

THE CALTRAIN STATION

PLANNING TOOLBOX

FEHR  PEERS

September 11, 2018

KEY TAKEAWAYS

- What is the Station Planning Toolbox?
- Why is it needed?
- Technical Input
- Toolbox Demonstration

ABOUT CALTRAIN

- Peninsula Corridor Joint Powers Board – governing body
- Bay Area commuter rail serves San Francisco, San Mateo, and Santa Clara counties
- Service dates to 1860s
- Average weekday ridership: ~65,000 riders



CALTRAIN CORRIDOR

- Caltrain owns right-of way from San Francisco to San Jose to Tamien Station (51 miles)
- UPRR owns corridor south of Tamien Station; Caltrain has limited trackage rights
- Primarily two track system with some 4-track segments
- Varying right-of-way widths throughout corridor
- 42 At-Grade crossings, viaducts, and bridges
- 32 Passenger Stations in 3 Counties and 19 cities
- 92 Weekday trains (Baby Bullet/Limited/Local Services)
- Diesel push/pull
- Corridor Electrification is under construction



STATION MANAGEMENT TOOLBOX

- Purpose: Provide a decision-making tool and technical analysis to help assess potential outcomes and trade-offs associated with access improvements and TOD at stations
- Funded by FTA planning grant and local match
- **Objectives:**
 - Establish performance goals and metrics related to Caltrain's station-based assets and programs
 - Provide Caltrain with a methodology to quickly and transparently evaluate the performance of potential access investments and transit oriented developments at and near stations

STATION MANAGEMENT TOOLBOX

Tasks & Timing

1. Create the Toolbox Framework

Establish the range of decision and planning scenarios where the Toolbox is needed, and propose tools for quantitative analysis to aid in decision-making


summer 2018

2. Build the Toolbox

Create the set of tools that will comprise the Toolbox and facilitate technical analysis

3. Test the Toolbox

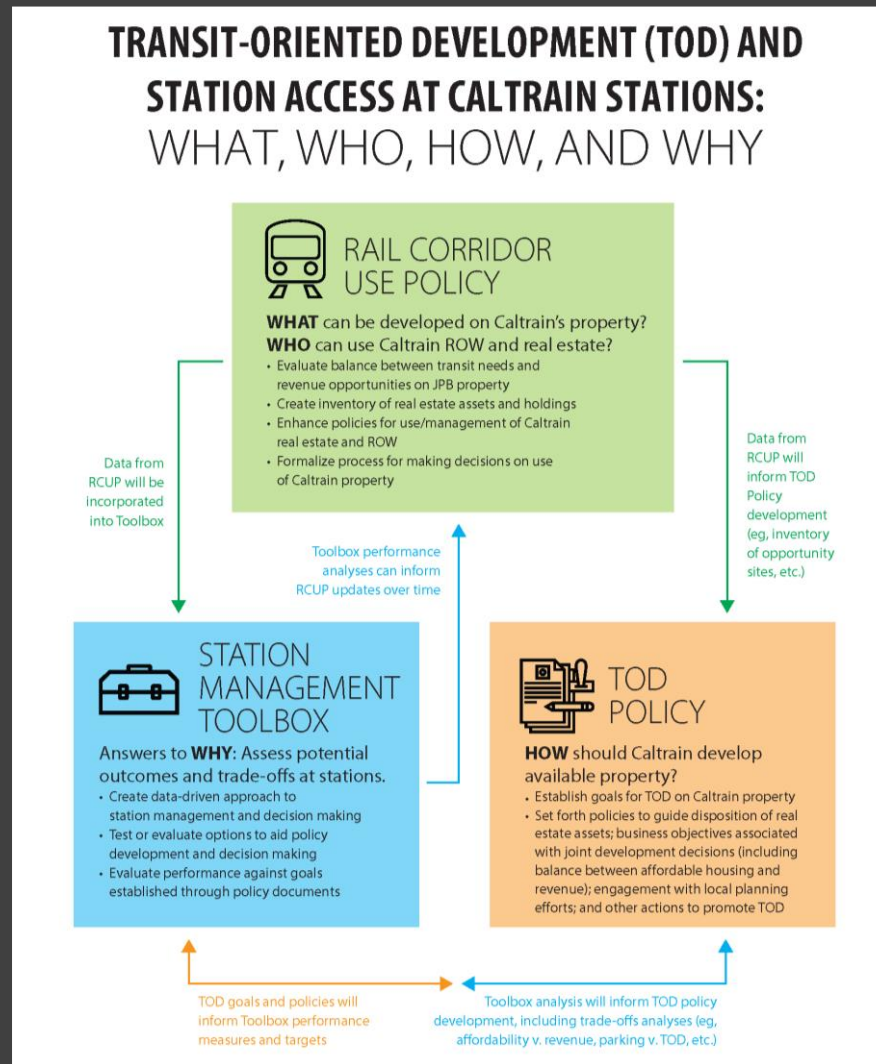
Use case studies of three Caltrain stations (South San Francisco, Belmont, and Redwood City) to test the Toolbox and develop case study plans


