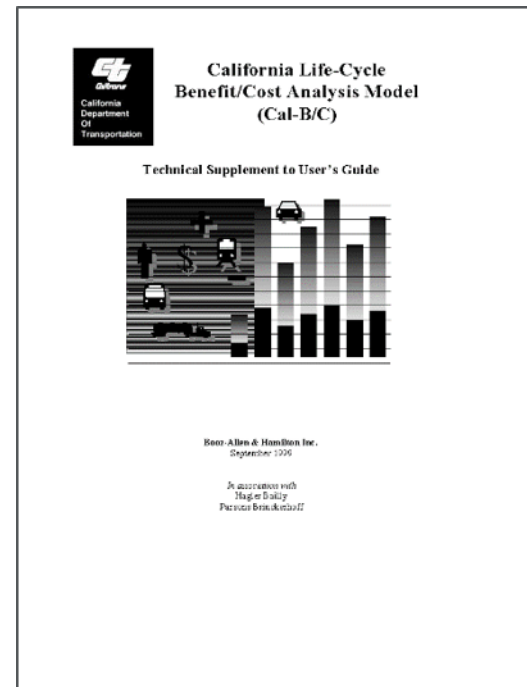
PARAMETERS

03

Other Resource Guides and Historical Technical Documentation

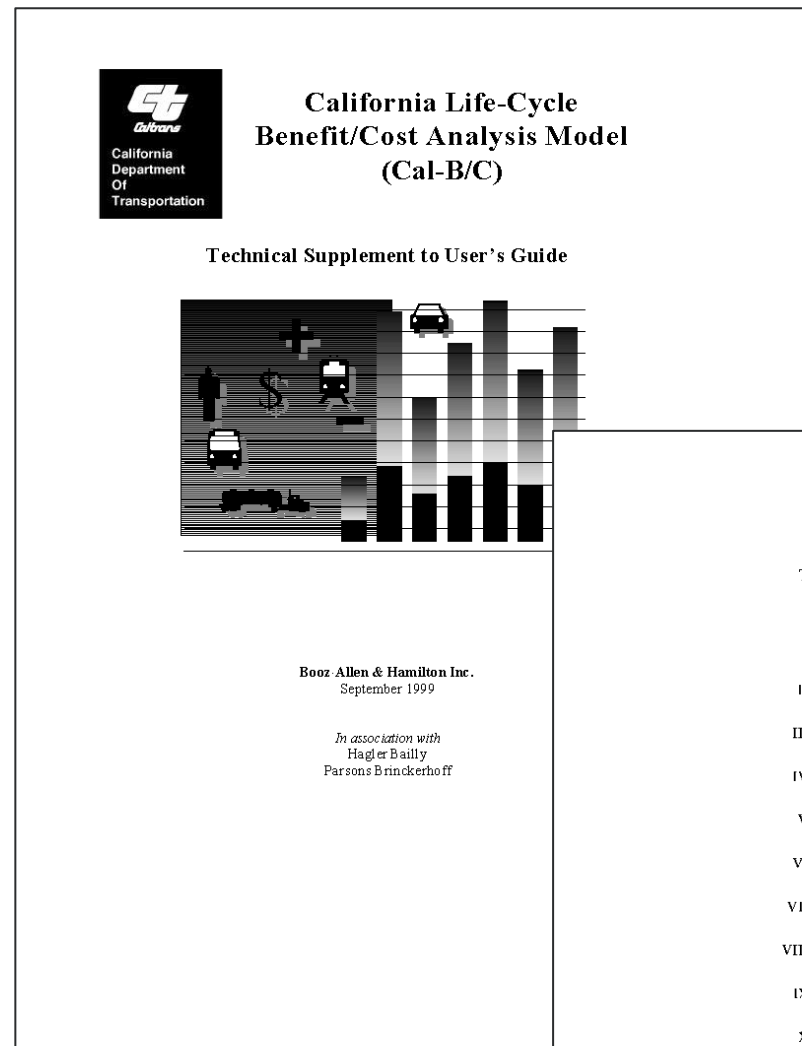
Cal-B/C Historical Technical Documents

- Most information in these historical documents has been updated and incorporated into the current User's Guides
- However, these supplements may provide useful background information and details on methodological approaches used in Cal-B/C
- Documents are available on the Caltrans, TEB website



