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Technical Memorandum

Date: October 26th, 2021

To: Geoff Sears, Wareham Development
Kirsten Walraven, Wareham Development

From: Magnus Barber, CHS Consulting
Ben Miller, CHS Consulting

Re: 1550 EmeryStation Biotech Campus Project – Parking Study Methodology Memorandum

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This technical memorandum presents the assumptions, methodology, and analysis used to determine the likely parking demand for the proposed 1550 EmeryStation Biotech Campus Project ("proposed project") at 1550 62nd Street in Emeryville, California. CHS is submitting this memorandum to assist the project sponsor in determining the appropriate parking supply for the project. In addition, this information may assist the project sponsor in presenting a rationale for incorporating more parking than the maximum permitted by the Emeryville Municipal Code.

EXECUTIVE SUMMARY

The proposed project consists of a 300,000 square foot lab and office building, a 495 space, 5 level parking structure and an existing 48,000 square foot commercial building and 41 live/work units. The project would be located on a 3.9-acre site bounded by Hollis, 62nd, and 63rd streets and Overland Avenue. CHS assessed the proposed parking supply for the project in relation to likely demand. The main purpose of this study, presented in the following memorandum, is to provide a factual basis to be used to demonstrate the need to exceed the maximum permitted parking pursuant to the Emeryville Municipal Code.

CHS reviewed City off-street parking requirements and compared the mandated supply to analysis of the project's likely parking demand using three methods:

- The industry standard parking demand data generated by the Institute of Transportation Engineers (ITE) Parking Generation Manual (5th Edition)
- Parking data for similarly sited biotech campus developments
- Parking demand at the existing EmeryStation Campus, studied via parking occupancy and an employee survey conducted by CHS

All three methods result in parking demand numbers substantially greater than those presented in the City's staff report[1], in large part because the City's calculation omitted parking demand from the existing structure. Therefore, the project is likely to generate more parking demand than can be accommodated by both the proposed 495 space supply and the maximum allowed supply pursuant to the Emeryville Municipal Code, as set forth in **Figure 1**.

[1]Planning Commission Staff Report, EmeryStation Overland (UPDR21-001), April 22 2021

Figure 1: Comparison of Project Parking Demand Estimates

Land Use	Emeryville Municipal Code Requirement[1]		Existing EmeryStation Demand [2]		ITE Demand[7]
	City[3]	Sponsor[4]	Floor Area[5]	Employees[6]	
R&D	196	-	-	-	-
Office	123	99	59	57	122
Lab (50/50 Office & R&D)	-	231	562	541	365
Medical (Hospital/Clinic)	-	69	80	77	111
Retail	-	5	3	3	6
Restaurant	-	19	-	-	28
Residential	-	27	23	22	29
Warehouse	-	2	-	-	3
Max Permitted Supply	**319**	**452**	**729**	**700**	**730**
Proposed Supply	495				
Deficit / Surplus	**176**	**43**	**-234**	**-205**	**-235**

Notes:

1. Based on Emeryville Municipal Code parking demand rates and includes Transit Hub Overlay Reduction of 50%
2. Based on project sponsor provided data for existing EmeryStation Campus and employees
3. Based on City assumptions of 50/50 split of office and R&D floor area; includes 10 percent above demand permitted by Municipal Code.
4. Based on project sponsor assumption of land use mix similar to existing EmeryStation Campus occupied land uses; includes 10 percent above demand permitted by Municipal Code
5. Based on existing EmeryStation demand of 2.21 parking spaces per 1,000 square foot of occupied land uses; includes 10 percent above demand permitted by Municipal Code but does not include demand from existing uses.
6. Based on existing EmeryStation demand of 0.53 parking spaces per employee; includes 10 percent above demand permitted by Municipal Code but does not include demand from existing uses.
7. Based on ITE Trip Generation Manual, 5th Edition; Includes 10 percent above demand permitted by Municipal Code
8. ITE Parking Generation Manual, 5th Edition does not have a directly comparable land use to the project's Lab land use, and thus, the R&D land use (ITE Code 760) was used with adjustments made to account for the Dense Multi-Use Urban setting.