TBD - aligning with Business Plan

TOD AND STATION ACCESS

at Caltrain Stations

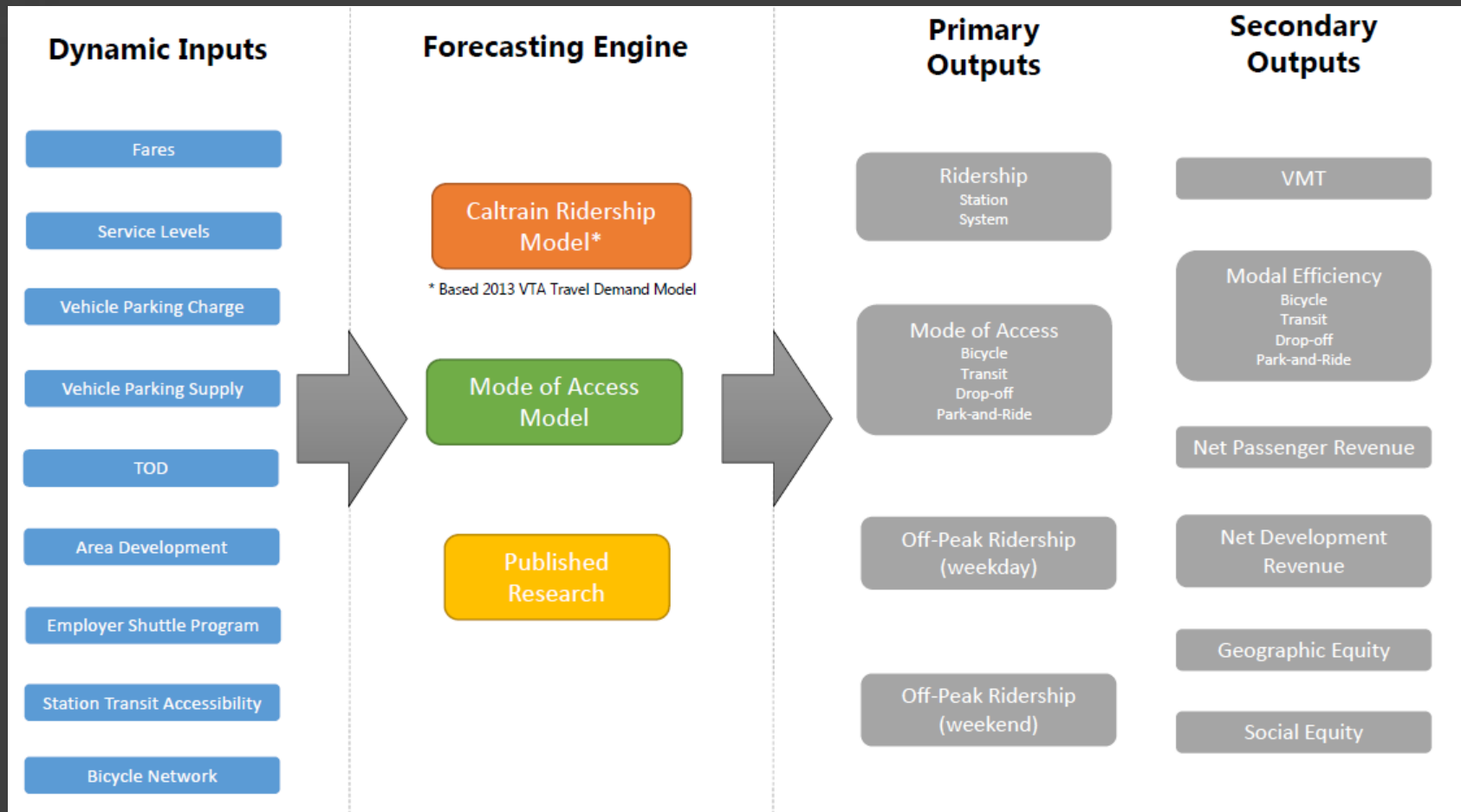
Relationship between the three projects



CALTRAIN PLANNING TOOLS

- Three interrelated planning and policy analyses to address station access and transit-oriented development (TOD)
- Key questions for each project:
 - **Rail Corridor Use Policy:** What can be developed on JPB property? Who can use JPB right-of-way and real estate?
 - **TOD Policy:** How should Caltrain develop available property?
 - **Station Management Toolbox:** Help answer “Why?” questions to help assess outcomes and trade-offs of station access and TOD decisions