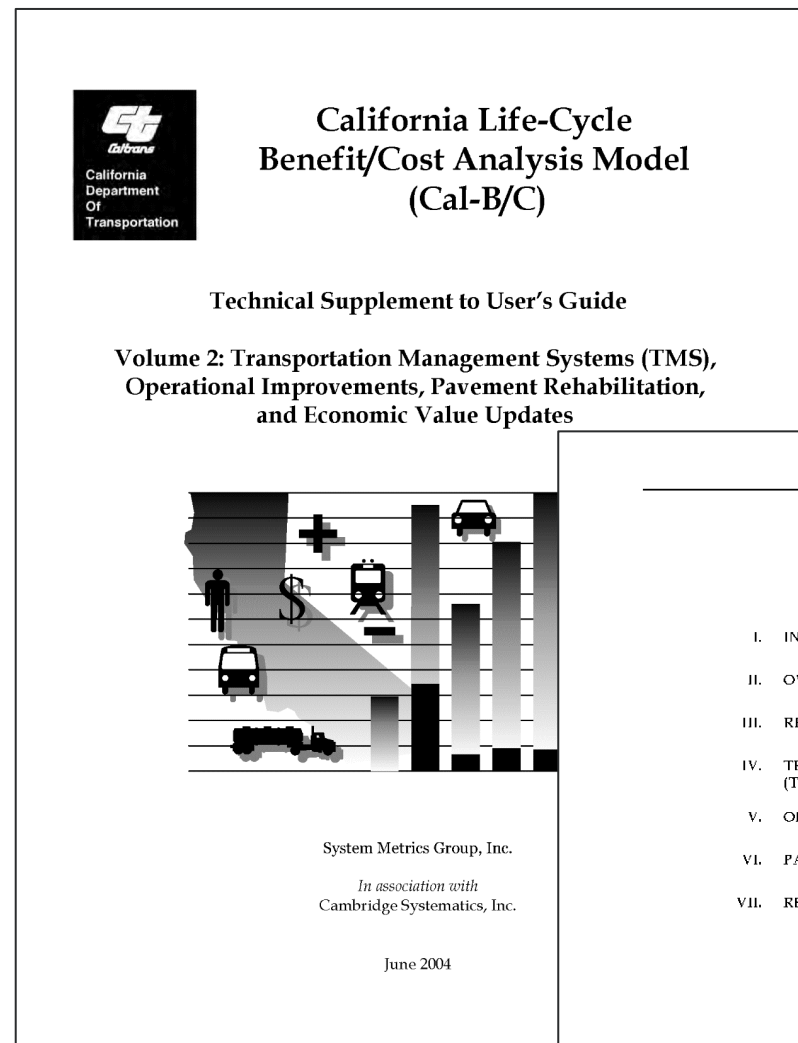
Cal-B/C Technical Supplement

- Released in 1999
- First technical supplement to provide methodological background for the original Cal-B/C model
- Cal-B/C Parameter Guide contains the most recent economic values and parameter updates
- Other technical details from this volume have been incorporated into the Cal-B/C Sketch User's Guide



Cal-B/C Technical Supplement Vol. 2

- Updated in 2004
- Expanded the Sketch tool analysis capabilities
- Part of Caltrans' efforts to mainstream ITS and implement Transportation Management System (TMS)
- Allowed Cal-B/C to handle most of the projects included in the State Highway Operation and Protection Program (SHOPP)
- Volume 2 explains updated approaches used to evaluate projects



Cal-B/C Technical Supplement Volume 2

Table of Contents

- I. INTRODUCTION
- II. OVERVIEW OF REVISED FRAMEWORK
- III. REVIEW OF IDAS MODEL
- IV. TRANSPORTATION MANAGEMENT SYSTEM (TMS) PROJECTS
- V. OPERATIONAL IMPROVEMENTS
- VI. PAVEMENT REHABILITATION
- VII. REFERENCES

1 System Metrics Group, Inc.

Cal-B/C Technical Supplement Vol. 3

- Updated in 2012
- Incorporated technical details for new project types:
 - Queuing projects
 - Rail grade-separation projects
 - High Occupancy Vehicle (HOV) lane requirement changes, the construction of High Occupancy Toll (HOT) lanes, or the conversion of existing HOV lanes
- The technical supplement also contains some information on Cal-B/C Corridor

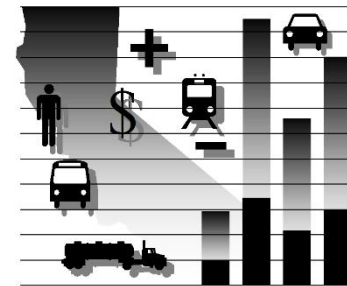


California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C)

Technical Supplement to User's Guide

Volume 3: Traffic Operations Consistency,
Network and Corridor Analysis, New Capabilities,
and Economic and Parameter Value Updates

Revision 2



System Metrics Group, Inc.

February 2012

Cal-B/C Technical Supplement Volume 3 Rev 2

Table of Contents

- I. INTRODUCTION
- II. OVERVIEW OF THE REVISED MODEL
- III. UPDATES TO ECONOMIC AND PARAMETER VALUES
- IV. TRAFFIC OPERATIONS CONSISTENCY
- V. HIGH OCCUPANCY TOLL (HOT) LANES
- VI. GRADE-SEPARATED RAIL CROSSINGS
- VII. QUEUES AND QUEUING ANALYSIS
- VIII. NETWORK AND CORRIDOR ANALYSIS
- IX. CAL-B/C CORRIDOR

Cal-B/C Technical Supplement Vol. 4

- Updated in 2017
- First technical supplements to provide methodological background for:
 - Cal-B/C AT (Active Transportation)
 - Cal-B/C PnR (Park and Ride)
 - Cal-B/C IF (Intermodal Freight)
- Volume 4 presents research on Risk Assessment and BCA



