

Beyond the Lot Line

Designing Equitable Parking Strategies
for Transit Oriented Communities

ITE Western District Conference · Bellevue, Washington

Cristian Belmudez · CR Associates



MTS Policy 18

Explore opportunities to convert transit parking areas to Transit Oriented Development — prioritizing affordable housing and highest possible density.

MTS Board requested a comprehensive parking study to help inform the agency of future parking demand, trade-offs, and alternatives.

The Competing Perspectives

Parking Preservation

Reducing parking may cause individual rider hardship, reduce system ridership in automobile-centric environments, or cause spillover parking into adjacent neighborhoods.

vs.

TOD Prioritization

Well-utilized parking may not be necessary if riders are willing to shift arrival modes, and new transit trips generated by dense housing could outweigh potential park-and-ride losses while generating real estate revenue for system reinvestment.

Process



Parking Calculator Tool

Existing Conditions

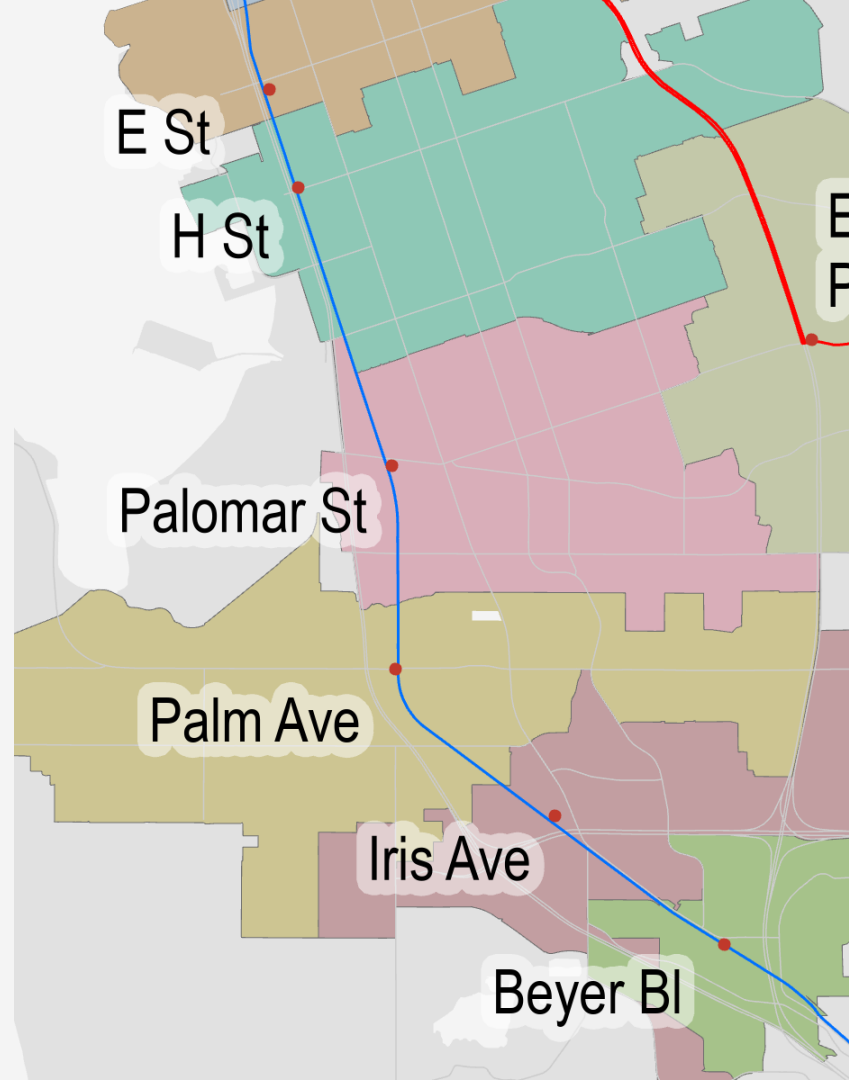
Developed 37 catchment areas to identify potential users

Network Travel Time Analysis

Traffic Analysis Zones

10-15 Minute Travel Time to Station

Fastest Travel Time to Downtown



Existing Conditions

Catchment Area Characteristics and Profiles

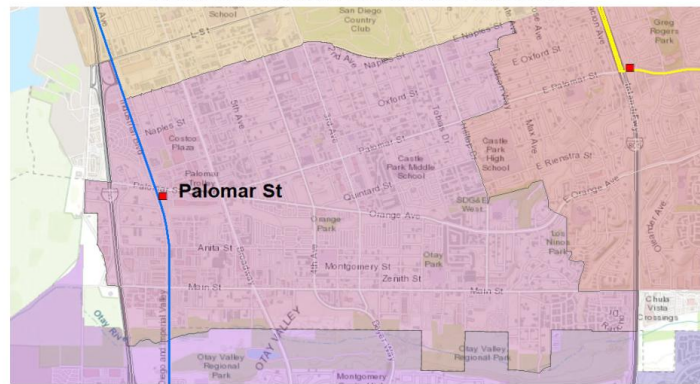
Average Trolley Weekday Boardings

Source: MTS

Mode-of-Arrival

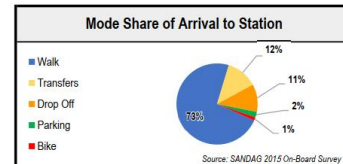
Source: 2015 SANDAG On-Board Survey and CR Associates

