



Cal-B/C Training Module 8d

Cal-B/C Park-and-Ride (PnR)

Understanding Project Input Sheets and Data

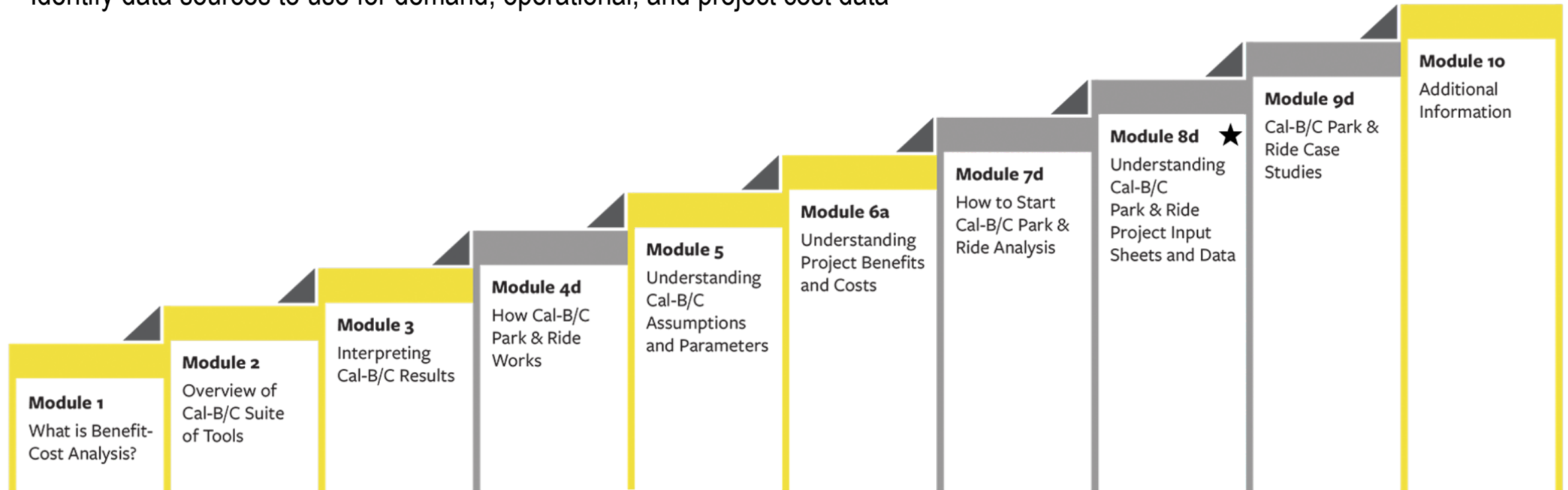


01

About This Module

This module will...

- Build on Modules 4d and 7d to provide more details on how to get data for your benefit-cost analysis (BCA) using Cal-B/C Park-and-Ride
- Identify data sources to use for demand, operational, and project cost data



★ *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
- **Module 4d** presented an overview of how Cal-B/C Park-and-Ride works including a review of all worksheets and inputs
 - This current module complements Module 4d
- **Module 5** highlighted the information in the Parameters worksheet and discussed key assumptions used by Cal-B/C
- **Module 6a** provided detailed information on how Cal-B/C Park-and-Ride calculates benefits
- **Module 7d** presented the approach to starting a Cal-B/C Park-and-Ride analysis

Requirements for Making Full Use of This Module

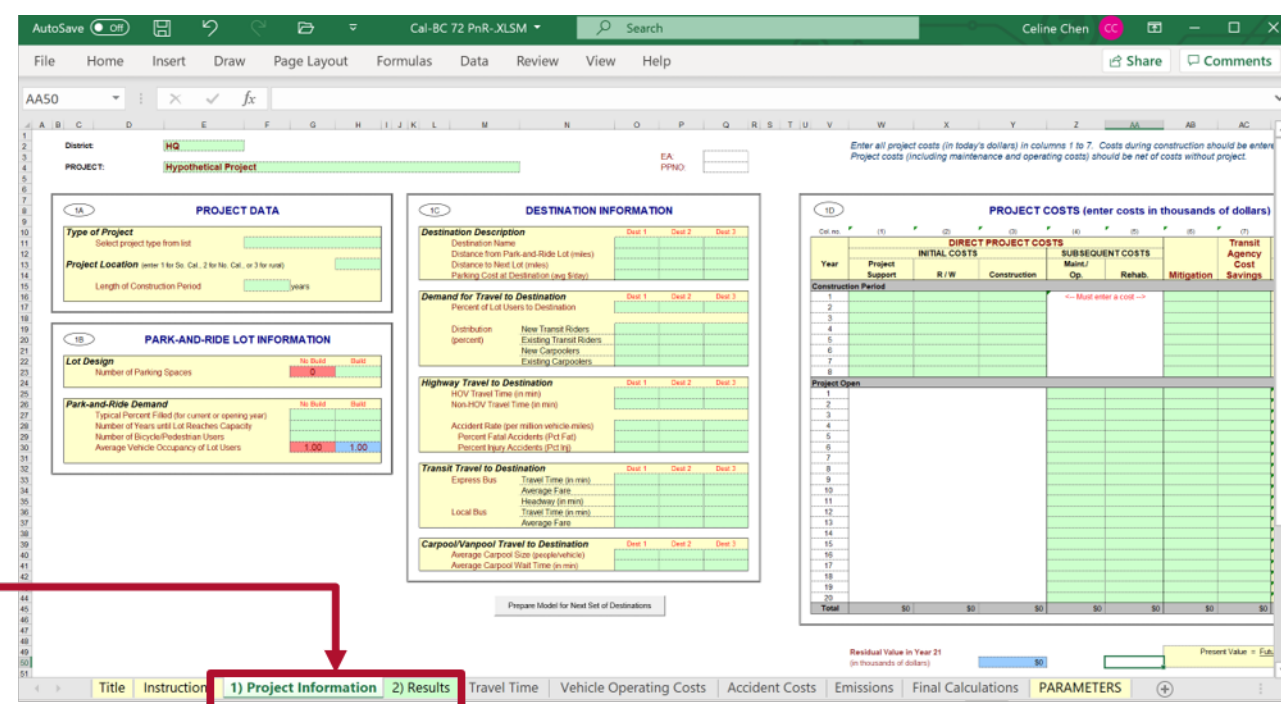
- Basic understanding of traffic engineering and transportation planning methodologies, data and terminology
- Useful to understand Park-and-Ride operational characteristics
- Working knowledge of travel demand modeling concepts and data
- Ability to navigate websites and download relevant data
- Knowledge of Microsoft Excel and data analysis features
 - Pivot tables and charting tools to manipulate data



02

Cal-B/C Park-and-Ride Data Entry Worksheets Overview

Primary Cal-B/C Data Entry Worksheets



Worksheets where data will be entered

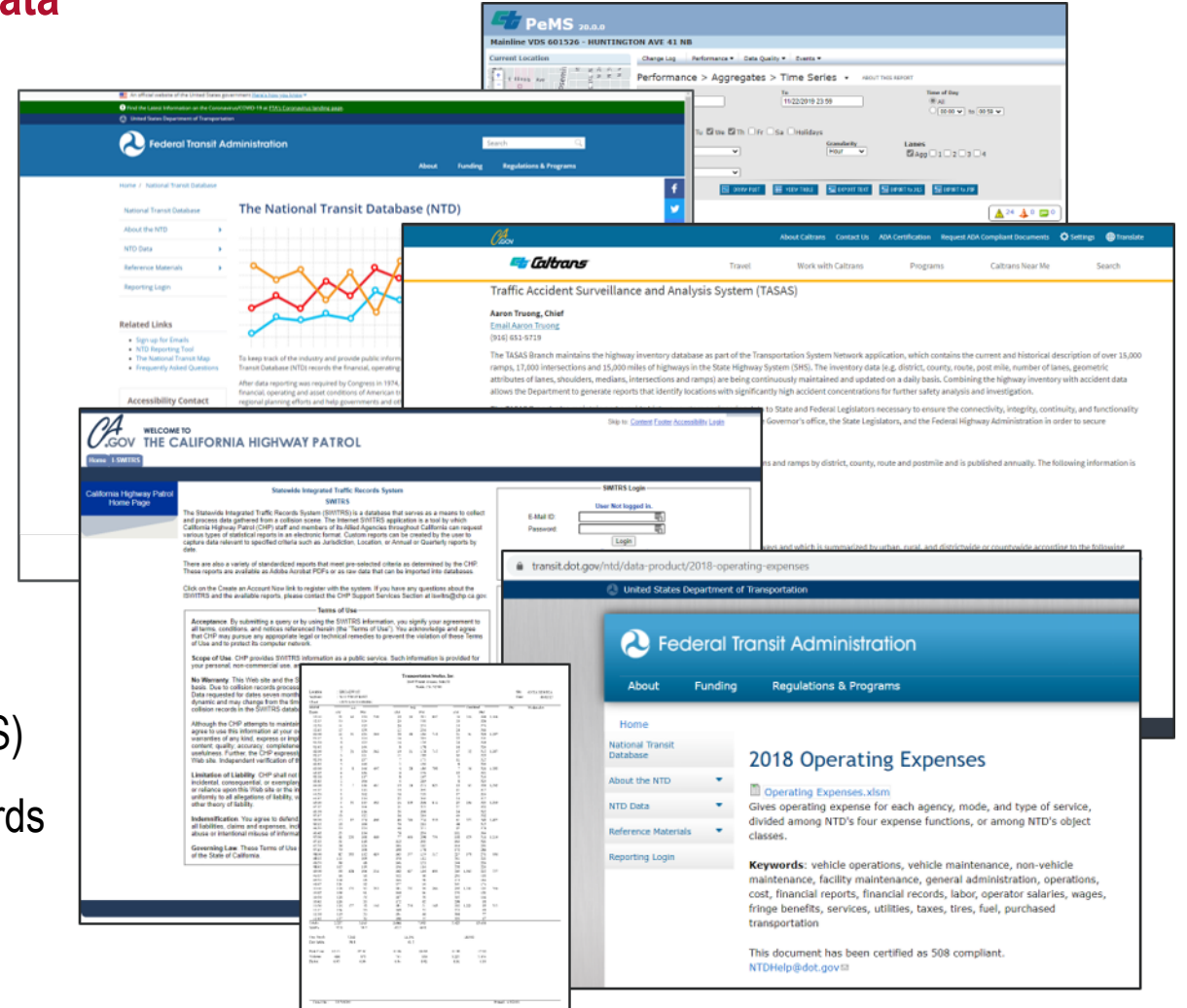
Worksheets where Cal-B/C performs calculations and tabulates results

