Electric Train Reconfiguration & Bike Improvements at Stations

Caltrain Board
June 6, 2019

Overview

- Additional State Funding (Board Action Dec 2018)
  - $183M for 37 additional electric vehicles (7 cars instead of 6 cars)
  - $3.5M+ bike parking & micromobility improvements at stations
- Bike car security concerns and additional capacity requested from bike community
- Process established to determine final Board direction

Outreach Process

Item	Audience	Date
Outreach Process: Update	CAC, BAC Subcommittee, Bike Coalitions	February
Outreach Process: Input/Process Determined	Board	March
Joint Workshop	CAC & BAC	April
Broader Outreach: Survey Results & Station Events	General Ridership	April/May
Staff Recommendation	CAC & BAC	May
Board Decision	Board	June

Changing System

	2015	2018
Ridership / Service	• ~58,000 ridership • 5 trains peak hour (5 car trains) • Metrolink cars on the way	• ~ 65,000 daily ridership (12% increase) • 5 trains peak hour (combination 5 & 6 car trains) • Significant number of trains (23) with standees some trains at 140% over-capacity • Average passenger trip: 20+ miles / 40 mins • Electrification in construction
Bikes	• 6,200 daily bike boardings • 48 or 80 bikes onboard bikes spaces per train	• 5,919 daily bike boardings • 72-80 on board bike spaces per train
Micromobility options	• Bike share very limited, no scooters etc.	• Variety of new first / last mile options

Today Trains (Bikes)

- Caltrain carries more bikes onboard than any commuter rail in the country
- A person bringing a bike onboard takes two spaces (bike and seat)

Bike Security Taskforce Est. 2018

- Interdepartmental (rail ops, safety, transit police, communications, customer service)
- Meets on regular basis and will continue to do so
- Improvements Implemented
  - Standardized security messages on social media
  - Transit police reporting form updated & customized for bikes
  - Bike theft data (onboard and at stations) incorporated into monthly safety reports
  - Annual bike security presentation to Bicycle Advisory Committee
  - Bike safety tips posted on Caltrain websites
  - Annual survey included bike security related questions
  - Updated lost and found website with bike info
- Additional Improvements Planned (registering bikes, cameras, etc)

Today Trains (Capacity)

- Overcrowding and standing

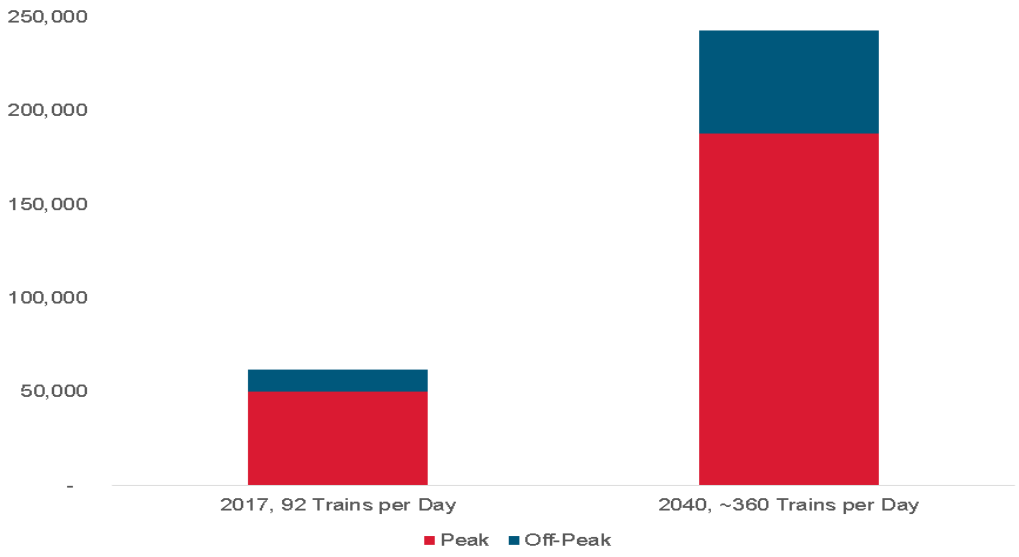
Morning Commute

	Over 100% Capacity			Over 100% Capacity	
NB Train	Seats	Bikes	SB Train	Seats	Bikes
305			206		
207			208		
309			310		
211			212		
313	X		214		
215	X		216		
217	X	X	218		
319	X		320		
221	X		222		
323	X		324	X	X
225	X	X	226		
227	X		228		
329	X		330	X	
231			232		X
233	X	X	134		

Note: 23 trains over 100% capacity throughout the day

Future Operations / Demand

- 2022: 7-car electric trains
  - Seating capacity equivalent to a 5-car diesel train
- 2040: By 2040 underlying demand for approximately 240,000 daily trips



- While Caltrain is able to expand its Electric train consists to seven car trains, adding further capacity will be challenging. In addition to purchase additional vehicles, other investments, such as platform extensions, will be required.
- This is a holistic analysis that will illustrate both the opportunities as well as the limits to adding capacity to the Caltrain system as a whole.