Palomar Street Station and Catchment Area Characteristics



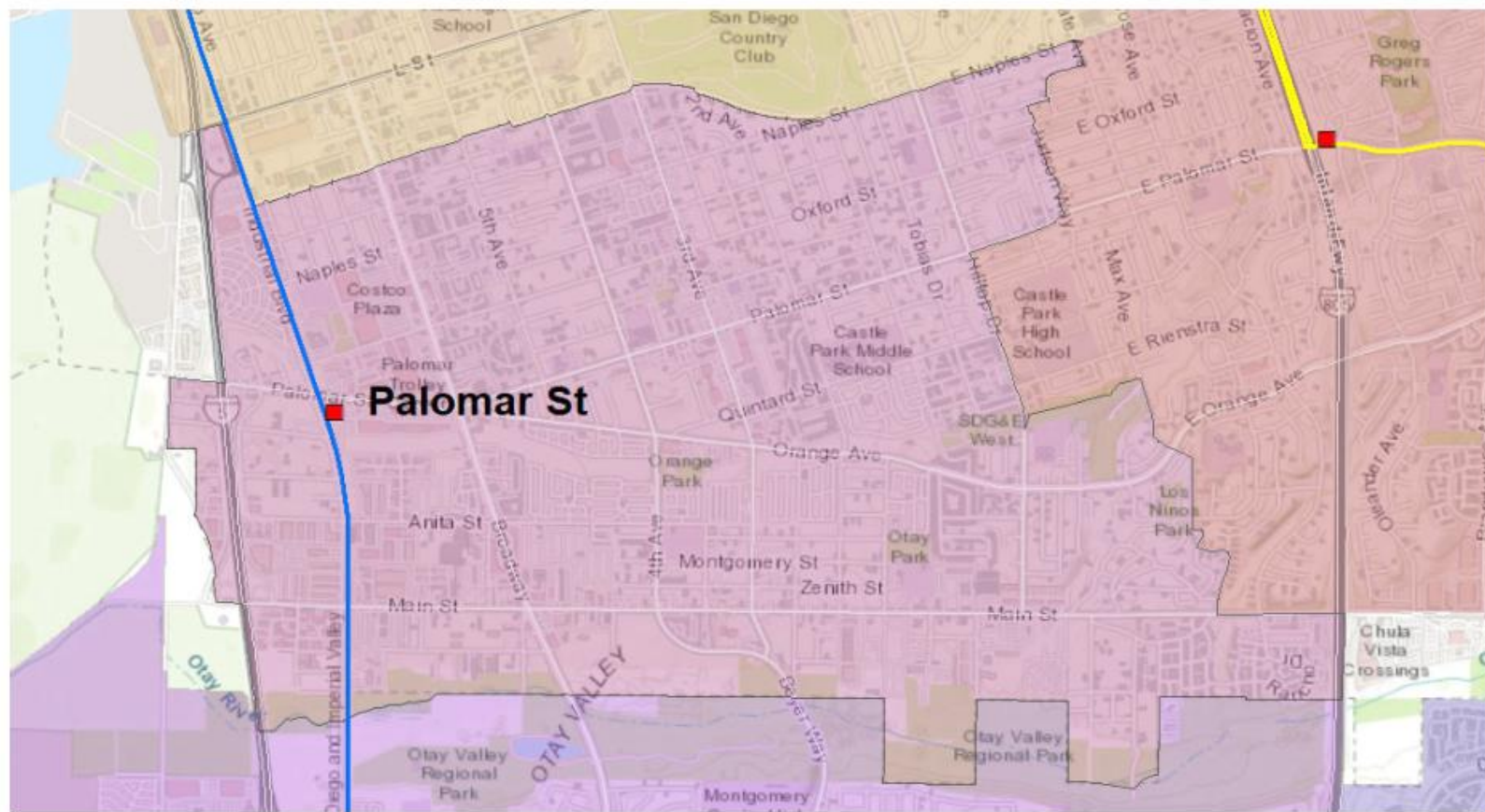
Ridership	
2019 Average Weekday Ridership	4,861
2022 Average Weekday Ridership	4,201
Percentage Change from 2019 to 2022	-14%

Catchment Area Characteristics	
Square Mileage	4.5
Total Population	42,585
Percent of Population in Poverty	13%
Total Households	12,833
Average Vehicles per Household	1.86
Means of Transportation to Work	
Drive	85.3%
Other Categories	
Transit	6.0%
From Home	5.3%
Walk	1.9%
Bike	0.0%
Percentage of Downtown-bound Commuters	5.3%



Station Accessibility	
Employment Accessible by Transit	
within 30-minutes	12,626
within 45-minutes	54,721
within 60-minutes	150,206
Transit Travel Time to Downtown	31 Minutes
Miles from Nearest Freeway Exit	0.3 Miles
Nearest Alternative Park & Ride	H Street
Net Travel Increase to Access Nearest Alternative Park & Ride	3 Minutes

Palomar Street Station and Catchment Area Characteristics



Ridership

Mode Share of Arrival to Station

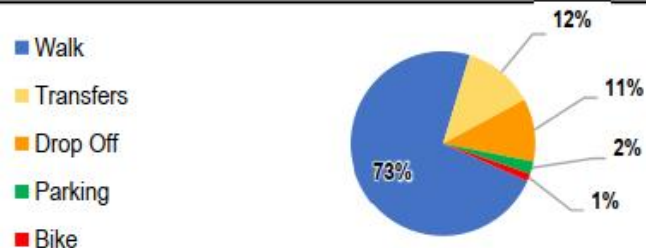
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Mode Share of Arrival to Station



Source: SANDAG 2015 On-Board Survey

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within 30-minutes	12,626
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Existing Conditions

Understanding existing parking utilization

Automated License Plate Reader (ALPR) cameras were installed at every access/egress location. Field staff manually captured additional data for verification.