04

Additional Online Data Resources

Project Costing Information

- **Contract Cost Data:** (<https://sv08data.dot.ca.gov/contractcost/>)
 - Searchable historical bid data for Caltrans construction cost data
 - Caltrans Districts 1 -12, from 1993 to 2021
- **Coded Items:** (<https://dot.ca.gov/programs/design/ccs-coded-items>)
 - Coded Contract Items
 - Department-Furnished Materials and Supplemental Work Items
- **Other Estimating Resources:** (<https://sv08data.dot.ca.gov/contractcost/resources.html>)
 - Bid Summary Results: (<http://ppmoe.dot.ca.gov/des/oe/planholders/bidsum-result.php>)
 - Caltrans Construction Cost Indexes: (<http://ppmoe.dot.ca.gov/des/oe/hist-price-index.php>)
 - Equipment Rental Rate Information: (<http://www.dot.ca.gov/hq/construc/equipmnt.html>)
 - Caltrans Statewide Crude Oil Price Index: (<http://www.dot.ca.gov/hq/construc/crudeoilindex/>)
 - The PDPM On Cost Estimates (Chapter 20): (http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt20.pdf)
 - (Construction Contract Development Guide (formerly the Ready-To-List or RTL Guide): <http://ppmoe.dot.ca.gov/des/oe/guidance.html>)
 - Headquarters' Estimating Site: <http://www.dot.ca.gov/design/pjs/>
 - Guidance on Time-Related Overhead (TRO) and Mobilization
 - http://www.dot.ca.gov/design/pjs/coste/PG_Time_Related_Overhead_Item-Memo.pdf
 - http://www.dot.ca.gov/design/pjs/coste/PG_Mobilization_Contract_Item-Memo.pdf

The screenshot displays the Caltrans Contract Cost Data website. At the top, there is a navigation menu with links for Contract Cost Data Home, Code Search, Other Resources, Search Tips, and Help. Below this, a section titled "Other Estimating Resources" provides links to Bid Summary Results and a historical price index. The main content area is titled "Coded Items" and includes a search form for "Contract Cost Data". The search form has fields for "Item Code or Description*", "Include data from" (set to "all"), and "Year(s)". It also includes optional parameters for "Total Price (for item)" (Min \$, Max \$), "Quantity" (Min, Max), and "Unit" (set to "-any-"). A "Search" button is located at the bottom right of the search form. The footer contains a "Contact Us" link and copyright information for the State of California.

Contract Cost Data

Cost Data Home

Welcome to the Contract Cost Database Search Page. This site allows you to search historic bid data for Caltrans construction cost data. Use of this site constitutes acceptance of the [conditions of use](#). For more help on using this site [use this help page](#). For the most recent bid data, go to the [Headquarters bid summary results page](#).

Search Parameters

Item Code or Description*

Include data from bidder(s). (Note: Does not include irregular bidders).

To make multiple selections from the boxes below, hold the control key down as you make selections. Leave boxes unselected or blank to query for all the values.

District(s)	Year(s)
District 01	2021
District 02	2020
District 03	2019
District 04	2018
District 05	2017
District 06	2016
District 07	2015
District 08	2014
District 09	2013
District 10	2012
District 11	2011
District 12	2010

Optional Parameters:
(Fill in as many as you need, or leave them blank to search all)

Total Price (for item)

Min \$

Max \$

Quantity

Min

Max

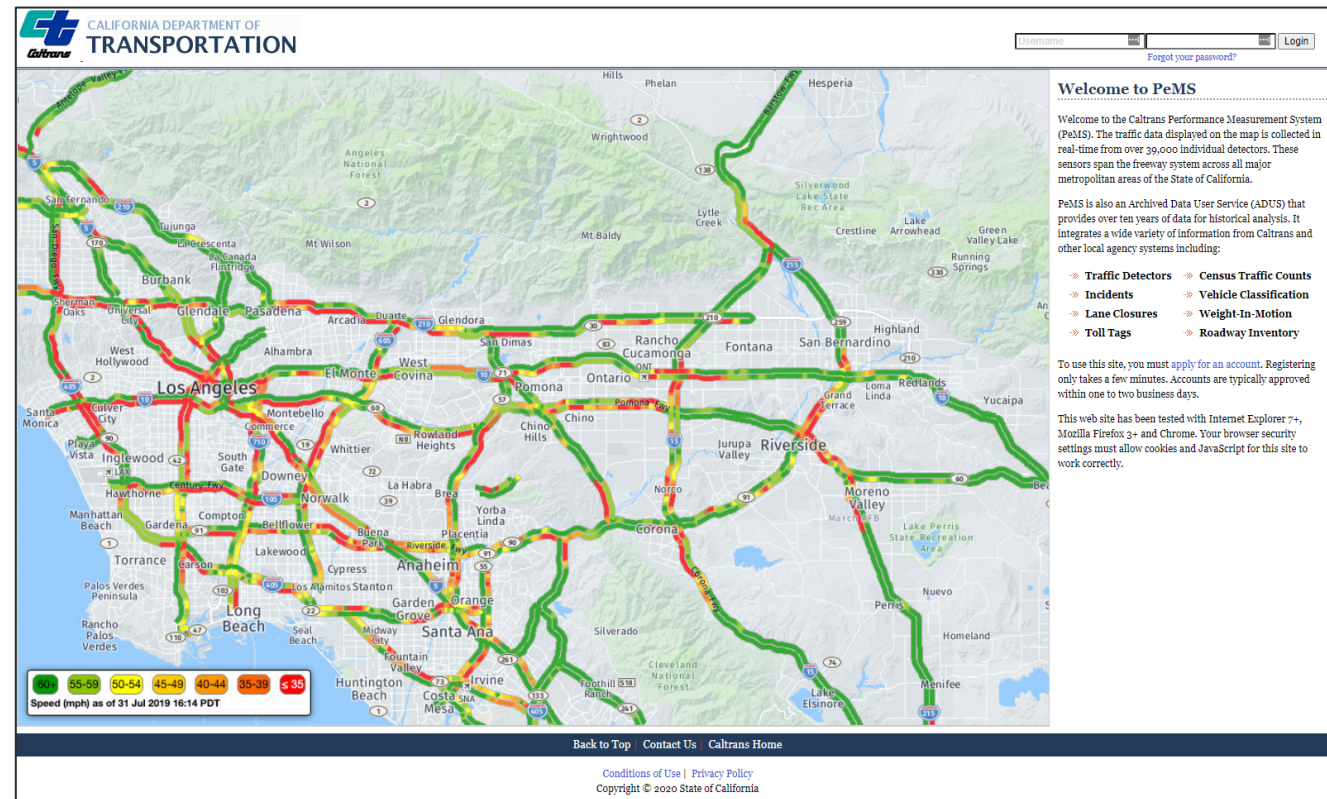
Unit convert to this unit whenever possible