Financial Implications: Onboard Bikes

Initial electric vehicle purchase = $551M for 16 six-car trainsets ($34.4M per train)

Six-car trainset = 567 seats + 72 bike spaces

- 72 seats removed to install bike spaces
- 16 trainsets x 72 = 1,152 seats removed

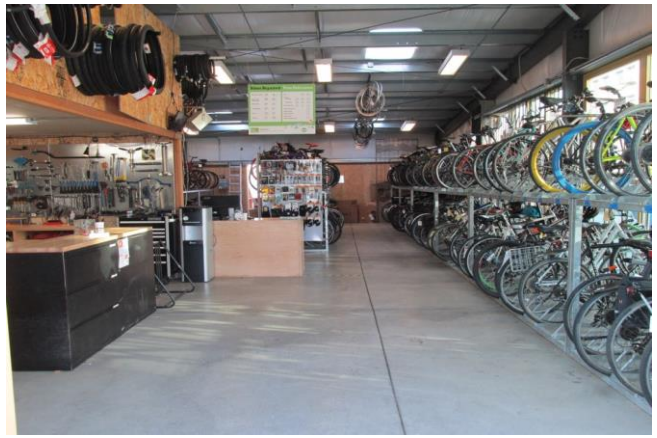
- Per seat/bike space cost = $53.8k
- Per trainset seat/bike space cost = $3.88M
- **Investment in additional rolling stock to provide equivalent seats = $62M**

Note: *Legislation precludes charging for bikes onboard*

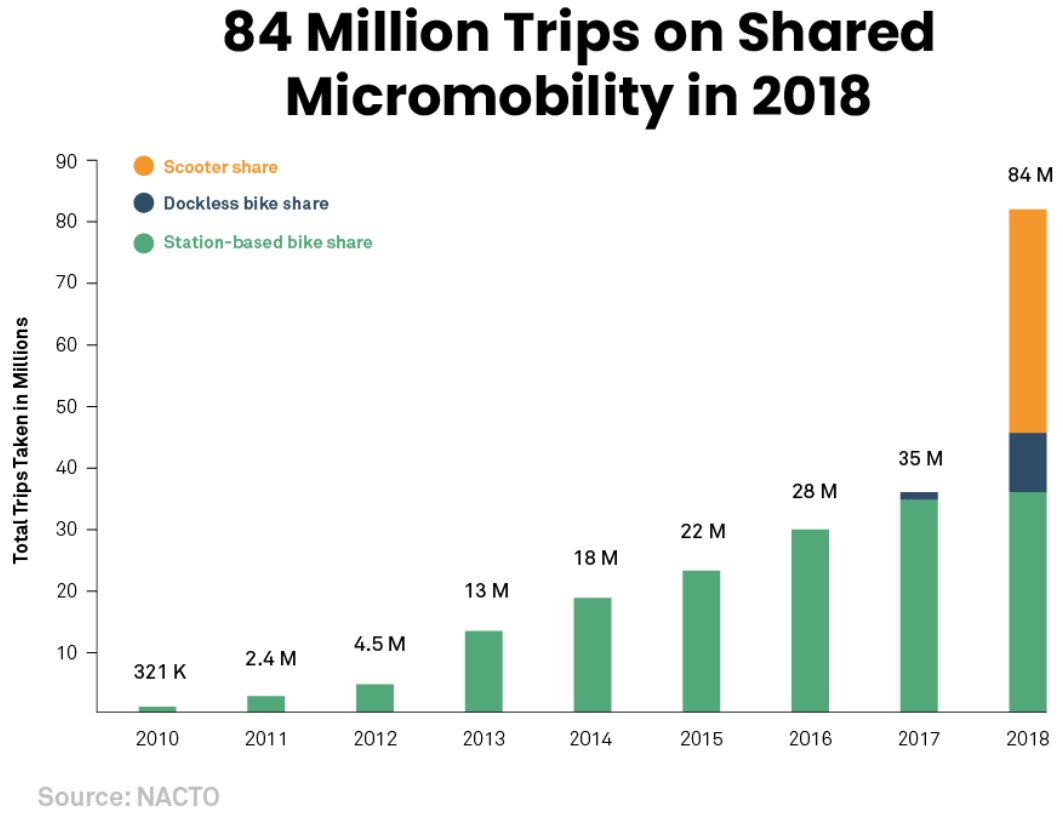
Bike Parking & Micromobility at Stations

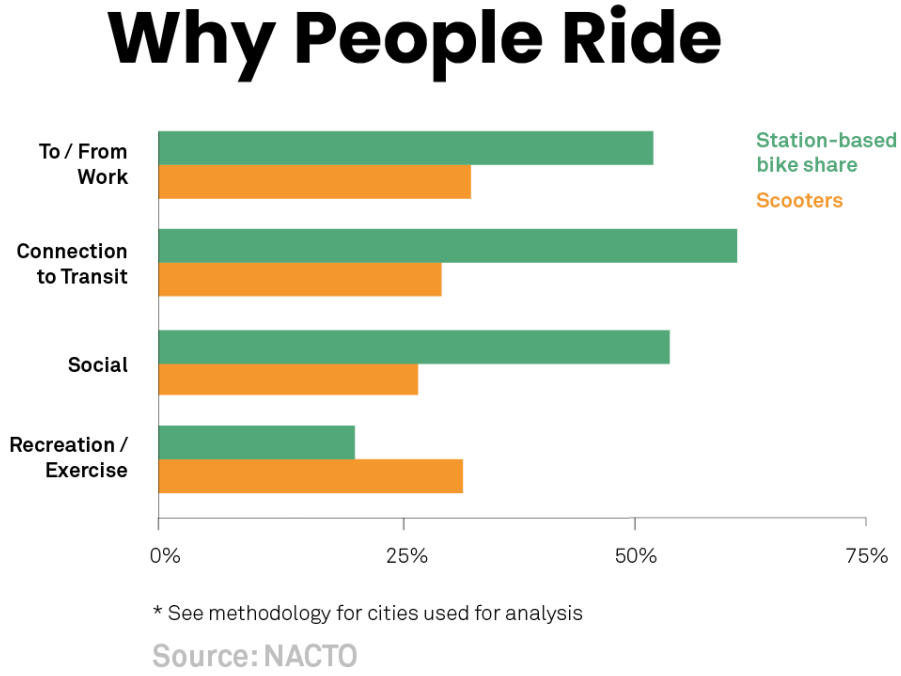
Options at Stations Improving

- Working to offer more:
  - Electronic lockers
  - Shared access bike rooms
  - Better management
  - Bike share (potential RFI)
  - Scooter share
- Untapped potential - much more space at stations than onboard trains
- Looking at best practices around the world