Two factors in this analysis stand out. Part of the City's parking calculations include a 50 percent reduction because the project is located within the Hollis Street Transit Overlay District, centered on the Emeryville Amtrak Station. However, Amtrak does not provide commuter rail service frequencies and lacks destination access compared to BART. Furthermore, Amtrak lacks the bus and direct BART connections required to reduce parking demand by 50 percent. Second, the project applicant already applies several Transportation Demand Management (TDM) strategies within their existing campus. These include participation in the Emery-Go-Round (EGR), an enhanced pedestrian network, and a voluntary Commute Trip Reduction (CTR) Program. However, despite the proximity to Amtrak and the TDM strategies currently employed at the existing campus, parking demand exceeds the city's cap. This suggests that the new campus would also not experience transit ridership sufficient to justify the theoretical 50% trip reduction. However, the applicant has stated that the new project will incorporate existing TDM strategies and is considering additional measures that have the potential to reduce parking demand to the match the proposed supply, as detailed in this report.

1.0 PROJECT UNDERSTANDING

The proposed project is located on a 3.9-acre site bounded by 63rd Street to the north, Hollis Street to the east, 62nd Street to the south, and Overland Avenue to the west. The proposed project is located across 62nd Street from the Emeryville Post Office and Heritage Square Development, across Overland Avenue from the Union Pacific mainline railroad tracks, across 63rd Street from the Alameda County Fire Services Building and FedEx facility, and across Hollis Street from a series of small one-story industrial buildings. The project site is also located approximately 0.2 miles north from the Emeryville Amtrak Station.

The project site is currently developed with 160,000 square feet of buildings, including the 83,000 square foot "Hollis Street Building" fronting Hollis Street and various other older ancillary single-story warehouse buildings on the western portion of the site that total approximately 77,000 square feet. The project sponsor plans to subdivide the parcel to create two parcels. The first parcel would retain the existing Hollis Street Building with modifications at the rear to accommodate the new building and parking structure. This building currently consists of approximately 48,000 square feet of ground-level floor space and 41 dwelling units on the second level. The second parcel, currently occupied by the various one-story warehousing buildings and surface parking, will be razed to accommodate the proposed project and associated parking structure.

The proposed project consists of a new five-story, 80 foot tall, 300,000 square foot Research and Development (R&D) building and a new 495-space, seven-story parking garage. The new R&D building would be located on the western portion of the project site oriented towards Horton Street. The new parking garage would be located on the northeast portion of the project site, tucked between the new R&D building and the Hollis Street Building. Automobile access to the new garage would be via 63rd Street. The new garage would accommodate parking demand for both the new 300,000 square foot R&D building and the existing Hollis Street Building, including the 48,000 square foot of leasable ground level floor area and 41 dwelling units. The new R&D building would also include three onsite freight loading spaces and class 2 (long-term) bicycle storage area with capacity to store up to 58 bicycles for employees on the ground-level. Additionally, 58 class 1 (short-term) bicycle parking spaces would be provided. The proposed project is anticipated to accommodate between 900 and 1,200 new employees in addition to the 4,800 employees at the existing EmeryStation Campus.

2.0 EXISTING TRANSPORTATION USAGE

Employee travel patterns at the existing EmeryStation Campus were assessed to determine current employee travel habits, as employee travel patterns to the proposed project are likely to be similar to existing EmeryStation Campus employees, given the same location, activities, and similar pool of biotech research employees.

2.1 Existing Employee Parking Demand

The project sponsor provided CHS with parking supply and occupancy data for the existing EmeryStation Campus to determine existing employee parking demand. As shown in **Figure 2**, the existing EmeryStation Campus totals approximately 1,154,523 gross square feet (gsf), including 829,455 gsf of lab floor area, 152,771 gsf of office floor area, 161,451 gsf of medical floor area, and 10,846 gsf of retail floor area.