- Parking Demand
- Parking Turnover
- Vehicle Type (Standard, Taxi, Bus, etc.)



Why This Matters

Occupancy alone can overstate dependence.

Duration data separates drop-off activity from genuine transit parking demand.

This directly informs how much parking must be replaced or mitigated when a site redevelops.

< 5 min

Drop-off / Pick-up

Not transit parkers —
short-duration vehicles only

5–30 min

Ambiguous Short-Term

Short errand, missed connection,
or unusual trip purpose

> 2 hrs

Committed Transit Use

The target population —
riders who park and ride

Existing Conditions

Existing Parking Occupancy

Source: CR Associates

Existing Parking Duration

Source: CR Associates

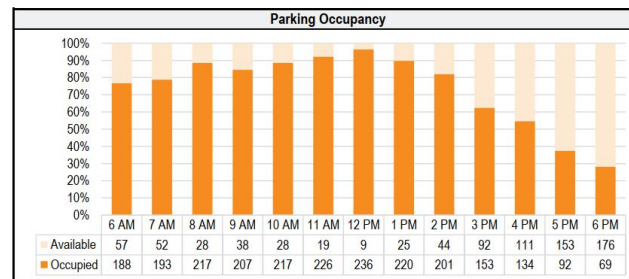
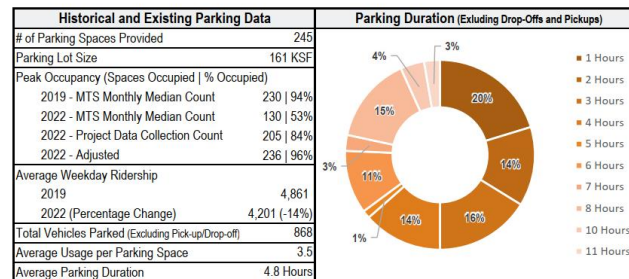
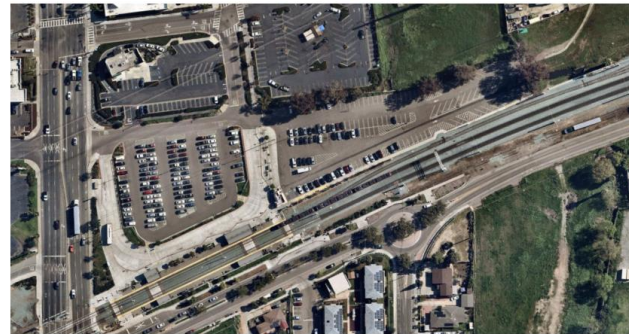
Existing Parking Supply

Source: CR Associates, MTS

Historical Parking Occupancy

Source: MTS

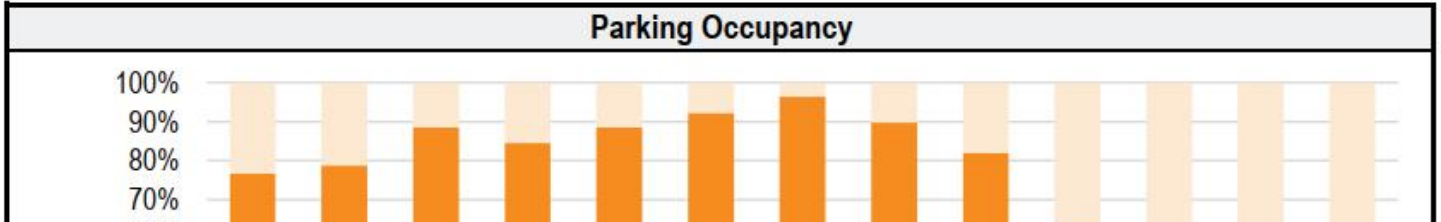
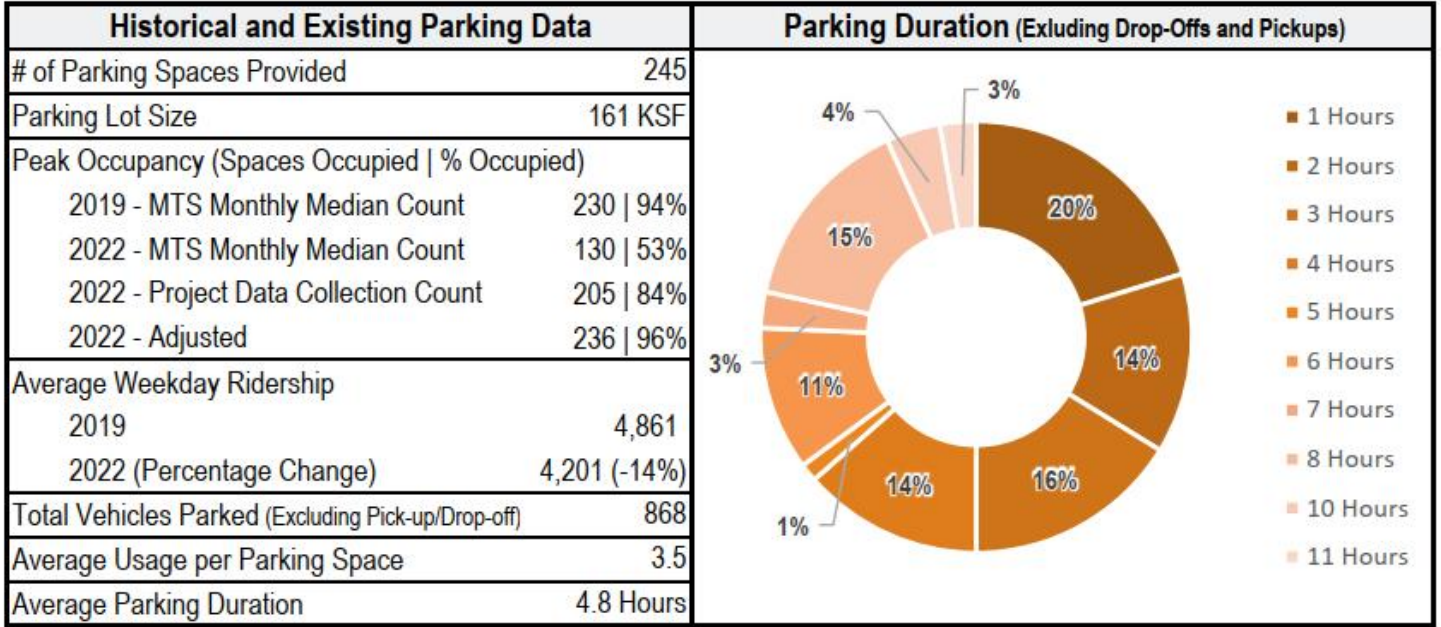
Palomar Station Parking Occupancy and Turnover



