



East County Integrated Transit Study

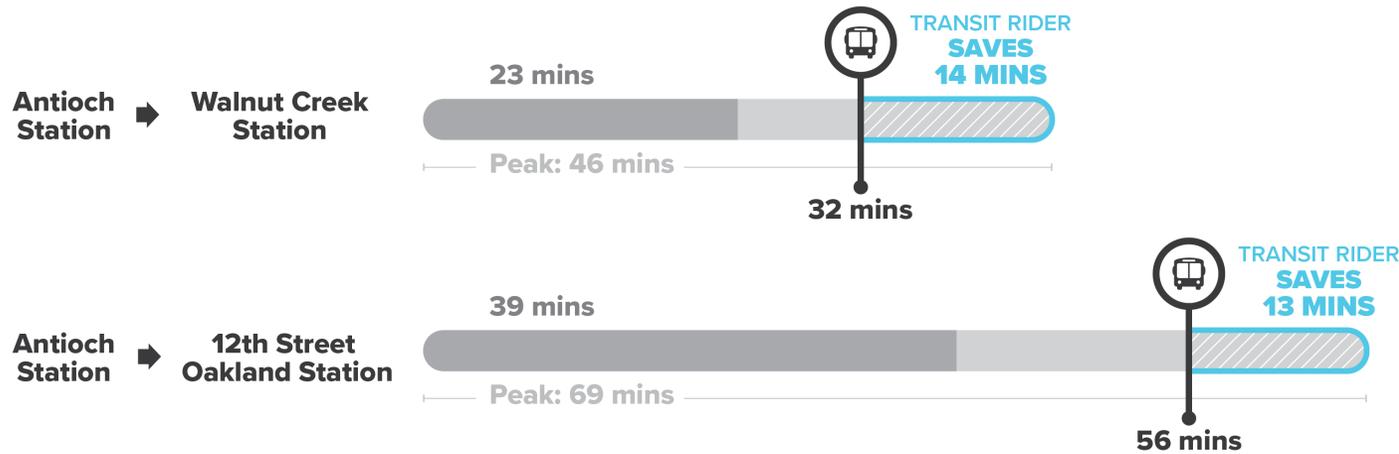
CCTA Board Meeting

Matt Kelly, Senior Transportation Planner, CCTA

December 15, 2021

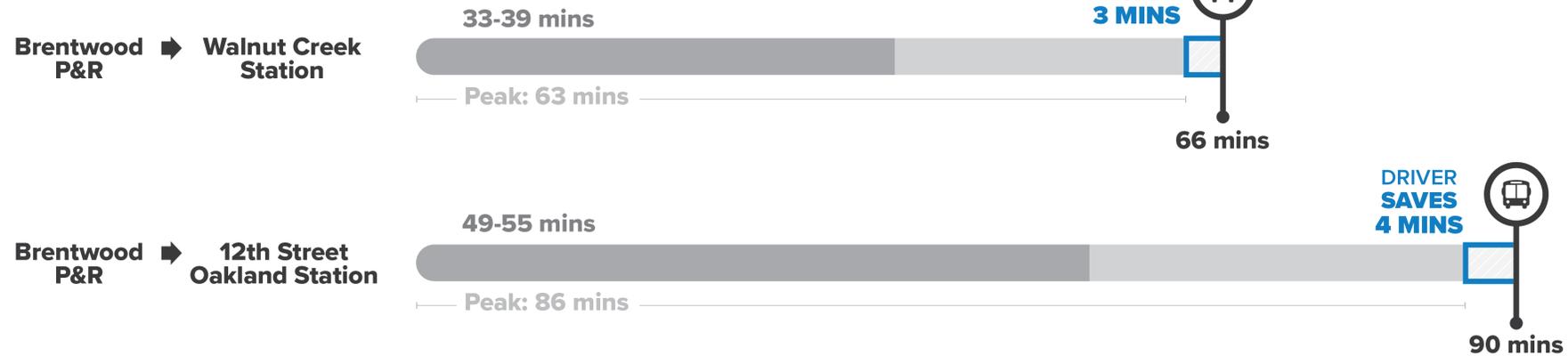


Existing Travel Time Comparison (2019)



Antioch residents have competitively faster transit commute options to Central County and Bay Area job centers

Free Flow Drive Time → ← AM Peak Drive Time Transit Trip (BART) AM Time Savings by Transit