Reset Search

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Copyright © 2007 State of California

Caltrans Performance Measurement System (PeMS)

- Real-time and historical performance data from 1998
- Various formats and presentation styles
- Data available includes speeds and volumes for:
 - Freeway mainline lanes
 - Freeway HOV lane
 - Freeway on-ramps and off-ramps (volumes only)
- CHP incident data, Caltrans TASAS data, and other relevant data for Cal-B/C analysis
- Estimates of truck volumes is also available
- Raw 5-minute, hourly, daily detector data and a wide range of other datasets can be downloaded for analysis outside of PeMS
- <http://pems.dot.ca.gov/>



Federal Transit Administration (FTA) National Transit Database (NTD)

- NTD data products include:
 - Detailed transit capital and operational data
 - National transit profiles: summaries and trends
 - Time series data on transit systems dating back to 1991
 - Up-to-date time series of monthly ridership data
- NTD data support Cal-B/C transit evaluations:
 - Ridership and service trends
 - Estimate transit in-vehicle speeds and travel times
 - Estimate cars per train based

<https://www.transit.dot.gov/ntd>

An official website of the United States government [Here's how you know](#)

Find the Latest Information on the Coronavirus/COVID-19 at [FTA's Coronavirus landing page](#).

United States Department of Transportation

Federal Transit Administration

About Funding Regulations & Programs

Home / National Transit Database

National Transit Database

About the NTD

NTD Data

Reference Materials

Reporting Login

Related Links

- [Sign up for Emails](#)
- [NTD Reporting Tool](#)
- [The National Transit Map](#)
- [Frequently Asked Questions](#)

Accessibility Contact

National Transit Database
1200 New Jersey Avenue, SE
Federal Transit Authority
Washington, DC 20590
United States

Email:
NTDhelp@dot.gov

Business Hours:
9:00am-5:00pm ET, M-F

The National Transit Database (NTD)

To keep track of the industry and provide public information and statistics as it continues to grow, FTA's National Transit Database (NTD) records the financial, operating and asset condition of transit systems.

After data reporting was required by Congress in 1974, the NTD was set up to be the repository of data about the financial, operating and asset conditions of American transit systems. The NTD is designed to support local, state and regional planning efforts and help governments and other decision-makers make multi-year comparisons and perform trend analyses. It contains a wealth of information such as agency funding sources, inventories of vehicles and maintenance facilities, safety event reports, measures of transit service provided and consumed, and data on transit employees.

What's New

In December 2019, FTA released its 2018 NTD data products, which provide the most recent data on transit ridership, expenses, fares, safety, assets and other transit system information. Data products are posted following transit agency submittal deadlines and review by FTA, making 2018 the most current information. See the [NTD Data page](#) to view the full set of publications and documentation.

FTA grant recipients – those receiving funding from the Urbanized Area Formula Program (5307) or Rural Formula Program (5311) – are required to submit data to the NTD in uniform categories. More than 660 transit providers report to the NTD through the Internet-based system.

Caltrans Traffic Operations Data Sources

- Traffic Census Program
- Caltrans Traffic Counts are summarized annually into four categories:
 - Traffic Volumes: Annual Average Daily Traffic (AADT)
 - Truck Traffic: Annual Average Daily Truck Traffic
 - Ramp Volumes
 - Peak Hour Volume Data
- <https://dot.ca.gov/programs/traffic-operations/census>