Title	Instructions	1) Project Information	2) Results	Travel Time	Vehicle Operating Costs	Accident Costs	Emissions	Final Calculations	PARAMETERS
	Instructions: Summary instructions on how to fill out each data item in Cal-B/C	Project Information: <ul style="list-style-type: none"> Project Description/ Type of Project Lot Design / Park-and-Ride Demand Destination Information / Travel Demand / Traffic Performance / Transit Data Project Costs 	Results: <ul style="list-style-type: none"> BCA results Itemized Benefits (\$) Emission Savings (Tons) 	Travel Time: Calculates No Build and Build Person-Hours and Costs by: <ul style="list-style-type: none"> Year Facility Mode 	Vehicle Operating Costs: Calculates Highway No Build and Build Fuel and Non-Fuel Costs by: <ul style="list-style-type: none"> Year Facility 	Accident Costs: Calculates No Build and Build Collision Costs by: <ul style="list-style-type: none"> Year Facility Mode 	Emissions: Calculates No Build and Build Running and Starting Emissions and Costs: <ul style="list-style-type: none"> Year Facility Mode 	Final Calculations: Tabulates final results, including: <ul style="list-style-type: none"> Net present value Internal rate of return 	PARAMETERS: Key default analysis parameters and assumptions for all Cal-B/C tools

Suggested Data Sources for Evaluations in Cal-B/C Park-And-Ride

Traffic and Transit Passenger Demand and Performance Data

- Regional travel demand model data
- 3rd party data sources
- Caltrans Performance Measurement System (PeMS)
- Caltrans Managed Lane Annual Report
- Federal Transit Administration (FTA) National Transit Database
- Transit operator schedules (for local and express buses)
- Public agency Park-and-Ride inventory data
- Other sources for data (Field data collection, crowd-sourced data)



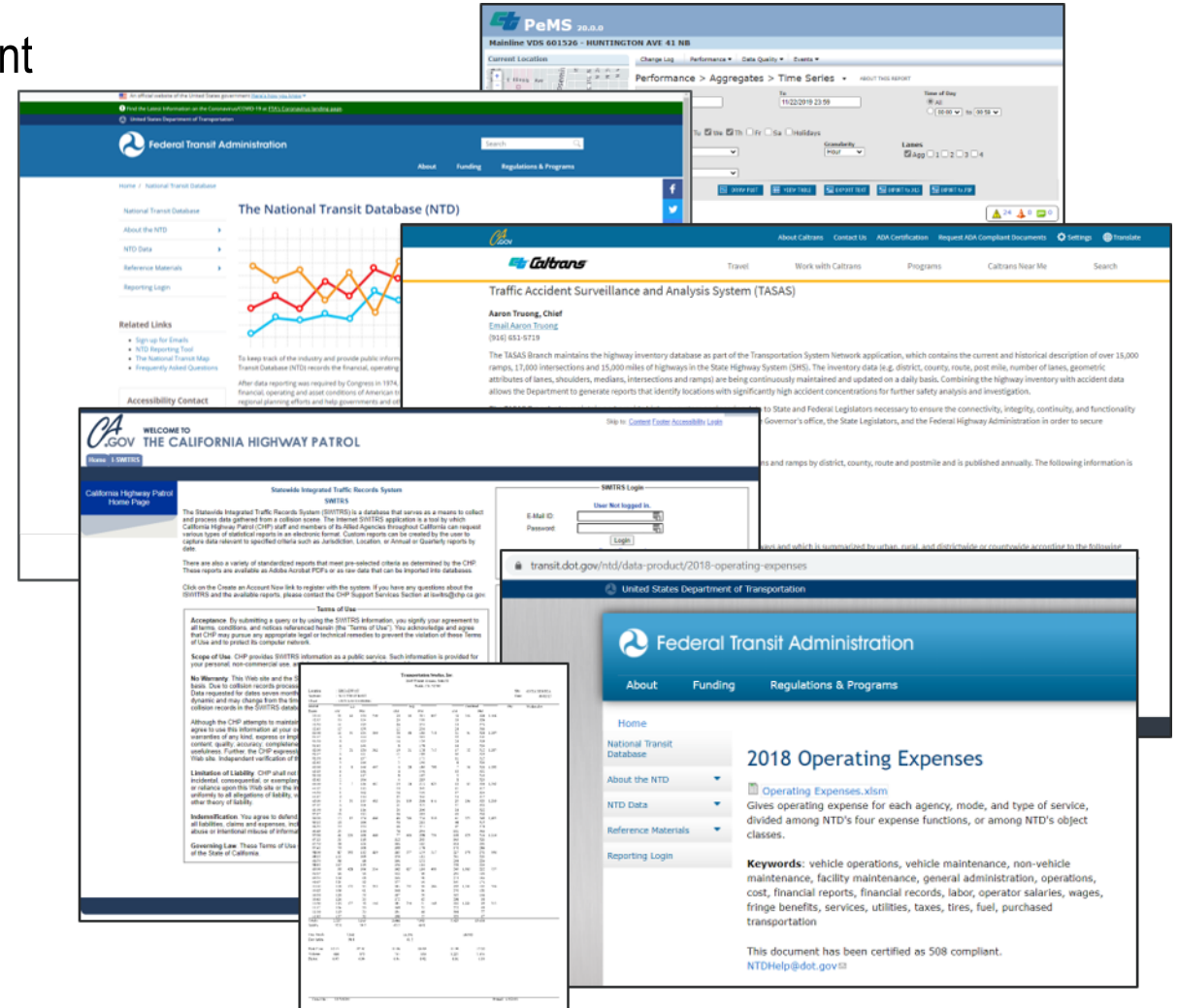
Traffic Collision and Safety Data

- Caltrans Traffic Accident Surveillance and Analysis System (TASAS)
- California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS)
- Other Sources (e.g., Transportation Research Board publications)

Suggested Data Sources for Evaluations in Cal-B/C Park-And-Ride (cont.)

Project Cost Data

- Project Study Report (PSR) or other Project Initiation Document
- Project Report (PR)
- Regional Transportation Improvement Program (RTIP)
- State Highway Operations and Protection Program (SHOPP)
- FTA capital cost database



Suggested Data Sources for Cal-B/C PnR Evaluations by Input Item

Section Title	Data Input Item	Cell Location(s)	Suggested Data Sources (for required input cells; or to update Cal-B/C estimates or default values)	
1A) Project Data	Type of Project	D11	Depends on proposed project	
	Project Location	D13	Depends on proposed project location	
	Length of Construction Period	D15	Project Initiation Document (PID)/Project Study Report (PSR)/Project Report (PR) or other source	
1B) Park-and-Ride Lot Information	Lot Design - Number of Parking Spaces	D23	Depends on proposed project	
	Park-and-Ride Demand	Typical Percent Filled (for current or opening year)	D27	PnR inventory/field data collection, modeling/forecasting
		Number of Years until Lot Reaches Capacity	D28	Modeling/Forecasting or field observations of other lots
		Number of Bicycle/Pedestrian Users	D29	Modeling/Forecasting, field data collection, surveys
		Average Vehicle Occupancy of Lot Users	D30	Calculated by Cal-B/C; Modeling/Forecasting; Caltrans Managed Lane Annual Report

Suggested Data Sources for Cal-B/C PnR Evaluations by Input Item (cont.)

Section Title	Data Input Item		Cell Location(s)	Suggested Data Sources (for required input cells; or to update Cal-B/C estimates or default values)	
1C) Destination Information	Destination Description	Destination Name	M11	Depends on proposed project and destination	
		Distance from Park-and-Ride Lot (miles)	M12	Depends on proposed project and destination	
		Distance to Next Lot (miles)	M13	Depends on proposed project and destination	
		Parking Cost at Destination (avg \$/day)	M14	3rd party data sources (i.e. Parkopedia, Google Maps)	
	Demand for Travel to Destination	Percent of Lot Users to Destination		M17	Modeling/Forecasting; FTA National Transit Database
		Distribution (percent)	New Transit Riders	M19	Modeling/Forecasting; FTA National Transit Database
			Existing Transit Riders	M20	Transit operator data, Modeling/Forecasting; FTA National Transit Database
			New Carpoolers	M21	Modeling/Forecasting
			Existing Carpoolers	M22	PnR inventory/field data collection, Modeling/Forecasting

Suggested Data Sources for Cal-B/C PnR Evaluations by Input Item (cont.)

Section Title	Data Input Item		Cell Location(s)	Suggested Data Sources (for required input cells; or to update Cal-B/C estimates or default values)	
1C) Destination Information	Highway Travel to Destination	HOV Travel Time (in min)	M25	PeMS, 3rd party data (e.g., INRIX, HERE)	
		Non-HOV Travel Time (in min)	M26	PeMS, 3rd party data (e.g., INRIX, HERE)	
		Accident Rate (per million vehicle-miles)	M28	TASAS	
		Percent Fatal Accidents (Pct Fat)	M29		
		Percent Injury Accidents (Pct Inj)	M30		
	Transit Travel to Destination	Express Bus	Travel Time (in min)	M33	Transit operator data, FTA National Transit Database for average speeds by modes converted to travel times
			Average Fare	M34	Transit operator data, FTA National Transit Database
			Headway (in min)	M35	Transit operator data, FTA National Transit Database
		Local Bus	Travel Time (in min)	M36	Transit operator data, FTA National Transit Database for average speeds by modes converted to travel times
	Average Fare		M37	Transit operator data, FTA National Transit Database, transit operator websites	
	Carpool/ Vanpool Travel to Destination	Average Carpool Size (people/vehicle)		M40	Modeling/Forecasting; American Community Survey
Average Carpool Wait Time (in min)		M41	Field observations		

Suggested Data Sources for Cal-B/C PnR Evaluations by Input Item (cont.)

Section Title	Data Input Item		Cell Location(s)	Suggested Data Sources (for required input cells; or to update Cal-B/C estimates or default values)
1D) Project Costs	Direct Project Costs	Initial Project Costs (Support, R/W, Const.)	W12-Y12	PS&E, PR, PSR/PAED, RTIP/SHOPP, FTA Capital Cost database; other planning documents
		Subsequent Costs (O&M, Rehab)	Z12/AA12	
	Other Costs	Mitigation/Transit Agency Cost Savings	AB10/AC10	

03

Park-and-Ride Lot Information - Traffic and Transit Passenger Demand and Performance Data

Regional Travel Demand Models

- Can help identify top destinations by examining Origin-Destination (OD) patterns
- “Select link” analysis as from travel demand model to identify top ODs on a corridor
 - Traffic demand model expertise needed for this analysis

