

APPENDIX



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APPENDIX A. BICYCLE AND PEDESTRIAN LTS METHODOLOGY

METHODOLOGY

The Bicycle LTS methodology is broken into three categories: segments (bike paths, lanes, or routes), intersection approaches (turn lanes), and intersection crossings (unsignalized intersections). Table-based criteria are applied separately for each category using the “worst case principle,” meaning the worst (or highest) score among the criteria considered governs the overall LTS score for that facility.

Depending on the community context and the detail level desired, the overall methodology may be simplified based on the general consistency of facility types, as certain elements (e.g., turn lanes, bike lanes, speed limits, etc.) may not exist in a particular community. If there are no turn lanes on an approach, then this portion of the methodology is skipped. Signalized intersections do not receive an LTS score. Signalized crossings usually do not create a barrier, as the signal provides a protected crossing, and are not considered in the methodology.

SEGMENTS

Table 4.1 through **Table 4.3** display the LTS scoring criteria utilized for analyzing the level of traffic stress for the various types of roadway segments, including segments within mixed traffic, segments with bicycle lanes alongside a parking lane, and segments with bicycle lanes not alongside a parking lane. Class I shared-use paths and Class IV separated bikeways, not shown in these tables, automatically receive an LTS score of 1, because of the increased level of comfort a facility separated from vehicular traffic provides a bicyclist. These table were adapted from the criteria tables presented in the Mineta methodology, incorporating vehicle lanes as a surrogate for street width.

Bicycle LTS for roadway segments accounts for traffic volumes, speed, presence and width of a bicycle lane, presence, width of a parking lane, and bicycle lane blockage, which denotes the frequency at which a bicycle lane is blocked. If there is no known data available suggesting frequent blockage of bicycle lanes, bicycle lane blockage is assumed rare, which is consistent with the Mineta methodological approach.

Bicycle LTS criteria for analyzing segments in mixed traffic are shown in **Table 4.2**. Mixed traffic segments are roadway segments that do not have Class II bicycle lanes. Roadway segments with Class III bicycle routes are analyzed as mixed traffic segments.

Table 4.3 presents the LTS analysis criteria for segments with bicycle lanes. As shown, some criteria result in “no effect.” No effect denotes that when other variables are accounted for there is no impact, or no effect, on the LTS score at that traffic stress level. For example, **Table 4.3** shows “no effect” for two of the four criteria considered at LTS 4—the combined width of the adjacent bicycle and parking lanes and bicycle lane blockage. In this example, this means that a roadway segment featuring a bicycle lane alongside a parking lane, two or more through lanes per direction, and/or speeds at or higher than 40 mph, the width of the bicycle and parking lane will have no impact on the LTS score. If the sum of the bicycle and parking lane width is below 14 feet, considering only these criteria would result in LTS 3 score. When through lanes per direction and speeds are also considered and surpass two or more lanes and 40 mph speed thresholds shown in **Table 4.3**, the

overall traffic stress of the segment would result in LTS 4. In this case, the combined bicycle/parking lane width and bicycle lane blockage would have no bearing on the overall score.

TABLE 4.1: BICYCLE LTS CRITERIA FOR SEGMENTS WITHIN MIXED TRAFFIC

BIKEWAY CLASS	EXISTING MILES		
	2-3 lanes	4-5 lanes	6+
UP TO 25 MPH	LTS 1 or 2	LTS 3	LTS 4
30 MPH	LTS 2 or 3	LTS 4	LTS 4
35 MPH OR MORE	LTS 4	LTS 4	LTS 4

TABLE 4.2: BICYCLE LTS CRITERIA: SEGMENTS (BIKE LANES ALONGSIDE A PARKING LANE)

	LTS 1	LTS 2	LTS 3	LTS 4
THROUGH LANES PER DIRECTION	1	No effect	2 or more	No effect
SUM OF BICYCLE LANE WIDTH AND PARKING LANE WIDTH ¹	15 feet or more	14 to 15 feet	Less than 14 feet	No effect
SPEED LIMIT OR PREVAILING SPEED	Up to 25 mph	30 mph	35 mph	40 mph or more
BICYCLE LANE BLOCKAGE	Rare	No Effect	Frequent	No Effect

TABLE 4.3: BICYCLE LTS CRITERIA: SEGMENTS (BIKE LANES NOT ALONGSIDE A PARKING LANE)

	LTS 1	LTS 2	LTS 3	LTS 4
THROUGH LANES PER DIRECTION	1	No effect	2 or more	No effect
SUM OF BICYCLE LANE WIDTH AND PARKING LANE WIDTH ¹	6 feet or more	Less than 6 feet	No effect	No effect
SPEED LIMIT OR PREVAILING SPEED	Up to 30 mph	No effect	35 mph	40 mph or more
BICYCLE LANE BLOCKAGE	Rare	No Effect	Frequent	No Effect

APPROACHES

Based on the Mineta methodology, only approaches with right turn markings were included in the LTS analysis. Right turn lanes at intersection approaches can “challenge a cyclist's normal position and create a weaving conflict” (Mineta 2012). Intersection approach scoring criteria for approaches are displayed in **Table 4.4** and **Table 4.5**.

Table 4.4 presents the scoring criteria for right-turn approaches to an intersection that are adjacent to a bicycle lane, and **Table 4.5** presents the scoring criteria for approaches adjacent to mixed traffic segments (i.e., travel lanes that include Class III or Sharrows). These criteria include length of the right turn lane, configuration of the bicycle lane in relation to the right turn lane, and the estimated speed associated with the curb radius at the intersection turn.

The length of the turn lane accounts for the time a bicyclist is exposed to right-turning vehicles—longer turn lanes result in greater exposure and increased traffic stress. The curb radius accounts for the speed of a turning vehicle. A smaller curb radius will result in a tighter turn and slower turning speeds, while a larger curb radius will allow a vehicle to make a turn at greater speeds and result in higher traffic stress.

The bicycle lane configuration at an intersection approach also greatly influences traffic stress. At approaches where bicycle lanes exist along the adjacent roadway segment and a right turn lane is introduced, bicycle lanes are often configured to shift to the left so the bicycle lane is configured to the left of the right turn pocket. In these cases, either the bicycle lane abruptly veers to the left, or the bicycle lane disappears for roughly 100 feet then reappears closer to the intersection at the left of the right turn lane. Both of these scenarios require a bicyclist to merge to the left against vehicles entering the right turn lane. This increases traffic stress given that bicyclists must look over their shoulder to navigate the potential conflict with right-turning vehicles potentially traveling at high speeds and increases user priority ambiguity.

An approach featuring a free right movement, more than one turn lane, a trapped bicycle lane or a through-right lane will also result in increased traffic stress. According to the Mineta methodology, an approach configuration where the bicycle lane continues straight will result in the lowest traffic stress, because this type of configuration will result in an unambiguous priority placed on the bicyclist and cars merge across the bicycle lane rather than vice versa.

TABLE 4.4: BICYCLE LTS CRITERIA FOR APPROACHES ALONGSIDE BICYCLE LANES

CONFIGURATION	LTS
SINGLE RIGHT-TURN LANE UP TO 150 FT LONG STARTING ABRUPTLY WHILE BICYCLE LANE CONTINUES STRAIGHT AND INTERSECTION ANGLE/CURB RADIUS SUCH THAT TURNING SPEED IS ≤ 15 MPH	LTS ≥ 2
SINGLE RIGHT-TURN LANE LONGER THAN 150 FT STARTING ABRUPTLY WHILE BICYCLE LANE CONTINUES STRAIGHT AND INTERSECTION ANGLE/CURB RADIUS SUCH THAT TURNING SPEED IS ≤ 15 MPH	LTS ≥ 3

CONFIGURATION	LTS
SINGLE RIGHT-TURN LANE WITH BICYCLE LANE THAT SHIFTS TO THE LEFT AND INTERSECTION ANGLE/CURB RADIUS SUCH THAT TURNING SPEED IS ≤ 15 MPH	LTS ≥ 3
SINGLE RIGHT-TURN LANE WITH ANY OTHER CONFIGURATION OR DUAL RIGHT-TURN LANES OR RIGHT-TURN LANE ALONG WITH A COMBINED THROUGH/RIGHT LANE	LTS ≥ 4

TABLE 4.5: BICYCLE LTS CRITERIA FOR APPROACHES ALONG MIXED TRAFFIC SEGMENTS

CONFIGURATION	LTS
SINGLE RIGHT-TURN LANE UP TO 75 FT LONG AND INTERSECTION ANGLE/CURB RADIUS SUCH THAT TURNING SPEED IS ≤ 15 MPH	No effect
SINGLE RIGHT-TURN LANE BETWEEN 75 FT AND 150 FT LONG AND INTERSECTION ANGLE/CURB RADIUS SUCH THAT TURNING SPEED IS ≤ 15 MPH	LTS ≥ 3
ANY OTHER CONFIGURATION	LTS ≥ 4

METHODOLOGY

The Pedestrian Level of Traffic Stress (LTS) methodology was developed by the Oregon Department of Transportation (ODOT). It is broken into two categories: segments (sidewalks, paths, and multi-use paths) and intersection crossings (unsignalized intersections). Table-based criteria are applied separately for each category using the “worst case principle,” meaning the worst (or highest) score among the criteria considered governs the overall LTS score for that facility.

Depending on the community context and the detail level desired, the overall methodology may be simplified based on the general consistency of facility types, as certain elements (e.g., median islands, buffer type and width, sidewalk ramps, etc.) may not exist in a particular community. If there are no sidewalk ramps on a crossing, then this portion of the methodology is skipped. Signalized intersections generally do not receive an LTS score. Signalized crossings usually do not create a barrier, as the signal provides a protected crossing, and are not considered in the methodology.

SEGMENTS

Table 4.1 through **Table 4.4** display the LTS scoring criteria utilized for analyzing the level of traffic stress based on varying criteria such as sidewalk condition and total buffering width. There are four tables used to classify sidewalk segments, and the methodology follows a “worst case principle” meaning the lowest score assigned through the table criteria is applied to the segment. These tables are the criteria tables presented in the ODOT methodology.

Pedestrian LTS for sidewalk segments accounts for sidewalk condition, physical buffer type, total buffering width, and general land use. Pedestrian LTS criteria for analyzing segments based on these criteria are presented in **Tables 4.1** through **Table 4.4**

Table 4.1 presents the LTS analysis criteria for segments with bicycle lanes. As shown, some criteria do not change across changing conditions. This denotes that when other variables are accounted for there is no impact, or no effect, on the LTS score at that traffic stress level. For example, **Table 4.1** shows no change in LTS when total buffering width increases from 10 to 25 feet on a two-lane roadway. In this example, a 10-foot buffer has been found sufficient to facilitate a low stress experience on a two-lane road. This begins to change as more travel lanes are introduced and facilitate higher speeds with more traffic volume.

TABLE 4.1: PEDESTRIAN LTS CRITERIA FOR SEGMENT SIDEWALK CONDITION

Actual/Effective Sidewalk Width (ft) ²		Sidewalk Condition				
		Good	Fair	Poor	Very Poor	No Sidewalk
Actual	<4	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4
	≥4 to <5	PLTS 3	PLTS 3	PLTS 3	PLTS 4	PLTS 4
	≥5	PLTS 2	PLTS 2	PLTS 3	PLTS 4	PLTS 4
Effective	≥6 ⁴	PLTS 1	PLTS 1	PLTS 2	PLTS 3	PLTS 4

TABLE 4.2: PEDESTRIAN LTS CRITERIA: SEGMENT PHYSICAL BUFFER TYPE

Physical Buffer Type				
Buffer Type ¹	Prevailing or Posted Speed			
	≤25 MPH	30 MPH	35 MPH	≥40 MPH
No Buffer (curb tight)	PLTS 2	PLTS 3	PLTS 3	PLTS 4
Solid surface	PLTS 2 ²	PLTS 2	PLTS 2	PLTS 2
Landscaped	PLTS 1	PLTS 2	PLTS 2	PLTS 2
Landscaped with trees	PLTS 1	PLTS 1	PLTS 1	PLTS 2
Vertical				

¹Combined buffers: If two or more of the buffer conditions apply, use the most appropriate, typically the lower stress level

TABLE 4.3: PEDESTRIAN LTS CRITERIA: SEGMENT TOTAL BUFFERING WIDTH

Total Number of Travel Lanes (both directions)	Total Buffering Width (ft) ¹				
	<5	≥5 to <10	≥10 to <15	≥15 to <25	≥25
2	PLTS 2	PLTS 2	PLTS 1	PLTS 1	PLTS 1
3	PLTS 3	PLTS 2	PLTS 2	PLTS 1	PLTS 1
4 - 5	PLTS 4 ²	PLTS 3	PLTS 2	PLTS 1	PLTS 1
6	PLTS 4 ²	PLTS 4 ²	PLTS 3	PLTS 2	PLTS 2

¹Total Buffering Width is the summation of the width of buffer, width of parking, width of shoulder and width of the bike lane on the same side of the roadway as the pedestrian facility being evaluated.

TABLE 1. PEDESTRIAN LTS CRITERIA: SEGMENT GENERAL LAND USE

PLTS	Overall Land Use	HDM Land Use Context
PLTS 1	Residential, central business districts (CBD), neighborhood commercial, parks and other public facilities, governmental buildings/plazas, offices/office parks	Traditional Downtown/CBD Urban Mix Residential Corridor
PLTS 2	Low density development, rural subdivisions, un-incorporated communities, strip commercial, mixed employment	Suburban Fringe Rural Community
PLTS 3	Light industrial, big-box/auto-oriented commercial	Commercial Corridor
PLTS 4	Heavy industrial, intermodal facilities, freeway interchanges	

CROSSINGS

Pedestrian Crossing LTS is assessed based on the criteria presented in **Tables 4.6** through **4.10**. There are 5 criteria tables, and the lowest score assessed is applied to the crossing. Crossings at signalized intersections generally receive an LTS of 1 unless engineering judgement necessitates adjustments based on factors such as illumination and crossing distance. Unsignalized intersections with median refuges and those without a median refuge are analyzed separately, as shown in **Table 4.6** and **Table 4.7**.

According to the ODOT methodology, signalized crossings are generally not analyzed as these crossing control types generally do not create a barrier to connectivity. In most cases, signalization provides adequate protection when crossing an intersection. An exception to this scoring criteria is roadways that are exceptionally wide (i.e., more than eight travel lanes), where data exists to suggest that signal timings do not provide adequate crossing time for pedestrians, or where limited sight lines on conflicting movements are insufficiently marked or illuminated.