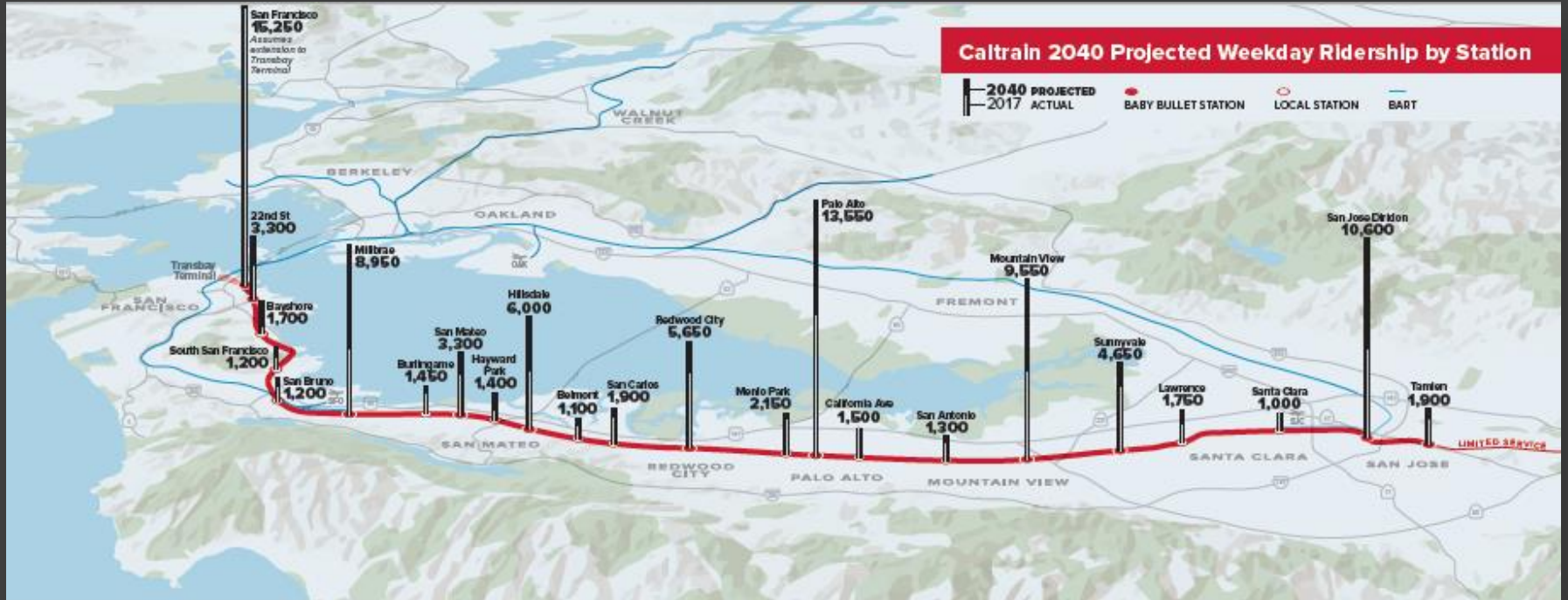
TOOLBOX FRAMEWORK



CALTRAIN RIDERSHIP MODEL

- **Regional Travel Demand Model**
 - Good for system-wide ridership but misses station-level detail
 - Changes from model baseline estimated using elasticities for population, employment, fare, service level
- **Direct Ridership Calibration**
 - Adjusts station level ridership via linear regression models
 - Improves sensitivity to station area population, employment, accessibility
- **TOD Ridership Calculation**
 - Ridership from TOD development calculated separately based on trip rates from research

CALTRAIN RIDERSHIP MODEL



MODE OF ACCESS MODEL

- **Models estimated from 2016 rider survey**
 - Separate models for AM vs PM peaks and for access vs egress
 - Predictor variables include population, employment, accessibility by walk, bike, transit, shuttles, parking availability & cost, Caltrain frequency
 - Logit models transformed to linear regression via Berkson method
- **Adjustments to initial access/egress models**
 - TOD mode of access/egress
 - Ride-hailing trend
 - Changes in station parking

RIDE HAILING TRENDS

- **Effect on Caltrain Ridership**
 - Tool can adjust total ridership based on trends in ride hailing
 - Best current research suggests commuter rail not influenced by ride hailing, so current version of tool does not include adjustment