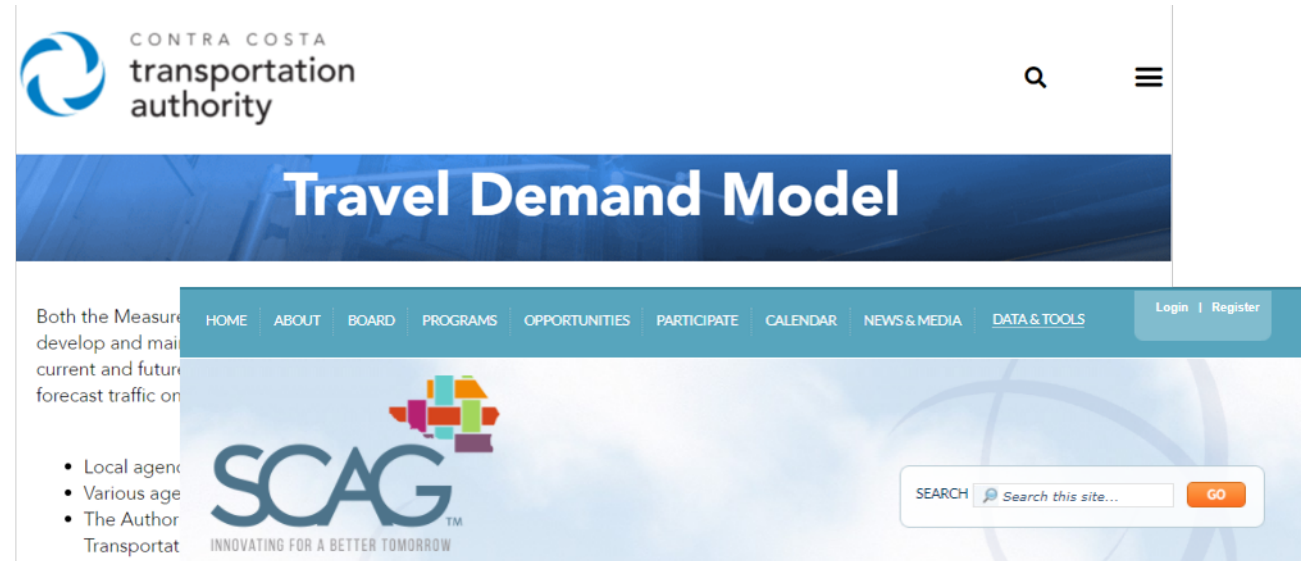


Table E-3: Model Results for Step 4 Expansion of Airway Lot and Shuttle from Bernal Lot (2030)

Facility Type	2015 Observed Results			2030 Modeled Values		
	Parking Capacity	Transit Parking	Percent Utilization	Parking Capacity	Transit Parking	Percent Utilization
BART Stations	4076	4076	100%	4626	4620	100%
ACE Stations	846	720	85%	846	841	99%
Satellite Lots I-580	447	16	4%	794	426	54%
Satellite Lots I-680	92	36	39%	292	242	83%
Existing Satellite Lots	539	117	22%	886	468	53%
New Satellite Lots	-	-	-	200	200	100%
Total Satellite	539	52	10%	1086	668	62%
Total Park-and-Ride	5461	4849	89%	6558	6130	93%

Note: The model estimates of “Transit Parking” do not account for the existing and potential additional use of the satellite lots for private employer shuttles at the lots where high-frequency shuttle service to BART is not being evaluated. This accounts for use of roughly 215 existing spaces, up to 119 additional spaces by 2020 and up to 464 additional spaces by 2030.

3rd Party Data Providers

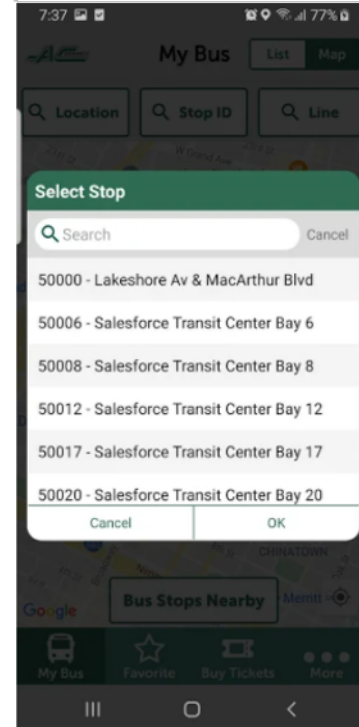
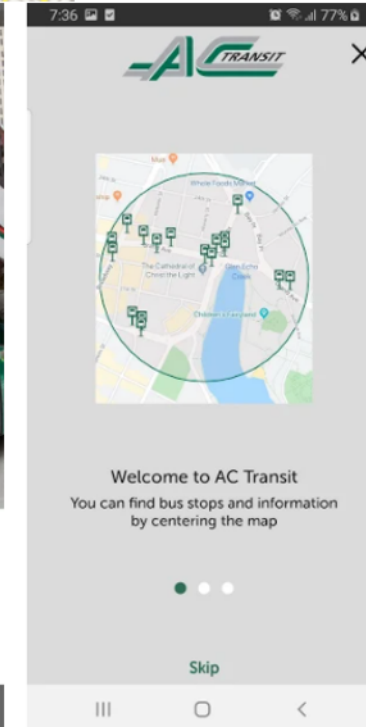
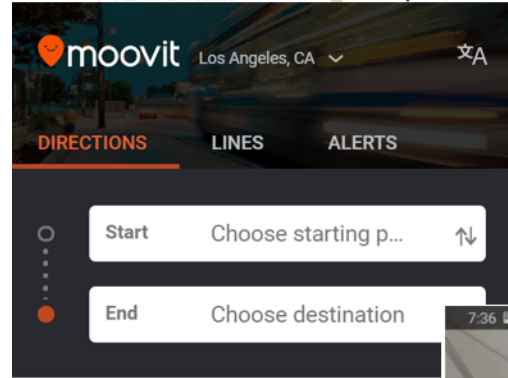
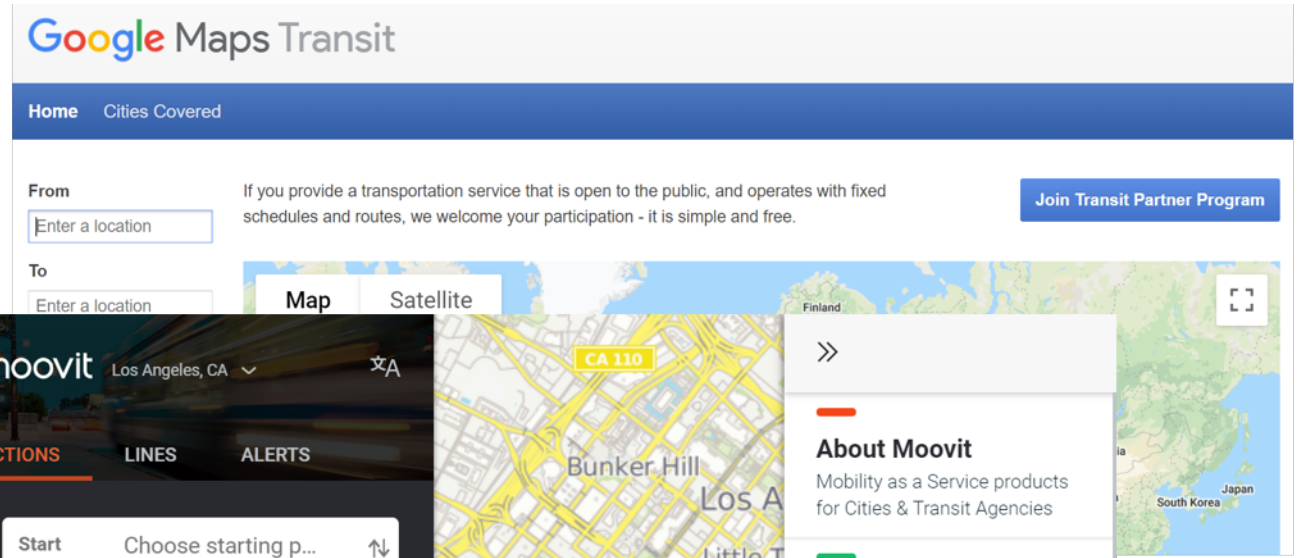
- Can provide demand data and help identify top destinations for Park-and-Ride service
- Can be used to estimate average parking lot costs at destinations (e.g. Parkopedia)
- Can be used to estimate travel times to destinations (e.g. ClearGuide in LA County)

The image displays three screenshots from different data providers:

- Parkopedia:** A screenshot showing a search for "Palm Park Parking Lot" in Santa Barbara, California. The results show a cost of \$4 for 2 hours and a 28-minute walk to the destination.
- Traffic Analysis Tool:** A screenshot from a tool titled "Explore Solutions to Congestion for a Single Road". It shows two donut charts: "8% Walkable Share" and "32% Bicyclable Share". It also features a map of "Top Origin and Destination TAZs" and a "Traffic From Origin" chart.
- Transit Demand Map:** A screenshot of a map showing transit routes and demand. The summary indicates "~163k trips by ~157k people, daily". The map includes a legend for "Where People Live" (number of people per square mile) and "Transit Routes" (Light Rail, Subway, Rail, Bus, Ferry, Cable Car).

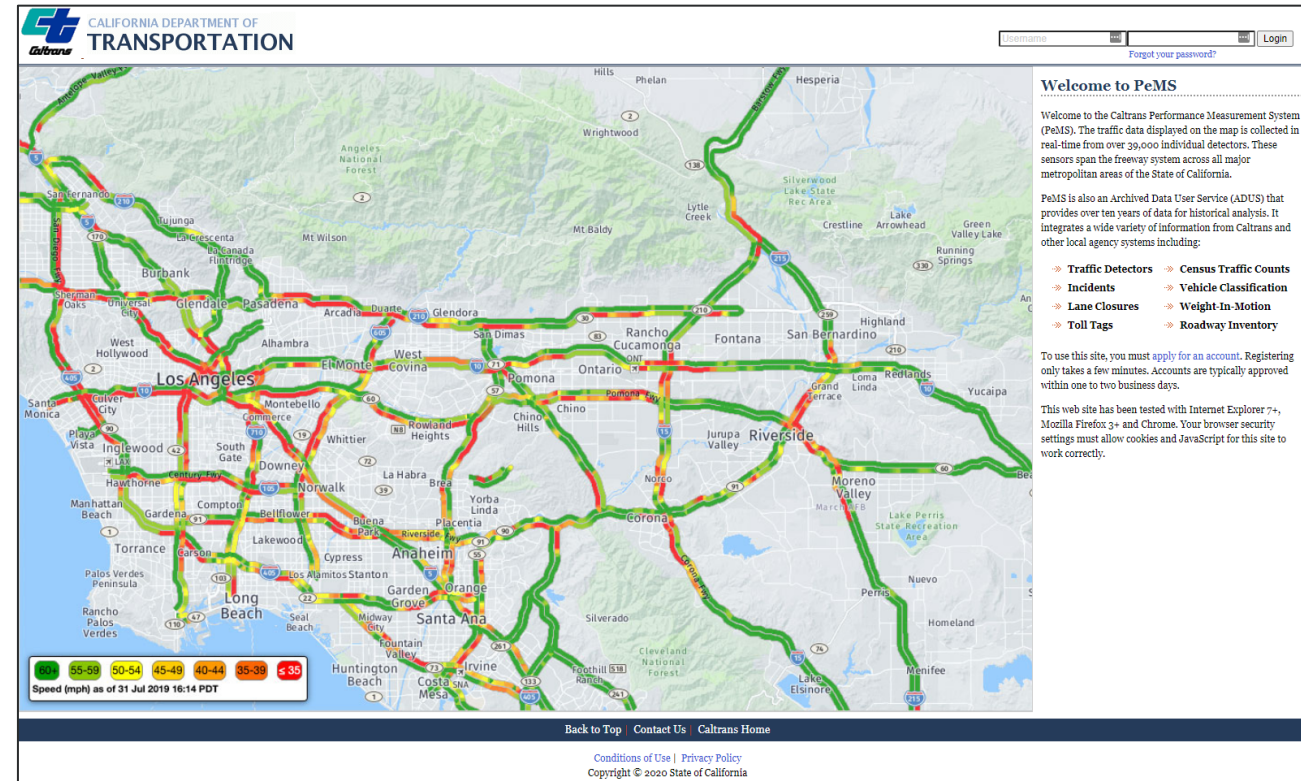
3rd Party Transit Navigation Apps

- Can be used to input estimate travel times
- Can provide estimated travel time for local and express buses based on schedules
- Examples:
 - Public transit operator apps
 - Google Maps Transit
 - Apps such as Transit App, Moovit