Crossings at intersections between two roadways classified as local/residential that received LTS 1 (low-stress) scores, were also assumed to be low-stress due to low volumes and speed.

TABLE 4.4: PEDESTRIAN LTS CRITERIA ON COLLECTOR & LOCAL UNSIGNALIZED CROSSING^{1,2,3,4}

Prevailing Speed or Speed Limit (mph)	No Median Refuge		Median Refuge Present
	Total Lanes Crossed		Maximum One Through/Turn Lane Crossed per Direction
	1 Lane	2 Lanes	
≤ 25	PLTS 1	PLTS 1	PLTS 1 ⁵
30	PLTS 1	PLTS 2	PLTS 1
35	PLTS 2	PLTS 2	PLTS 2
≥ 40	PLTS 3	PLTS 3	PLTS 3

¹For street being crossed.²Minimum PLTS 3 when crossing lacks standard ramps.³Use Table 4.10 for one-way streets, when ADT exceeds 5,000, or total number of lanes exceeds 2.⁴Street may be considered a one-lane road when no centerline is striped and when oncoming vehicles commonly yield to each other.⁵Refuge should be at least 10 feet for PLTS 1, otherwise use PLTS 2 for refuges 6 to <10 feet.TABLE 4.5: PEDESTRIAN LTS CRITERIA ON ARTERIAL UNSIGNALIZED CROSSING WITHOUT A MEDIAN REFUGE^{1,2}

Prevailing Speed or Speed Limit (mph)	Total Lanes Crossed (Both Directions) ³					
	2 Lanes			3 Lanes		
	<5,000 vpd	5,000-9,000 vpd ⁴	>9,000 vpd	<8,000 vpd	8,000-12,000 vpd ⁴	>12,000 vpd
≤ 25	PLTS 2	PLTS 2	PLTS 3	PLTS 3	PLTS 3	PLTS 4
30	PLTS 2	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 4
35	PLTS 3	PLTS 3	PLTS 4	PLTS 3	PLTS 4	PLTS 4
≥ 40	PLTS 3	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4

¹For street being crossed.²Minimum PLTS 3 when crossing lacks standard ramps.³Use Table 4.10 for one-way streets. Use PLTS 4 for crossings of four or more lanes.⁴Use these columns when ADT volumes are not available.

TABLE 4.8: PEDESTRIAN LTS ADJUSTMENTS FOR ARTERIAL CROSSWALK ENHANCEMENTS¹

Treatment ²	Adjustment	Treatment	Adjustment
Markings ³	-0.5	In-street signs	-1.0
Roadside signage ³	-0.5	Curb extensions	-0.5
Illumination	-0.5	Raised crosswalk	-1.0
PAB (e.g. RRFB)	-1.0	Standard 12" flashing beacon	-0.5

¹2.0 Maximum reduction or PLTS 2. Not intended for application at roundabouts.

²Pedestrian hybrid beacons (PHB) are equivalent to signalized crossings.

³Not applicable for roadways with pedestrian median refuges as crosswalk markings and roadside signage assumed as part of the basic installation.

TABLE 4.9: PEDESTRIAN LTS CRITERIA FOR ARTERIAL UNSIGNALIZED INTERSECTION CROSSING (1 TO 2 LANES) WITH A MEDIAN REFUGE^{1,2}

Prevailing Speed or Speed Limit (mph)	Maximum Through/Turn Lanes Crossed per Direction			
	1 Lane	2 Lanes		
	Any	<5,000 vpd	5,000-9,000 vpd ⁴	>9,000 vpd
≤ 25	PLTS 1 ³	PLTS 1 ³	PLTS 2	PLTS 2
30	PLTS 2	PLTS 2	PLTS 2	PLTS 2
35	PLTS 2	PLTS 2	PLTS 2	PLTS 3
≥ 40	PLTS 3	PLTS 3	PLTS 3	PLTS 4

¹For street being crossed.

²Minimum PLTS 3 when crossing lacks standard ramps.

³Refuge should be at least 10 feet for PLTS 1, otherwise use PLTS 2 for refuges 6 to <10 feet.

⁴Use these columns when ADT volumes are not available.

TABLE 4.10: PEDESTRIAN LTS CRITERIA FOR ARTERIAL UNSIGNALIZED INTERSECTION CROSSING (3 OR MORE LANES) WITH A MEDIAN REFUGE^{1,2}

Prevailing Speed or Speed Limit (mph)	Maximum Through/Turn Lanes Crossed per Direction			
	3 Lanes			4+ Lanes
	<8,000 vpd	8,000-12,000 vpd ⁴	>12,000 vpd	Any
≤ 25	PLTS 1 ³	PLTS 2	PLTS 3	PLTS 4
30	PLTS 2	PLTS 2	PLTS 3	PLTS 4
35	PLTS 3	PLTS 3	PLTS 4	PLTS 4
≥ 40	PLTS 4	PLTS 4	PLTS 4	PLTS 4

¹For street being crossed.

²Minimum PLTS 3 when crossing lacks standard ramps.

³Refuge should be at least 10 feet for PLTS 1, otherwise use PLTS 2 for refuges 6 to <10 feet.

⁴Use these columns when ADT volumes are not available.

APPENDIX B. ACTIVE TRANSPORTATION PROJECTS

City of Merced

Location	From	To	Facility Type	Length	Priority	Cost Estimate
McKee Rd	E 27th St	E Yosemite Ave	4	2.05		\$1,000,000
Mercy Ave	Mansionette Dr	G St	3B	0.27		\$60,000
Mission Ave	SR-59	S Coffee St	2B	3.01		\$1,260,000
Motel Dr	Almond Ave	Glen Ave	4	0.41	High	\$200,000
N Parsons Ave	Yosemite Ave	E 27th St	4	1.92		\$940,000
O St	26th St	8th St	4	1.39	High	\$680,000
Olive Ave	Campus Pkwy	R St	4	4.52	High	\$2,200,000
Orion Dr	Twilight Ave	Horizons Ave	3B	0.10		\$20,000
Orion Dr Path	R St	Twilight Ave	1	0.19		\$930,000
Pacific Dr	San Augustine Ave	Horizons Ave	2	0.69		\$180,000
R St	W Childs Ave	W Yosemite Ave	4	3.23	High	\$1,570,000
Rascal Bike Path	McKee Rd	Snelling Hwy	1	4.20	High	\$20,150,000
S Parsons Ave	S Coffee St	Yosemite Pkwy	4	1.95	High	\$950,000
San Augustine Ave	Cassis Dr	W Yosemite Ave	2B	0.59		\$250,000
San Jose Ave	Lehigh Dr	W Yosemite Ave	2B	0.55		\$230,000
Sullivan Bike Path	Snelling Hwy	Devonwood Dr	1	0.71		\$3,390,000
Tyler Rd	E Mission Ave	E Childs Ave	1	1.01		\$4,870,000
V St	W 24th St	W Main St	3B	0.52		\$110,000
V St	W Main St	SR-140	2B	0.33	High	\$140,000
W 11th St	D St	X St	3B	1.82	High	\$370,000
W 13th St	B St	R St	3B	1.45	High	\$300,000
W 16th St	G St	V St	2	1.37	High	\$360,000
W 18th St	G St	V St	2B	1.37	High	\$570,000
W 21st St	Glen Ave	R St	3B	1.58	High	\$320,000
W 8th St	MLK Jr Way	West Ave	3B	1.20	High	\$250,000
W Childs Ave	De Long St	N West Ave	2B	2.10	High	\$880,000
W Main St	G St	O St	3B	0.73	High	\$150,000
W Yosemite Ave	G St	San Augustine Ave	2B	1.66	High	\$690,000
West Ave	W Childs Ave	W 11th St	2B	0.94	High	\$400,000

Spot Improvement Projects

Location	Cross Street	Project Type	Cost Estimate
Heritage Dr	West Ave	Install RRFB	\$130,000
Parsons Ave	Bear Creek	New Bike/Ped Bridge	\$15,000,000
W 7th St	West Ave	Intersection Redesign	\$250,000
W Childs Ave	Reyes Elementary School	New Crossing	\$130,000
W Lopes Ave	West Ave	Install RRFB	\$130,000

APPENDIX C: TRANSIT AND PASSENGER RAIL INFORMATION

MERCED TRANSIT AUTHORITY

The Merced Transit Authority (MTA) operates “The Bus”. The Bus runs 15 fixed routes – ten local routes and five intercity routes. Weekday service runs from 6:00 AM to 8:00 PM, and weekend service runs from 8:00 AM to 6:00 PM. **Figure 27** shows the eight routes serving the City of Merced.

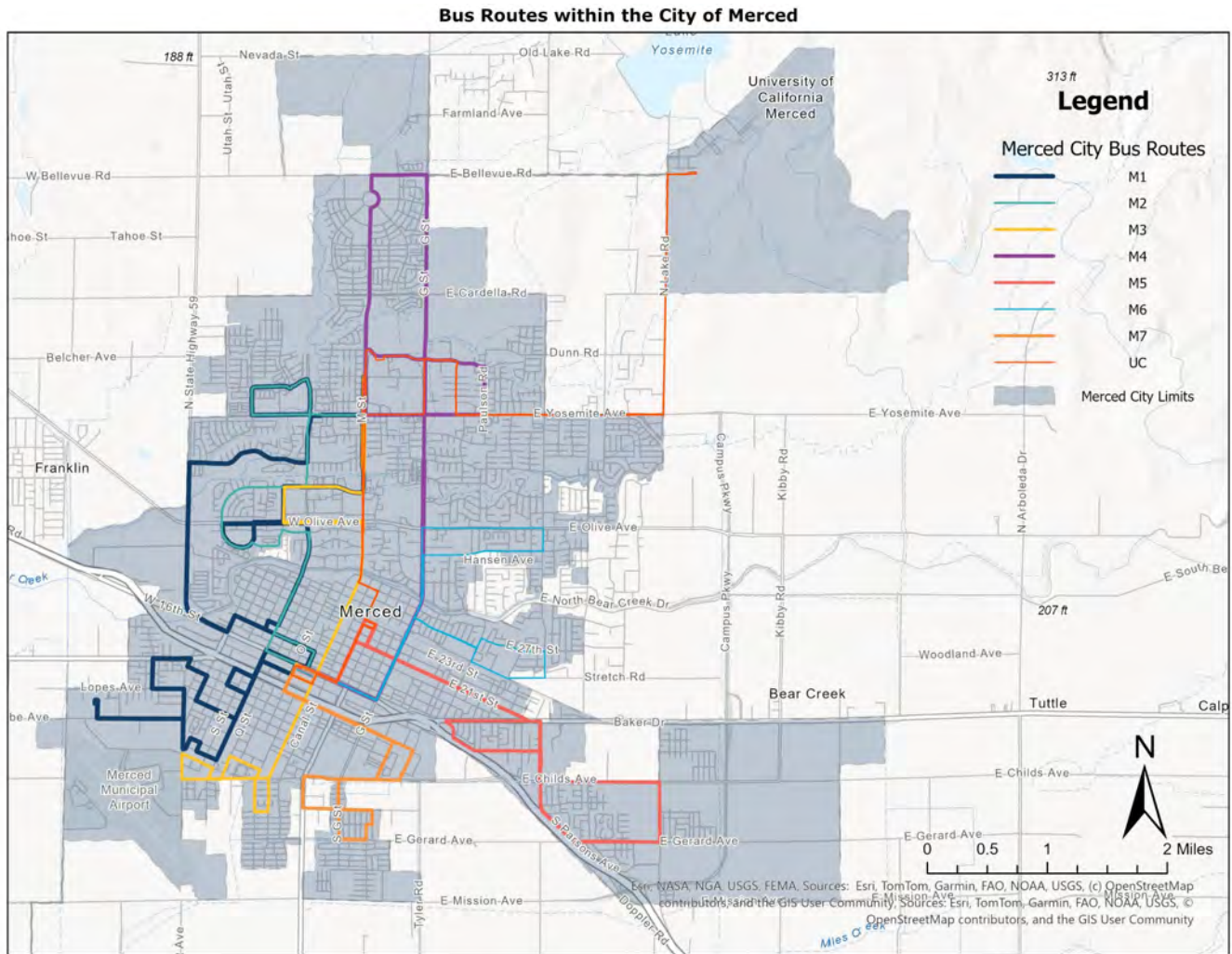


FIGURE 1: BUS ROUTES WITHIN THE CITY OF MERCED.

Source: California State Geoportal, The Bus.

Transit ridership in Merced County has faced notable fluctuations over the past several years, particularly due to the impacts of the COVID-19 pandemic. Based on unlinked passenger trips using bus, pre-pandemic ridership averaged around 65,000 trips per month through 2019. In 2020, ridership dropped sharply to approximately 20,000 monthly. Since then, ridership has gradually recovered, with current levels still climbing toward pre-2020 figures. **Figure 28** illustrates these ridership trends from 2018 through projected levels in 2025.

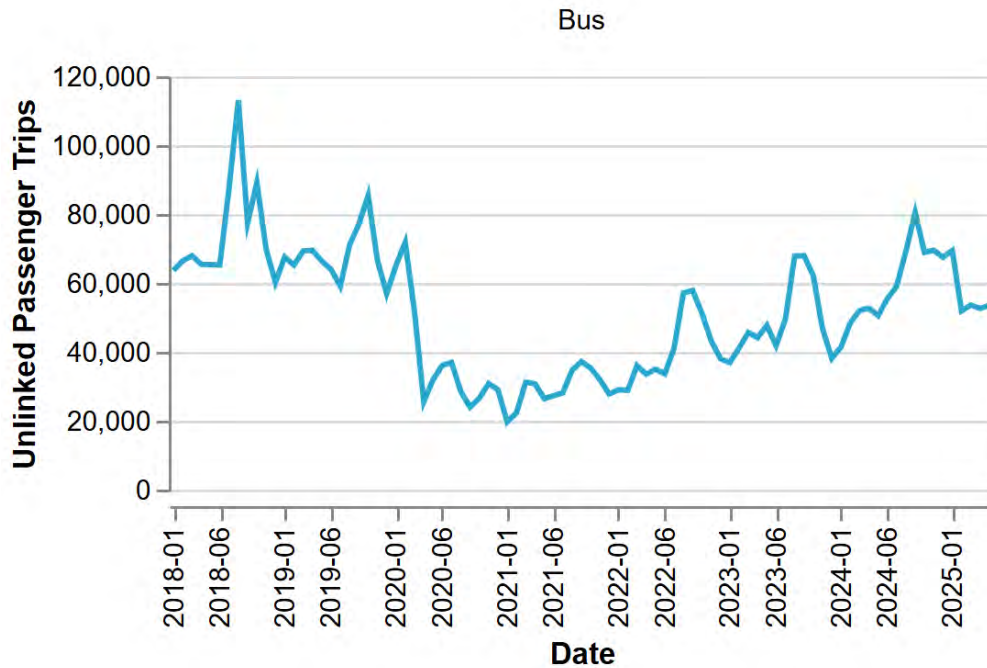


FIGURE 2: BI-YEARLY BUS RIDERSHIP, 2018 - 2025.