The screenshot shows the Caltrans website's 'Traffic Census Program' page. The header includes the Caltrans logo and navigation links for 'Travel', 'Work with Caltrans', 'Programs', 'Caltrans Near Me', and 'Search'. The main content area features a breadcrumb trail: Home | Programs | Traffic Operations | Traffic Census Program. The title 'Traffic Census Program' is followed by a brief description: 'Traffic Counts (a.k.a. Traffic Volumes) are for the State Highway System only (in various formats). Highways are signed as Interstate, California State Route, or United States Route. See examples below:'. Below this text are three highway shields: Interstate 80, California State Route 24, and United States Route 99. A note states: 'Traffic count information for city and county streets may be found at the city Traffic Engineering or Public Works Department, or the Community Development Office in the area where the street is located.' A link is provided: 'Explanation of Traffic Counts (Back & Ahead Leg Diagrams) (PDF)'. The page then states: 'Caltrans Traffic Counts are summarized annually into four categories:'. Two categories are detailed: 'Traffic Volumes: Annual Average Daily Traffic (AADT)' and 'Truck Traffic: Annual Average Daily Truck Traffic'. For AADT, it says 'For ALL vehicles on California State Highways.' and provides links for 'Webpage: 2017', 'PDF: 2016-AADT (PDF) | 2015-AADT (PDF) | 2014-AADT (PDF) | 2013-AADT (PDF)', and 'Excel: 2018-AADT (XLSX) | 2017-AADT (XLSX) | 2016-AADT (XLSX) | 2015-AADT (XLSX) | 2014-AADT (XLSX) | 2013-AADT (XLSX)'. A note specifies: 'Note: Only Excel format available from 2017 to current year.' For Truck Traffic, it says 'For truck traffic on California State Highways.' and provides links for 'PDF: 2016-AADT Truck (PDF) | 2015-AADT Truck (PDF) | 2014-AADT Truck (PDF) | 2013-AADT Truck (PDF)'. A right-hand sidebar titled 'Traffic Census Program' contains a list of links: 'Traffic Census Homepage', 'Monthly Vehicle Miles of Travel (MVMt)', 'Traffic Counts (Volumes)', 'Explanation of Traffic Counts (PDF)', 'Traffic Volume Trends (TVT) FAQ', and 'Traffic Data FAQ (PDF)'. Below this is a 'Related Resources' section with links to 'Planning Economic Forecasting', 'Highway Performance Monitoring System (HPMS)', 'GIS Data Library', 'Mobility Performance Reporting and Analysis Program', 'Performance Measurement System (PeMS)', 'Weigh-In-Motion (WIM) Data', 'Freight Mobility & Planning', 'Quick Map', and 'FHWA Office of Travel Monitoring'.

Federal Highway Administration (FHWA) – Truck Speeds

- FHWA Planning, Environment, Realty (HEPGIS) website has geo-spatial maps and data
- FHWA National Performance Management Research Data Set (NPMRDS) contains travel time data on the National Highway System
- Monthly Travel Time Reliability Index Layer has data to calculate truck speeds

<https://hepgis.fhwa.dot.gov/>

The screenshot shows the HEPGIS interface with a map of the San Bernardino region. A data table titled "Reliability Index Highway July - 1000/78842 Rows" is overlaid on the map. The table has columns for LENGTH, TMC, and average travel times for different periods: Truck Weekday 6 to 10am Avg, Truck Weekday 10am to 4pm Avg, Truck Weekday 4pm to 8pm Avg, Truck Weekend 8am to 8pm Avg, and Truck Overnight 8pm to 6am Avg. An Excel spreadsheet is also visible in the foreground, showing the same data table.

LENGTH	TMC	Truck Weekday 6 to 10am Avg	Truck Weekday 10am to 4pm Avg	Truck Weekday 4pm to 8pm Avg	Truck Weekend 8am to 8pm Avg	Truck Overnight 8pm to 6am Avg
0.00		0.00	0.00	0.00	0.00	0.00
0.58 126P04674		36.82	36.46	42.38		37.50
0.58 126P04128		33.51				40.48
0.55 126N04128		39.62	40.74		38.78	
0.55 126N04674		42.88	42.54		40.79	40.67
0.65 126-04128		44.01	43.32	44.06	40.60	44.01
0.51 126-04127		46.53	49.43		38.26	42.94
0.39 126P04127		26.34	25.81	25.44	23.37	25.21
41.83		45.70	29.68		35.04	38.44
243.11		235.83	237.79	224.53	228.11	228.11
269.10		279.83	216.33	246.56	247.60	
54.89		54.00	55.85	51.86	54.52	
47.16		42.80	40.50	40.11	43.76	
91.91		73.35	67.07	69.93	81.04	
70.65		70.83	76.97	67.32	69.94	
52.27		40.66	42.69	38.43	40.18	
41.30		41.09	45.55	40.42	40.59	

Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

- Highway inventory database housing and historical data for State Highway System (SHS) ramps, intersections, and roadways on the State Highway System (SHS)
- Inventory data
 - Examples: district, county, route, post mile, number of lanes, geometric attributes of lanes, shoulders, medians, intersections and ramps) continuously
- Data/Reports only accessible through Caltrans Staff
- <https://dot.ca.gov/programs/research-innovation-system-information/office-of-highway-system-information-performance>

The screenshot shows the Caltrans website interface for the Traffic Accident Surveillance and Analysis System (TASAS). The top navigation bar includes links for 'About Caltrans', 'Contact Us', 'ADA Certification', 'Request ADA Compliant Documents', 'Settings', and 'Translate'. Below this is a secondary menu with 'Travel', 'Work with Caltrans', 'Programs', 'Caltrans Near Me', and 'Search'. The main content area is titled 'Traffic Accident Surveillance and Analysis System (TASAS)' and lists several report categories:

- **Highway Sequence Listing**
Highway Sequence Listing lists all current highway segments, intersections and ramps by district, county, route and postmile and is published annually. The following information is provided in the report:
 - Location: District, route, county, city, and postmile
 - Highway group and facility type
 - Highway segment length
 - Description of bridges, intersections, and ramps
- **Annual Collision Data on California State Highways**
This report presents annual collision data on California State Highways and which is summarized by urban, rural, and districtwide or countywide according to the following categories: lane type, road miles travel, accidents, victims, rates, and fatalities. Additional data include trend data, data by district, basic average accident rates, accident data by date or hour, and by type of collision.
- **Place Name Publication**
The name report is prepared as a ready reference to places shown on the California System (CRS) maps.
- **Name Freeway Publication**
Named Freeways, Highways, Structures and Other Appurtenances in California are shown in the Name Freeway Publication as a reference to the many named facilities that are part of the California State Highway System. This publication provides information on officially named freeways; highways; structures such as bridges, tunnels, and interchanges; Blue Star Memorial Highways; Safety Roadside Rest Areas; and memorial plaques.
- **Traversable Highway Publication**