Caltrans Performance Measurement System (PeMS)

- PeMS can be used to get travel times from pre-defined routes and corridors
- Other features can be used to estimate travel times between the Park-and-Ride lot and the destinations by facility
- Provides real-time and historical performance data in a range of presentation styles and downloadable data sets
- Data includes:
 - Speeds
 - VMT/VHT to find speeds
- Data that can be used in Cal-B/C includes:
 - HOV and Non-HOV Travel Time
- More detailed PeMS training may be needed calculate data
- Apply for an account at <http://pems.dot.ca.gov/>



PeMS – Corridors and Routes

- Corridors and Routes features on PeMS provide travel time calculations
- PeMS Corridors and Routes are pre-defined freeway segments that PeMS remembers
- A key benefit of corridors and routes is that they allow for travel time comparisons that can differentiate between HOV and mainline (non-HOV) lanes
- A limitation is that PeMS only starts collecting the data after you create your route

PeMS 20.0.0
State of California

Overview | Facilities & Devices | Performance | Data Quality | Events

Facilities & Devices: Freeways, Routes, Corridors, Managed Facilities, Field Elements, Transit Agencies, Multimodal Corridors

From: 10/01/2019 To: 10/08/2019

Include Days: Su Mo Tu We Th Fr Sa Holidays

Time Period: Total Function: Mean

VIEW TABLE | EXPORT TEXT | EXPORT to .XLS

District	Corridor	Fwy-Dir	State PM		Length	Mean Travel Time Total			
			From	To		HOV/HOT	Mainline	Difference	HOV/HOT %
D03	21: US-50	US50-E	0.000	25.949	54	56	61	-5	92
D03	21: US-50	US50-W	25.949	0.000	54	58	65	-7	89
D03	22A: Placer I-80	I80-E	42.67	7.421	38	37	39	-2	95
D03	22A: Placer I-80	I80-W	7.421	42.67	38	36	38	-2	95
D03	22B: Sacramento to Sutter SR-99	SR99-N	R32.124	R8.07	12	0	12	-12	0
D03	22B: Sacramento to Sutter SR-99	SR99-S	R8.07	R32.124	12	0	12	-12	0
D03	22C: Sacramento SR-99	SR99-N	0.123	R24.35	24	24	27	-3	89
D03	22C: Sacramento SR-99	SR99-S	R24.35	0.123	24	24	26	-2	92
D04	01: 880/980/24	I880-N	31.525	R31.803	12	0	14	-14	0
D04	01: 880/980/24	SR24-W	R6.152	R1.847	12	0	13	-13	0
D04	01a: 880/980/24/13	SR13-N	T9.762	5.262	4	0	4	-4	0
D04	01a: 880/980/24/13	SR13-S	4.262	9.012	4	0	5	-5	0
D04	02: I-580	I580-E	5.758	47.795	6	0	6	-6	0
D04	02: I-580	I580-W	47.865	5.828	6	0	7	-7	0

PeMS – Corridor Level Analysis

- Allows user to identify major corridors from PnR location to various destinations
- Select Aggregates for VMT
- Select dates
 - Fall and/or Spring
 - Non-holiday, mid-week
- Can export Aggregates to Excel or Text files
- Calculate average speeds for travel time estimates
 - Select Quantity : Q (VMT/VHT)
 - Average speed for corridor = $Q = \text{VMT/VHT}$
- Do opposite direction, if needed

PeMS 20.0.0
Freeway SR94-W

Performance > Aggregates > Time Series

From: 10/13/2020 00:00 To: 11/10/2020 09:59
Max Range: 1 month

Include Days: Su Mo Tu We Th Fr Sa Holidays

Quantity: Q (VMT/VHT)

Second Quantity: -- None --

Granularity: Hour

Time of Day: All (00:00 to 00:59)

Postmile Range (0.45 - 9.16)

EXPORT to XLS

Hour	Q (VMT/VHT) (mph)	# Lane Points	% Observed
10/13/2020 00:00	67.3	960	94.7
10/13/2020 01:00	67.1	960	94.9
10/13/2020 02:00	67.3	960	95.0
10/13/2020 03:00	67.9	960	94.3
10/13/2020 04:00	69.2	960	89.8
10/13/2020 05:00	68.9	960	86.0
10/13/2020 06:00	64.8	960	85.0
10/13/2020 07:00	63.9	960	85.0
10/13/2020 08:00	65.2	960	85.2
10/13/2020 09:00	65.4	960	86.7
10/13/2020 10:00	65.8	960	86.5
10/13/2020 11:00	65.1	960	86.6
10/13/2020 12:00	65.7	960	87.3
10/13/2020 13:00	66.1	960	82.5
10/13/2020 14:00	65.8	960	82.0

View opposite direction of travel

Quantity: Q (VMT/VHT)

EXPORT to XLS

Excel Export Window: pems_out... Celine Chen

Hour	Q (VMT/VHT) (m#)	Lane Points	% Observed
10/13/2020 0:00	67.30	960	94.70
10/13/2020 1:00	67.10	960	94.90
10/13/2020 2:00	67.30	960	95.00
10/13/2020 3:00	67.90	960	94.30
10/13/2020 4:00	69.20	960	89.80
10/13/2020 5:00	68.90	960	86.00
10/13/2020 6:00	64.80	960	85.00
10/13/2020 7:00	63.90	960	85.00
10/13/2020 8:00	65.20	960	85.20
10/13/2020 9:00	65.40	960	86.70
10/13/2020 10:00	65.80	960	86.50
10/13/2020 11:00	65.10	960	86.60
10/13/2020 12:00	65.70	960	87.30
10/13/2020 13:00	66.10	960	82.50
10/13/2020 14:00	65.80	960	82.00

PeMS – Time of Day Contours

- Another way to calculate HOV vs non-HOV travel time data is from Time of Day Contours
- Select Performance -> Spatial Analysis -> Time of Day Contours
- Select dates
 - Example: 1 week in Fall and/or Spring
 - Non-holiday, mid-week
- Select HOV or Mainline
- Can export Aggregates to Excel or Text files
- Calculate travel time estimates using postmile distances and aggregate speeds

PeMS 20.0.0
Freeway I405-N

Performance > Spatial Analysis > Time of Day Contours

From: 10/07/2019 To: 10/13/2019
Min Range: 2 days Max Range: 1 week

Include Days: Su Mo Tu We Th Fr Sa Holidays

Postmile Range (0.36 - 72.09): .36 - 72.09

VDS Type: Mainline HOV

Color Map: Space Gauge; Z-Scale: Auto; View: 2-D

EXPORT to XLS

Time	Postmile (Abs)	Postmile (CA)	VDS/Speed	# Lane Points	% Observed
0:00	.37	.6	1211067 65.0	60	85.0
0:00	.7	.93	1208954 64.9	60	85.0
0:00	.88	1.11	1209043 64.9	60	85.0
0:00	1.34	1.57	1209090 64.9	60	0.0
0:00	1.7	1.93	1209163 64.9	60	85.0
0:00	2.12	2.35	1209177 65.0	60	85.0
0:00	2.66	2.89	1213966 63.5	120	0.0
0:00	2.76	2.99	1201157 64.9	120	85.0
0:00	3.08	3.31	1209187 64.9	60	85.0
0:00	3.63	3.86	1201183 65.0	60	85.0
0:00	3.84	4.03	1201209 64.9	60	85.0
0:00	4.78	5.01	1201229 65.0	60	85.0
0:00	4.82	5.05	1209075 65.0	60	0.0
0:00	5.32	5.55	1201259 65.0	60	0.0
0:00	5.51	5.74	1201281 65.0	60	85.0
0:00	5.98	6.21	1201304 65.0	60	85.0
0:00	6.62	6.85	1201331 65.0	60	85.0
0:00	6.84	7.07	1201363 64.6	60	85.0
0:00	7.5	7.73	1201397 65.0	60	85.0

Fall and/or Spring
Non-Holiday, Mid-Week

Select HOV or Mainline (non-HOV)

Select CA Abs PM

Export to CSV to
calculate travel time

PeMS – Hourly Summary

- Another way to get HOV vs non-HOV travel time data is from Hourly Summaries
- Select Performance -> Spatial Analysis -> Hourly Summaries
- Select dates
 - 1 week in Fall and/or Spring, non-holiday, mid-week
- Select HOV or Mainline
- Select VMT, then VHT
 - Average speed for route = VMT/VHT
- Can export to Excel or Text files
- Calculate travel time estimates using postmile distances and average aggregate speeds.

PeMS 20.0.0
Freeway I405-N

Performance > Spatial Analysis > Hourly Summary

From: 10/09/2019 To: 11/11/2019
Min Range: 1 day Max Range: 3 months

Include Days: Su Mo Tu We Th Fr Sa Holidays

Quantity: Vehicle Miles Traveled (VMT) Function: Mean

Postmile Range (0.36 - 72.09)

EXPORT TO XLS

CA PM	VDS	Name	Type	Observed	00	01	02	03	04	05	06
.6	1211066	N OF 5	Mainline	52.4	25.25	3.07	1.47	6.74	307.39	1,024.47	1,769.11
.6	1211067	N OF 5	HOV	53.0	25.56	13.26	10.07	13.55	40.56	174.23	285.63
.93	1201100	IRVINE C1	Mainline	52.3	151.10	98.18	79.79	111.53	313.02	728.37	1,295.45
.93	1208954	IRVINE C1	HOV	53.0	12.15	6.28	4.53	5.59	23.00	82.42	138.26
1.11	1201125	IRVINE C2	Mainline	35.3	245.32	155.89	121.37	153.04	385.91	881.67	1,521.23
1.11	1209043	IRVINE C2	HOV	53.0	11.51	5.55	3.63	5.12	23.56	91.29	165.77
1.57	1209090	S OF 133	HOV	0.0	17.14	7.29	4.92	5.42	28.84	120.01	242.46
1.57	1209092	S OF 133	Mainline	0.0	438.20	326.44	286.83	311.49	608.15	359.30	2,175.51
1.93	1209162	N OF 133	Mainline	34.8	158.69	93.14	78.85				23
1.93	1209163	N OF 133	HOV	53.0	12.57	5.45	3.44				55
2.35	1209176	LAGUNA CYN RD	Mainline	52.3	373.88	227.54	179.08				40
2.35	1209177	LAGUNA CANYON RD	HOV	53.0	15.45	6.76	4.27				85
2.89	1213963	SAND CANYON 1	Mainline	26.5	305.84	199.48	161.74	197.80	495.18	1,137.25	1,913.26
2.89	1213966	SAND CANYON 1	HOV	0.0	80.89	74.01	72.11	73.27	86.35	133.04	232.76
2.99	1201157	SAND CANYON	HOV	53.0	9.95	4.85	3.43	4.90	20.27	73.04	171.78
3.04	1201159	SAND CANYON	Mainline	53.0	158.97	112.65	94.45	109.99	256.97	597.18	1,073.50
3.31	1209059	N OF SAND CYN	Mainline	95.7	351.80	210.72	163.24	203.22	578.10	1,427.36	2,618.17
3.31	1209187	N OF SAND CANYON	HOV	95.7	13.47	6.40	3.97	5.58	33.19	135.35	283.01