Shared Micromobility Growth





Caltrain + Mircromobility

- Fourth and King Station
  - #1 busiest bike share station in Bay Area
  - June – Dec 2018: 150,000+ rides starting or ending at station
- Diridon Station
  - #3 busiest bike share station in SJ
  - June – Dec 2018: 7,000+ rides starting or ending at station
- 67% Caltrain cyclists travel less than two miles from their home to the station
- 76% Caltrain cyclists travel less than two miles from the station to their final destination

Recent Efforts to Improve Bike Options

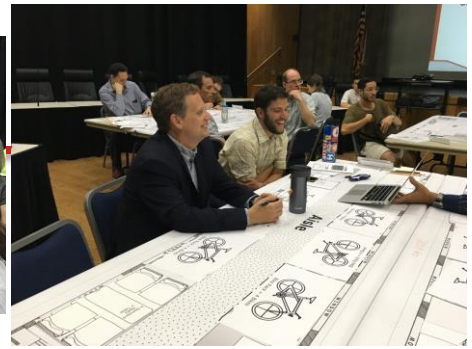
- Bike Parking Management Plan approved (November 2017)
- Bike Security Task Force (began January 2018)
- New station access planner hired (August 2018)
- Bike access & parking survey (Fall 2018)
- Funding for bike improvements at stations: $3.5M (TIRCP grant 2018)
- Bikes board first system-wide (March 2019)
- E-Lockers at Santa Clara Station (June 2019)

Caltrain Priorities (near / future)

- Capital plan for first 10 stations: Spring - Summer 2019
- Reassign unused keyed lockers: 1-2 stations/month (ongoing)
- 4th & King bike parking expansion plan: Winter 2019 / 2020
- San Carlos Station Improvements: Late 2019 - 2020
- Sheds managed by 3rd party: Late 2019 - 2020
- E-lockers system wide: 2022
- Support bike rooms at TODs
- Corridor-wide bike share

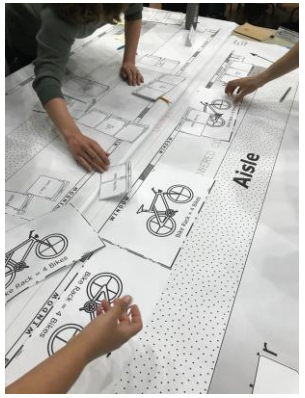
Joint CAC/BAC Workshop
(April 2019)

Joint CAC/BAC Workshop



Summary

- Attendance: Approximately 50 people
- Station Bike Improvements Activity: 62 responses
- Car Reconfiguration Activity: 8 Options Developed (3 CAC/BAC tables, 1 public table)
- Reflection Questionnaire: 15 Responses

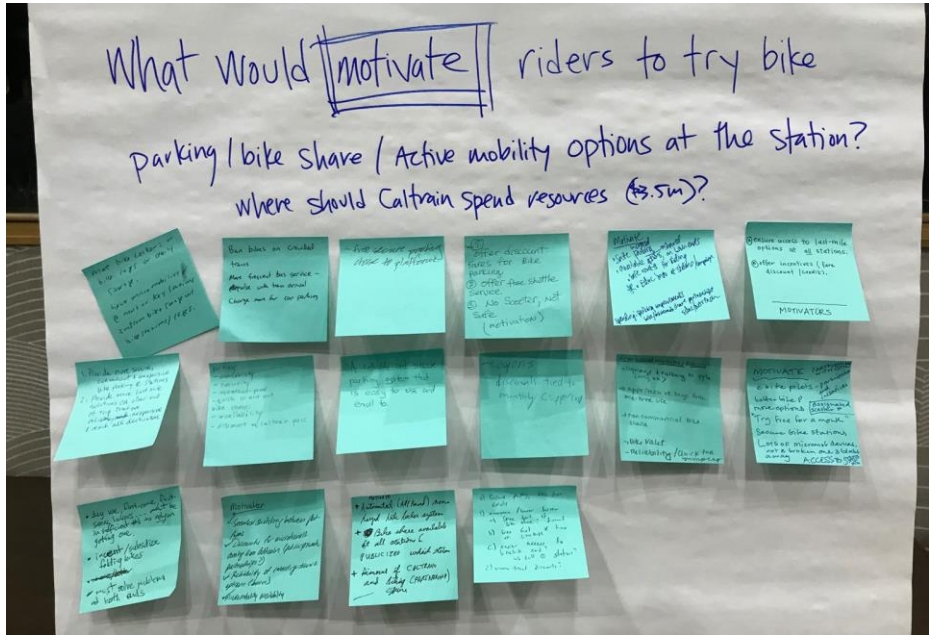


Station Bike & Micromobility Activity

Station Bike & Micromobility Activity - Motivators

Summary of Motivators:

- More on demand options
- Affordable, convenient, weather-sheltered and secure bike storage options
- Incentives to use micromobility
- Free or low cost with easy payment
- Free shuttles to/from stations & frequent bus service
- Education about bike parking & micromobility options