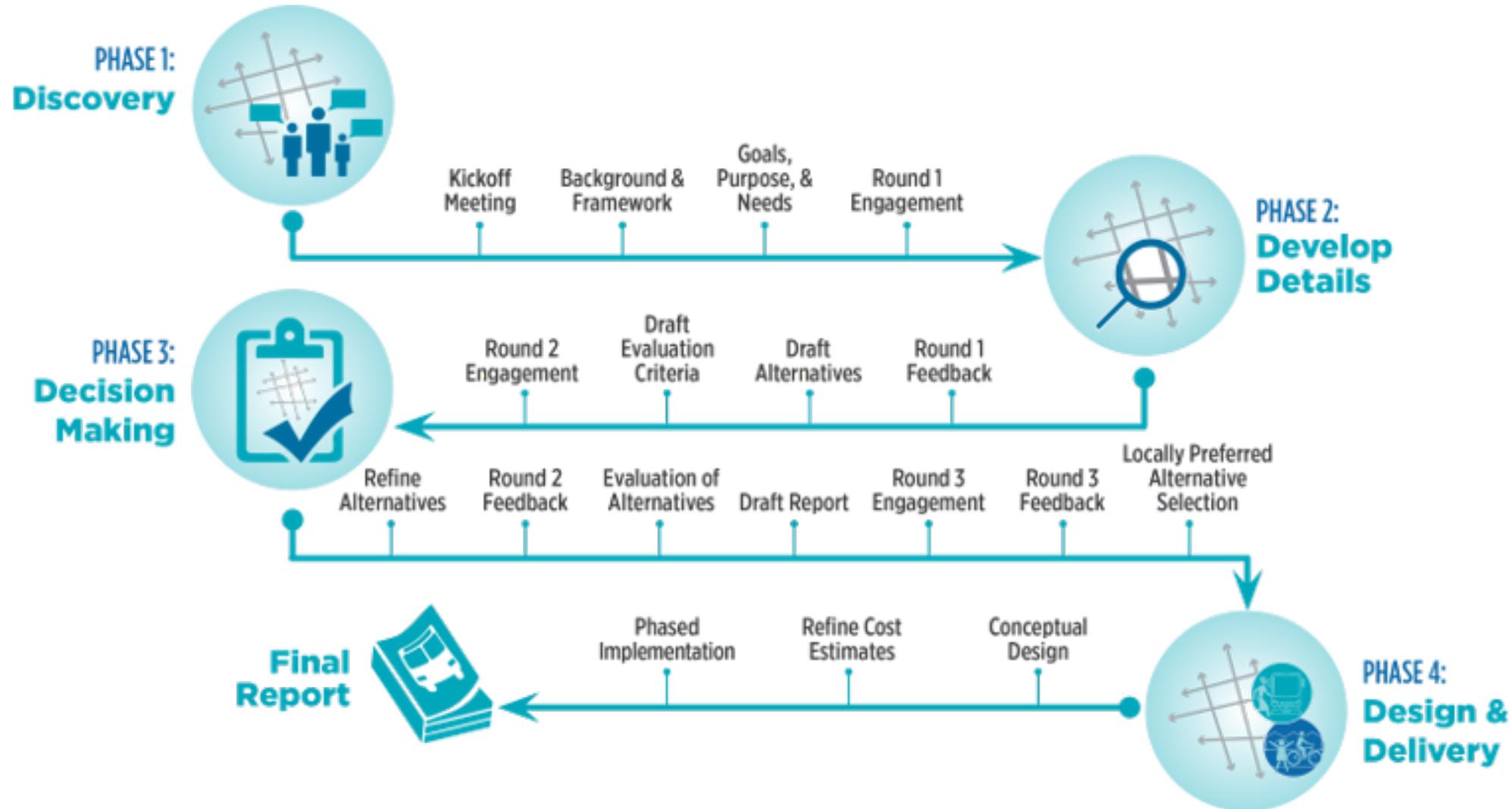


Brentwood residents have competitively slower transit commute options to Central County and Bay Area job centers

Free Flow Drive Time → ← AM Peak Drive Time Transit Trip (BART) AM Time Savings by Driving