Source: MCAG The Bus Ridership Data.

CATTRACKS

CatTracks is a bus service operated by UC Merced. This service is offered free of charge to students, staff, and faculty. The general public may use the service for \$0.35 per ride. Seven routes are offered and connect the UC Merced campus to the city. In 2024, the MCAG Social Services Transportation Advisory Council (SSTAC) noted in their meeting minutes¹ that for FY2022-23, CatTracks ridership was 200,000. **Figure 29** shows the CatTracks network.

¹ <https://www.mcagov.org/DocumentCenter/View/4726/SSTAC-Full-Agenda---July-11-2024?bidId=>

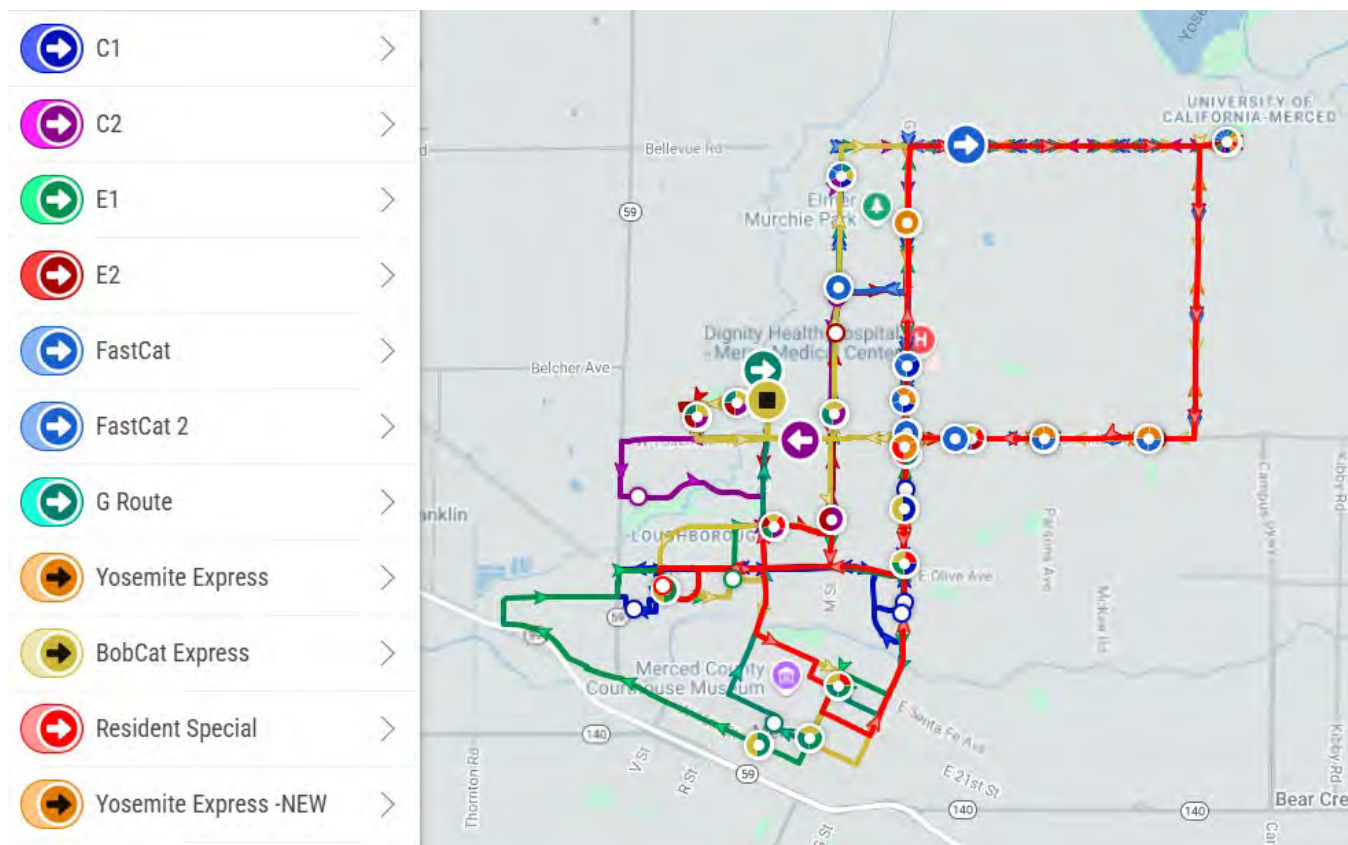


FIGURE 3: CATTRACKS BUS ROUTES FROM UC MERCED TO SURROUNDING CITY OF MERCED.

Source: UC Merced Transportation and Parking Services.

YOSEMITE AREA REGIONAL TRANSPORTATION SYSTEM

The Yosemite Area Regional Transportation System (YARTS) is a rural intercity bus program that serves communities in six counties, and in 2024, the City of Fresno. It was created in 2000 as a solution to growing congestion and pollution from visitors to Yosemite National Park. YARTS provides public transit for visitors, employees, and communities along its four routes to Yosemite National Park. **Figure 30** shows the four routes operated by YARTS.



FIGURE 4: MAP OF YARTS BUS ROUTES SERVING YOSEMITE VALLEY AND SURROUNDING COUNTIES.

Source: Yosemite Area Regional Transportation System.

As shown in **Figure 31**, the Merced-HWY 140 stop has the highest number of riders compared to other YARTS stops. Since 2016, YARTS ridership has decreased by 53%, likely attributed to the effects of COVID-19.

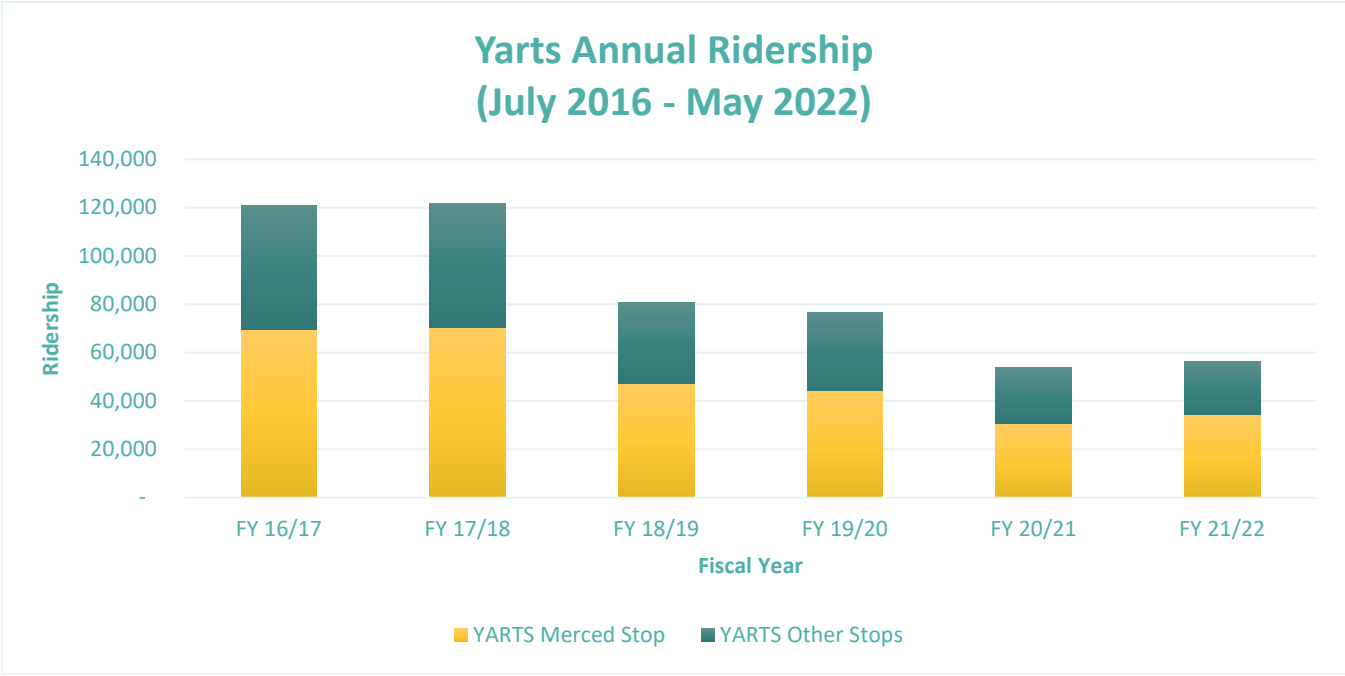


FIGURE 5. YARTS ANNUAL RIDERSHIP

Source: Mono County YARTS Ridership

PASSENGER RAIL

Passenger rail in Merced is primarily run by Amtrak, which offers a series of buses in concurrence with its rail services. However, the new California High Speed Rail would include a station stop in downtown Merced.

AMTRAK

Amtrak rail service currently provides six daily round-trip services through the San Joaquins and Merced Station. The San Joaquins is the only passenger rail provide in Merced County. Prior to the COVID-19 pandemic, the San Joaquins had seven daily round-trip services with Merced Station being the fifth busiest stop. However, service dropped to four daily round-trips during COVID-19. Burlington Northern Santa Fe (BNSF) Railroad, a freight rail provider, maintains right-of-way and shares its tracks with Amtrak. **Figure 1** shows the regional freight railroads in both the county and City of Merced. The City of Merced also hosts a number of freight rail routes. Two Class I rail routes in the city include BNSF and Union Pacific.

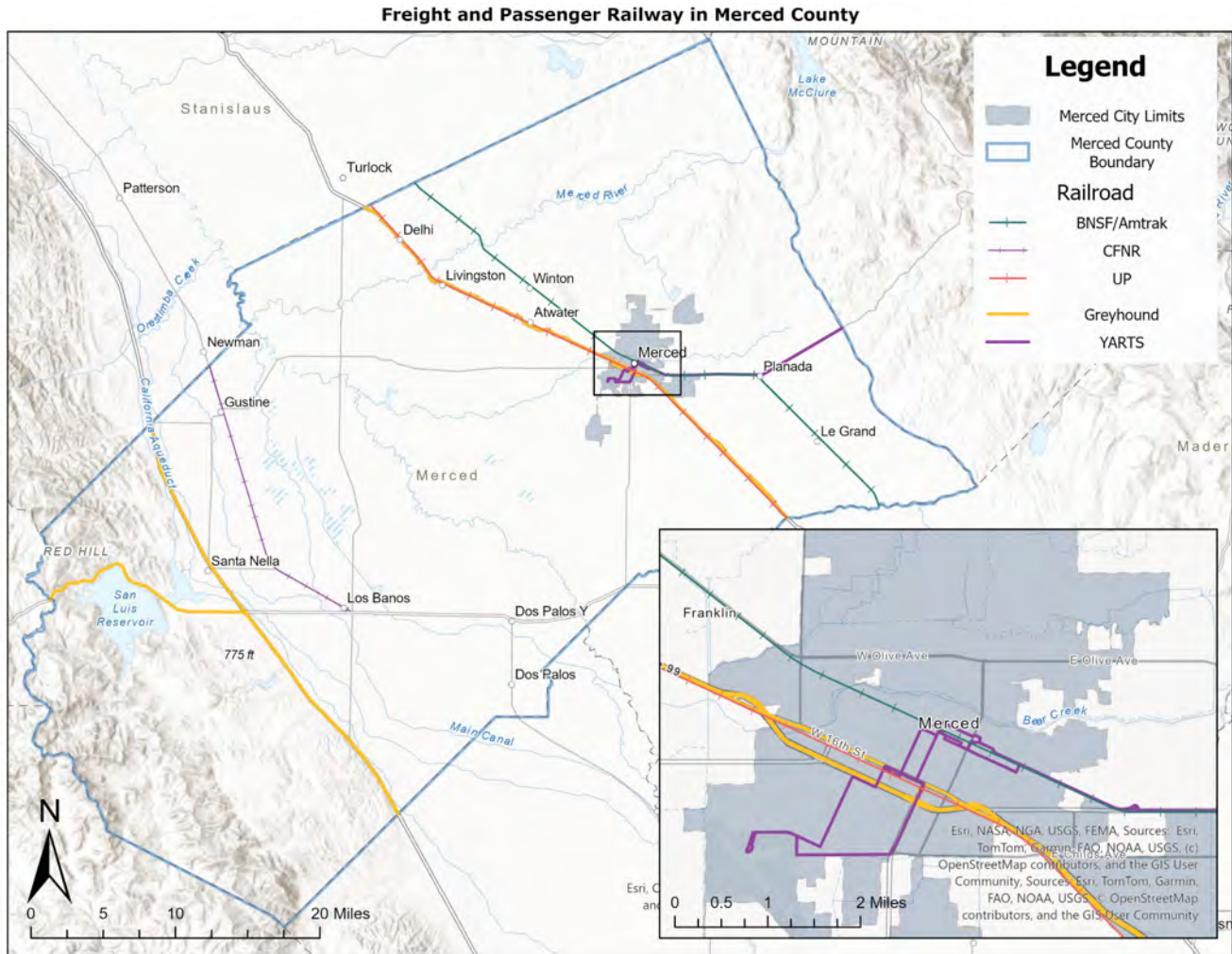


FIGURE 1: FREIGHT AND PASSENGER RAILROAD IN MERCED INCLUDING GREYHOUND AND YARTS BUS THRUWAY SERVICE.

Source: California State Geoportal

Ridership in the San Joaquins service saw a 43% decrease in ridership from 2019 and 2020. It has been steadily increasing from the COVID-19 pandemic impacts by 50% from 2020 to 2024 shown in **Figure 2**. Ridership at the Merced station follows a similar pattern to the whole system. The station saw a 41% drop in ridership from 2019 to 2020. However, as shown in **Figure 3**, ridership at the Merced station is nearing recovery to pre-pandemic levels compared to entirety of the San Joaquin network.