 - Can be updated easily if future research supports it
- **Effect on Mode of Access**
 - Tool adjusts mode of access based on trends in ride hailing
 - Ride hail access substitutes for other modes in accord with research and Caltrain-specific data
 - Size of ride hail effect can be selected by user

STATION MANAGEMENT TOOLBOX

Graphic User Interface for Tool Inputs

Caltrain Station Management Toolbox



SYSTEMWIDE INPUT

Service Level: 120 % of baseline
 Fare: 110 % of baseline
 Ride Hailing Trend: Very High
 Parking Price: 150 % of baseline

STATION INPUT

Station: Redwood City

AREA DEVELOPMENT

Caltrain Transit-Oriented Development Options

Site: A Townhomes and Low Density Flats

Residential	62	DU	Affordable Housing	0	%
Office	0	KSF	Dev Revenue	7093	\$1K NPV
Retail	0	KSF			
Other Commercial	0	KSF			

Site: B 2016 Baseline

Residential	0	DU	Affordable Housing	0	%
Office	0	KSF	Dev Revenue	0	\$1K NPV
Retail	0	KSF			
Other Commercial	0	KSF			

Site: C No site available

Residential	0	DU	Affordable Housing	0	%
Office	0	KSF	Dev Revenue	0	\$1K NPV
Retail	0	KSF			
Other Commercial	0	KSF			

Caltrain Parking

Baseline Parking	557	Spaces
Parking Removed by TOD	200	Spaces
Parking Added by TOD	0	Spaces
New Parking Total	357	Spaces

Station has free parking

STATION INPUT (Continued)