01 | Project Status

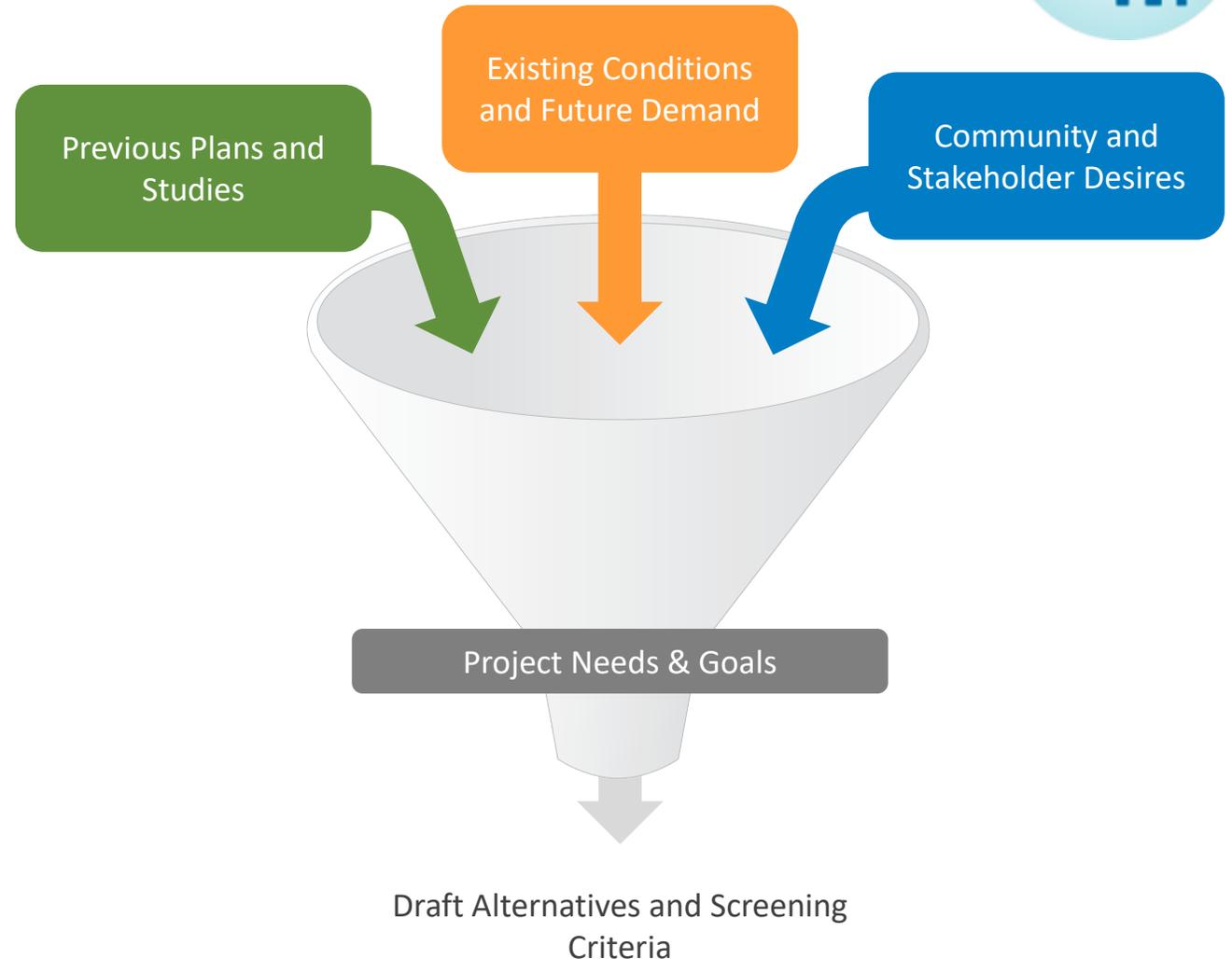
Project Workflow



01 | Phase 1 Overview



- Deepen understanding of **stakeholder** needs
- Clear and compelling **project needs statement**
- Create **foundation** for high-capacity modal alternatives / elements



01 | Phase 2 Overview

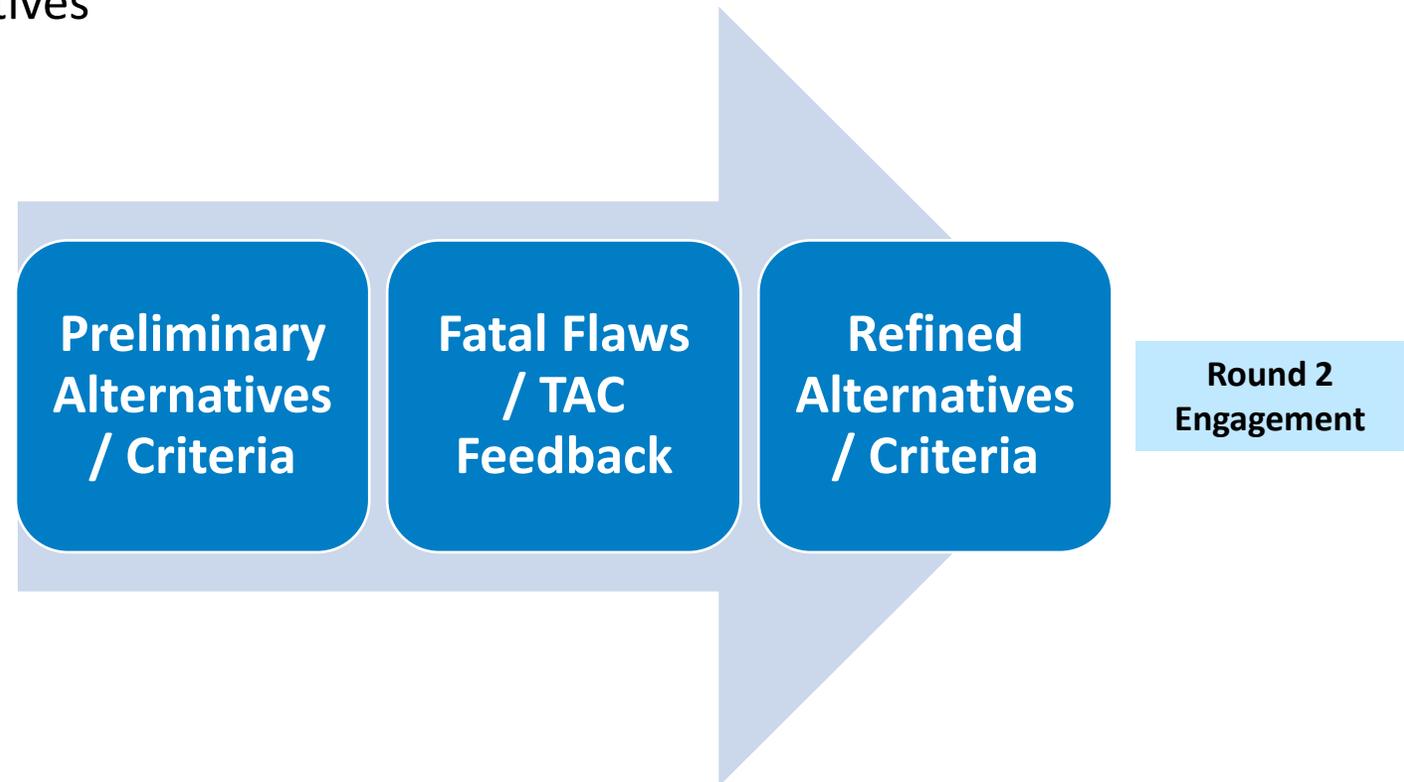
Objectives and Desired Outcomes

Develop reasonable set of Alternatives and Criteria for Round 2 community buy-in and detailed evaluation in Phase 3