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01/14/2020
02:30 PM

California Department of Transportation
Table B - Selective Accident Rate Calculation

Page# 1
Event ID: 4185099

Location Description	Rate Group (RUS)	Tot	No. of Accidents / Significance							ADT Main X-St	Total M/V+ or MVM	Accident Rates					
			Tot	Fat	Inj	F+I	Veh	Wet	Dark			Pers Inj	Actual Fat	F+I	Tot	Average Fat	F+I
...	8.293 MI H U	627	5	243	248	488	64	221	5	131.2	794.27	0.006	.31	.79	0.003	.24	.77
...	43.789 MI H NA	10598	31	2854	2885	9474	465	3609	34	226.8	7249.88	0.004	.40	1.46	0.004	.34	1.09
...	16.763 MI H NA	13269	24	3676	3700	11844	654	4626	25	237.3	8100.70	0.003	.46	1.64	0.004	.34	1.08
...	11.506 MI H NA	1475	3	394	397	1255	76	478	3	177.1	1487.53	0.002	.27	.99	0.004	.27	.85

CHP Statewide Integrated Traffic Records System (SWITRS)

- Collision data collected for all incidents reported to law enforcement for both arterials and State Highways
- Source for collision data not on the SHS
- Account is required to access detailed data
- California accident data by locations, dates, and collision types
- Data is available in either report or raw formats

<https://iswitrs.chp.ca.gov/Reports/jsp/index.jsp>

The image displays two screenshots of the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) website. The top screenshot shows the main page with a navigation menu (HOME, FIND AN OFFICE, NOTIFY CHP, NEWS & ALERTS, TRAFFIC, PROGRAMS & SERVICES, CHP CAREERS) and a search bar. The bottom screenshot shows the 'SWITRS Reports - Criteria Selection' page, which includes a sidebar with navigation options (SWITRS Reports, OTS Reports, Raw Data, Request History, User Profile, Report Samples, Logout) and a main content area with the following form fields:

- FILTER RECORDS BY:**
 - JURISDICTION: ALL
 - LOCATION: Any
 - COUNTY: ALL
- REPORTING PERIOD START (MM/DD/YYYY):** []
- REPORTING PERIOD END (MM/DD/YYYY):** []
- INCLUDE COLLISIONS THAT OCCURRED ON:**
 - PRIVATE PROPERTY (Use for Univ/State Park Dist/Airport/Harbor)
 - STATE HIGHWAY (interstate, U.S., state route)
- REPORT TYPE:** Collisions and Victims by Motor Vehicle Involved With
- Buttons:** GENERATE REPORT, CLEAR FORM

Additional text on the page includes a 'SWITRS Login' section with fields for E-Mail ID and Password, and a 'CPRA Advertisment' section regarding the Public Records Act (CPRA).

Caltrans Office of Pavement Management

- Pavement data for the State Highway System (SHS)
 - Pavement Management System (PaveM) – current and historical pavement condition, current programmed projects, traffic, and climate data
 - Automated Pavement Condition Survey (APCS) - PaveM input and validates pavement performance prediction models
 - State of the Pavement Report (SOP) - Annual report based the APCS
 - <https://dot.ca.gov/programs/maintenance/pavement/pavement-management>

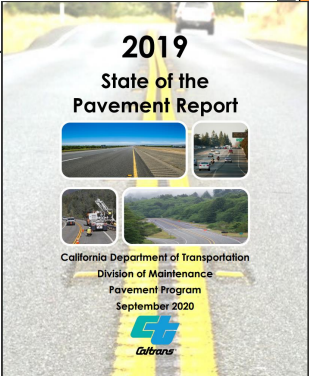
- Local Agencies may have their own Pavement Programs/ Data Systems
 - May have inventory data for all roads within the city or county
 - May assess pavement condition based on distress information
 - May identify all pavement segments that need rehab or replacement
 - <https://mtc.ca.gov/our-work/fund-invest/investment-strategies-commitments/fix-it-first/local-streets-roads/pavement>

The screenshot displays the Caltrans Pavement Management website interface. The top navigation bar includes links for Home, Programs, Maintenance, Pavement, and Pavement Management. The main content area is titled "Pavement Management" and provides information about the Office of Pavement Management (2389 Gateway Oaks Drive, Suite 200, Sacramento, CA 95833) and its primary functions: managing, operating, developing, and maintaining Caltrans Pavement Management System (PaveM); collecting, analyzing, and managing automated pavement condition survey (APCS) data; and developing and publishing the State of the Pavement Report (SOP). It also lists the primary functions of the Office of Pavement Management: manage, operate, develop, and maintain Caltrans Pavement Management System (PaveM); collect, analyze, and manage automated pavement condition survey (APCS) data; and develop and publish the State of the Pavement Report (SOP). The website also provides a link to the State of the Pavement Report (SOP) and a link to the Automated Pavement Condition Survey (APCS) data.