Figure 2: Existing EmeryStation Land Uses

Land Use	Size (gsf)	%
Lab	829,455	72%
Office	152,771	13%
Medical (Hospital/Clinic/Lab)	161,451	14%
Retail	10,846	1%
Total	**1,154,523**	**100%**

Source: Wareham Development, 2021
Notes: gsf = gross square feet

The existing EmeryStation Campus has 2,354 parking spaces that are shared between all land uses. However, the EmeryStation Campus currently parks 2,549 vehicles, 195 more vehicles than parking spaces, by employing valet parking to maximize available parking floor area. **Figure 3** shows the resulting parking demand for the EmeryStation Campus is approximately 2.21 spaces per 1,000 gsf of occupied floor area.[2] However, CHS does not have available data to determine the exact demand generated by each individual land use. Additionally, the EmeryStation Campus currently accommodates approximately 4,800 employees (approximately four employees per 1,000 square feet of occupied floor area)[3], which equates to approximately 0.53 parking spaces per employee.[4]

Figure 3: Existing EmeryStation Blended Average Parking Ratio

Land Use	Spaces/1,000 gsf	Spaces/employee
Mixed: lab/office/medical/retail	2.21	0.53

2.2 Employee Commute Survey Analysis

CHS conducted an employee commute survey to better understand actual parking demand based on existing employee commute mode choices, and to identify the most effective potential TDM measures for shifting commuters away from drive-alone trips in order to reduce parking demand. The survey questions and the complete response data set are provided in **Appendix A**.

The employee commute survey elicited responses from 525 employees, which is a representative portion of the 4,800-employee workforce (approximately 11 percent) that currently work at the EmeryStation Campus near the project site. Given the survey is drawing responses from existing employees in similar roles who work in a similarly sited building in Emeryville with similar pedestrian, bike, and transit access, the survey represents a more accurate assessment of employee commute choice than nationally sourced data sets that represent a more generalized approximation.

Employees were asked to provide their home ZIP code to better understand employee distribution in relation to regional transportation resources (i.e., BART/Amtrak stations) and identify clusters that could potentially participate in carpool/vanpool programs. As shown in **Figure 4**, the highest concentrations of employees are primarily located in ZIP codes near the project site that are typically well served by local and regional transit services. The top ten most populous employee home ZIP codes accounted for approximately 29 percent of respondents with the top ZIP code accounting for over eight percent of all respondents. However, many employees are dispersed across the region at relatively low density, resulting in an average daily VMT of 18.4 miles per employee.[5]