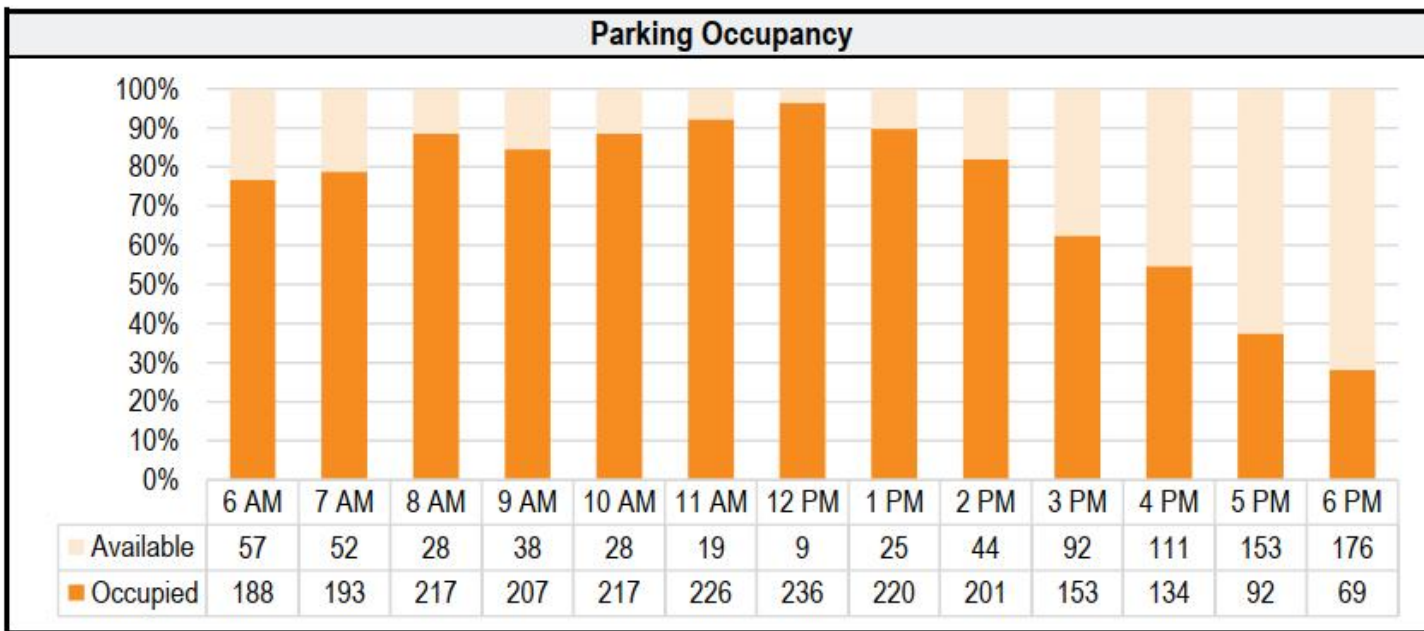
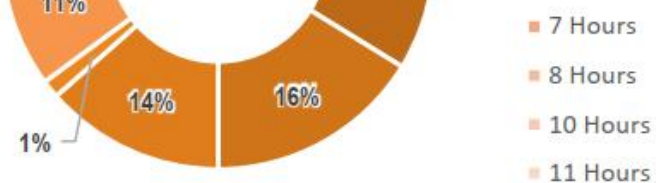
Palomar Station Parking Occupancy and Turnover



Historical and Existing Parking Data		Parking Duration (Excluding Drop-Offs and Pickups)	
# of Parking Spaces Provided	245		
Parking Demand	121 KOF	4%	3%



Average Weekday Ridership	4,861
2022 (Percentage Change)	4,201 (-14%)
Total Vehicles Parked (Excluding Pick-up/Drop-off)	868
Average Usage per Parking Space	3.5
Average Parking Duration	4.8 Hours



Existing Conditions

Inverse relationship between **parking mode of arrival** and **catchment area commuter density**

6 of 8

Stations with **highest** parking mode of arrival were in the **bottom 25%** of stations by commuter density

4 of 8

Stations with **lowest** parking mode of arrival were in the **highest 25%** of stations by commuter density

Larger Geographic Catchment Areas = Longer Trips = More Driving

Existing Conditions

Inverse relationship between parking mode of arrival and transit ridership

4 of 8

Stations with **highest** ridership were in the **bottom 25%** of stations by parking mode of arrival

4 of 8

stations with **lowest** transit ridership were in the **highest 25%** of stations by parking mode of arrival

Higher Need for Park and Ride = Lower Transit Ridership

Future Conditions

2035 Projections

Regional Transportation Plan (RTP) 2021

Estimates ridership and mode of arrival share for baseline and future conditions based on population growth, employment growth, and transportation investments, among other factors.