Overlaid on the website is a Microsoft Excel spreadsheet titled "Caltrans Pavement Program Pavement Condition Summary Report (PaveM) BOTH DIRECTIONS; ALL LANES". The spreadsheet shows data for District 7, County: Los Angeles (LA), Route: 605, from PM: 8.000 to PM: 8.000, with a length of 8.000 miles. The data is organized into columns for Year/Condition Lane Miles, Green, Yellow, Blue, Orange, Red, Good, Fair, Poor, Total Lane Miles, Effectiveness ((Red + Orange) / Total Lane Miles) %, and Rehab Effectiveness (Red/Total Lane Miles) %.

Year/Condition Lane Miles	Traditional Condition (lane miles)					MAP-21 Condition (lane miles)			Total Lane Miles	Effectiveness (%)	
	Green	Yellow	Blue	Orange	Red	Good	Fair	Poor		Effectiveness ((Red + Orange) / Total Lane Miles) %	Rehab Effectiveness (Red/Total Lane Miles) %
2015	59,805	9,956	4,407	0,174	1,950	41,600	34,692	0,000	76,292	2.78	2.56
2016	69,715	3,775	2,827	0,000	0,241	57,153	15,164	0,241	76,558	0.31	0.31
2017	No Data Available										
End Previous Years Actuals - Begin APCS Data Collection Year and Predicted Years											
2018	65,857	2,800	1,735	6,166	0,000	47,306	28,160	1,092	76,558	8.05	0.00
2019	64,652	2,800	0,643	8,463	0,000	45,912	29,554	1,092	76,558	11.05	0.00
2020	63,823	2,800	0,643	9,292	0,000	43,187	32,279	1,092	76,558	12.14	0.00
2021	58,680	4,612	0,643	12,623	0,000	36,424	39,042	1,092	76,558	16.49	0.00
2022	54,049	4,612	1,787	15,710	0,000	29,162	45,160	2,236	76,558	20.52	0.00
2023	51,204	2,904	1,787	19,899	0,854	24,236	50,086	2,236	76,558	26.59	1.12
2024	42,525	5,656	0,884	26,639	0,854	21,837	52,485	2,236	76,558	35.91	1.12
2025	32,298	8,954	0,884	32,714	1,708	21,266	53,056	2,236	76,558	44.96	2.23
2026	29,018	7,778	0,643	37,411	1,708	19,489	54,833	2,236	76,558	51.10	2.23
2027	26,703	8,175	0,643	39,329	1,708	18,574	55,533	2,451	76,558	53.60	2.23
2028	24,816	8,175	0,643	41,216	1,708	16,514	57,593	2,451	76,558	56.07	2.23
2029	21,377	8,866	0,643	41,780	3,892	12,842	60,173	3,543	76,558	59.66	5.08
2030	21,377	8,866	0,643	41,780	3,892	12,842	59,999	3,717	76,558	59.66	5.08
2031	20,538	6,845	0,397	43,794	4,984	11,894	60,093	4,571	76,558	63.71	6.51
2032	19,446	6,845	0,397	43,248	6,622	11,535	59,670	5,553	76,558	65.14	8.65

The spreadsheet also includes a "Detailed Breakdown of MAP-21 Fair Condition (lane miles)" section with columns for Year/Condition Lane Miles, Fair (Poor Cracks), Fair (Poor Rides), Fair (Poor Rut/Fault), Fair (Fair Cracking), Fair (Fair Cracking), Fair (Fair Cracking), Fair (IRI & Rut), and Fair (All Fair).



U.S. Census Bureau - American Community Survey (ACS)

- Population, socioeconomic, demographic, journey-to-work data available for high-level planning and forecasting
- Mode share data available by census tract
- Grant applications for improvements often request ACS-based information

United States Census Bureau

Search

BROWSE BY TOPIC EXPLORE DATA LIBRARY SURVEYS/ PROGRAMS INFORMATION FOR... FIND A CODE ABOUT

2015-2019 American Community Survey 5-year Public Use Microdata Sample (PUMS) files are now available.

// Census.gov > Our Surveys & Programs > American Community Survey (ACS)

AMERICAN COMMUNITY SURVEY (ACS)

About the ACS

Respond to the ACS

News & Updates

Data

Microdata

Guidance for Data Users

Geography & ACS

Technical Documentation

Methodology

Library

Operations and Administration

Contact Us

< Back to Our Surveys & Programs

American Community Survey (ACS)

The American Community Survey (ACS) helps local officials, community leaders, and businesses understand the changes taking place in their communities. It is the premier source for detailed population and housing information about our nation.

How do I respond to the ACS?

ACS data help with COVID-19 response efforts

Should I respond to both the ACS and 2020 Census?

Data

<https://www.census.gov/programs-surveys/acs>

Emissions Data

- Some users may wish to evaluate the impacts of improved technologies (e.g., more fuel-efficient locomotives)
- This type of edit requires advanced expert knowledge to identify and to convert emissions factors into a parameter consistent with Cal-B/C
- Association of American Railroads (<https://www.aar.org/>)
- California Air Resources Board (<https://arb.ca.gov/>)
- California Air Resources Board emissions inventory EMFAC 2017 (<https://arb.ca.gov/emfac/>)

**PUTTING
TECHNOLOGY
TO WORK**

**HOW FREIGHT RAIL
DELIVERS THE
21ST CENTURY**



TECHNOLOGY ASSESSMENT:
FREIGHT LOCOMOTIVES

A screenshot of the EMFAC website. The browser address bar shows 'arb.ca.gov/emfac/'. The page features the 'EMFAC' logo, a navigation menu with 'EMISSIONS INVENTORY', 'PROJECT ANALYSIS', 'SCENARIO ANALYSIS', and 'FLEET DATABASE', and a main content area with a 'Welcome to EMFAC' heading and a paragraph of introductory text. A date stamp 'MAY 2018' is visible in the bottom right corner of the page.