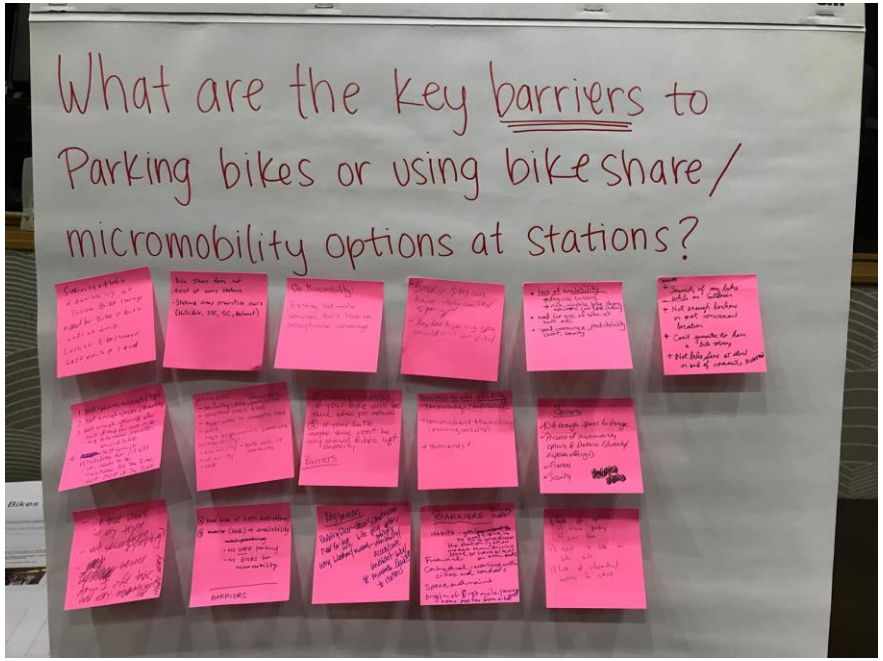
Station Bike & Micromobility Activity - Barriers

Summary of Micromobility Barriers:

- Low reliability/availability
- Lack of info about how to use

Summary of Bike Parking Barriers:

- Fear of theft
- Lack of info about how to use
- Ease of paying for bike lockers
- Location of bike rack/locker spaces
- Lack of information about bike parking availability

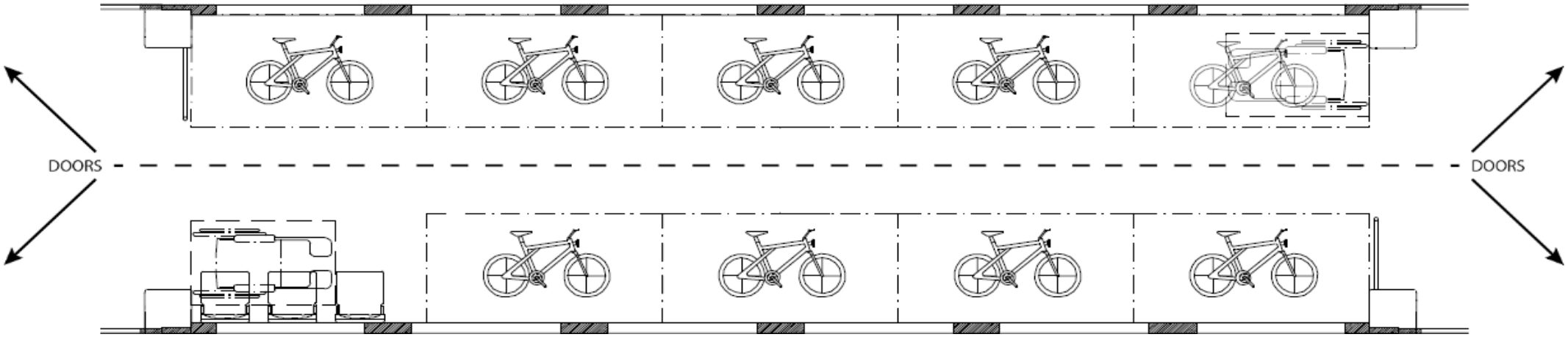


How this Informs Future Work

- Proximity to platforms
- Highly trafficked areas
- Lighting
- Low & no cost options
- Ease of payment
- Multiple options for parking and micromobility
- Coordination and partnerships
- Outreach, promotion & education

Electric Train Reconfiguration Activity

Current Electric Train Bike Car Configuration



- Bike car configuration is duplicated across two cars.
- Number Seats: 3 flips seats each car (6 total train)
- Number Bike Spaces: 36 each lower level car (72 total train)

Reconfiguration Activity

Goal: Create opportunities to weigh in on bike security solutions that work for all riders

- Small Groups: Mix CAC and BAC members; public group
- Interactive: Groups receive set of train parts to arrange on bike and 7th car layouts to create two different configuration options
- Report out options to the larger group

Joint Workshop: High Level Summary

- Items of note
  - Wide range of priorities
  - With the given activity constraints, all CAC/BAC groups landed on max 72 bikes or fewer in all options
  - Public group decided that bike capacity was more important than seats next to bikes in two-car option (80 bikes, 8 seats). Many didn’t want to be constrained to a three-car configuration.