Caltrans Managed Lane Annual Report

- Caltrans district offices prepare annual reports with statistics on managed facilities (e.g., express lanes, HOV lanes, HOT lanes)
- Provides vehicle classification and occupancy counts during peak travel periods for managed lanes and adjacent general purpose lanes at select locations
- Data that can be used in Cal-B/C Park-and-Ride includes:
 - AVO statistics for managed lane and adjacent general purpose lane

2016 MANAGED LANE ANNUAL REPORT



www.dot.ca.gov/dist07



District 7
Los Angeles and Ventura Counties

Division of Traffic Operations
Office of System Performance
Managed Lanes Branch

May 2017

CALTRANS - DISTRICT 7 HOV Lane Operation on Route 134

Co. Rte. Dir.	LA 134 WB		LA 134 EB	
	JACKSON	JACKSON	JACKSON	JACKSON
Post Mile	7.41		7.41	
Date	11/02/16		11/02/16	
Occupancy Requirement	2 +		2 +	
	AM HOV Peak 1-Hour 7:30 - 8:30	AM HOV Peak 2-Hour 6:30-8:30	PM HOV Peak 1-Hour 15:45 - 16:45	PM HOV Peak 2-Hour 16:00-18:00
High Occupancy Vehicle (HOV) Lane Vehicle Summary				
Carpools (Vehicles with 2-5 occupants only)	1051	1931	972	1789
Vanpools	13	28	7	32
Buses	3	3	5	4
Motorcycles (MC's)	23	58	29	53
Single Occupant Vehicles	7	11	94	144
White Decal Vehicles (Electric Veh. & Compressed Natural Gas)	80	126	35	86
Green Decal Vehicles (Plug-in Hybrids)	86	140	29	80
Total Vehicles in HOV Lane	1263	2297	1171	2188
2 person carpool volume in HOV lane (vehicles)	959	1765	892	1638
2 or more (2+) person carpool volume in HOV Lane (veh.)*	1064	1959	979	1801
3 person carpool volume in HOV lane (vehicles)	85	155	65	108
3 or more (3+) person carpool volume in HOV Lane (veh.)*	105	194	87	163
HOV Lane People Summary				
People in Carpools (Vehicles with 2-5 occupants only)	2203	4041	2046	3702
People in Vanpools	78	168	42	192
People in Buses	70	70	110	100
People in CNG/EV/Plug-in Hybrid, Single Occ. Veh. and MC's	196	335	187	363
Total HOV Lane People	2547	4614	2385	4357
General Purpose (GP) Lane Summary*				
Number of General Purpose Lanes	4			
General Purpose Lane Vehicles**	7800	15241	6841	13819
General Purpose Vehicles per Lane**	1950	3810	1710	3405
General Purpose Lane People**	8384	16334	7548	15035
General Purpose People per Lane**	2096	4083	1887	3759
Freeway Summary				
Total Freeway Vehicles	9063	17538	8012	15787
Total Freeway People	10931	20948	9933	19392
Percent of Total Freeway Vehicles in HOV Lane	13.94%	13.10%	14.62%	13.73%
Percent of Total Freeway Vehicles per General Purpose Lane	21.52%	21.73%	21.35%	21.57%
Percent of Total Freeway People in HOV Lane	23.30%	22.03%	24.01%	22.47%
Percent of Total Freeway People per General Purpose Lane	19.17%	19.49%	19.00%	19.38%
GP Lane Carpool Summary*				
2+ Carpool volume in GP Lanes (vehicles)*	480	913	490	1044
2+ Percent Carpools in GP Lanes	6.15%	5.99%	7.16%	7.66%
3+ Carpool Volume in GP Lanes (vehicles)*	35	73	55	99
3+ Percent Carpools in GP Lanes	0.45%	0.48%	0.80%	0.73%
Average Occupancy				
HOV Lane Average Occupancy (people)	2.02	2.01	2.04	2.01
General Purpose Lane Average Occupancy (people)	1.07	1.07	1.10	1.10
HOV Lane Violation				
HOV Lane Violation (percentage)	0.55%	0.48%	8.03%	6.64%
Equivalent Number of GP Lanes				
Equivalent number of GP Lanes needed to carry HOV people	1.22	1.13	1.26	1.16

Peak 1-hour & peak 2-hour totals are based on the highest volume during the following peak period counts: 6:30-8:30 & 15:30-18:00.

*The peak hour of the general purpose lane may vary from the peak hour of the HOV lane.

** Carpools and vanpools only.

** Single occupant vehicles, carpools, vanpools, buses, motorcycles, CNG/EV/Plug-in Hybrids and trucks.

FTA National Transit Database (NTD)

- Estimate local and express bus speeds if no other data is available
- Estimate transit in-vehicle speeds and travel times based on other similar systems (Vehicle Service Miles/Vehicle Service Hours)
- Obtain parking facility information for existing facilities (e.g., number of parking spaces, capital expenses)
- <https://www.transit.dot.gov/ntd>

United States Department of Transportation
Federal Transit Administration

Home » NTD Data

National Transit Database

About the NTD

NTD Data

NTD Data Reports

Transit Agency Profiles

Annual National Transit Summaries and Trends

Census Updates

Reference Materials

Reporting Login

NTD Data

Click here to see the [NTD Data Products Guide](#)

Data Categories

Agency Information

Assets

Data Dictionary/Questionable Items

Expenses

Fares/Funding

Monthly Ridership

Resources

Safety and Security

Service Data

Product Type

Annual Database (Excel)

Data Product Year

2018

Search

Apply

Title	Product Type	Data Product Year
2018 Annual Database Agency Information	Annual Database (Excel)	2018
2018 Annual Database Agency Mode Service	Annual Database (Excel)	2018

Agency	City	Mode	Type of Service	VOMS	Max Trains in Operat	Average Speed (mi/hr)	Average Passenger Trip Length (mi)	Passengers per Hour	Vehicle Revenue Miles	Vehicle Revenue Hours	Train Revenue Miles	Train Revenue Hours	Unlinked Passenger Trips	Passenger Miles	Directional Route Miles
11	New Jersey Transit Corporation	Newark	LR	PT	42	20	16.49	3.85	122.81	2,084,803	126,422	1,239,042	73,848	15,526,126	59,777,983
14	New Jersey Transit Corporation	Newark	LR	DO	14	14	10.02	2.33	108.06	503,616	50,262	503,616	50,262	5,431,405	12,633,883
17	Los Angeles County Metropolitan Transp	Los Angeles	LR	DO	196	74	20.78	7.46	76.64	17,999,250	866,272	7,233,941	339,891	66,387,207	495,011,734
36	Metropolitan Transit Authority of Harris C	Houston	LR	DO	54	33	11.78	2.83	63.24	3,535,806	300,133	2,173,944	199,878	18,980,255	53,624,968
49	Massachusetts Bay Transportation Auth	Boston	LR	DO	151	86	8.48	2.50	80.41	5,986,849	706,032	3,094,405	357,618	56,768,835	141,734,607
65	Maryland Transit Administration	Baltimore	LR	DO	38	18	19.76	6.04	49.03	2,988,892	151,280	1,620,946	84,045	7,416,504	44,778,153
85	Denver Regional Transportation District	Denver	LR	DO	163	56	16.33	7.12	35.16	11,758,421	720,150	4,412,895	272,969	25,322,058	180,411,468
102	Utah Transit Authority	Salt Lake City	LR	DO	92	30	18.37	4.98	49.41	6,655,535	362,257	2,932,154	164,865	17,899,716	89,112,550
112	Dallas Area Rapid Transit	Dallas	LR	DO	109	51	22.33	8.05	62.99	10,236,821	458,345	5,568,402	249,897	28,873,235	232,288,823
122	City and County of San Francisco, dba: San Francisco	San Francisco	LR	DO	146	126	9.57	2.74	89.54	5,324,769	556,545	3,691,470	382,942	49,833,591	136,717,088
132	Tri-County Metropolitan Transportation D	Portland	LR	DO	116	58	14.27	5.40	62.16	8,932,446	626,091	4,486,727	314,978	38,919,828	210,180,550
136	Port Authority of Allegheny County	Pittsburgh	LR	DO	58	29	12.82	3.95	44.94	2,184,781	170,363	1,491,379	114,507	7,655,539	30,261,649
137	Metro Transit	Minneapolis	LR	DO	76	23	12.54	4.02	58.64	5,336,357	425,583	1,934,151	146,891	24,955,617	100,276,941
160	San Diego Metropolitan Transit System	San Diego	LR	DO	97	33	18.10	5.79	77.37	8,656,486	478,175	3,109,789	172,358	36,995,201	214,376,455
181	Santa Clara Valley Transportation Autho	San Jose	LR	DO	61	29	15.03	5.52	39.57	3,314,903	220,589	2,091,151	142,376	8,507,096	46,981,059
206	Bi-State Development Agency of the Mis	St. Louis	LR	DO	58	29	23.46	6.86	51.16	6,210,574	264,761	3,105,288	132,380	13,550,443	92,945,521
210	The Greater Cleveland Regional Transit / Cleveland	Cleveland	LR	DO	13	11	13.93	5.85	33.43	682,556	48,997	68,558	48,997	1,638,170	9,580,135
230	City of Charlotte North Carolina, dba: Ch	Charlotte	LR	DO	21	18	15.84	5.15	64.55	1,420,469	89,679	714,968	45,123	5,768,961	29,838,989
240	Transportation District Commission of H	Hampton	LR	DO	6	6	13.11	3.48	47.93	387,609	29,571	387,609	29,571	1,417,350	4,932,543
245	Central Puget Sound Regional Transit At	Seattle	LR	DO	54	19	20.54	6.59	92.56	5,429,764	264,385	1,979,509	96,212	24,470,264	161,293,358
253	Niagara Frontier Transportation Authority	Buffalo	LR	DO	23	7	11.21	2.68	54.65	926,900	82,671	354,058	31,678	4,518,285	12,128,749
399	Sacramento Regional Transit District	Sacramento	LR	DO	69	18	17.77	6.32	41.72	4,418,237	248,656	1,649,800	94,670	10,372,688	65,530,788
1173	Valley Metro Rail, Inc.	Phoenix	LR	PT	38	18	15.13	7.17	72.45	3,297,498	217,912	1,567,840	103,590	15,786,911	113,208,491