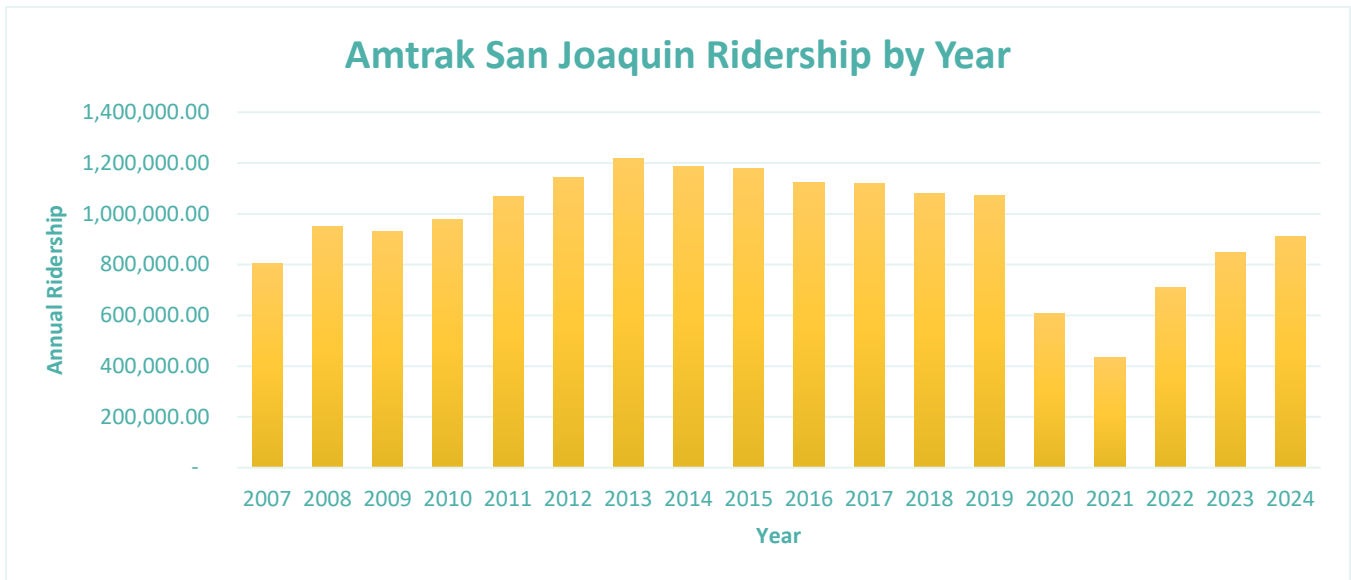


FIGURE 2: RIDERSHIP OVER TIME, SAN JOAQUINS.

Source: Amtrak Year End Ridership Fact Sheet.

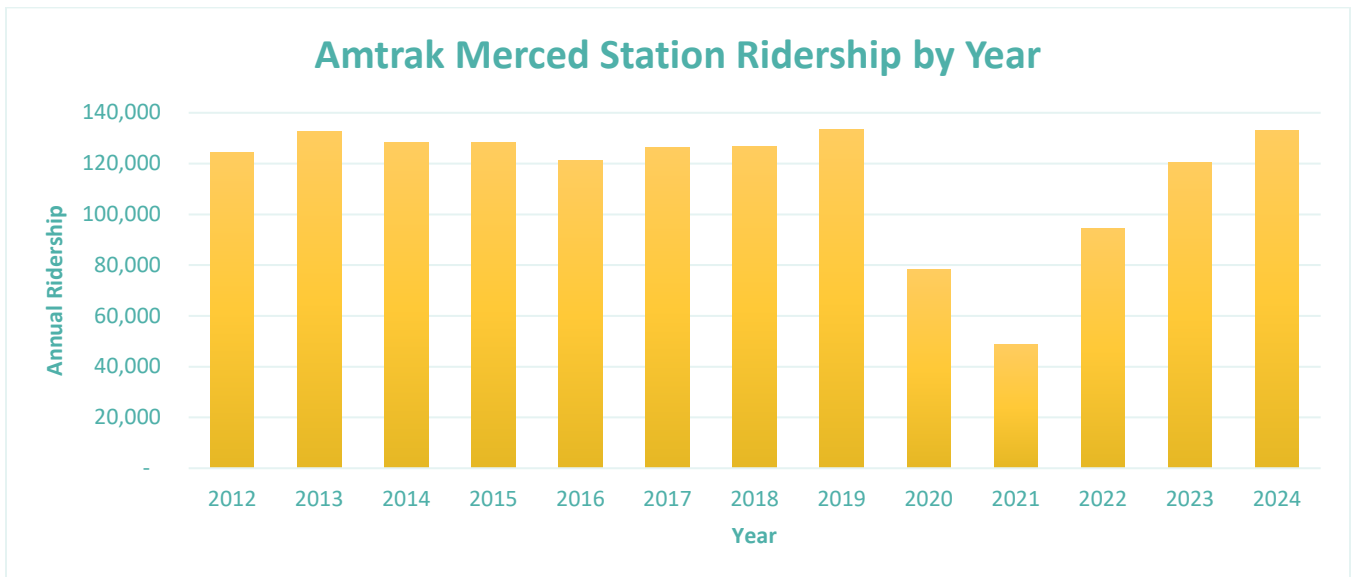


FIGURE 3: ANNUAL RIDERSHIP USING THE MERCED STATION.

Source: Amtrak Year End Ridership Fact Sheet.

HIGH SPEED RAIL

As early as 1981, planners and leadership in California have had vision of high speed, safe, reliable, and environmentally sustainable transportation from southern to northern parts of the state. Through the High-Speed Rail Development Act of 1994 and \$8 billion in funding as part of the federal American Reinvestment and Recovery Act of 2009, the rail system has been progressing with design,

According to the Authority's 2022 Business Plan, Merced to Bakersfield currently takes 2.5 hours by car and 3 hours by Amtrak, the HSR will reduce these travel times by 100 minutes with 18 round trips per day. The Merced HSR station will be the northern terminal of the initial Central Valley HSR segment. **Figure 5** shows the current HSR system status as of June 2024.



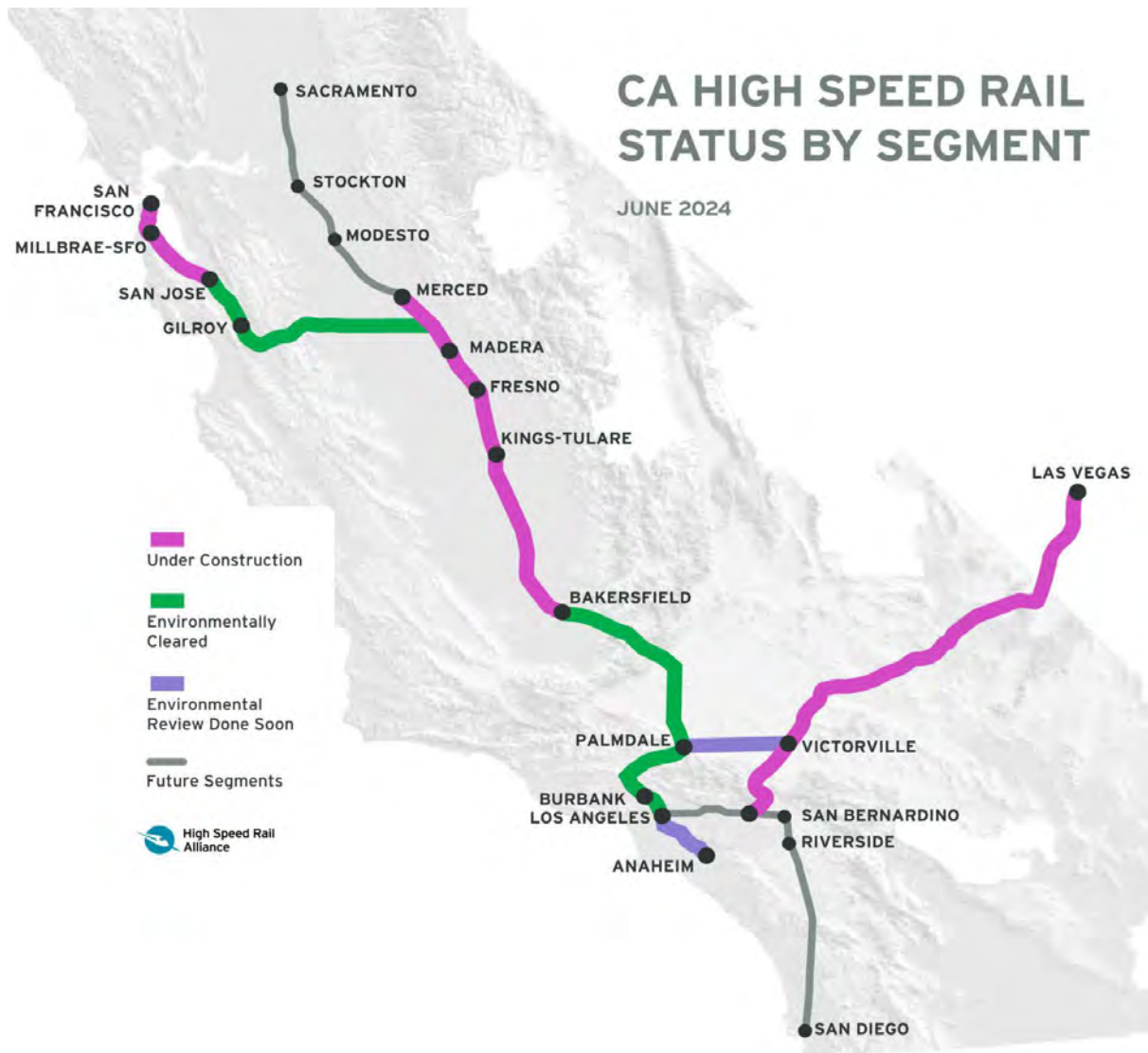


FIGURE 5: HSR 2024 PROGRESS, CALIFORNIA HIGH-SPEED RAIL.

Source: California High-Speed Rail Authority.