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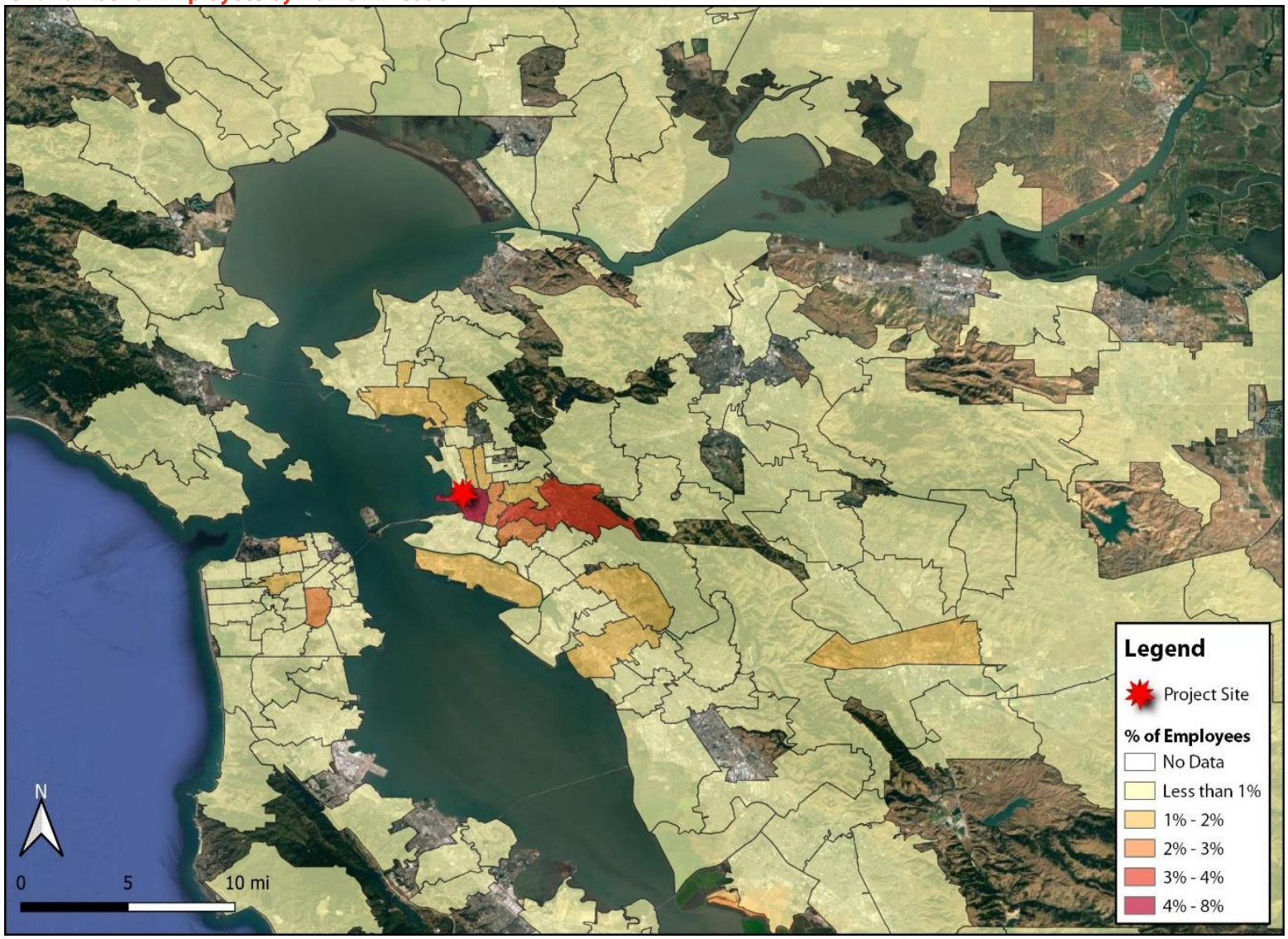
[2] 2,549 occupied spaces / (1,154,523 gsf occupied floor area / 1000) = 2.21 spaces per 1,000 gsf of occupied floor area
[3] 4,800 employees / (1,154,523 gsf /1,000) = 4.15 employees per 1,000 square feet
[4] 2,549 occupied spaces / 4,800 employees = 0.53 spaces per employee
[5] Average daily VMT per employee was calculated using the centroid of each identified home ZIP code from the employee commute survey as measured by driving distance to the proposed project site, using the fastest route available (shortest travel time).

Figure 4: Number of Employees by Home ZIP Code



Source: CHS Consulting Group, 2021

Figure 5 shows approximately 67 percent of employees currently drive alone, 16 percent take public transit, nine percent bike, six percent walk, and three percent carpool or vanpool. Additionally, two telecommute, and two respondents did not answer. Of those who carpool, the average vehicle occupancy rate is 3.4 persons per vehicle. Note that the drive alone mode split for survey respondents (67%) was higher than that suggested by the parking occupancy (53%), though the latter could be explained by incomplete data – employees could be parking in the public garage (for which no data was available) or on street, or it could be due to the preferences of employees who responded to the survey.

Figure 5: EmeryStation Employee Mode Split

Mode	Employees	%
Drive Alone	349	66.7%
Transit	83	15.9%
Bike	44	8.4%
Walk	30	5.7%
Uber/Lyft/Taxi	0	0.0%
Telecommute	2	0.4%
Carpool	15	2.9%
Responses	**523**	**100.0%**

Source: CHS Consulting Group, 2021

Figure 6 shows that before the Covid-19 pandemic shelter-in-place orders went into effect, nearly 80 percent of employees commuted into the office five days per week or more. However, employees anticipate coming into the office significantly less post-pandemic with only 35 percent saying they would commute into the office five days per week or more. This suggests that on most days parking demand could be significantly lower than anticipated, though the finding should be treated with care because there could be occasions on which most employees are onsite at the same time.