Bus Schedules on Similar Corridors

- Comparable locations and route lengths can be used to estimate headways and travel time by Express or Local Bus

Line-Línea
Silver Streak

**WEEKDAY
OTRE SEMANA**

WESTBOUND/EN DIRECCIÓN OESTE

MONTCLAIR TO LOS ANGELES MONTCLAIR HACIA LOS ANGELES

Station	Montclair Transit Center	Pomona Transit Center	W. Covina Pkwy. & California Ave.	El Monte Station	Cal State L.A.	USC Medical Center	Union Station Patsouras Bus Plaza Station	L.A. Convention Ctr. (Flower St. & Pico Blvd.)
A	12:00	12:17	12:37	12:53	1:02	1:05	1:08	1:25
B	1:00	1:13	1:31	1:45	1:53	1:57	2:00	2:14
C	2:00	2:13	2:31	2:45	2:53	2:57	3:00	3:14

G Monday through Friday except holidays To El Cerrito Plaza BART

Salesforce Transit Center	6th St. & University Ave.	University Ave. & San Pablo Ave.	Solano Ave. & San Pablo Ave.	Solano Ave. & Colusa Ave.	El Cerrito Plaza BART
4:40p	5:10p	5:13p	5:24p	5:30p	5:38p
5:40p	6:20p	6:23p	6:34p	6:40p	6:51p

G AC TRANSIT SCHEDULE

EFFECTIVE: August 9, 2020

P.M. service only

- El Cerrito**
El Cerrito Plaza BART
Fairmount Avenue
- Kensington**
Colusa Avenue
- Albany**
Solano Avenue
San Pablo Avenue
- Berkeley**
University Avenue
- San Francisco**
Salesforce Transit Center

Monday through Friday

Effective Jun 21 2020

J Line (Silver) 910/950

Northbound to El Monte (Approximate Times)

Southbound to San Pedro (Approximate Times)

Route	Northbound to El Monte					Southbound to San Pedro								
	SAN PEDRO	HARBOR GATEWAY	LOS ANGELES	DOWNTOWN LOS ANGELES	EL MONTE	EL MONTE	DOWNTOWN LOS ANGELES	LOS ANGELES	HARBOR GATEWAY	SAN PEDRO				
	8	7	6	5	4	2	1	1	2	3	5	6	7	8
	Pacific & 21st	Harbor Beacon Park/Ride Lot	Harbor Gateway Transit Center	Harbor Freeway Green Line Station (See Note A)	Figuerroa & 7th	Union Station [El Monte Busway & Alameda] (See Note A)	El Monte Bus Station	El Monte Bus Station	Union Station [El Monte Busway & Alameda] (See Note A)	Flower & 7th	Harbor Freeway Green Line Station (See Note A)	Harbor Gateway Transit Center	Harbor Beacon Park/Ride Lot B	Pacific & 21st
910	—	—	4:40A	4:47A	5:06A	5:16A	5:31A	910	3:30A	3:44A	3:55A	4:12A	4:19A	—
950	4:32A	4:43A	5:00	5:07	5:26	5:36	5:51	950	4:00	4:14	4:25	4:42	4:49	5:05A
910	—	—	5:18	5:25	5:45	5:55	6:10	910	4:18	4:32	4:43	5:00	5:07	—
950	5:04	5:16	5:34	5:41	6:01	6:12	6:27	910	4:36	4:50	5:01	5:18	5:25	—
910	—	—	5:50	5:57	6:18	6:29	6:44	950	4:50	5:04	5:15	5:32	5:39	5:55
950	5:30	5:42	6:00	6:07	6:28	6:39	6:54	910	5:05	5:19	5:30	5:47	5:54	—
910	—	—	6:10	6:17	6:38	6:49	7:04	910	5:20	5:34	5:45	6:02	6:09	—
950	5:50	6:02	6:20	6:27	6:48	6:59	7:14	950	5:35	5:49	6:00	6:18	6:25	6:41
910	—	—	6:30	6:37	6:58	7:09	7:24	910	5:45	5:59	6:10	6:28	6:35	—
950	6:10	6:22	6:40	6:47	7:08	7:19	7:34	910	5:54	6:09	6:20	6:38	6:45	7:01
910	—	—	6:50	6:57	7:18	7:29	7:44	950	6:04	6:19	6:30	6:48	6:55	—
950	6:30	6:42	7:00	7:07	7:28	7:40	7:55	950	6:14	6:29	6:40	6:58	7:05	7:21
910	—	—	7:10	7:17	7:38	7:50	8:05	910	6:24	6:39	6:50	7:08	7:15	—

Public Agency Park-and Ride Inventory Data

- Some Caltrans districts and public agencies have published inventory data available
- Data can be used to estimate number of parking spaces and number of bicycle/pedestrians
- Examples:
 - Caltrans District 4 - <https://dot.ca.gov/caltrans-near-me/district-4/d4-popular-links/park-and-ride-lots>
 - Caltrans District 11 - <https://dot.ca.gov/caltrans-near-me/district-11/programs/district-11-planning-local-assistance/district-11-park-ride-program>
 - SANDAG - <https://www.icommutesd.com/commuters/ParkNRide.aspx>

CALTRANS DIST. 4 PARK & RIDE LOTS

ALAMEDA COUNTY										
County Abbr.	Route	Post Mile	City	Name	Location	Parking Spaces	Bike Storage	Transit links (see table)	Location	
ALA	238	0.7	Fremont	Mission SJ Park ⁽¹⁾	Rte. 238 at Mission SJ Park, (joint use lot near High School)	22	lockers	AC, VTA	map	
ALA	580	13.2	Livermore	Livermore	Portola near Alviso Place, (1/2 mi from I-580)	94	lockers	NONE	map	
ALA	580	29.2	Castro Valley	Center Street	E. of Center St. at I-580	138	lockers	AC	map	
ALA	580	30.7	Castro Valley	John Drive	N. side of Foothill Blvd. at John Dr. (near I-580)	8		AC	map	
ALA	580	41.4	Oakland	580/Fruitvale	Under I-580 between Fruitvale/Champion St.	178	lockers & racks	AC	map	
ALA	680	6.4	Fremont	680/Mission Blvd.	S.E. quad. of Rte. 238 (Mission Blvd.)/I-680	127		AC, VTA	map	
ALA	880	32.2	Oakland	7th & Linden	Under I-880 at 7th St./Linden St.	179	racks	AC, BART	map	

CONTRA COSTA COUNTY

County Abbr. | Route | Post Mile | City | Name | Location | Parking | Bike Storage | Transit links (see table) | Location

CC | CC | CC | CC

home > commuters > park & ride

Commute SANDAG

about | commuters | employers | partners | planners & developers | school | events

Search Go

P Park & Ride

Just park and go. Conveniently located throughout the San Diego region, Park & Ride lots are free and a great place to meet your carpool or vanpool. Some Park & Ride lots also offer bike lockers or access to transit. For information about MTS Parking Permits, please visit [sdmts.com](#).

[Map of San Diego Regional Park & Ride Lots \(PDF version\)](#)

[Caltrans Park & Ride Lots map](#)

For more information about Park & Ride lots throughout the region, please contact the Caltrans District 11 Park & Ride Coordinator at d11parkandride@dot.ca.gov

Please select a city or community:

Lot	Location / Address	City	ZIP Code	Parking Spaces
01	AGUA DULCE BLVD. 3642 AGUA DULCE BLVD. -SR 94 & SWEETWATER SPRGS BLVD	CASA DE ORO	91977	46
02	RIVERFORD ROAD 11575 WOODSIDE AVENUE	LAKESIDE	92040	29
03	FELICITA PLAZA 1785 S ESCONDIDO BLVD (FELICITA PLAZA)	ESCONDIDO	92025	29
04	FREEMONT ROAD 10029 CARMEL MOUNTAIN ROAD (SKATEBOARD	SAN DIEGO	92129	99

commuter spotlight

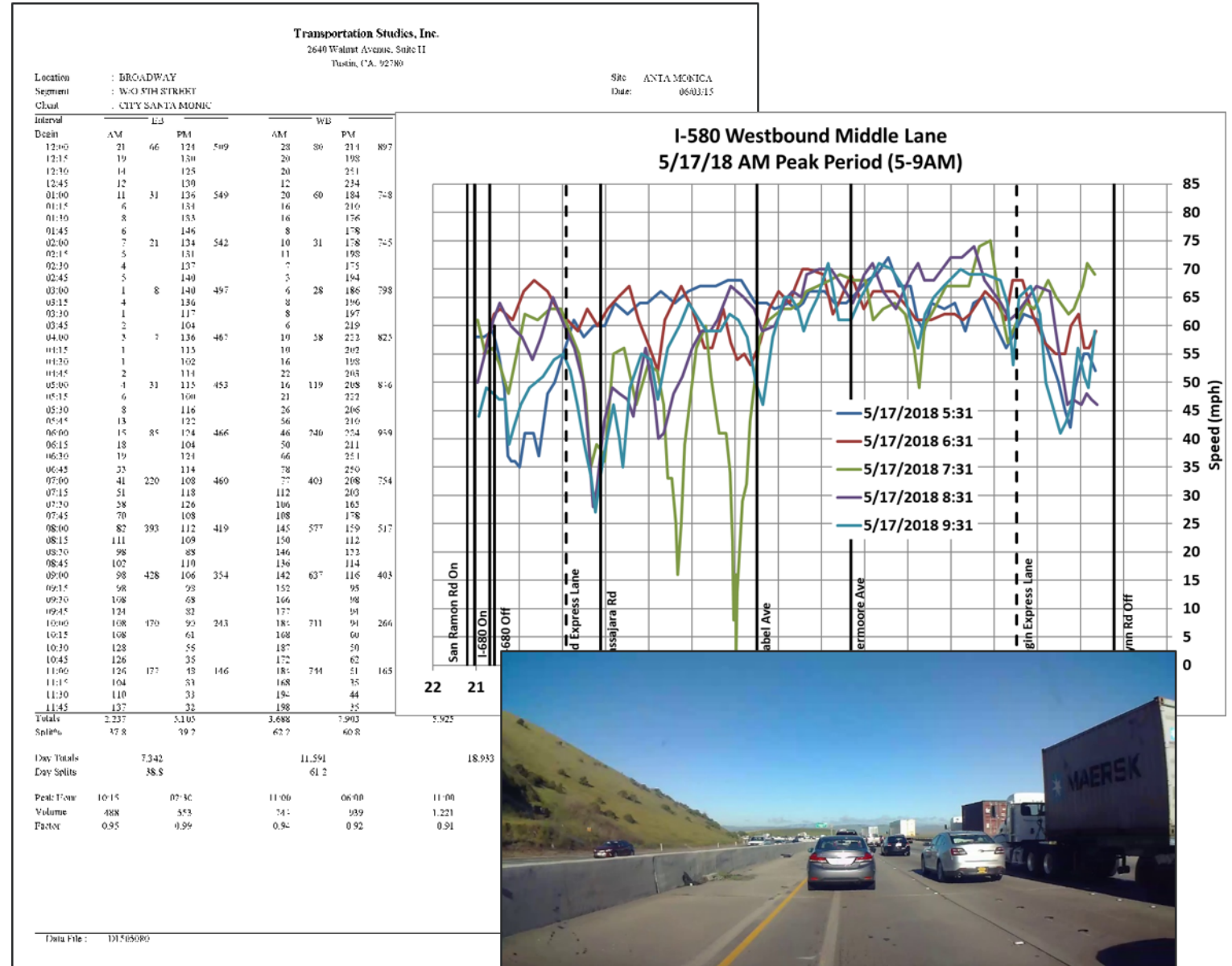
vanpool

"Our vanpool has been together for over 15 years, with riders from Fallbrook, Ramona, Rancho Bernardo, Poway, and Peñasquitos. We love the Sabre Springs Transit Station for its location off the I-15 Express Lanes, its many parking spots, security, and the cover it provides from the weather (when we get weather)."