APPENDIX D: HIGH SPEED RAIL AUTHORITY DESIGN CONCEPT PRESENTATION

Merced Concept Plan November 2023

Station Option 1

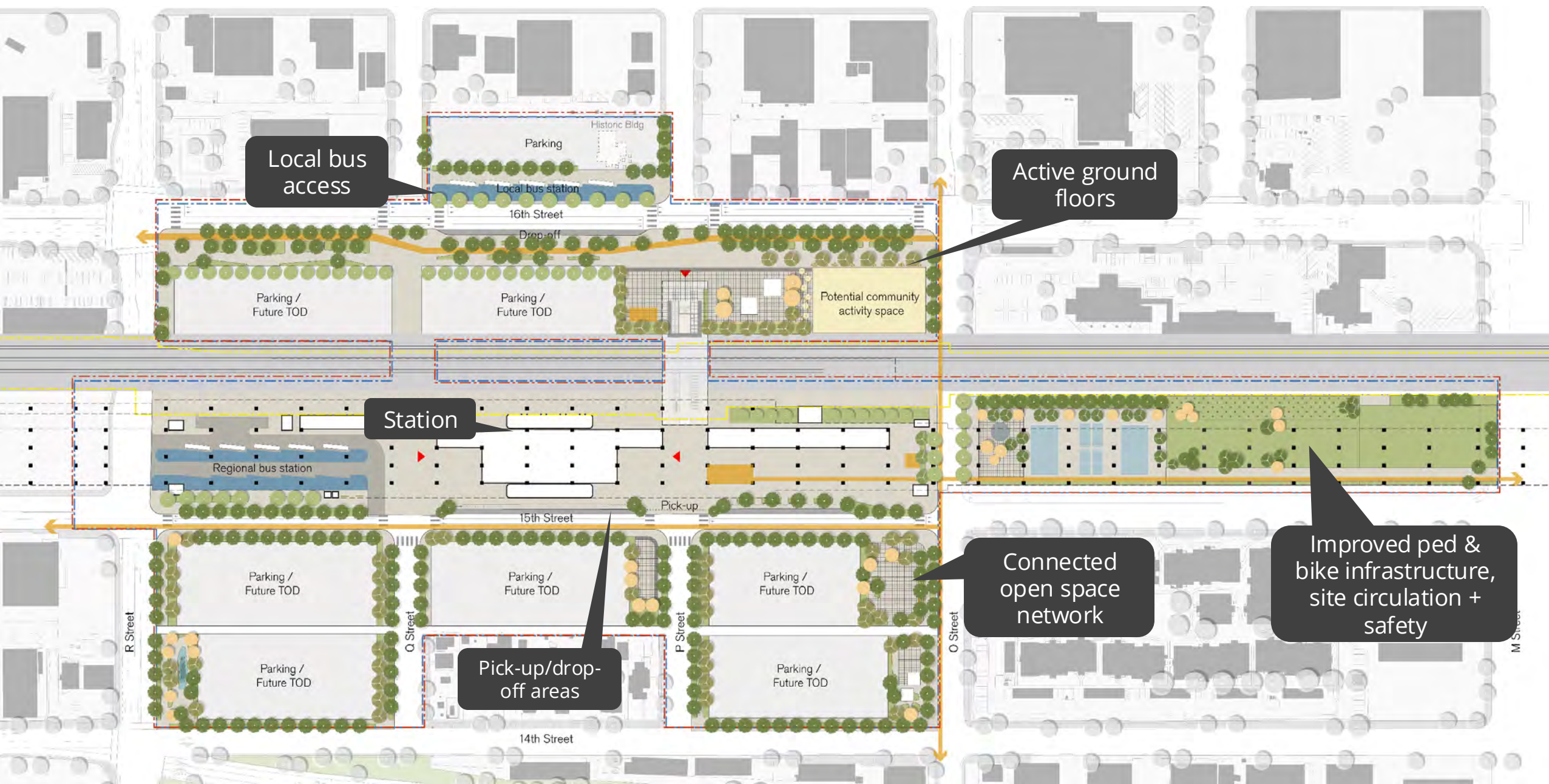


Station Option 2



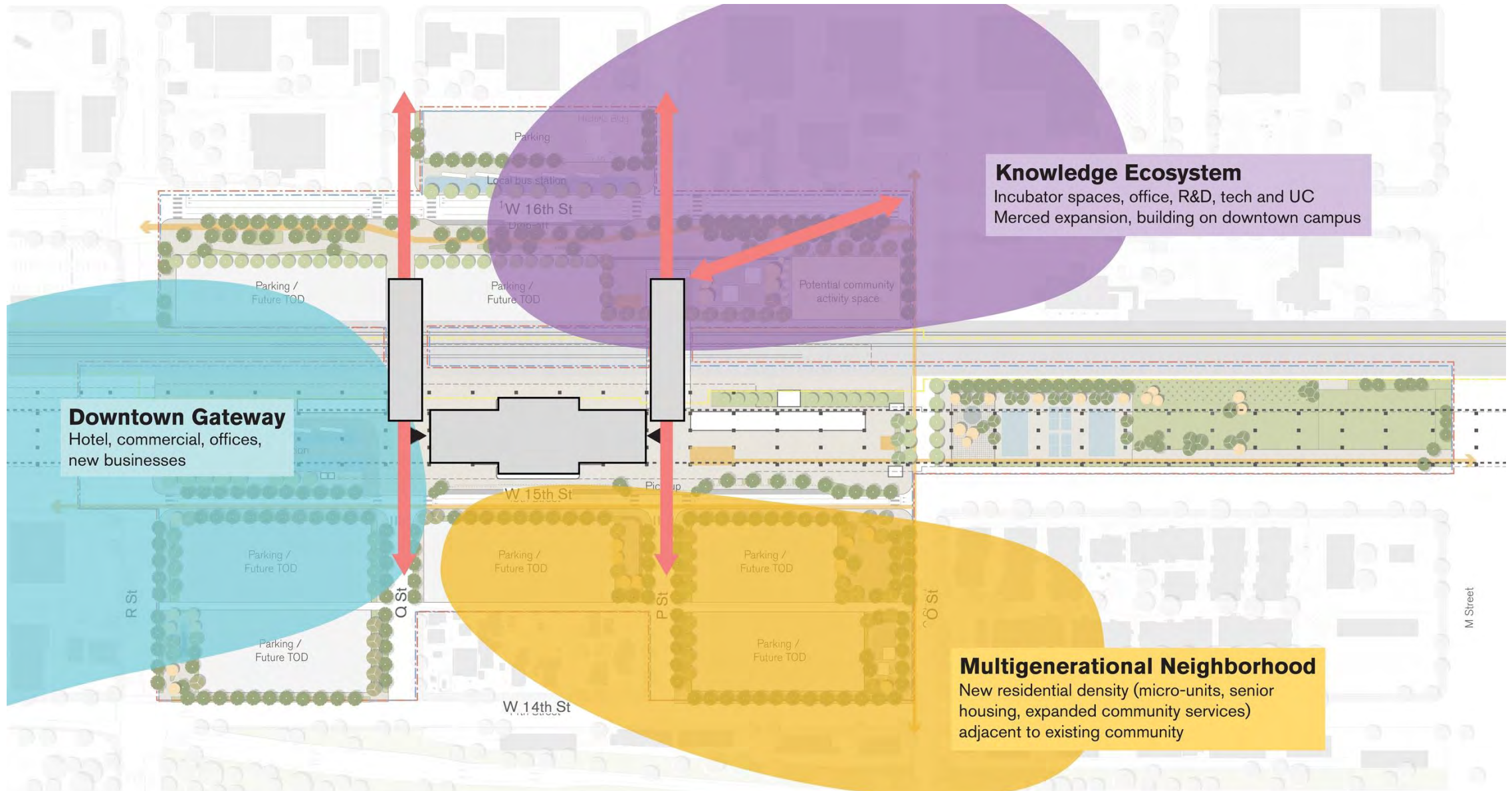
Concept Plan Update - Day 1

Foster + Partners ARUP



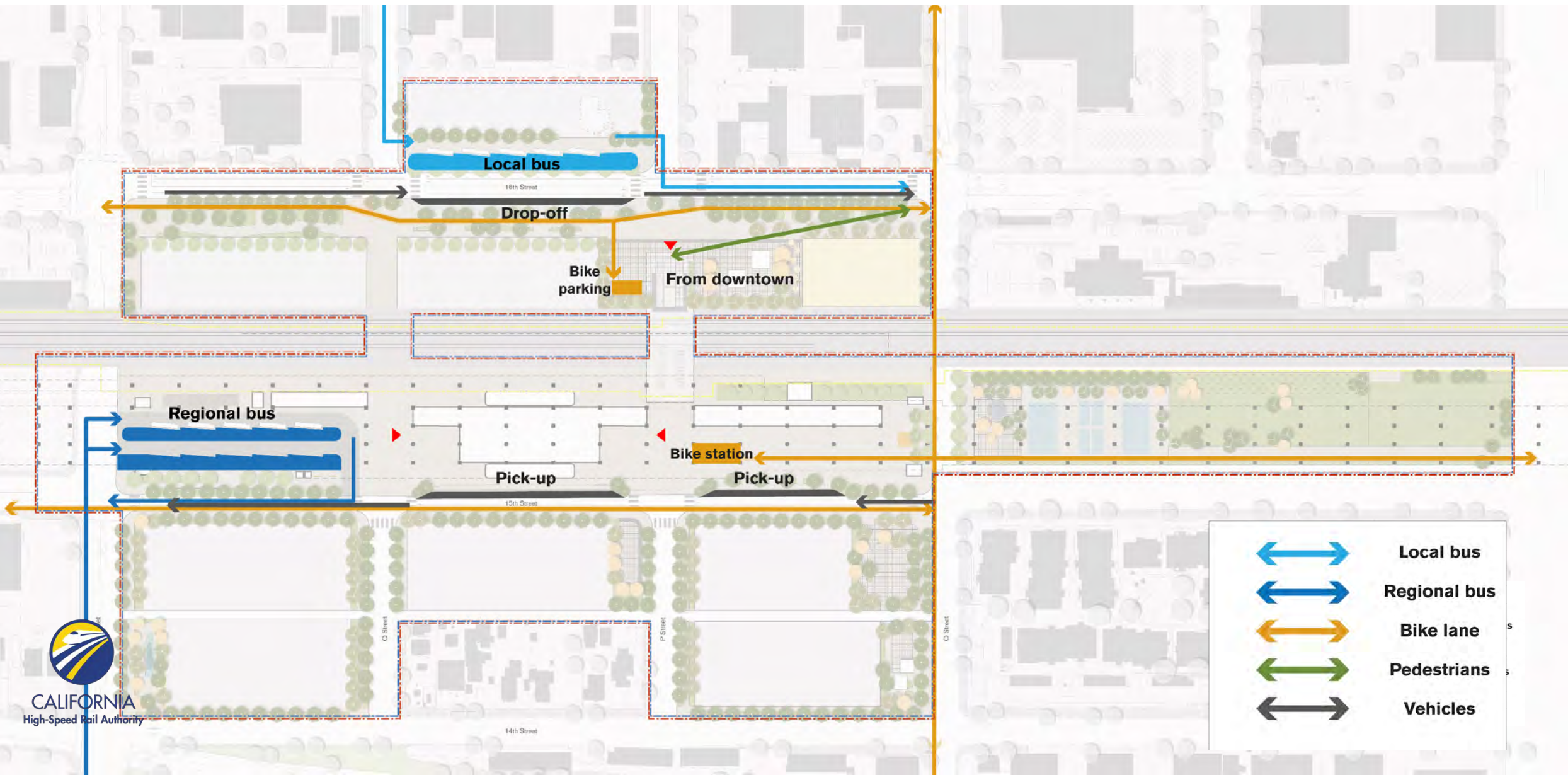
Merced Preliminary TOD Vision

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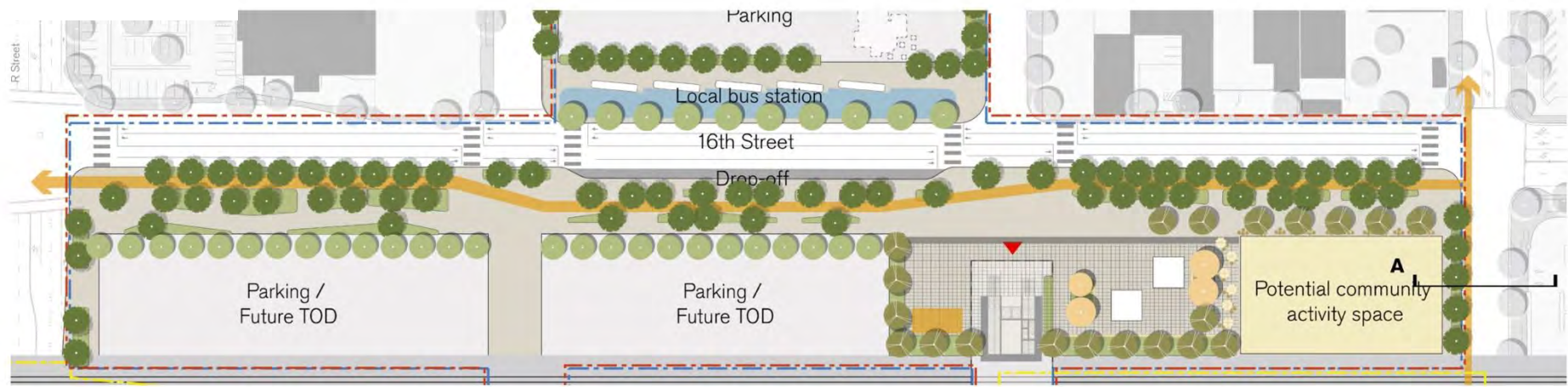