- Based on Round 1 Goals and Objectives

Framework for evaluation of Alternatives

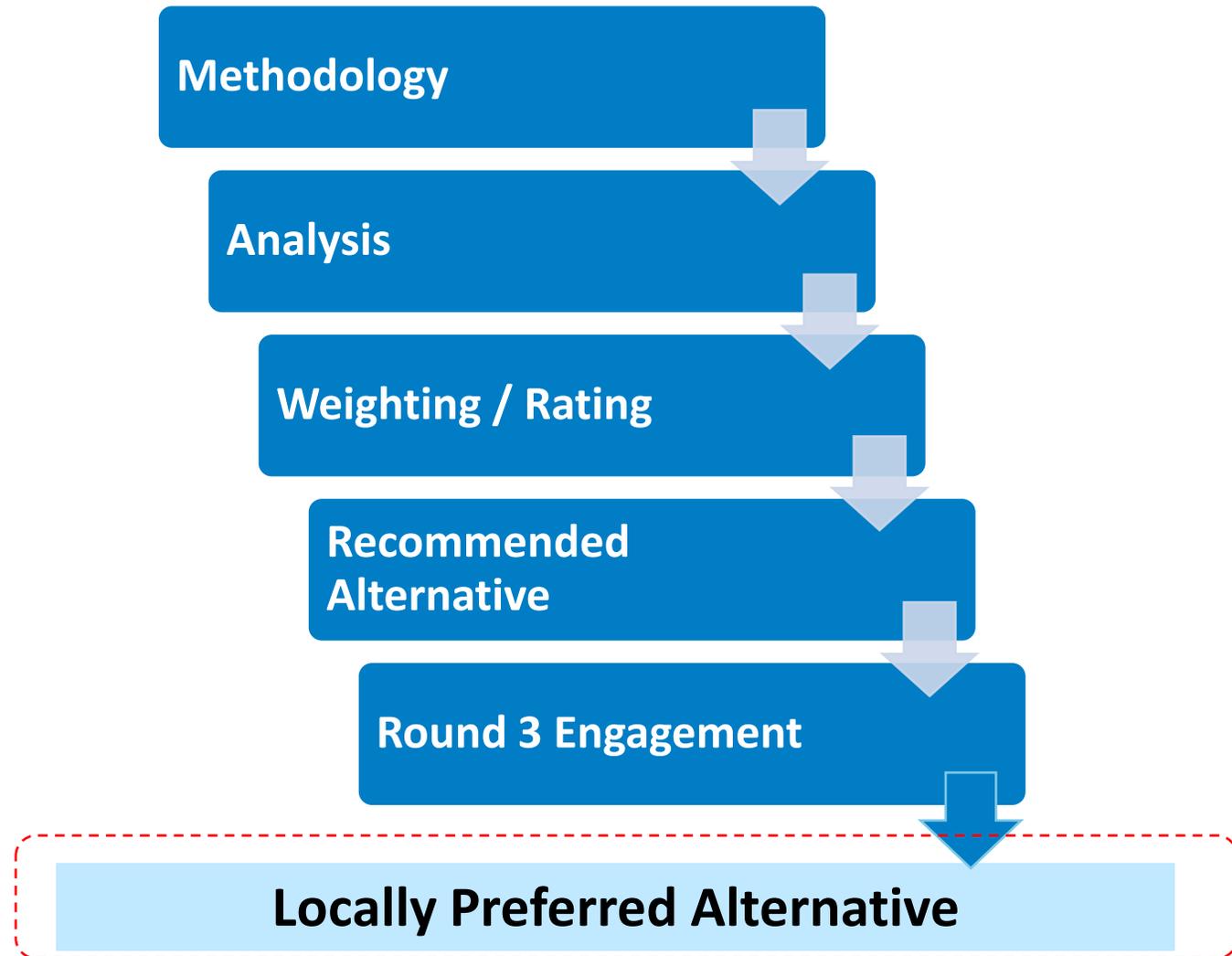
- Quantitative
 - Data-driven
 - Performance-based
- Qualitative
 - Community and equity
 - Relative comparisons



01 | Phase 3 Overview

Evaluation of Alternatives

- **Methodology** – define how each criteria will be measured, data collection, analysis parameters, and tools required
- **Analysis** – document assumptions, assess and analyze benefits / tradeoffs, and estimate performance
- **Weighting / Rating** – determine breakpoints and thresholds for scoring comparative performance



02 | Alternative Development

02 | ECITS Goals

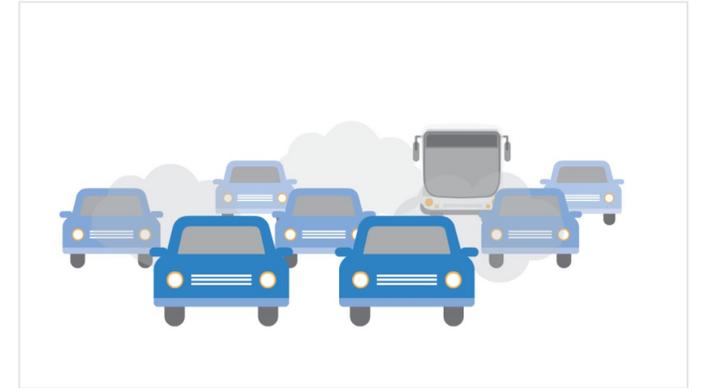
Improve Transit User Experience



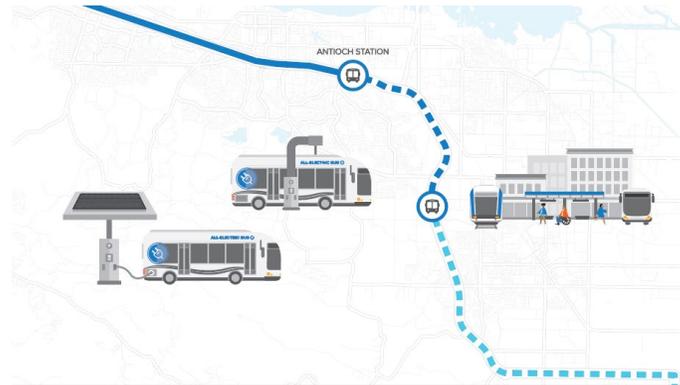
Respond to Equitable Access Needs



Improve Air Quality Through Reduced Auto Trips (VMT)