Figure 6: Number of Days EmeryStation Employees Commute to Work

Days Per Week	Pre-Pandemic		Post Pandemic	
	Employees	%	Employees	%
One	13	3%	47	9%
Two	10	2%	93	18%
Three	15	3%	122	23%
Four	68	13%	75	14%
Five	400	78%	179	34%
Six	6	1%	5	1%
Seven	1	0%	1	0%
Responses	**513**	**100%**	**522**	**100%**

Figure 7 shows the majority (approximately 69 percent) of employees arrive to work between 8:00 and 9:00 a.m., and **Figure 8** shows the majority (approximately 66 percent) depart work between 5:00 and 6:00 p.m.

Figure 7: Typical Employee Arrival Times to Work

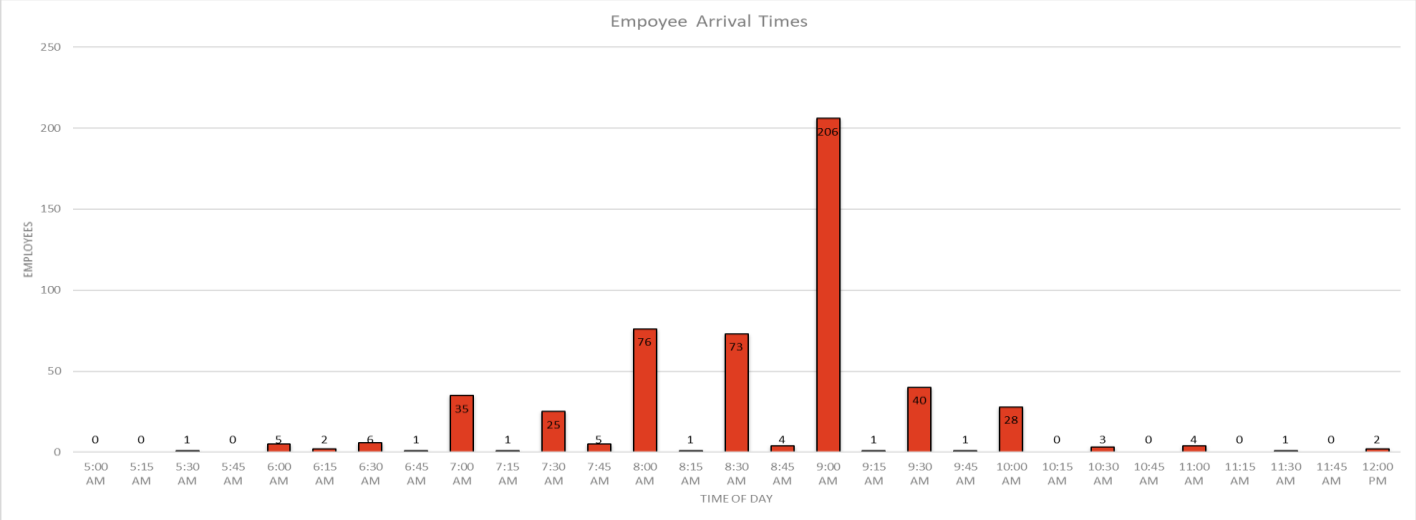


Figure 8: Typical Employee Departure Times from Work

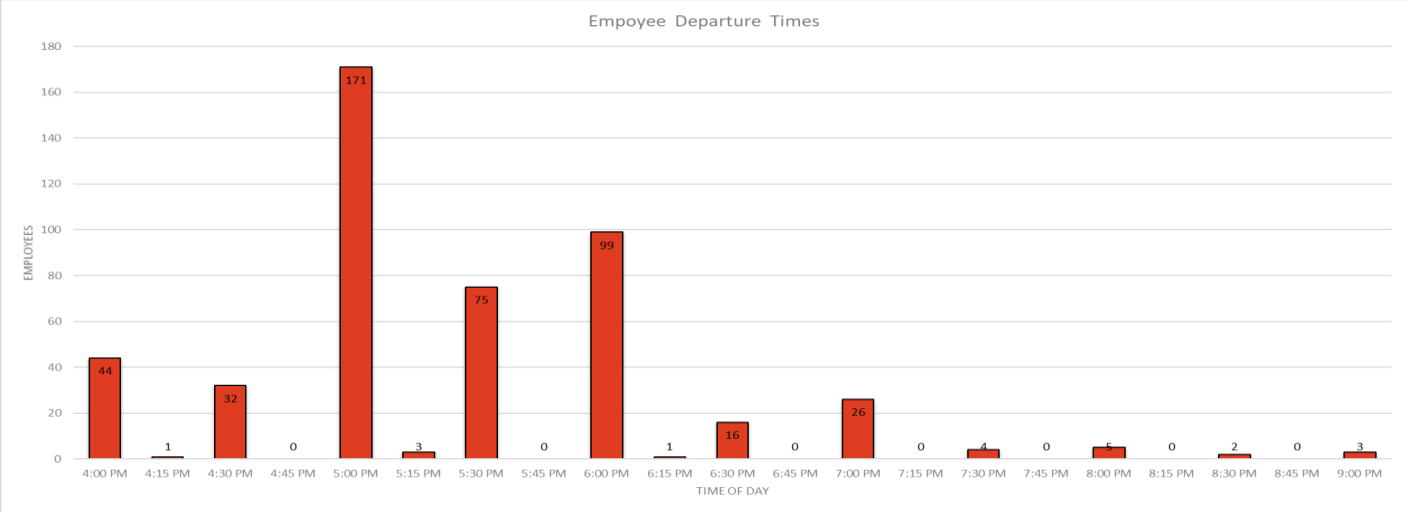


Figure 9 shows employees who already use alternative commute modes chose to do so for a number of reasons. The most popular reasons include reduced stress (38 percent), convenience (34 percent), cost savings (33 percent), and improve air quality/environmental reasons (30 percent).

Figure 9: EmeryStation Employee Motivations for Using Alternative Modes

Motivation	Employees	%
Cost Savings	153	33%
Reduced Stress	179	38%
Time Savings	96	21%
Convenience	158	34%
Improve Air Quality/Environmental Reasons	140	30%
Save Wear and Tear on Personal vehicle	66	14%
Subsidy from Employer	59	13%
Other Cash Incentives or Tax Savings	26	6%
Other	33	7%
Respondents	**466**	**-**

Figure 10 shows employees that currently drive-alone do so for a variety of reasons, including their car provides the most flexibility (49 percent), no reasonable transit options available (42 percent), their car allows them to get home in an emergency (25 percent), they do not like to depend on others (20 percent), they do not have anyone to carpool with (20 percent), and parking is free or inexpensive (19 percent).