- Pete A. vannooler

Field Data Collection

- Used when automatically collected data may not be available
- Travel Time Studies (Probe / Floating Vehicles)
- Vehicle Classification and Occupancy Counts

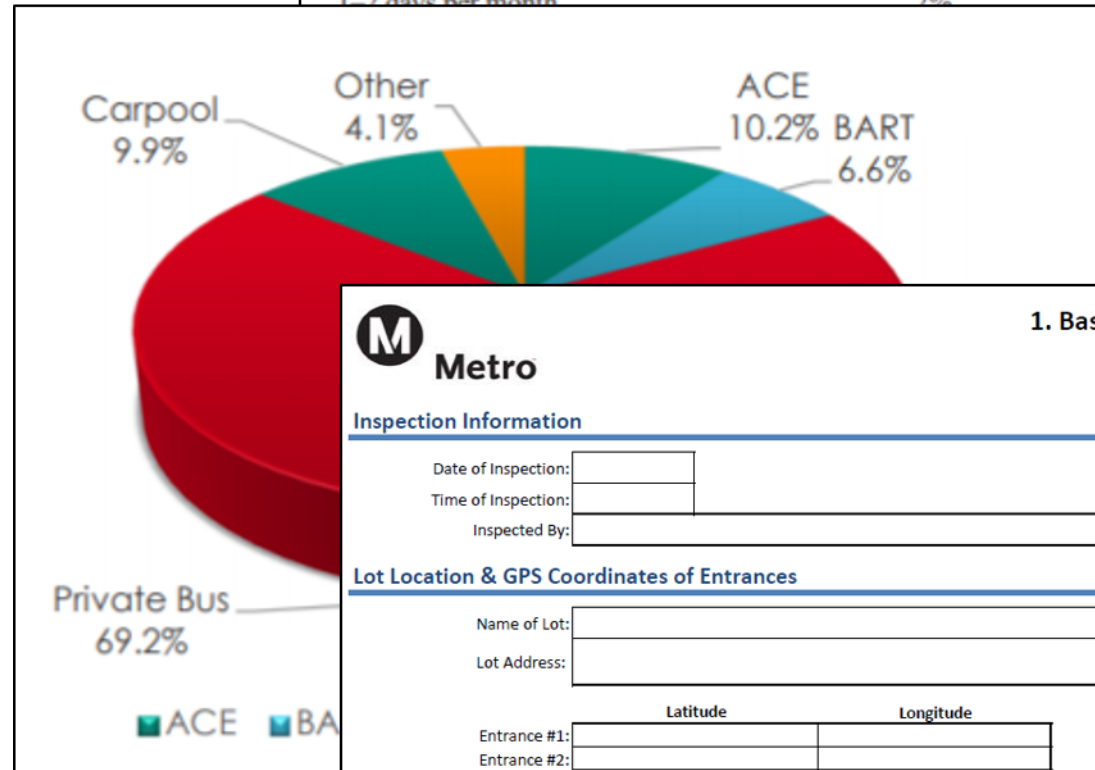


Field Data Collection - Surveys

- Park-and-Ride Surveys and Inventories
- May be needed to supplement regional travel demand models
- Can be used to estimate:
 - Top 3 destinations for a potential PnR facility
 - Number of bicycle/pedestrian users
 - Distribution of new/existing transit and carpool riders
 - Average carpool size and wait time

TABLE 1 Travel Patterns of BART Commuters at Rockridge Station

Attribute	Monthly Paid	Others
<i>BART use frequency</i>	N= 60	N=158
Only occasionally	0%	7%
1-2 days per month	2%	6%
		22%
		53%
		12%
		N=158
		81%
		17%
		2%
		N=158



1. Basic Information

Inspection Information

Date of Inspection:

Time of Inspection:

Inspected By:

Lot Location & GPS Coordinates of Entrances

Name of Lot:

Lot Address:

	Latitude	Longitude
Entrance #1:	<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>
Entrance #2:	<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>
Entrance #3:	<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>
Entrance #4:	<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>

Lot Type

	Yes/ No	Number of Levels	Comments
Surface	-	n/a	<input style="width: 100%;" type="text"/>
Above Ground Structure	-	<input style="width: 50%;" type="text"/>	<input style="width: 100%;" type="text"/>
Underground Structure	-	<input style="width: 50%;" type="text"/>	<input style="width: 100%;" type="text"/>

Notes: If multiple lot types exist, then indicate on area map where each lot type is located.

04

Traffic Collision Data

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

- Highway inventory database which contains the current and historical collisions on the SHS
- Data/Reports accessible through Caltrans Staff
- Data that can be used in Cal-B/C includes:
 - Accident Rate (per million vehicle-miles)
 - Percent Fatal Accidents (Pct Fat)
 - Percent Injury Accidents (Pct Inj)
- <https://dot.ca.gov/programs/research-innovation-system-information/office-of-highway-system-information-performance>

OTM22130
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)	No. of Accidents / Significance								ADT Main X-St	Total MV+ or MVM	Accident Rates					
		Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kid Inj			Fat	Actual F+I	Tot	Average Fat	F+I	Tot
	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
	14,506 MI H NA	1475	3	394	397	1255	76	478	3	177.1	1487.53	0.002	.27	.99	0.004	.27	.85

Statewide Integrated Traffic Records System (SWITRS)

- Database with detailed data gathered from a collision scene by CHP and local law enforcement
- California accident data by locations, dates and collision types
- Used for collision data off the State Highway System (SHS) – TASAS should be used for SHS projects
- Downloadable but requires extensive data manipulation
- Data that can be used in Cal-B/C includes:
 - Accident Rate (per million vehicle-miles)
 - Percent Fatal Accidents (Pct Fat)
 - Percent Injury Accidents (Pct Inj)
- <https://iswitrs.chp.ca.gov/Reports/jsp/index.jsp>

The image shows a screenshot of the California Highway Patrol (CHP) website and an Excel spreadsheet. The website header includes the CHP logo and navigation links. The main content area is titled "SWITRS - Statewide Integrated Traffic Records System" and provides a brief description of the system. Below the website, an Excel spreadsheet is open, displaying a table of traffic collision data. The spreadsheet has columns for CASE_ID, ACCIDENT PROC DA, JURIS, COLLISION DATE, COLLISION TIME, OFFICER I, REPORTING, DISTRICT, DAY OF, V, CHP, SHIF, POPULATI, CNTY, CITY, LO. The data rows show various accident records with their respective details.

CASE_ID	ACCIDENT PROC DA	JURIS	COLLISION DATE	COLLISION TIME	OFFICER I	REPORTING	DISTRICT	DAY OF	V	CHP	SHIF	POPULATI	CNTY	CITY	LO
6980428	2015	20151112	1941	20150621											
8371443	2017	20170609	1941	20170506											
8068295	2016	20160621	1941	20160610											
8347200	2017	20170417	1941	20170405											
8064659	2016	20160624	1941	20160603											
8513141	2017	20180119	1931	20171213											
6244413	2013	20140421	1941	20131007											
8422238	2017	20170803	1941	20170721											
8151848	2016	20161026	1941	20161009											
8041984	2016	20160527	1909	20160514											
8486588	2017	20180109	1931	20171011											
8440707	2017	20170911	1931	20170817											
8399963	2017	20170705	1907	20170619											
6941724	2015	20151019	1941	20150525											
6446622	2014	20150305	1941	20140407											
8283016	2016	20170125	1941	20161227											
8085729	2016	20160727	1948	20160626											
6693006	2014	20141202	1973	20140924											

The Excel spreadsheet also shows a pivot table summarizing the data by reporting district and year. The pivot table is structured as follows:

Reporting District	2013	2014	2015	2016	2017
Atlantic_Primary	1		4	1	3
Atlantic_Secondary					1
Cherry/Garfield/Eastern_Primary	5	1		3	
Cherry/Garfield/Eastern_Secondary					2
Fwy_At_Atlantic			1		2
Fwy_At_Cherry/Garfield/Eastern	1	1			
Fwy_At_Eastern (West)	1			1	
Not a 710 ICM Arterial	1	3	2	3	1
(blank)	63	70	78	71	59
Grand Total	72	76	84	80	68

05

Project Cost Data

Project Costs – Direct Initial Costs

- The level of detail for cost estimates depends on where the project is in the development process
- Regional Transportation Improvement Programs (RTIP) and Caltrans State Highway Operation and Protection Program (SHOPP) have project costs broken down by “capital” and “support”, but without details

PROJECT COSTS (enter costs in thousands of dollars)									
Year	INITIAL COSTS			SUBSEQUENT COSTS		Mitigation	Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	Project Support	R / W	Construction	Maint./ Op.	Rehab.			Constant Dollars	Present Value
Construction Period									
1				<-- Must enter a cost -->				\$0	\$0
2				<-- Must enter a cost -->				0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1								\$0	\$0
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
9								0	0
10								0	0
11								0	0
12								0	0
13								0	0
14								0	0
15								0	0
16								0	0
17								0	0
18								0	0
19								0	0
20								0	0
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Note: Remember to enter costs in thousands of dollars (1000\$). Otherwise, you will not get a correct Benefit/Cost Ratio

Project Costs – Direct Initial Costs

- Pre-planning stages are more difficult
 - Caltrans has a project cost database that has rule-of-thumb cost guides
- Cost estimates for Park-and-Ride facilities depend on the type of lot
- Other sources for Park-and-Ride initial and subsequent costs include other regional Park-and-Ride projects

CONSTRUCTION COST ESTIMATES PER PARKING STALL (2012\$/stall)				
Type of Facility	Low	Middle	High	Source(s)
Above Ground Multi-Level Structure	\$ 9,000	\$ 16,000	\$ 46,000	New York City Park and Ride Study
Below Ground	\$ 30,000	\$ 53,000	\$ 76,000	New York City Park and Ride Study
Leased Lot	\$ 5.00	\$ 8.55	\$ 15.00	Riverside County Transportation Commission (RCTC) Contract Lease Rates. 2012 FTIP
Surface Lot	\$ 2,500	\$ 10,000	\$ 21,000	San Joaquin Council of Governments Park-and-Ride Lot Master Plan Study