Support Economic Development



Support Future Transit Investments



Communicate the Benefits of Transit

02 | Mode and Guideway

Primary Alternatives, plus possible sub-options

- HCT rail in SR 4 median
- Freeway BRT in SR 4 median
- Express Bus in SR 4 GP / HOV lanes
- Arterial 'Rapid Bus' connection

Zero Emissions Vehicles

- Battery-electric bus, fuel cell bus
- Battery-electric multiple unit (EMU) rail
- Electrified rail (OCS)



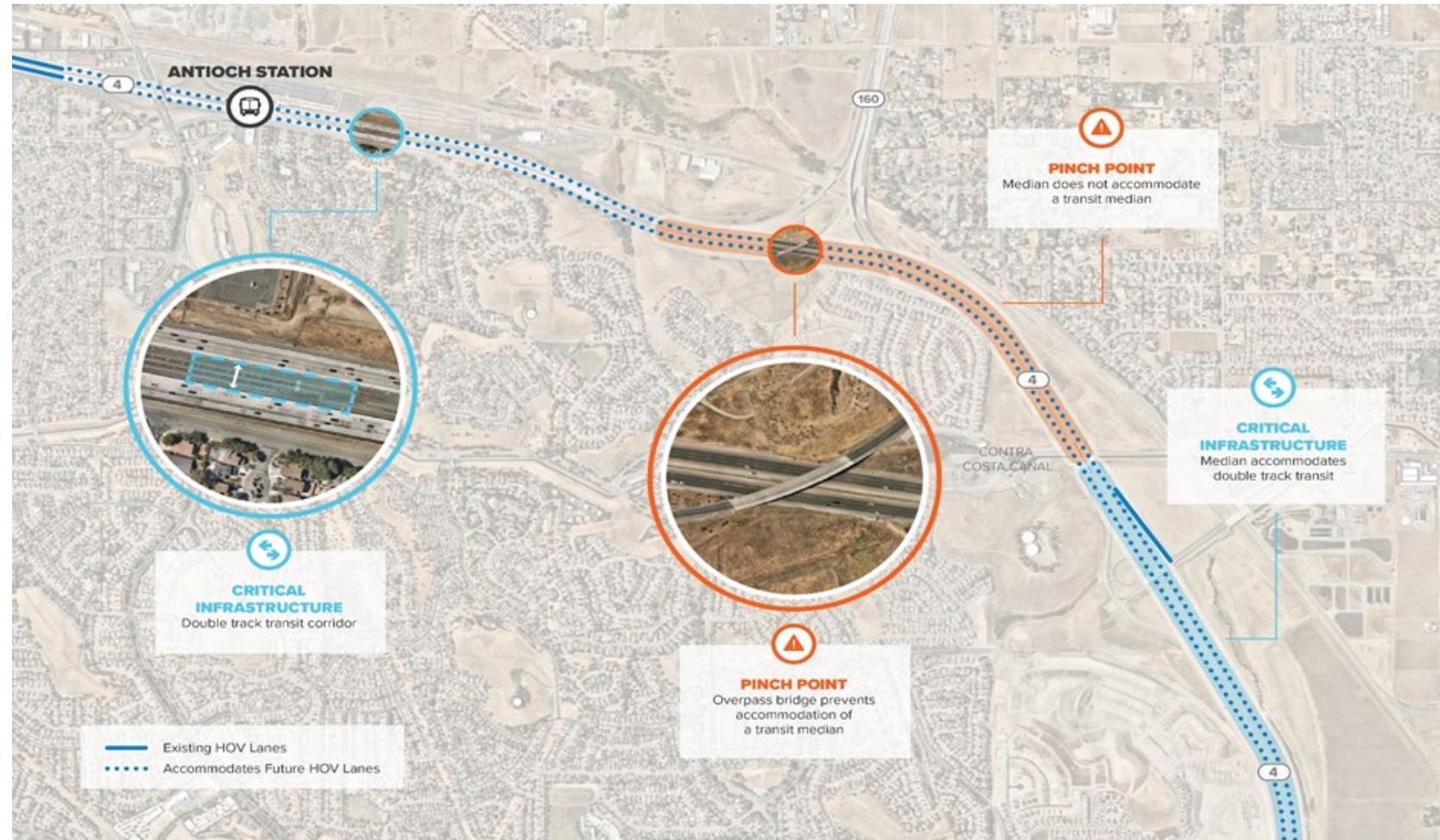
Protera ZX5



Stadler GTW EMU

02 | Segmentation and Guideway Infrastructure

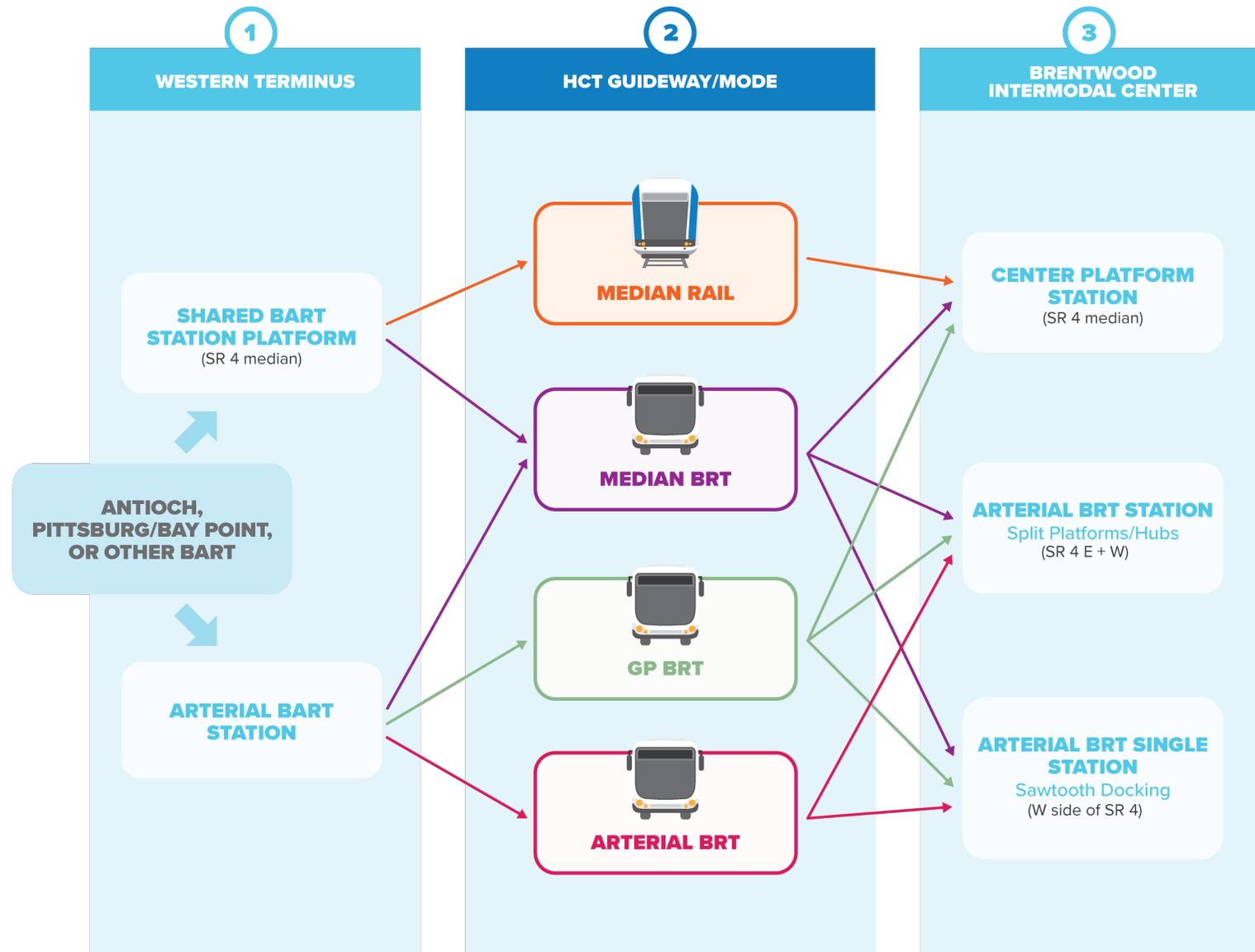
- Segments based on available median or ROW to install dedicated HCT guideway
- Site-specific challenges to maintain dedicated guideway at interchanges and station areas



02 | Alternative Framework

Critical considerations:

1. Western terminus and station platform tie-in
2. Mode & HCT guideway configuration
3. Brentwood Intermodal and station platform tie-in



Refining Alternatives

Fatal Flaw Assessment



Constructability

Does the option have any unique design challenges that may require highly custom infrastructure or construction equipment to install?



Safety & Security

Would any infrastructure or operating conditions create potential safety risks?



Compatible Operations

Does the option include mode technology or supporting infrastructure that create potential conflicts with existing transit service or mobility operations?



Jurisdiction / Regulatory

Does the option cause Agencies, Operators, or Users any potential conflicts with adopted laws, policies, regulations, or agreements?