Data Included:

- 2016 Baseline Year and 2035 Future Year Boardings
- 2016 Baseline Year and 2035 Future Year Mode of Arrival Share
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Source: SANDAG RTP 2021

Future Conditions

2035 Projections

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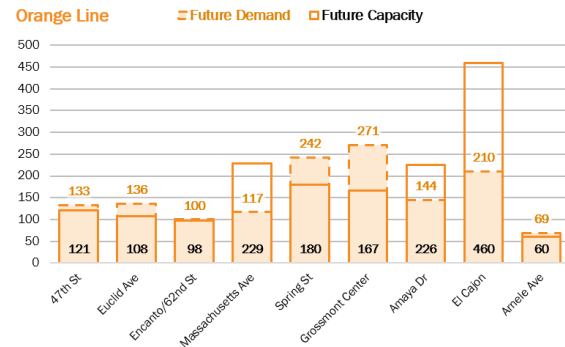
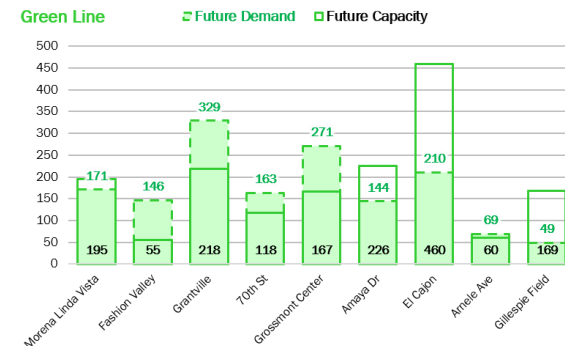
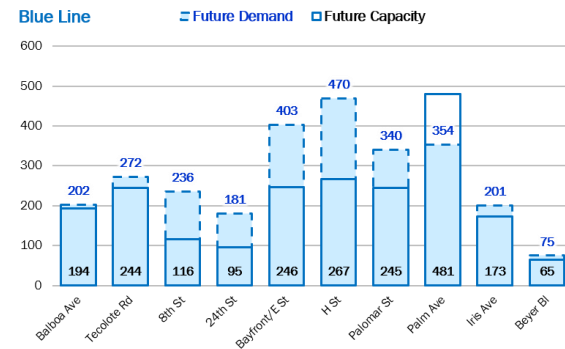
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Future Parking Demand

Extrapolated based on field-observed existing demand and the rate of change observed between baseline and future year model projections

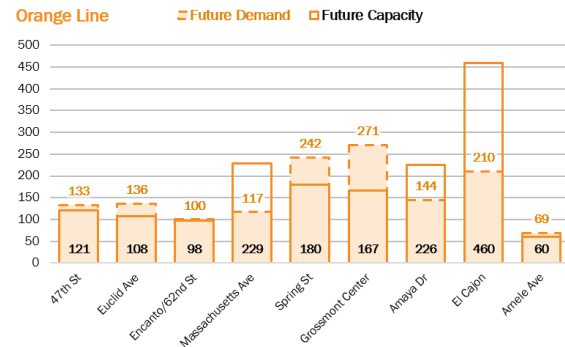
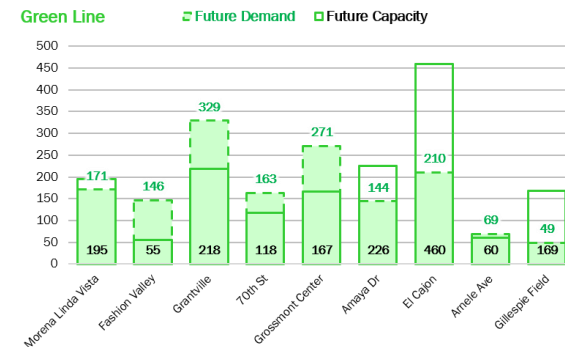
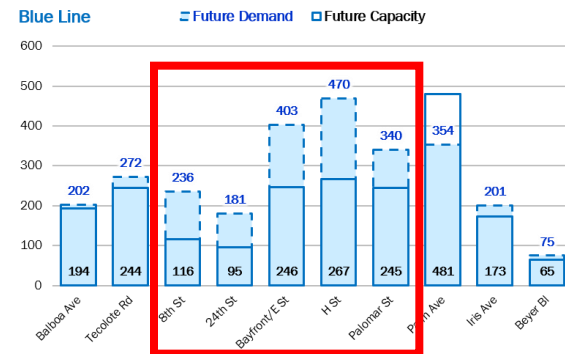


Future Conditions

2035 Projections

Deficit Stations

Corridors like the Blue Line South are projected to experience massive parking pressure, with stations like 8th Street (203%) and 24th Street (191%) facing severe future overutilization