Element	Low	Middle	High	Source(s)
Right of Way (ROW) Average Land Cost per Acre (US 2012 Dollars)	\$ 30,000	\$ 500,000	\$ 2,000,000	Review of vacant land prices in Southern California using www.zillow.com , www.landwatch.com , and from ROW cost estimates from the 2010 FTIP.
Preliminary Engineering/Design Cost as a % of Construction Cost	5.00%	7.50%	10.00%	Valley Metro Regional Public Transportation Authority: RPTA Park and Ride Reprioritization Study
Average Annual Maintenance and Operations (M&O) Costs per Parking Stall (US 2012 Dollars)	\$ 120	\$ 400	\$ 875	Based on M&O estimates from OCTA. Typical ranges are 10-30% of Total Construction Costs according to . Park & Ride Stakeholder Survey for District 12 Project

Project Costs – Federal Transit Administration (FTA) Capital Costs Database

- Microsoft Access database that can be used to estimate order-of-magnitude costs
- Contains “as-built” costs for federally funded projects including bus rapid transit
- Uses the FTA Standard Cost Category (SCC) codes for comparisons among transit operators



Cost Basis Name: Parking Structure		Unit Cost in National Avg. User Selected Base Year 2018		
Cost Category and Element	Units	Number of Projects	Average Unit Quantity	
10.100 Track: Embedded	Track Feet	0	0	\$0
10.110 Track: Ballasted	Track Feet	0	0	\$0
10.120 Track: Special (switches, turnouts)	Track Feet	0	0	\$0
10.130 Track: Vibration & Noise Dampening	Track Feet	0	0	\$0
10.140 Special Structures	LF Guideway	0	0	\$0
20 Stations, Stops, Terminals, Intermodels	Stations			\$26,369
20.010 At-Grade Station, Stop, Shelter, Mall, Terminal, Platform	Stations	0	0	\$0
20.020 Aerial station, stop, shelter, mall, terminal, platform	Stations	0	0	\$0
20.030 Underground station, stop, shelter, mall, terminal, platform	Stations	0	0	\$0
20.031 Cut and Cover	Stations	0	0	\$0
20.032 Bored Earth Soft Soils	Stations	0	0	\$0
20.033 Bored Rock Hard Soils	Stations	0	0	\$0
20.034 Unspecified	Stations	0	0	\$0
20.040 Major stations, landings, terminals: Intermodal, ferry, trolley, etc.	Stations	0	0	\$0
20.050 Unit development	Stations	0	0	\$0
20.060 Automobile parking multi-story structure	Spaces	7	1,849	\$26,369
20.070 Elevators, escalators	Number	0	0	\$0
20.071 Elevators	Number	0	0	\$0
20.072 Escalators	Number	0	0	\$0
20.073 Unspecified	Number	0	0	\$0
20.080 Passenger Overpass	Number	0	0	\$0
20.090 Underground Interconnecting Tunnel	Number	0	0	\$0
20.091 Cut and Cover	Number	0	0	\$0
20.092 Bored Earth Soft Soils	Number	0	0	\$0
20.093 Bored Rock Hard Soils	Number	0	0	\$0
20.094 Unspecified	Number	0	0	\$0

Project Costs – Subsequent Costs

- Caltrans and regional agencies have estimates for maintenance and operating costs for various facilities
- Transit annual operating expenses can be estimated from NTD data tables
- Park and Ride revenue data may be available
- Subsequent costs should be entered as a NET increase or decrease from the No Build case
 - May be positive (e.g., increased cost for operating and maintaining the lot)
 - May be negative (e.g., avoided maintenance or rehabilitation)

The image shows a screenshot of the Federal Transit Administration (FTA) website. The browser address bar shows the URL: transit.dot.gov/ntd/data-product/2018-operating-expenses. The page title is "2018 Operating Expenses". The document is titled "CALIFORNIA DEPARTMENT OF TRANSPORTATION" and "2015 Five-Year Maintenance Plan". It includes the Caltrans logo and states "To Be Finalized with the 2015 Ten-Year State Highway Operation and Protection Program Plan, May 2015". The document description says: "Gives operating expense for each agency, mode, and type of service, divided among NTD's four expense functions, or among NTD's object classes." The keywords listed are: "vehicle operations, vehicle maintenance, non-vehicle maintenance, facility maintenance, general administration, operations, cost, financial reports, financial records, labor, operator salaries, wages, fringe benefits, services, utilities, taxes, tires, fuel, purchased transportation". A note at the bottom states: "This document has been certified as 508 compliant. NTDHelp@dot.gov".

The second page is titled "2016 Annual Database Revenue Sources". The document is titled "2016 Revenue Sources.xlsx". The document description says: "Contains sum of funds that a transit agency earns from governmental and non-governmental sources, categorized by source of funds." The keywords listed are: "5307, full, ssw, small system, reduced reporter, rr, passenger fares, park and ride, auxiliary funds, non-transportation funds, and other transportation funds, revenues accrued through purchased transportation agreements and contributed services, and other directly generated funds categorized by funds earned, funds expended on operations, funds expended on capital, advertising, concessions, other sources of revenue, fare box, payment, passes, costs, tickets, earnings, investments, subsidies, income taxes, property taxes, fuel, lubricant taxes, electric propulsion power taxes, licensing, registration, fee, tolls, 5309, 5310, 5339, 5337, capital assistance on operations, funding, 5303, 5308, 5311, 5316, 5317, 5320, ARRA funds, grants, FTA other funds, USDOT grants, source of funding, earned funds, expended funds, funding statistics, local funding, state funding, federal funding, dedicated funds, non-federal funds". A note at the bottom states: "This document has not been certified as 508 compliant. NTDHelp@dot.gov".

Project Costs – Mitigation Costs

- Mitigation costs (in thousands of dollars) include costs to protect communities and the environment from negative impacts
 - Include wetland and community preservation as well as sound walls to reduce highway or rail transit noise
- Plans, PS&E, PR, and PSR will provide mitigation cost estimates (with details found in the appendices)
- Often these costs can be included in the “construction” costs for a project and may not need to be entered into Cal-B/C as a separate costs
 - Soundwalls and environmental mitigations are examples of mitigations that are built into the cost of projects presented in PRs
- On-going mitigation costs that continue after the project construction is completed will be included in PRs

PROJECT COST ESTIMATE
EA: 31450 PID: D01234567

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION				
Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation				
Total of Section 1-4				
130670	Temporary Reinforced Silt Fence	LF	\$ 144,076,600 x 3.0%	\$ 4,322,300
141000	Temporary Fence (Type ESA)	LF	x	- \$
				Subtotal Environmental Mitigation \$ 4,322,300
5B - LANDSCAPE AND IRRIGATION				
Item code	Unit	Quantity	Unit Price (\$)	Cost
Highway Planting				
Total of Section 1-4				
20XXXX	Highway Planting (Landscaped Status)	ACRE	\$ 144,076,600 x 3.0%	\$ 4,322,300
20XXXX	Irrigation System	LS	x 97,000.00	\$ 3,482,300
204099	Plant Establishment Work	LS	x	- \$
204101	Extend Plant Establishment Work	LS	x	- \$
20XXXX	Follow-up Landscape Project	LS	x	- \$
150685	Remove Irrigation Facility	LS	x	- \$
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS	x	- \$
206400	Check and Test Existing Irrigation Facilities	LS	x	- \$
21011X	Imported Topsoil (X)	CY/TON	x	- \$
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	QFT/SQYD	x	- \$
200122	Weed Germination	SQYD	x	- \$
208304	Water Meter	EA	x	- \$
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF	x	- \$
20890X	Extended A. Utilization (Use for Extension of Irrigation)	LF	x	- \$
				Subtotal Landscape and Irrigation \$ 7,804,600
5C - EROSION CONTROL				
Item code	Unit	Quantity	Unit Price (\$)	Cost
Move In/Move Out (Erosion Control)				
210010	Fiber Rolls	EA	x	- \$
210350	Compost Sock	LF	x	- \$
2102XX	Roller Erosion Control Product (X)	SQFT	x	- \$
21025X	Bonded Fiber Matrix	QFT/ACRE	x	- \$
210300	Hydromulch	SQFT	x	- \$
210420	Straw	SQFT	x	- \$
210430	Hydroseed	SQFT	x	- \$
210600	Compost	SQFT	x	- \$
210630	Incorporate Materials	SQFT	x	- \$
Total of Section 1-4				
				\$ 144,076,600 x 10.0% = \$ 14,407,700
				Subtotal Erosion Control \$ 14,407,700
5D - NPDES				
Item code	Unit	Quantity	Unit Price (\$)	Cost
130300	Prepare SWPPP	LS	1 x 10,000.00	10,000
130200	Prepare WPCP	LS	x	- \$
130100	Job Site Management	LS	x	- \$
130330	Storm Water Annual Report	EA	x	- \$
130310	Rain Event Action Plan (REAP)	EA	x	- \$
130320	Storm Water Sampling and Analysis Day	EA	x	- \$
130520	Temporary Hydraulic Mulch	SQYD	x	- \$
130550	Temporary Hydroseed	SQYD	x	- \$
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	x	- \$
130640	Temporary Fiber Roll	LF	x	- \$
130900	Temporary Concrete Washout	LS	x	- \$
130710	Temporary Construction Entrance	EA	x	- \$
130610	Temporary Check Dam	LF	x	- \$
130620	Temporary Drainage Inlet Protection	EA	x	- \$
130730	Street Sweeping	LS	x	- \$
Total of Section 1-4				
				\$ 144,076,600 x 10.0% = \$ 14,407,700
				Subtotal NPDES \$ 14,417,700
Supplemental Work for NPDES				
065595	Water Pollution Control Maintenance Sharing*	LS	x	- \$
065596	Additional Water Pollution Control**	LS	x	- \$
065597	Storm Water Sampling and Analysis***	LS	x	- \$
XXXXXX	Storm Water BMPs	LS	1 x 12,930,000.00	12,930,000
				Subtotal Supplemental Work for NPDES \$ 12,930,000
				TOTAL ENVIRONMENTAL \$ 40,952,300

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.
 **Applies to both SWPPPs and WPCP projects.
 ***Applies only to project with SWPPPs.

Project Costs – Savings to Transit Agency

- For projects with a Transit Vehicle Location (AVL) TMS Strategy, Cal-B/C will estimate annual cost savings to the transit agency
 - Based on the Transit Agency Costs data entry and the Transit Travel Time and Agency Cost Savings parameters

06

Conclusion

In this module, you learned...

- About potential data sources for data input and project costing for Cal-B/C Park-and-Ride
- How to get data from these sources

What's Next?

- **Module 9d** walks through a Park-and-Ride project example showing how to perform a BCA analysis
- **Module 10** is the final module in this training series and provides additional information and data sources for BCA in Cal-B/C tools