EMFAC

CALIFORNIA AIR RESOURCES BOARD

EMISSIONS INVENTORY PROJECT ANALYSIS SCENARIO ANALYSIS FLEET DATABASE

Welcome to **EMFAC**

This website provides California's emissions inventories of onroad and offroad mobile sources and tools to perform project-level assessment with custom meteorological conditions and scenario analysis with custom vehicle activity. It also provides detailed vehicle registration information aggregated up to the census block group level. This website is named after EMISSION FACTOR (EMFAC), a model that estimates the official emissions inventories of onroad mobile sources in California.

Updates

- November 2020: Fleet Database provides the information on the calendar year 2019.
- September 2020: Video tutorials on the new EMFAC website are made available.

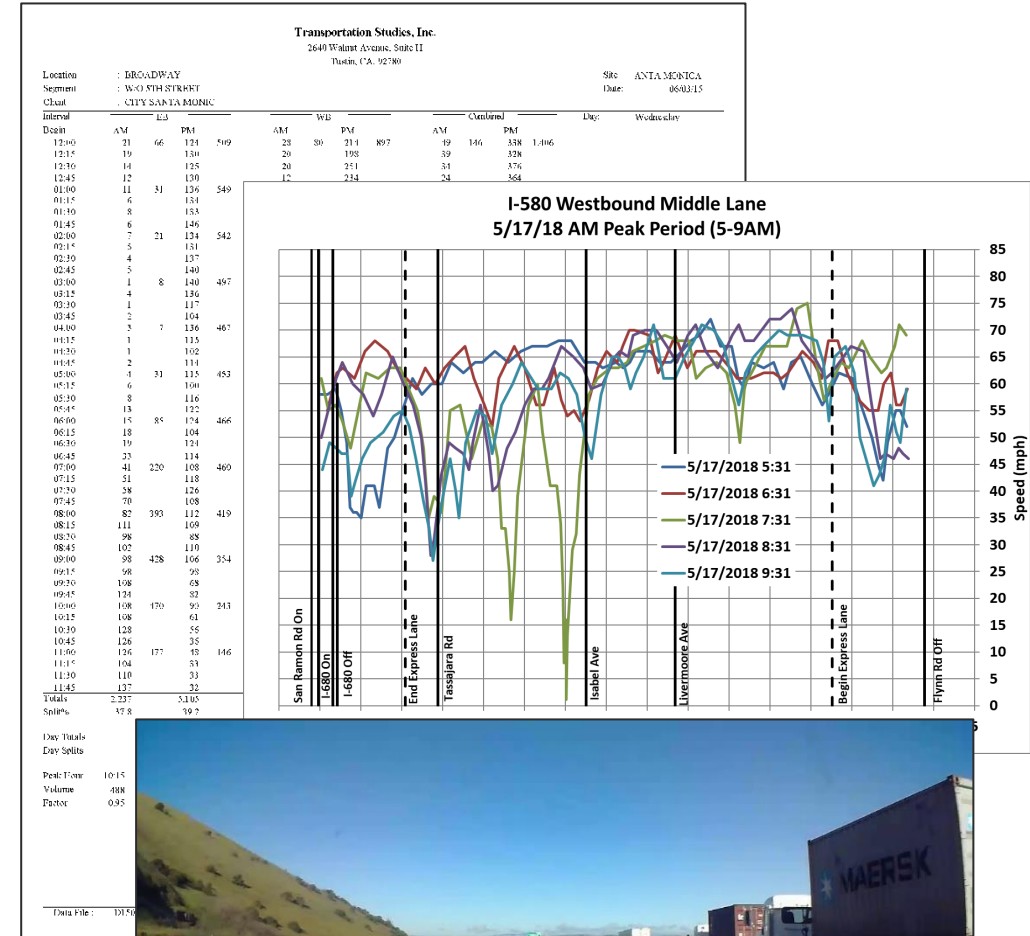
Crowd-Sourced Data

- INRIX (<https://inrix.com>)
 - Speed and travel time data at a very detailed spatial network and for various time intervals
- HERE (<https://www.here.com>)
 - Speed and travel time data similar to INRIX. May include truck speeds
- Streetlight (<https://www.streetlightdata.com>)
 - AADT, VMT, Speeds, & Travel Times at various spatial network scales and time intervals
- ReplicaHQ (<https://replicahq.com>)
 - Mobility and economic data at census-tract level
 - Detailed, activity-based travel models, region- and time-specific
 - Forecasting and impact analysis, built on Places data



Field Data Collection

- Field data collection can be used where other automatically collected data may not be available or of sufficient data quality
- Travel Time Studies (Probe / Floating Vehicles)
- Vehicle Classification and Occupancy Counts
- Average Daily Traffic (ADT) counts



04

Additional BCA Learning Resources

Closing Remarks

- This is the last module in the Cal-B/C Suite web-based training course
- In this module we provided some additional resources where you can find:
 - User's Guides and supplemental technical information about Cal-B/C from Caltrans Transportation Economics Branch website
 - Data sources to assist you in performing your BCA
 - Additional resources to learn more about BCA