Merced Station Access & Circulation

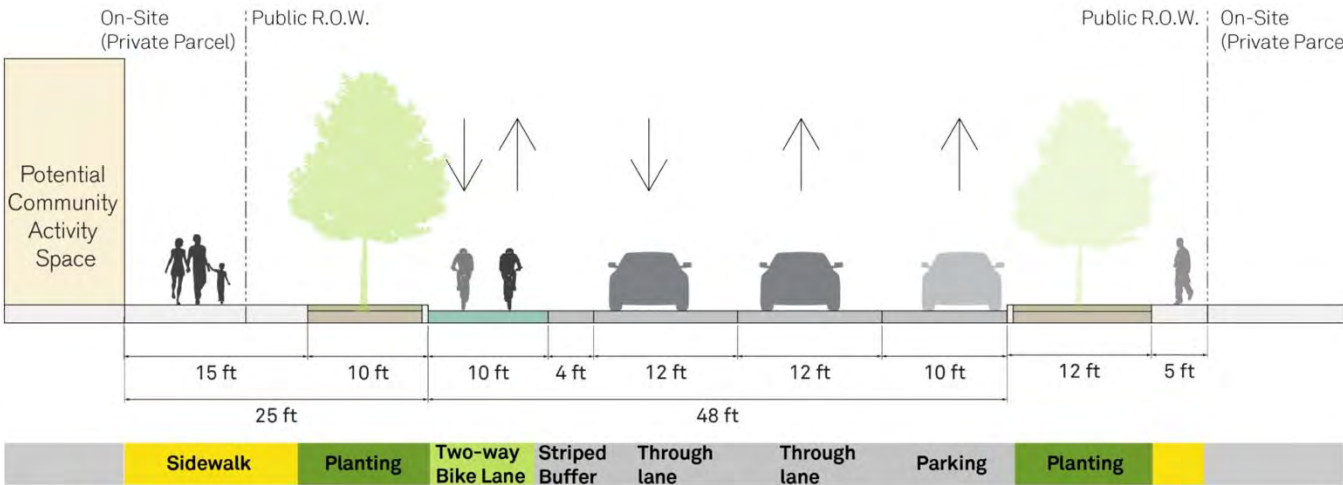
Foster + Partners | ARUP



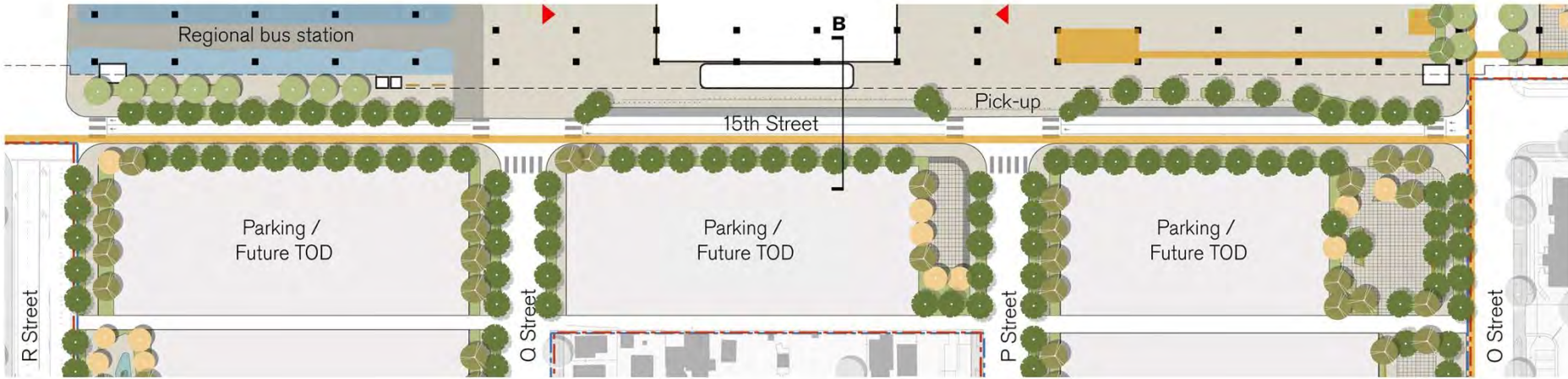
O Street



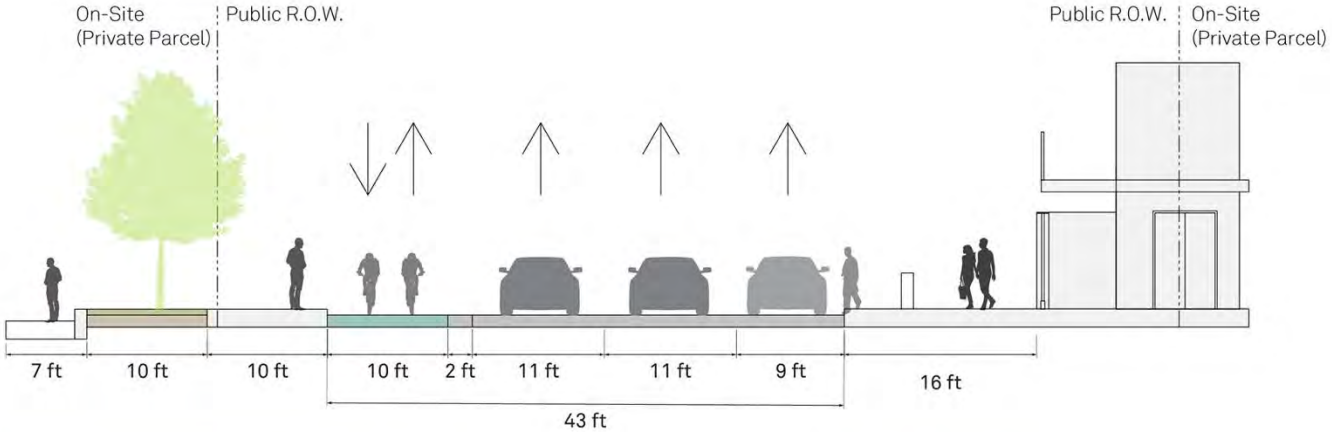
Merced Key Plan



Cross Section- O Street



Merced Key Plan

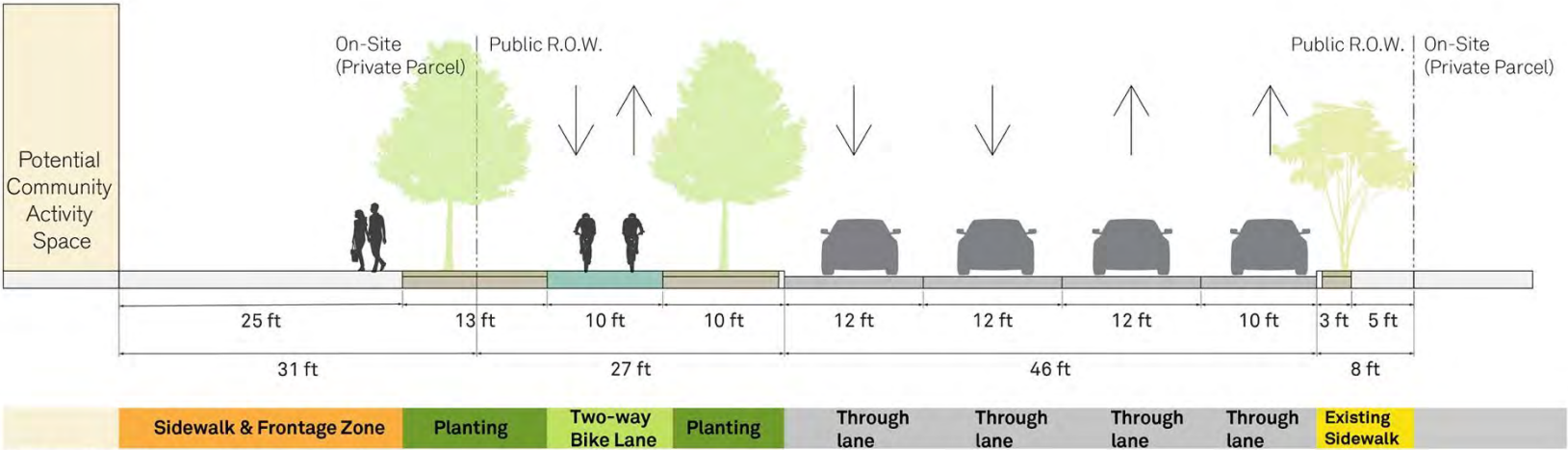


Walkway	Planting	Sidewalk	Two-way Bike Lane	Through lane	Through lane	Pick-up lane	Pick-up Zone	Sidewalk	Station
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Cross Section- 15th Street

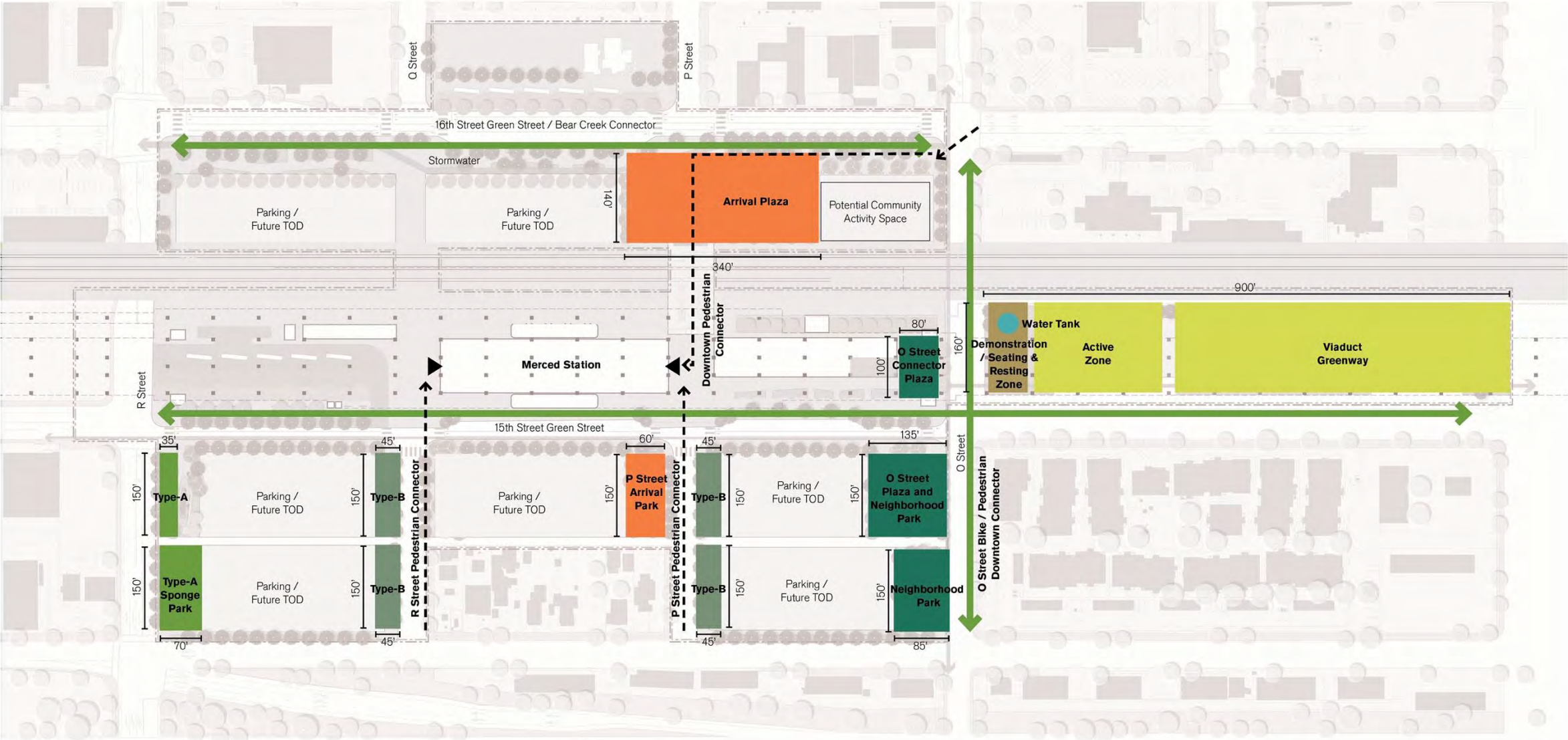


Merced Key Plan



Cross Section- 16th Street

Merced Open Space Network



Merced Open Space Configuration Plan

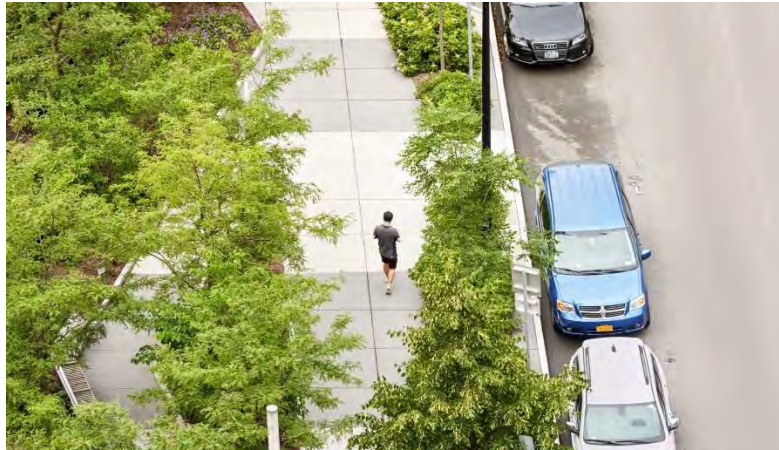
Arrival Plaza



16th Street Site Plan

- | | | | |
|---|---------------------|---|------------------|
| 1 | Two Way Cycle Track | 5 | Bicycle Storage |
| 2 | Stormwater Planters | 6 | Station Entrance |
| 3 | Pick-up Zone | 7 | Arrival Plaza |
| 4 | Cafe Plaza | 8 | TOD Spillout |

Arrival Plaza - Features



Street Frontage



Plaza

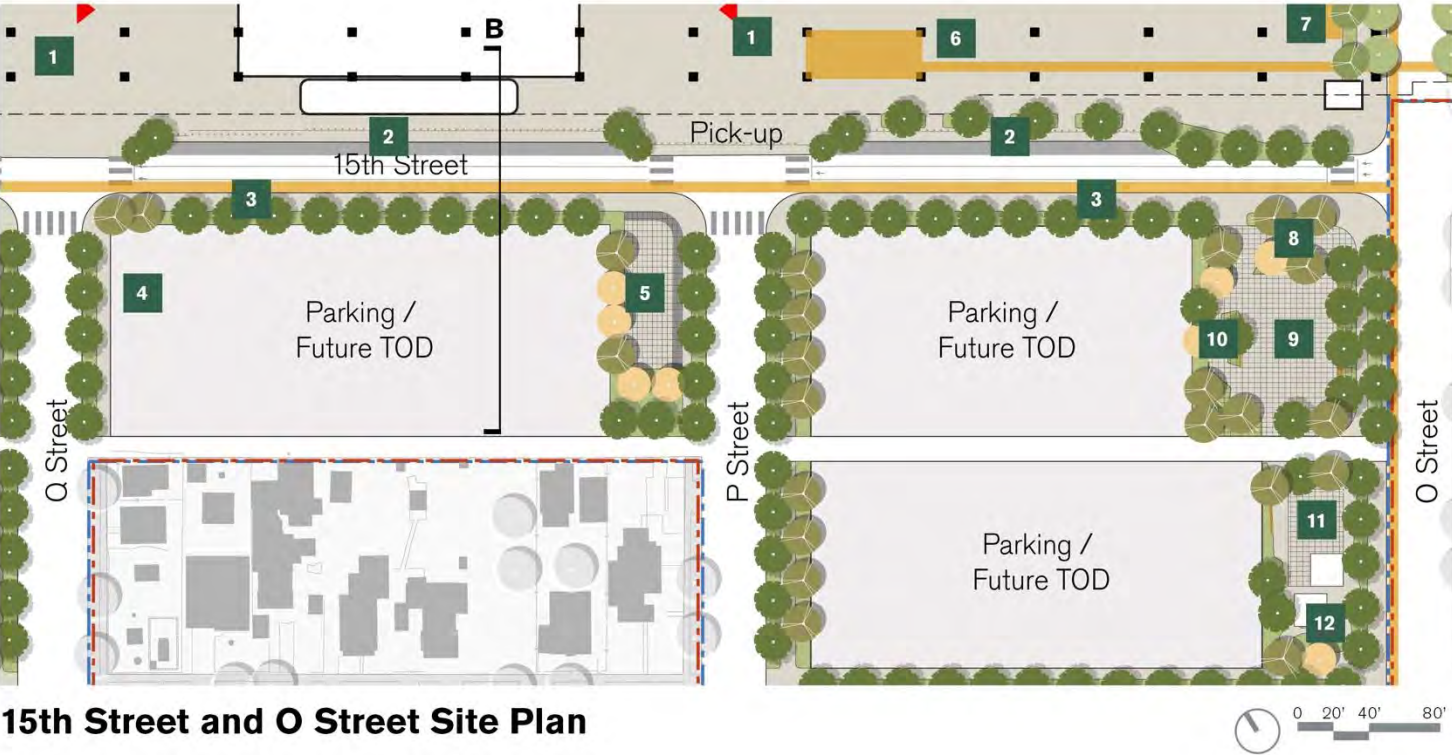


Seating Edges



Permeable Paving & Tree Shade

15th Street and O Street



- | | | | |
|---|-------------------------|----|--------------------------|
| 1 | Station Entrance | 7 | Bicycle Storage |
| 2 | Drop off Zone | 8 | Neighborhood Plaza |
| 3 | Two-way Cycle Track | 9 | Neighborhood Games Court |
| 4 | Station Spill Out Plaza | 10 | Seating Grove |
| 5 | Station Spill Out Park | 11 | Neighborhood Park |
| 6 | Vendor Spill Out Zone | 12 | Nature Play |

15th Street and O Street Site Plan

O Street Open Space Network - Features



Neighborhood Park



Gathering Spaces



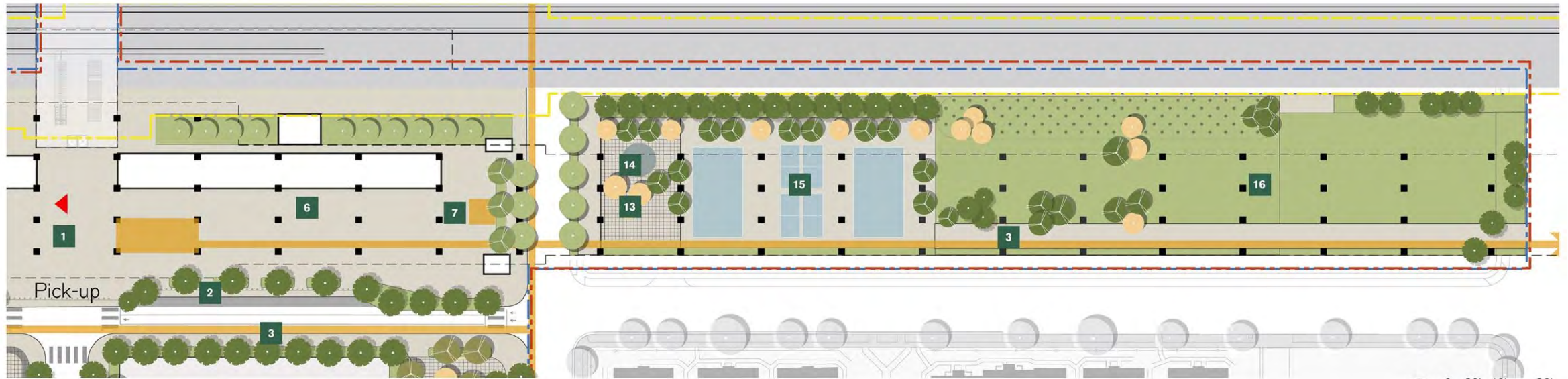
Play Area



Community Garden

Viaduct Greenway

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15th Street Site Plan

- | | |
|-------------------------|---------------------------|
| 1 Station Entrance | 13 Seating & Resting Zone |
| 2 Drop off Zone | 14 Water Tank |
| 3 Two-way Cycle Track | 15 Active Zone |
| 6 Vendor Spill Out Zone | 16 Viaduct Greenway |
| 7 Bicycle Storage | |