Cost Effective

Is there an option that can meet the same infrastructure, service, and technology components – at a much lower price and with little-to-no difference in quality?

03 | Final Alternatives & Criteria

03 | Six (6) Refined Alternatives



1. **BART** rail extension between Brentwood and Antioch

2. **Freeway BRT** in median to Antioch

3. **Freeway BRT** to Pittsburg / Bay Pt

4. **Express Bus** in travel lanes to Antioch

5. **Express Bus** in travel lanes to Pittsburg / Bay Pt

6. **Rapid Bus** on arterials to Antioch

6a. Hillcrest Alignment

6b. Slatten Ranch Road Alignment



Zero Emission Vehicles (ZEV)



Does not preclude rail

First / Last Mile station connectivity recommendations developed separately



TRAVEL TIME SAVINGS

MEASUREMENT

What is the time spent traveling by car compared to the time spent traveling by transit from East County to various Bay Area destinations?



TRANSFERS

MEASUREMENT

How many transfers would be needed to take transit from East County to various Bay Area destinations and how easy is it to make these connections?



QUALITY OF ACCESS

MEASUREMENT

Where do commuters from Antioch, Oakley, and Brentwood live?
Are the stations accessible to them?



TRANSPORTATION COSTS

MEASUREMENT

What is the cost of driving and parking compared to the cost of taking transit, which includes the price of the transit pass/ticket, and costs associated with traveling by bike, car, or micromobility to transit station?



TRANSIT RIDERSHIP POTENTIAL

MEASUREMENT

How many new riders are expected to use the planned transit service?