Future Conditions

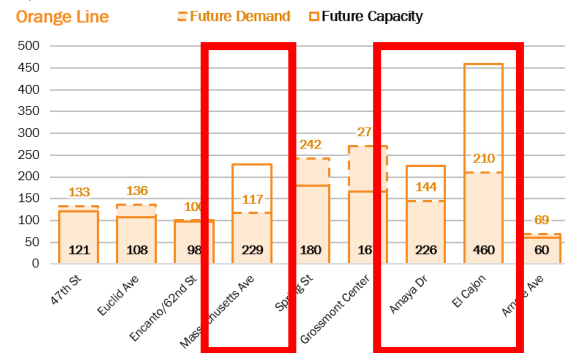
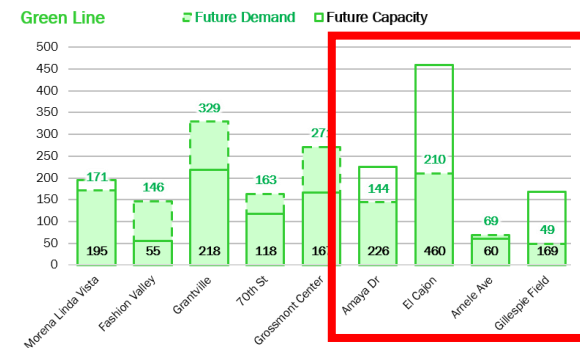
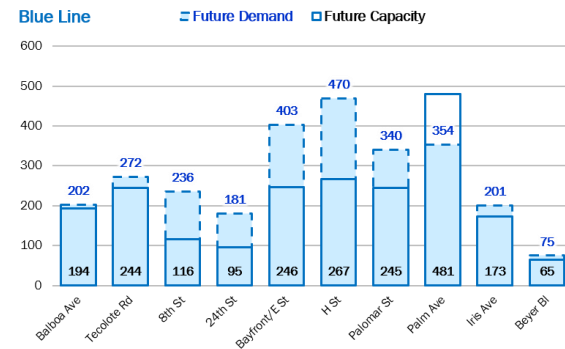
2035 Projections

Deficit Stations

Corridors like the Blue Line South are projected to experience massive parking pressure, with stations like 8th Street (203%) and 24th Street (191%) facing severe future overutilization

Surplus Stations

Only a handful of stations are projected to retain spare capacity (under 85% utilization) by 2035. These include Palm Avenue on the Blue Line, Amaya Drive and El Cajon on the Green/Orange Lines, Massachusetts Avenue on the Orange Line, and Gillespie Field on the Green Line



Best Practices

Parking Management & Regulation

Information Sharing

Real-time or expected availability shared via trip planning platforms. Directs users to stations with capacity and distributes demand across the system.

Pricing

Paid parking manages demand and can redirect overflow to lower-demand neighboring stations. Revenue can support access improvements.

Permitting & Regulation

Time limits, permit systems, and reserved spaces optimize turnover and prioritize transit users over non-transit activity.



Best Practices

Parking Replacement & Right-Sizing

Right-Size to Projected Demand

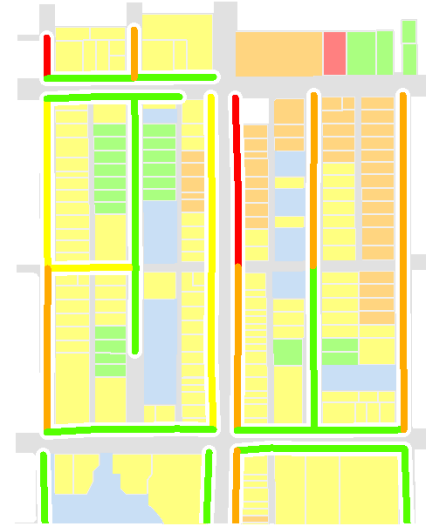
Replace supply based on 2035 forecasted demand, not existing inventory. Five stations project well below 85% occupancy — viable TOD candidates without full replacement.

Structured or Shared Parking

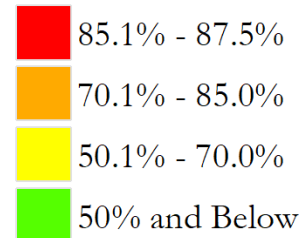
Where demand warrants replacement, structured or shared parking can be incorporated into TOD, maintaining transit access while enabling higher densities.

Absorption by Nearby Stations

Several stations have spare capacity to absorb displaced demand from neighboring redevelopment sites, reducing on-site replacement requirements.



**On-Street Parking Occupancy
within 1/8 Mile (760 ft) of Parcel**



Recommendations

Identified candidates for redevelopment

Strong Development

Based on historical and existing parking occupancy counts

Constrained/Mode-Shift

High ridership and high parking occupancy

Poor Redevelopment

Indicative of low reliance on transit parking and viable alternatives

Decrease In Parking Supply Would Likely Result in Spillover Parking

Figure 21: Encanto/62nd Street Trolley Station Summary Recommendations

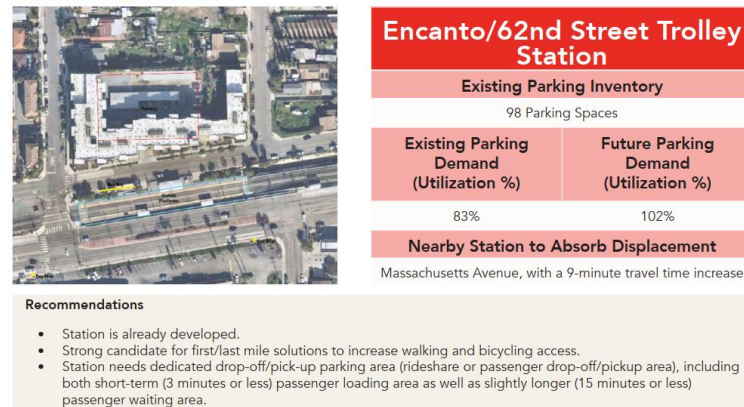
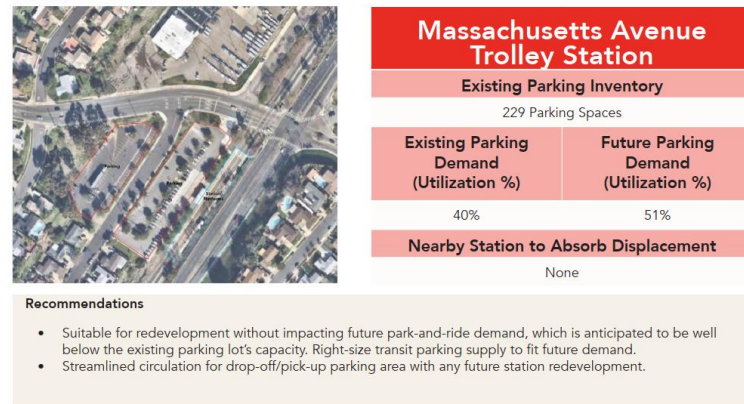