Viaduct Greenway - Features



Games Court



Seating and Resting Zone

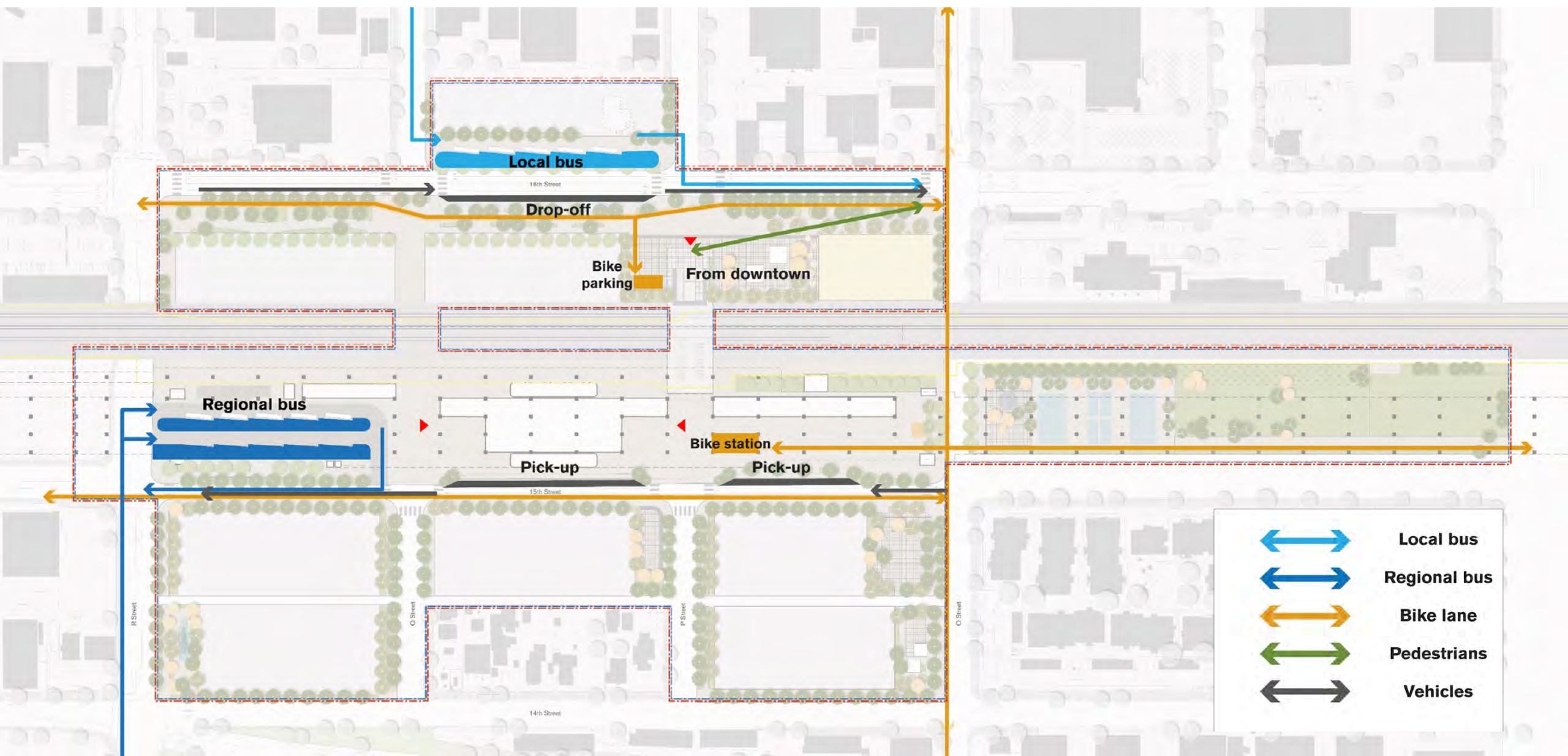


Active Zone

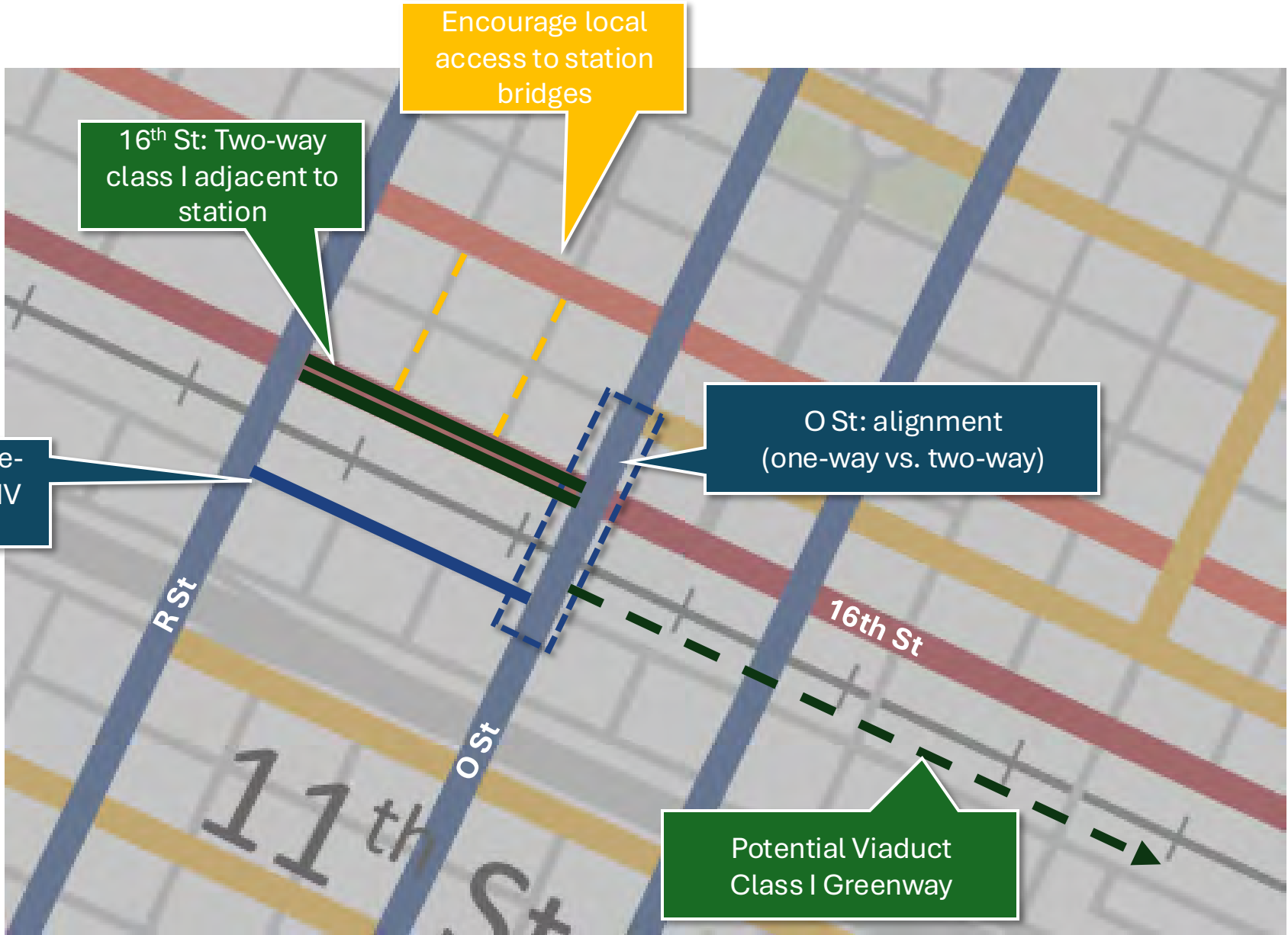


Greenway

Station Access/Circulation

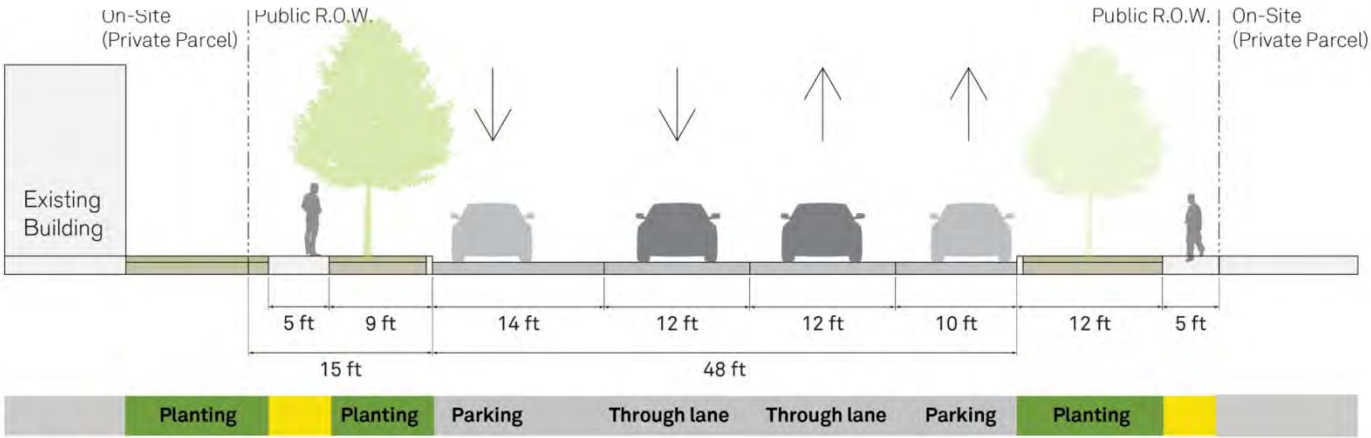


Bike Facilities

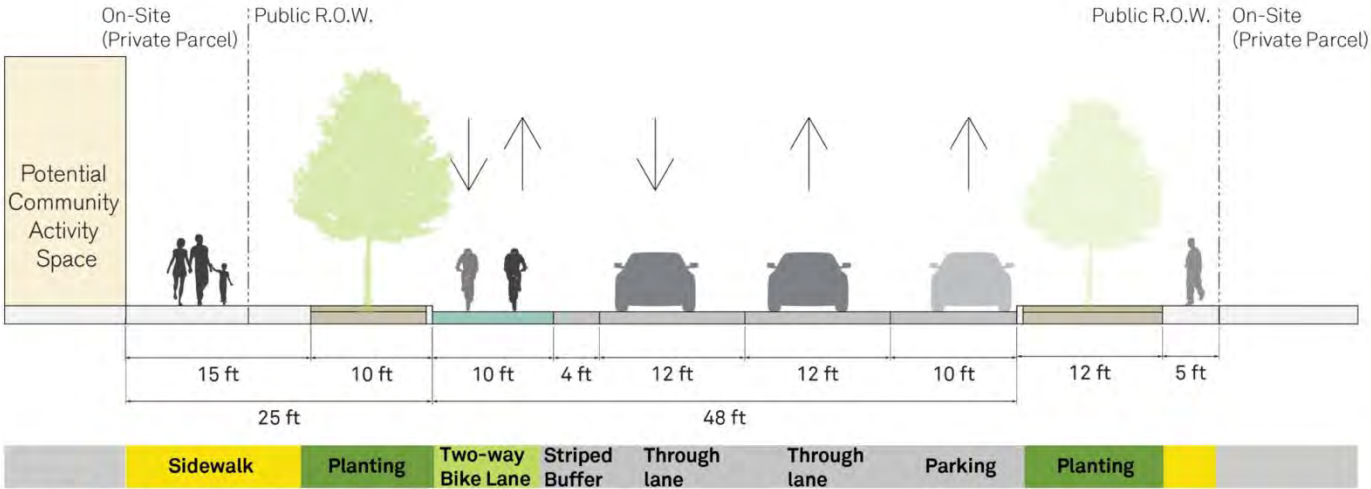


KEY	Existing/Proposed
Class I	
Class II	
Class IIB	
Class III	
Class IIIB	
Class IV	
Ped Improvement	
Spot Improvement	