Joint Workshop: Reconfiguration Options

	TWO CAR TOTAL		THREE CAR TOTAL		Comments
	Seats	Bikes	Seats	Bikes	
Group 1	16	72	52	72	Focus: Keep existing 72 bikes, increase security by adding seats
Group 2	20*	70*	53*	72*	Bikes in middle of car increase security and help with loading/reduce dwell. For 3rd car, would rather lose seat than bike rack. Interested in legislation to allow charging for bringing a bike onboard
Group 3	64*	42*	76*	69*	Increase flexible use of space. Wanted to compromise on seat and bike space.
Public	8	80	34	92	Non-consensus if their two-car configuration actually increased security for bikes. Suggested security cameras w/mobile device viewing. Three-car focus on bike capacity. Some didn't want to be constrained to three cars.

*Includes spaces that have bikes and seats in the same location. If someone sits in a seat, the bikes spaces will not be available.

Workshop Comments / Reflections

Workshop Questionnaire / Reflection

Question	Yes	Somewhat	No
Felt many riders would be well-served by bike parking improvements and bike share/micromobility programs	73%	27%	0%
Felt they had a better understanding of the elements, constraints and challenges that go into electric train bike car configuration after completing the workshop	73%	13%	13%
Felt the workshop gave an opportunity for them to share their viewpoints and concerns	60%	27%	0%

Workshop Questionnaire / Reflection

"Very helpful and enlightening."

"Definitely learned how we're optimizing useability for all users, including cyclists demographic."

"Felt that the problem addressed in the workshop was overly constrained."

"Public table was overloaded...too many cooks problem and an incomplete solution (that said this was a terrific exercise -- kudos to staff)"

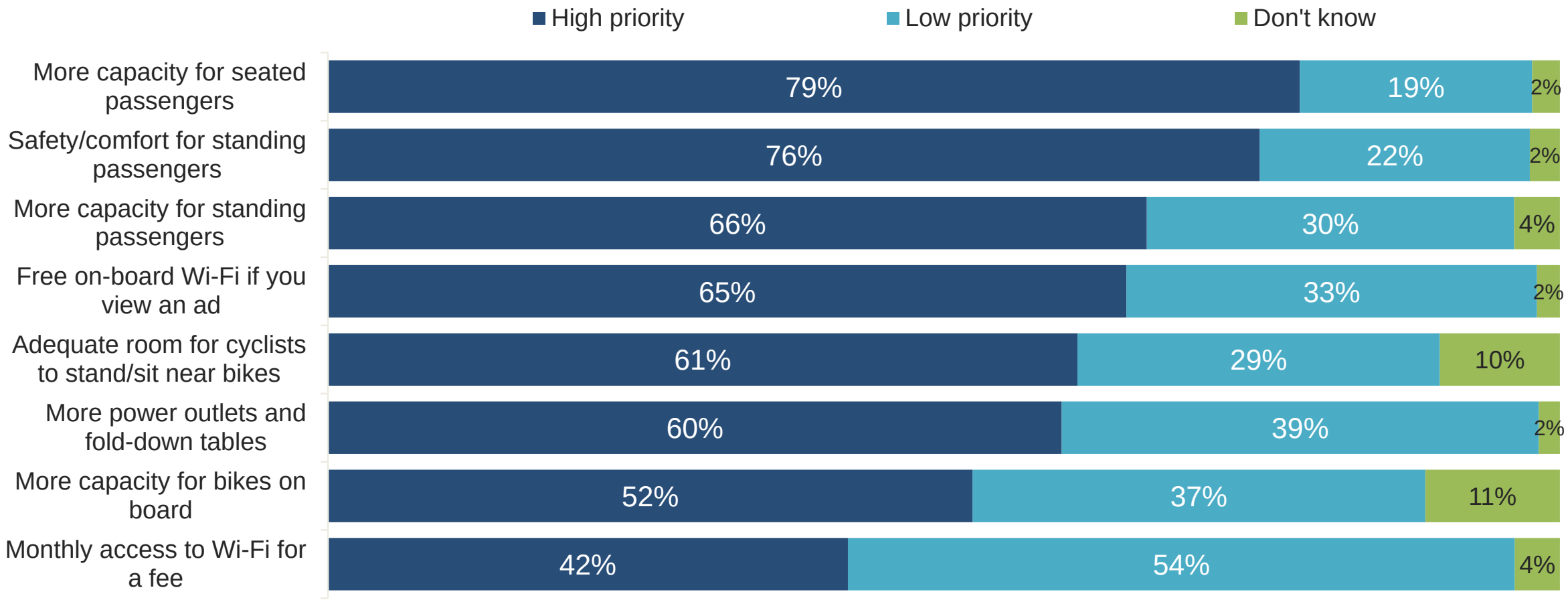
"My priority would be to fit as many humans on board as possible and reduce dwell time as much as possible."