Other Station Area Development

	Baseline	New Total		New	Baseline	New Total	%
Residential	7849	10849	DU	Affordable Housing	0	15	%
Office	6491	6491	KSF				
Retail	598	598	KSF				
Other Commercial	2301	2301	KSF				

AREA CONNECTIVITY

Public Transit Access

Default: Med

High - Station has heavy or light rail transfer opportunities, as well as bus service

Capital Costs for Access Improvements	0	\$1K NPV
Operating/Maintenance Costs for Access Improvements	0	\$1K Annual

Employee Shuttle Program

	Value	New Total	
Shuttles during AM Peak Hour	8	12	Shuttles
Capital Costs for Access Improvements	0	0	\$1K NPV
Operating/Maintenance Costs for Access Improvements	0	0	\$1K Annual

Station Area Walkability

Default: Med

Very High - Station area is highly walkable and very comfortable for all pedestrians

Capital Costs for Access Improvements	0	\$1K NPV
Operating/Maintenance Costs for Access Improvements	0	\$1K Annual

Bike Lane miles within 1 mile of station

	Class I	Class II	Class III	Class IV	
Value	0.9	1.5	13	0	Lane Miles
New Total	0.9	5	8	4	Lane Miles
Capital Costs for Access Improvements	0	0	0	0	\$1K NPV
Operating/Maintenance Costs for Access Improvements	0	0	0	0	\$1K Annual

○ Current Station ● Modified Station

Restore Systemwide Default Restore Station Default See Detailed Report

STATION MANAGEMENT TOOLBOX

Graphic User Interface for Tool Outputs

Caltrain Station Management Toolbox



RIDERSHIP OUTPUTS

	STATION		SYSTEM	
	Baseline	New Total	Baseline	New Total
Daily Boardings	6,705	7,535	125,261	127,404
Change in Off-Peak Ridership	↑			
Change in Peak Balance	-			
Modal Access Efficiency ?				
Index	5.5	5.8	5.4	5.5

	STATION		SYSTEM	
	Baseline	New Total	Baseline	New Total
AM Peak Mode of Access				
Park-and-Ride	17%	8%	17%	12%
Other drop-off	7%	22%	10%	7%
Ride Hail	19%	16%	18%	18%
Transit	46%	17%	20%	17%
Bike		35%		18%
Walk			32%	28%

	STATION		SYSTEM	
	Baseline	New Total	Baseline	New Total
AM Peak Mode of Egress				
Park-and-Ride		15%		13%
Other drop-off	11%	7%	27%	25%
Ride Hail		10%		10%
Transit			11%	10%
Bike	73%	67%		
Walk			49%	46%

REVENUE OUTPUTS ?

	STATION		SYSTEM	
	Baseline	New Total	Baseline	New Total
Passenger Revenue Annual \$1K	\$8,547	\$10,565	\$169,329	\$189,439
Parking Revenue Annual \$1K	\$842	\$810	\$7,669	\$10,272
Other Operating Costs Annual \$1K	\$0	\$0	\$0	\$0
Development Revenue NPV \$1K	STATION		SYSTEM	
		\$7,093		\$7,093
Other Capital Costs NPV \$1K	STATION		SYSTEM	
		\$1,160		\$1,160

EQUITY & ENVIRONMENTAL OUTPUTS

	STATION		SYSTEM	
	Baseline	New Total	Baseline	New Total
Jobs within 1/2 mile	17,256	17,256	488,474	488,474
New Affordable Housing 1/2 mile	0	450	0	450
Access/Egress VMT	3,819	3,703	150,958	147,894

PARKING OUTPUTS ?