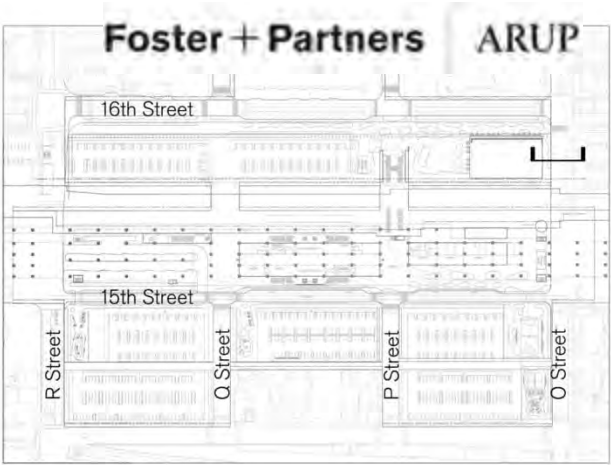
O Street



Cross Section- O Street Existing

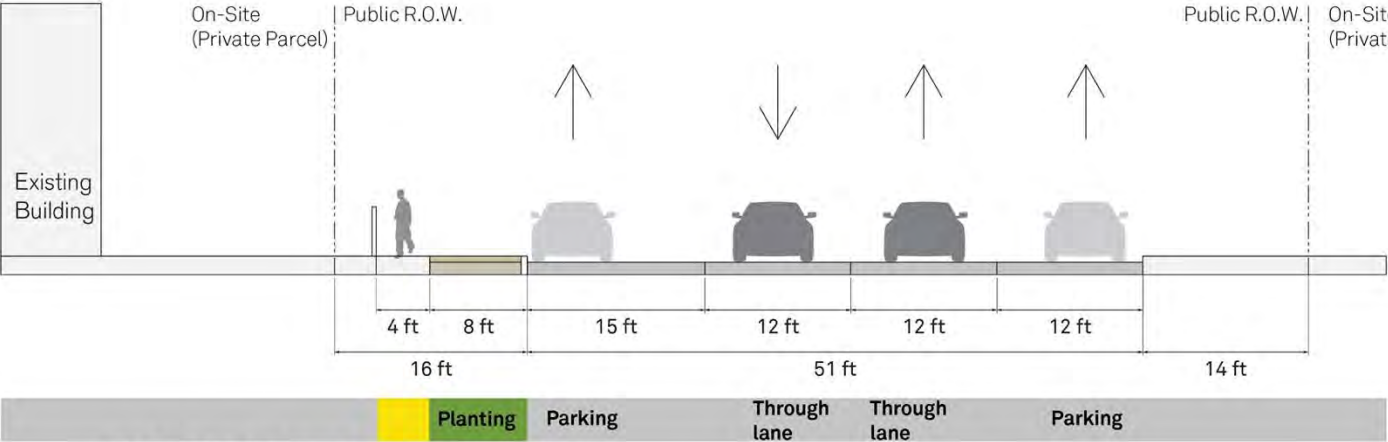


Cross Section- O Street Proposed

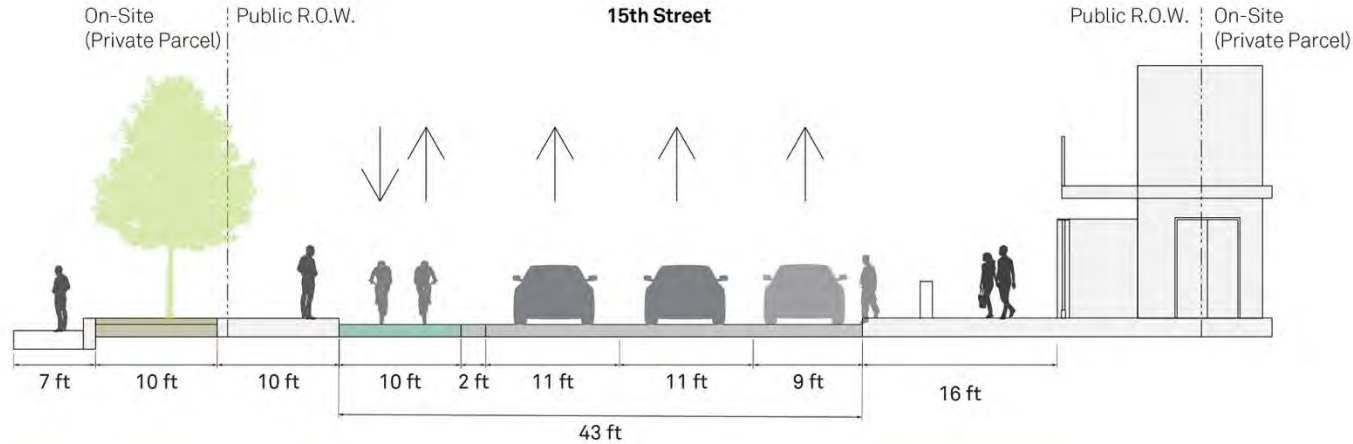


Merced Key Plan

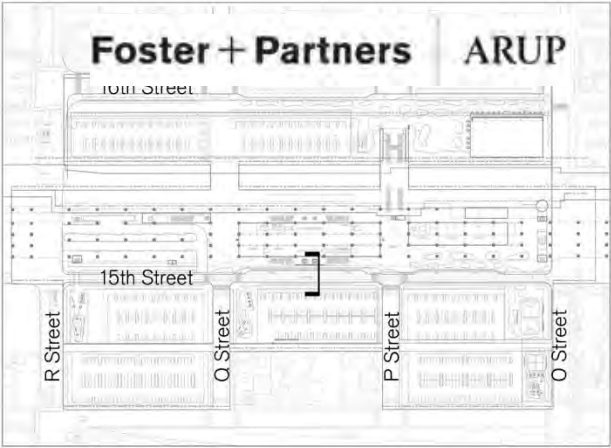
15th Street



Cross Section- 15th Street Existing

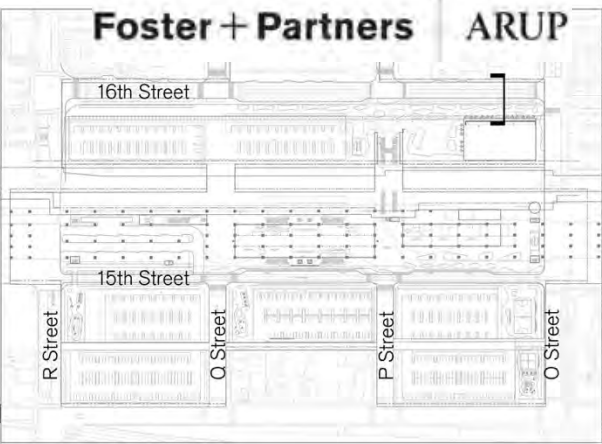
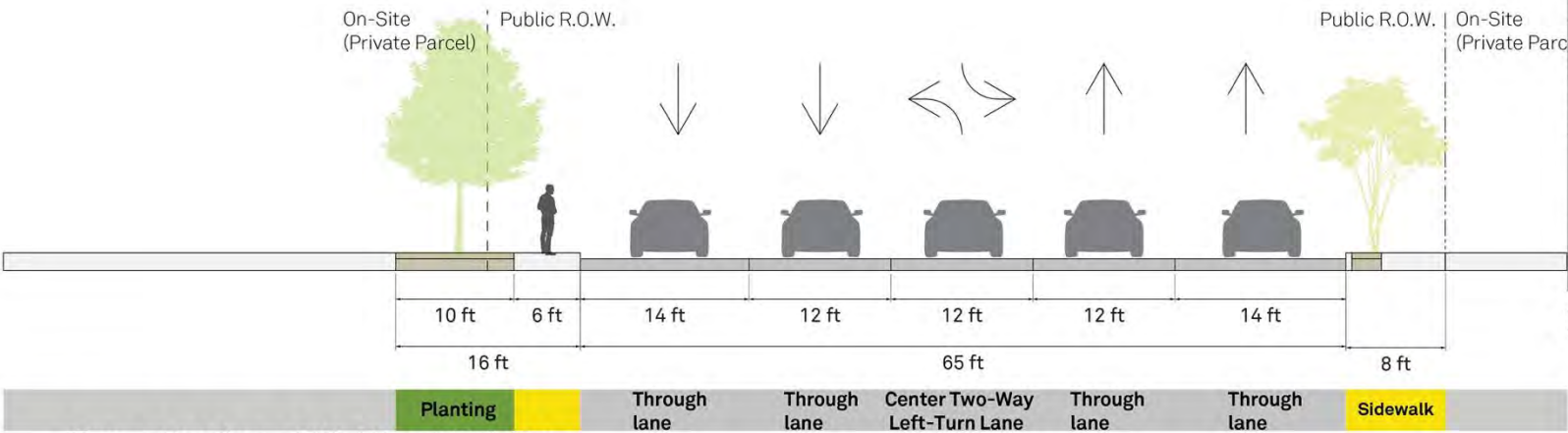


Cross Section- 15th Street Proposed

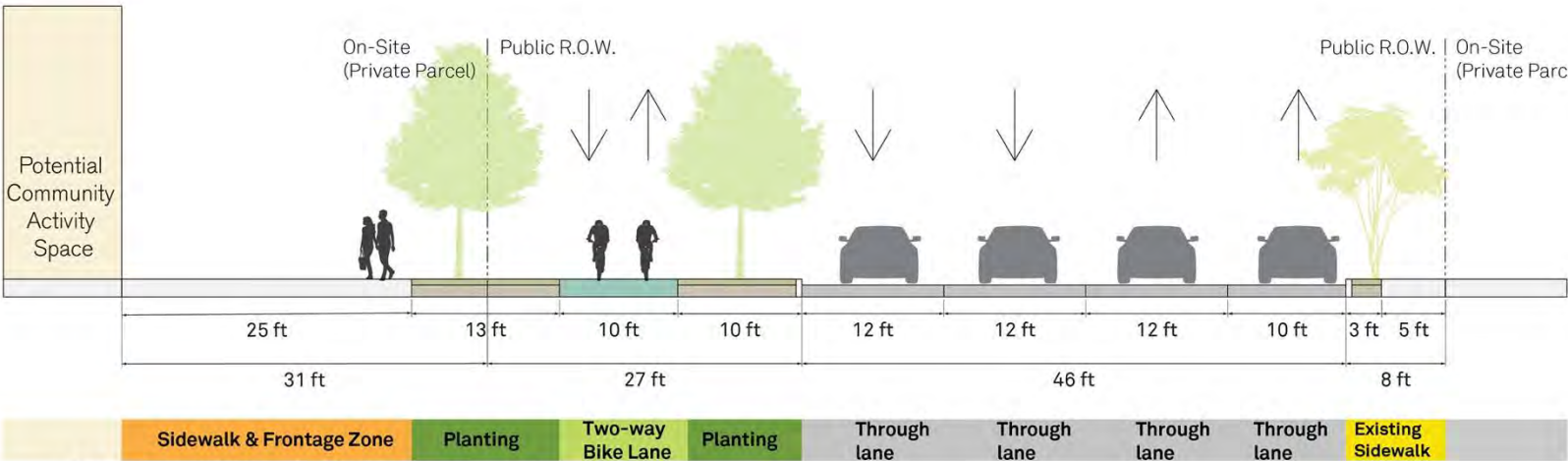


Merced Key Plan

16th Street

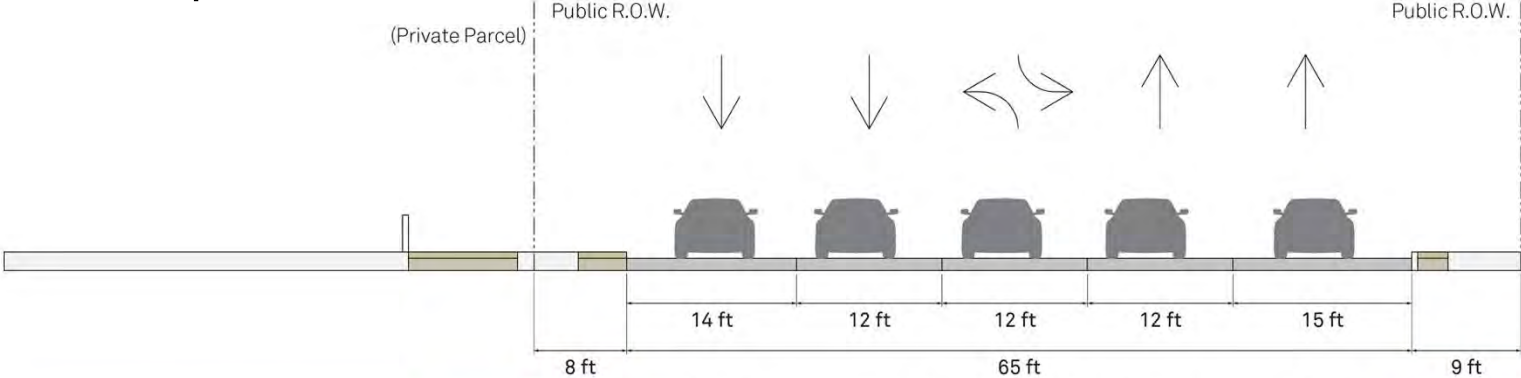


Merced Key Plan

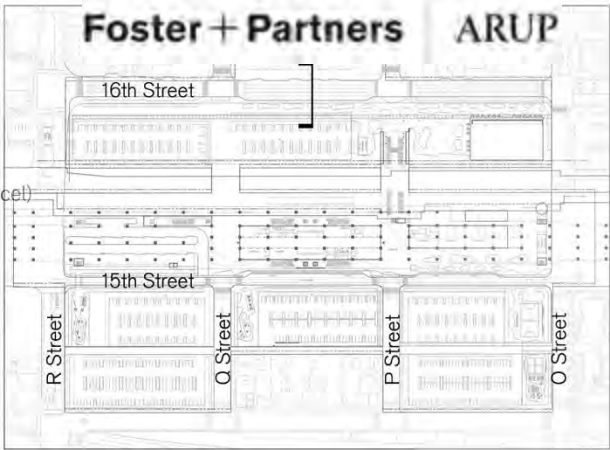


16th Street

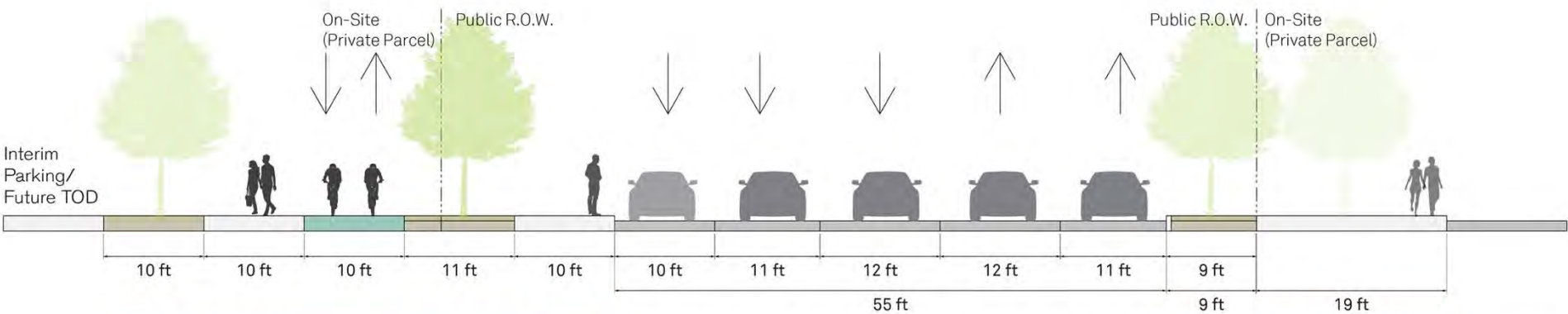
At Station Drop-off Area



Cross Section- 16th Street Existing



Merced Key Plan



Cross Section- 16th Street Pick-up Area Proposed

16th Street Local Bus Access