Rider Survey

Rider Survey

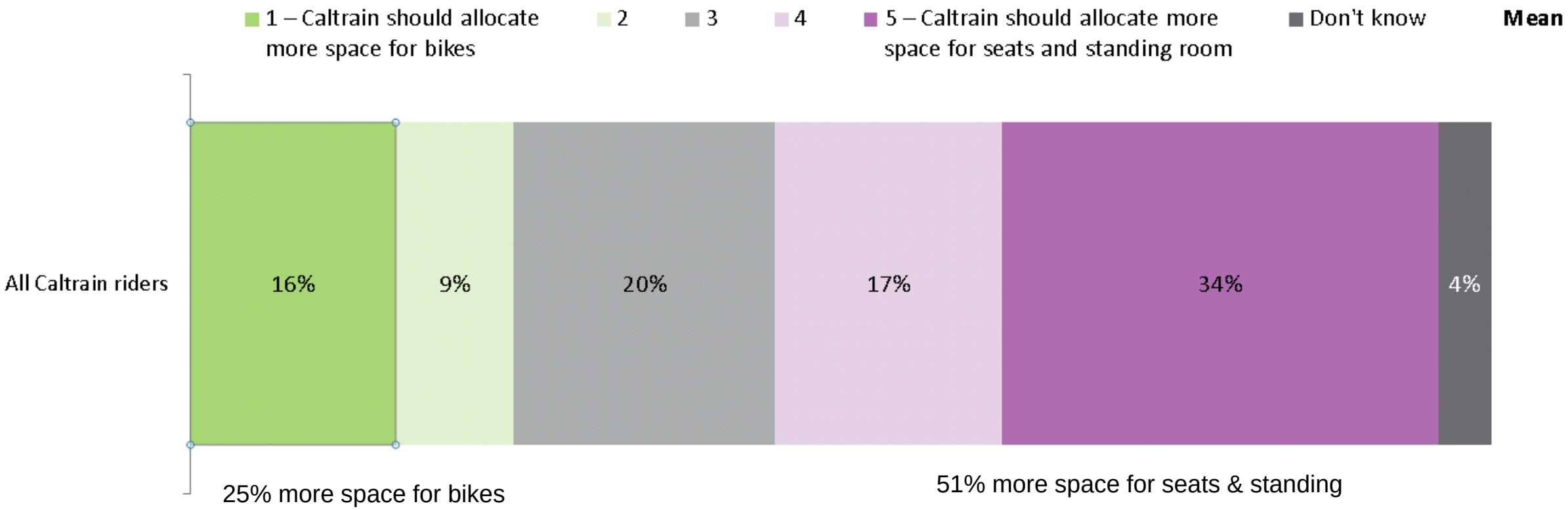
- Conducted February 21 – April 1, 2019
- Statistically accurate, overall margin of error ±2.3 percentage points
- 1,817 interviews
- Web survey of those who ride Caltrain more than once every six months
- Surveys conducted by phone were done by trained, professional interviewers; landlines and mobile phones included
- Surveys offered in English, Spanish, Mandarin, and Vietnamese

Riders Priority for New Electric Trains



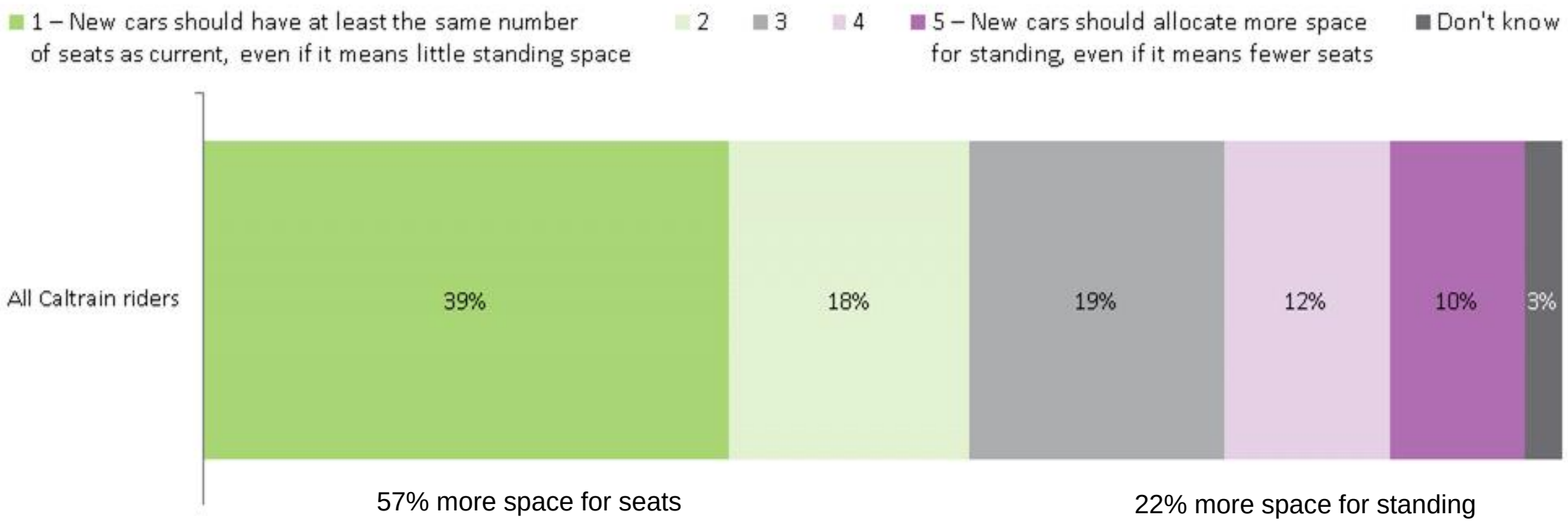
Q93=100. Caltrain is also planning to purchase new train cars in the near future. For each of the following, please indicate how high a priority you think it should be for Caltrain to consider including in new train cars.

Electric Train Allocation of Space



Q.101: Some people say Caltrain should allocate more space for bikes on board the trains, even if it leaves less space for riders, because allowing more bikes on the trains helps the environment and reduces traffic by taking more cars off the road.
Other people say that Caltrain should allocate more space for seats and standing room, even if it means bikes sometimes get bumped, because commute hour trains are already overcrowded and accommodating as many passengers as possible is the best way to help the environment and reduce traffic by taking cars off the road.