EMISSIONS REDUCTION POTENTIAL

MEASUREMENT

What is the potential reduction in vehicle miles travelled, carbon dioxide and other vehicle emissions?



CAPACITY ON ROADWAY

MEASUREMENT

How many people could be moved through the State Route 4 (SR-4) corridor (in East County) with the proposed transit alternatives?



COMPATIBILITY WITH LOCAL AND REGIONAL PLANNING

MEASUREMENT

How does proposed station area and SR-4 improvements align with existing plans?

03 | Evaluation Criteria



FLEXIBLE SERVICE

MEASUREMENT

How flexible is the alternative to respond to potential future demands for high capacity transit connections in East County?



TIME TO IMPLEMENT

MEASUREMENT

How long will it take to build?



DEDICATED TRANSIT RIGHT-OF-WAY

MEASUREMENT

How much of the transit service will operate within space (lanes) designated for transit-only use?



COMMUNITY PREFERRED SOLUTION

MEASUREMENT

Based on community and stakeholder feedback, which alternative is most popular? Which alternative is least popular?



FUTURE RAIL EXTENSION

MEASUREMENT

Is the alternative compatible with BART median guideway design criteria?



COST EFFECTIVENESS

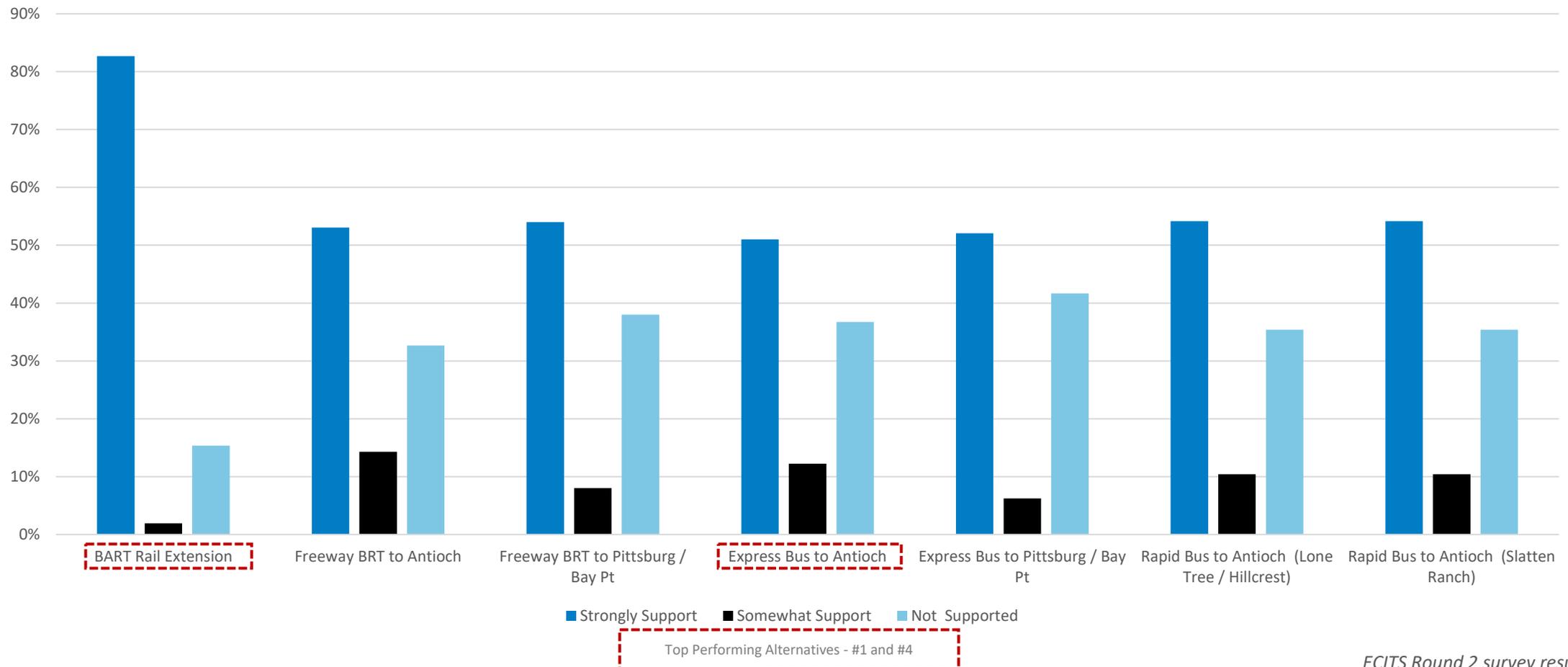
MEASUREMENT

What is the cost (per new rider) of building, operating and maintaining the transit infrastructure?

04 | Evaluation Results

04 | Round Engagement 2 Results

Public Level of Support for Alternatives



04 | Evaluation Findings

Top performing Alternatives:

- Alt 1 BART rail extension to Brentwood
- Alt 4 Express Bus from Brentwood to Antioch

<i>max - 70</i>	<i>max - 100</i>
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Additional Considerations:

- Near-term implementation opportunities, constraints
- MTC and BART rail expansion guidelines

Alt	Description	Total Score	Weighted Score	Ranking
1	BART Rail Extension	56	78.8	1
2	Freeway BRT to Antioch	42	60.4	4
3	Freeway BRT to Pittsburg / Bay Pt	41	59.4	5
4	Express Bus to Antioch	45	67.2	2
5	Express Bus to Pittsburg / Bay Pt	42	62.8	3
6a	Rapid Bus to Antioch (Lone Tree / Hillcrest)	39	57.8	6
6b	Rapid Bus to Antioch (Slatten Ranch)	34	49.2	7