	Station Value	2016 Park & Ride Riders by Access Distance	
		STATION	SYSTEM
Baseline Parking Spaces	557		
Parking Occupancy	72%		
Net Change Parking Spaces	-200		
Net Change Park & Ride Riders	-65		
Net Change Non-Park & Ride Riders	54		
Net Change Total Ridership	-11		
		60%	14%
		27%	24%
		10%	42%
			15%

DEMONSTRATION



Caltrain Station Management Toolbox

1 Scenario: 2040

2 SYSTEMWIDE INPUT

Scenario Level: 2040
 % of Scenario: 100%
 Side Hauling Transit: 20%
 Parking Cost: 150 \$/hour

4 STATION INPUT

Station: Mountain View

AREA DEVELOPMENT

Caltrain Transit-Oriented Development Options

Site A: 200' Surround

Residential	0	DU	After-Hours Housing	0	%
Office	0	RSP	Day Revenue	0	\$/hr
Retail	0	RSP			
Other Commercial	0	RSP			

Site B: No site available

Residential	0	DU	After-Hours Housing	0	%
Office	0	RSP	Day Revenue	0	\$/hr
Retail	0	RSP			
Other Commercial	0	RSP			

Site C: No site available

Residential	0	DU	After-Hours Housing	0	%
Office	0	RSP	Day Revenue	0	\$/hr
Retail	0	RSP			
Other Commercial	0	RSP			

5 Station: Station Has Free Parking

Residual Parking: 30 Spaces
 Parking Removed by TOD: 0 Spaces
 Parking Added by TOD: 0 Spaces
 New Parking Total: 30 Spaces

6 STATION INPUT (Continued)

Other Station Area Developments

Residential	300	4200	DU	After-Hours Housing	0	%
Office	100	1000	RSP			
Retail	200	200	RSP			
Other Commercial	400	400	RSP			

AREA CONNECTIVITY

7 Public Transit Access

Default: High - Station has heavy light rail transit opportunities, as well as bus service

Capital Costs for Access Improvements: 0 \$/hr NPV
 Operating/Maintenance Costs for Access Improvements: 0 \$/hr Annual

Employee Shuttle Program

Value	New Total	Shuttles
Shuttles during AM Peak Hour: 24	24	1
Capital Costs for Access Improvements: 0		\$/hr NPV
Operating/Maintenance Costs for Access Improvements: 0		\$/hr Annual

Station Area Walkability

Default: High - Station area is walkable and generally comfortable for most pedestrians

Capital Costs for Access Improvements: 0 \$/hr NPV
 Operating/Maintenance Costs for Access Improvements: 0 \$/hr Annual

Bike/Miles within 1 mile of station

Value	Class I	Class II	Class III	Class IV
Value: 2.4	1.7	4.0	0	0
New Total: 2.08	1.7	20.4	0.00	0
Capital Costs for Access Improvements: 0		Dollars		
Operating/Maintenance Costs for Access Improvements: 0		Dollars		

8 Restore Systemwide Default | Restore Station Default | See Detailed Report

STATION INPUTS

- 4** **Station:** Choose the station you'd like to modify. The chosen station will be circled yellow on the map. Stations you've already modified will be blue.

Caltrain Transit-Oriented Development Options: The drop-down menus for Site A, B, and C will be auto-populated with the chosen station's available sites and development options. For each site, choose from the drop-down the appropriate development option. If you'd like to customize a development, choose "Custom" and manually input the land use and revenue information.

- 5** **"Station Has Free Parking":** Check the box if free parking will be provided at the station in the Scenario Year.

Caltrain Parking Inputs: Input the parking either added or removed by the TODs entered in Step 4.

- 6** **Other Station Area Developments:** Add any additional development within the Station Area. The values should represent the new total land use.

- 7** **For transit, employee shuttles, walking, and biking, input:**

Access: Choose the level of accessibility for each transportation mode that matches the Scenario.

Capital Costs for Access Improvements: Input the expected capital costs (Net Present Value) Caltrain would allocate for the planned accessibility improvements for each mode.

Operating/Maintenance Costs for Access Improvements: Input the expected annual operating/maintenance costs for the access improvements.

Repeat steps 4-7 for each station that has Station Area modifications for the Scenario.

QUESTIONS?

The Caltrain Planning Toolbox

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