Electric Train Allocation of Space



Q 102: Some people say Caltrain should make sure the new train cars have at least the same number of seats as the current ones, even if that means little space for standing passengers, because with many riders on the train for an hour or more they should have as many seats as possible to make the ride safe and comfortable.
Other people say Caltrain should allocate more space for standing on the new train cars, even if that means fewer seats, because it would increase capacity while making it safer and more comfortable for people who end up having to stand.

Station Outreach

Station Outreach (Spring)

- San Francisco, Redwood City, Mountain View (AM commute)
- Feedback on bike parking / micromobility at stations as well as onboard
- Broader Caltrain topics too (Business Plan, Electrification)

Funding

Funding (for reconfiguration)

- Electrification project contingency
- TIRCP contingency
- FY20 Proposed Caltrain Capital Budget
  - $72 million (bridge repair, loco overhaul etc) need (as of 5/2/19)
  - $42 million identified in available funding sources (as of 5/2/19)
- Difficult priority decisions

Staff Analysis & Draft Recommendation

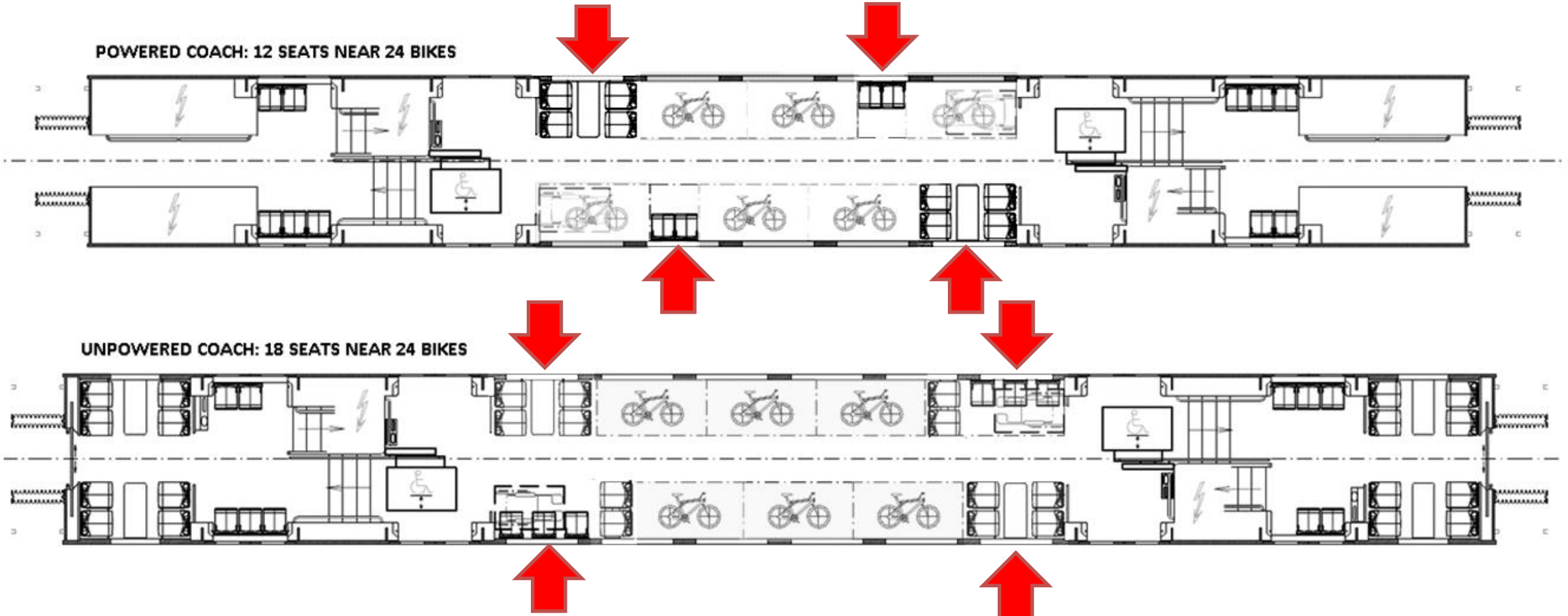
Staff Considerations

- Public input
- CAC/BAC Workshop (review of 2 car and 3 car configurations)
- Business plan information
- Survey
- Cost
- Operations (dwell times, circulation)
- Technical feasibility
- Minimize passenger conflicts
- Best serves needs of all passengers
- Project schedule
- Station Outreach
- CAC / BAC official positions
- Change Management Board (funding partners) feedback
- Staff Coordinating Council Recommendation
- Board feedback

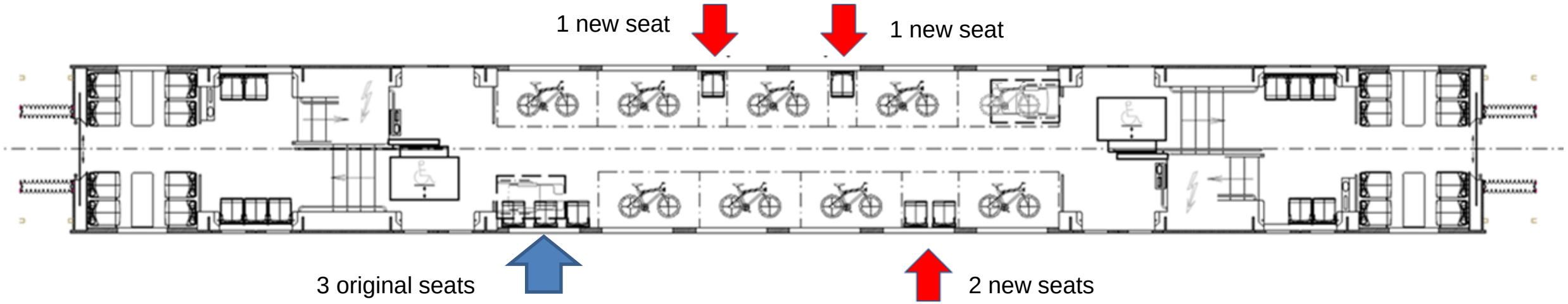
3-Car Option - Not recommended

- Maintain 72 bikes per train
- Address bike security concern, but not other considerations
- Total Seats: 669 (seats per bike car: 12-15)
- ~$10m to implement (engineering, testing, retrofit of train in manufacturing, new installs, documentation, contingency)