04 | Differentiators

Alt 1: BART Rail in SR-4 Median

Positives

- Reduced travel time
- Increased ridership, capacity, and emissions reduction
- Preservation of dedicated space for transit
- Compatible with future rail extension

Drawbacks

- Longer implementation timeline and high costs
- Requires additional station area density

Alt 4: Express Bus in SR-4 Travel Lanes, Brentwood to Antioch

Positives

- Low-cost and shorter implementation timeline
- Near-term service flexibility and future extension opportunities

Drawbacks

- Lower ridership, carrying capacity, and emissions reduction
- Does not preserve dedicated space for transit

Does not preclude a future rail extension

Not recommended for near-term implementation

Recommended for near-term implementation

04 | BART System Expansion and Land Use

- MTC Resolution 3434

- Policy applies to any physical transit extension project with regional discretionary funds
- Corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors
- Local station area plans that address future land use changes, station access needs, circulation improvements, pedestrian-friendly design, and other key features in a transit-oriented development
- BART corridor thresholds for Housing Units: **3,850 within ½ mile**

TABLE 3: Corridor Thresholds Housing Units — Average per Station Area

Project Type	BART	Light Rail	Bus Rapid Transit	Commuter Rail	Ferry
Housing Threshold	3,850	3,300	2,750	2,200	750

04 | BART System Expansion and Land Use

BART System Expansion Policy (December 1999)

- ECITS extension scores a **Low** on Transit Supportive Land Use for Residential
- ECITS extension scores a **Medium** on Transit Supportive Land Use for Employment

Existing Land Use: Residential	Low	Low-Medium	Medium	Medium-High	High
Residential Density (units per <i>gross</i> acre)	< 5	5-9	10-14	15-24	> 25
Residential Density (units per <i>net</i> acre)	< 15	16-25	26-45	46-75	> 75
Total Units w/i 1/2 mile radius	< 2,500	2,501- 5,000	5,001- 7,500	7,501- 12,500	> 12,500
Estimated Trips at 30% mode share**	< 1,800	1,801- 3,600	3,601- 5,400	5,401- 9,000	> 9,000

Existing Land Use: Employment	Low	Low-Medium	Medium	Medium-High	High
Employment Density (employees per <i>gross</i> acre)*	< 10	10-20	21-50	51-100	> 100
Million Sq. Ft. of Commercial Space w/i 1/2 mile radius	< 1.7	1.7-3.3	3.4-8.3	8.4-16.6	> 16.6
Total Employees w/i 1/2 mile radius	< 5,100	5,100- 9,900	9,901- 24,900	24,901- 49,800	> 49,800
Estimated Trips at 10% mode share**	< 1,000	1,000- 2,000	2,001- 5,000	5,001- 10,000	> 10,000

04 | Innovation Center @ Brentwood

Source: City of Brentwood

Land Use and Planned Development

- ~250 existing residential units
- 2,000+ proposed residential units
- 4M sq. ft. of commercial

Target TOD Supportive Thresholds:

- 3,850 residential units
- 10,000 residents
- 'Medium' commercial density (3.4M – 8.3M sq. ft.)



04 | Comparison of Alternatives

Alt	Description	Weekday Ridership [†]	Capital Costs	Annual O&M Costs	Annualized Cap Cost per Rider	Annualized O&M Cost per Rider
1	BART Rail Extension	3,700	\$240m	\$6.9m	\$216	\$6
2	Freeway BRT to Antioch	780	\$151m	\$4.7m	\$644	\$20
3	Freeway BRT to Pittsburg / Bay Pt	800	\$102m	\$8.2m	\$425	\$34
4	Express Bus to Antioch	770	\$3.6m	\$4.7m	\$16	\$20
5	Express Bus to Pittsburg / Bay Pt	800	\$7.0m	\$7.9m	\$29	\$33
6a	Rapid Bus to Antioch (Lone Tree / Hillcrest)	250	\$5.2m	\$5.8m	\$70	\$77
6b	Rapid Bus to Antioch (Slatten Ranch)	250	\$28.7m	\$5.8m	\$382	\$77

[†] - Horizon year 2040 ridership forecasts based on Plan Bay Area 2040 land uses, with adjustments to TAZs for planned residential and commercial development at the Innovation Center @ Brentwood

04 | Travel from Brentwood to Walnut Creek

All transit trips assume transfer to BART rail at Pittsburg/Bay Point

Alt	Description	Time [†] (min) (one way)	User Cost ^{††} (round trip)
1	BART Rail Extension	40.75	\$9.90
2	Freeway BRT to Antioch	52.80	\$13.50
3	Freeway BRT to Pittsburg / Bay Pt	54.80	\$9.20
4	Express Bus to Antioch	54.21	\$13.50
5	Express Bus to Pittsburg / Bay Pt	56.58	\$9.20
6a	Rapid Bus to Antioch (Lone Tree / Hillcrest)	60.33	\$13.50
6b	Rapid Bus to Antioch (Slatten Ranch)	57.3	\$13.50
	Driving	64	\$30.54

[†] - estimated (2019) weekday peak commute period travel times

^{††} - potential costs associated with method of arrival at Brentwood Station may vary

05 | Next Steps

ECITS Phase 3 Milestones

05 | ECITS Timeline

Phase 3 and 4 Upcoming Activities

Dec	Locally Preferred Alternative (LPA) approvals, and begin Conceptual Design
Jan	Identify design, construction, and operational issues and opportunities. Refine cost estimates and prepare Final Report
Feb 2022	Project Closeout