Figure 22: Massachusetts Avenue Trolley Station Summary Recommendations





Parking Calculator Tool

Transit Station **Massachusetts Ave**

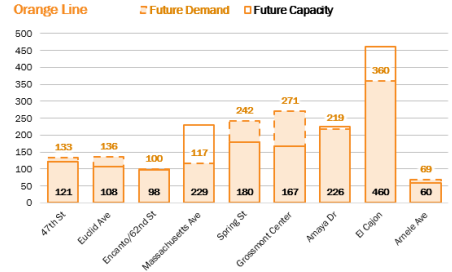
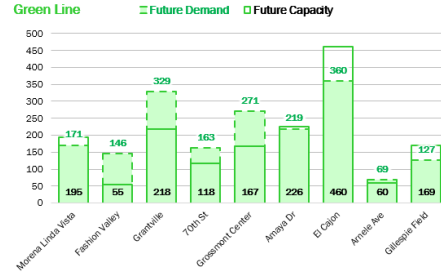
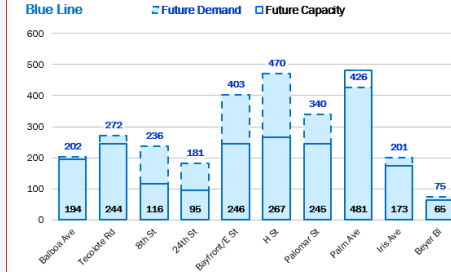
Boardings		Change in Arrival 2016 - 2035		
2016	1,005	Park and Ride	2.7%	
2035	1,373	Drop-Off	-0.7%	
Percent Change	36.6%	Other (Walk, bike, etc.)	-2.1%	

Existing (2022) Parking Demand				
Transit	Development	Total (Peak)	Capacity	Utilization
91		91	229	40%

Parking Demand for Potential Developments				
Land Use	Units	Type	Parking Rate	Demand
Residential				
Affordable Housing	45	DU	0.99	45
Retail/Commercial				
Convenience Market	5	KSF	5.44	28
Day Care/Office				
		KSF	0	0
Other				
Total Parking Demand from Potential Developments				73

Future Parking Demand				
Transit	Development	Total (Peak)	Capacity	Utilization
117	30	147	229	64%
Shared Parking? ☐ Yes				

Future Demand and Capacity by Trolley Line



Approved Future Demand and Capacity

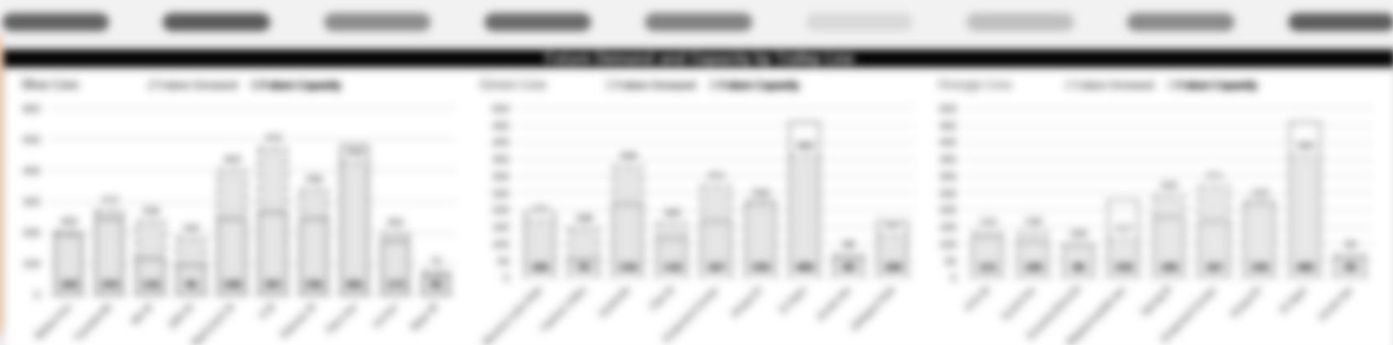
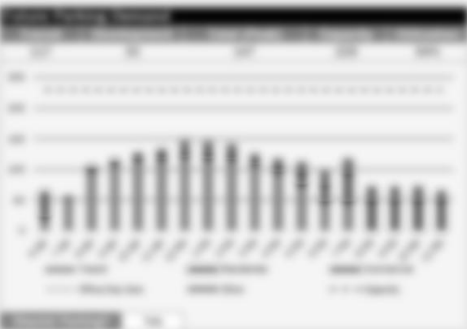
Station	Transit Demand	Developments								Total Demand	Capacity	Approved By	Date
		Residential	Demand	Retail/Commercial	Demand	Day Care/Office	Demand	Other	Demand				
Balboa Ave	202									202			
Tecolote Rd	272									272			
8th St	236									236			
24th St	181									181			
Bayfront/E St	403									403			
H St	470									470			
Palomar St	340									340			
Palm Ave	354					30 KSF Office	72			426	481	MTS	2/1/2025
Iris Ave	201									201			
Beyer Bl	75									75			
Morena Linda Vista	171									171			
Fashion Valley	146									146			
Grantville	329									329			
70th St	163									163			
Grossmont Center	271									271			
Amaya Dr	144	75 Affordable DU	75							219	226	MTS	5/15/2024
El Cajon	210	150 Affordable DU	150							360	460	MTS	3/2/2024
Arnele Ave	69									69			
Gillespie Field	49	50 Affordable DU	50	5 KSF Convenience Market	28					127	169	MTS	6/7/2025
47th St	133									133			
Euclid Ave	136									136			
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Transit Station Massachusetts Ave