= Seat locations



2- Car Option - Recommended

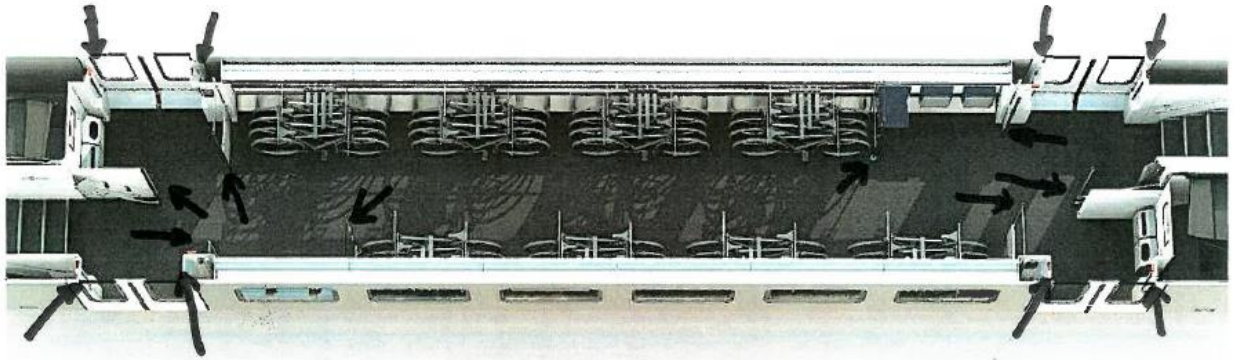


- Maintain 72 bikes per train (17% increase in capacity over today*)
- Address bike security concerns, add 8 additional seats in 2 bike cars and addresses other considerations
- Total Seats: 675 (seats per bike car: 7; total seats in the bike cars: 14)
- Costs ~$1m to implement

*Electrification lays the foundation for continued capacity growth, starting with an initial increase of six trains per peak hour in each direction (compared to 5 trains per hour today). Capacity is gained through more frequent service.

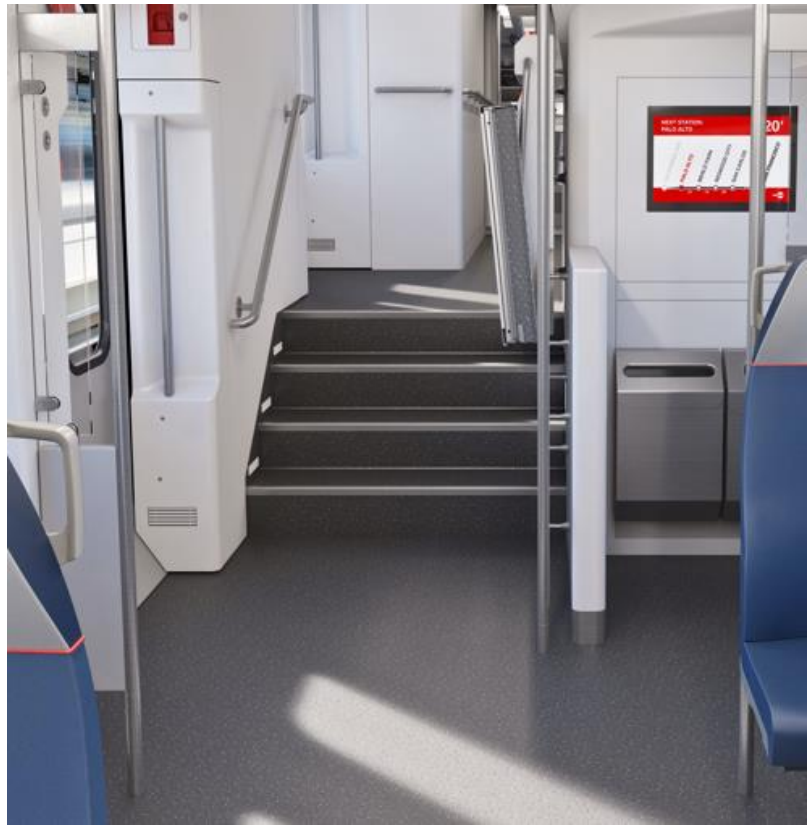
Standing Areas

- 16 stanchions located in each bike car, which provide a handhold for standing passengers
- Many more than today's cars



Note: Image has not been updated with latest staff recommendation to add 4 additional seats per car

↑ = Indicates a stanchion location



Staff Recommendation

- Invest at least $3.5M towards bike station parking / micromobility improvements before the start of electrified service
- Pursue options to leverage additional resources to implement and manage bike station parking / micromobility improvements
- Maintain 72 bike spaces across two bike cars and increase the number of seats in the two bike cars from 6 to 14 total seats in all electric trainsets
- Achieve all future increases to onboard bike capacity through increased train frequency as is being evaluated in the Caltrain Business Plan

Discussion