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Company		Financial Data (in millions)								Summary		
Year	Quarter	Revenue	Expenses	Operating Income	Net Income	EPS	Dividend	Market Cap	P/E Ratio	Total Assets	Total Liabilities	Equity
2018	Q1	100	70	30	20	1.5	0.5	1000	15	1200	800	400
2018	Q2	110	75	35	22	1.6	0.5	1050	16	1250	850	400
2018	Q3	120	80	40	24	1.7	0.5	1100	17	1300	900	400
2018	Q4	130	85	45	26	1.8	0.5	1150	18	1350	950	400
2019	Q1	140	90	50	28	1.9	0.5	1200	19	1400	1000	400
2019	Q2	150	95	55	30	2.0	0.5	1250	20	1450	1050	400
2019	Q3	160	100	60	32	2.1	0.5	1300	21	1500	1100	400
2019	Q4	170	105	65	34	2.2	0.5	1350	22	1550	1150	400
2020	Q1	180	110	70	36	2.3	0.5	1400	23	1600	1200	400
2020	Q2	190	115	75	38	2.4	0.5	1450	24	1650	1250	400
2020	Q3	200	120	80	40	2.5	0.5	1500	25	1700	1300	400
2020	Q4	210	125	85	42	2.6	0.5	1550	26	1750	1350	400
2021	Q1	220	130	90	44	2.7	0.5	1600	27	1800	1400	400
2021	Q2	230	135	95	46	2.8	0.5	1650	28	1850	1450	400
2021	Q3	240	140	100	48	2.9	0.5	1700	29	1900	1500	400
2021	Q4	250	145	105	50	3.0	0.5	1750	30	1950	1550	400

[illegible]

SPV Parking Calculator Tool

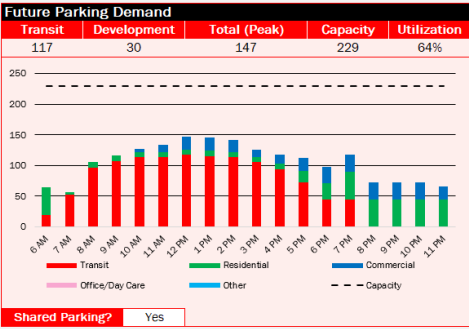
Transit Station:

Capacity:

Land Use	Units	Parking Type	Rate
Residential	1,000	Surface Lot	0.75
Commercial	1,000	Surface Lot	0.75
Office/Day Care	500	Surface Lot (See Note)	0.75

Shared Parking? ☐ Yes ☐ No

Land Use	Units	Type	Parking Rate	Demand
Residential				
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Retail/Commercial				
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Other				
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City of Portland Parking Calculator Tool

Transit Station:

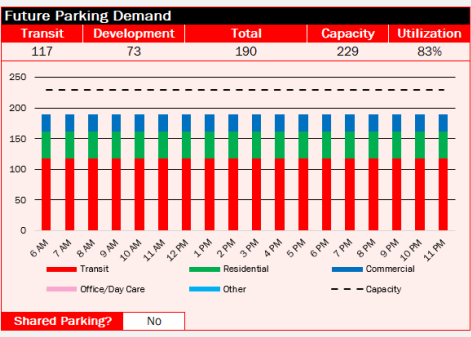
Capacity:

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Total Parking Demand: 73

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Parking Calculator Tool

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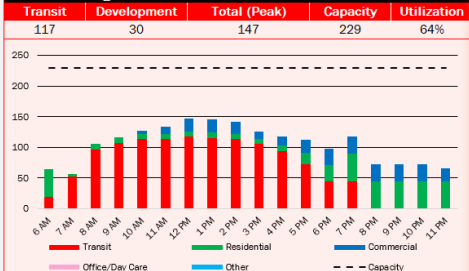
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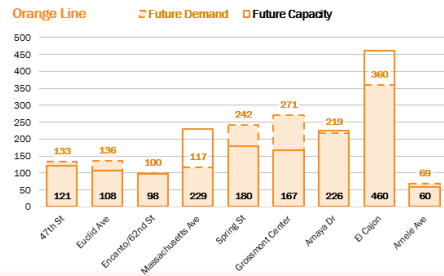
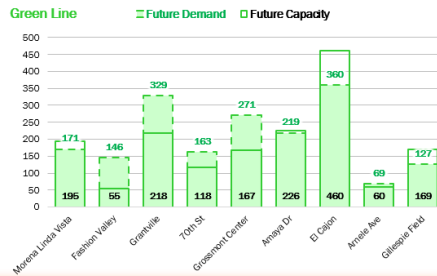
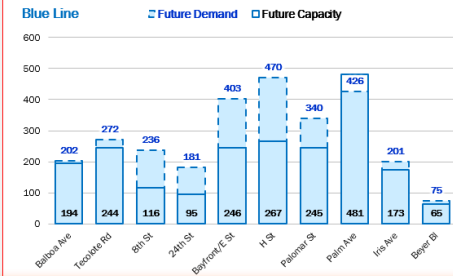
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Future Parking Demand



Shared Parking? ☐ Yes

Future Demand and Capacity by Trolley Line



Approved Future Demand and Capacity

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