Figure 10: EmeryStation Employee Motivations for Driving Alone

Motivation	Employees	%
Need Car at Work for Job	12	2%
I Drop-off Children/Family on Commute	71	14%
No Reasonable Transit Option	209	42%
Poor Bicycle / Pedestrian Access	28	6%
Need Car at Work for Personal Use	37	8%
Do not Have Anyone to Carpool with	98	20%
Parking is Free or Inexpensive	95	19%
Cannot Get Home in Emergency	125	25%
Need Car to Run Errands	74	15%
Do not Like to Depend on Others	99	20%
Need to Transport my Children	29	6%
My Car Provides Me the Most Flexibility	241	49%
Prefer to Drive Own Car	74	15%
Other	43	9%
Respondents	**492**	**-**

Figure 11 shows most employees are open to a variety of alternative commute modes, including taking the train (46 percent), riding the bus (33 percent), bicycling (28 percent), carpooling (23 percent), vanpooling (13 percent), and walking (13 percent). Only 21 percent of respondents indicated they were unwilling to consider an alternative mode for their work commute.

Figure 11: Most Appealing Alternative Commute Modes

Mode	Employees	%
Bus	172	33%
Train	235	46%
Bicycle	142	28%
Carpool	120	23%
Vanpool	68	13%
Walking	65	13%
None	108	21%
Other	21	4%
Respondents	**515**	-

Figure 12 shows when asked what measures would encourage them to use an alternative commute mode to driving-alone, respondents preferred a company subsidy for transit (32 percent), more flexible work hours (24 percent), guaranteed ride home program (23 percent), financial incentives (i.e., "parking cash-out") for biking or walking (22 percent), company subsidy for vanpools (17 percent), and help coordinating a carpool/vanpool (17 percent). Only 18 percent of respondents indicated they were not open to any of the provided measures to encourage alternative commute mode choices.

Figure 12: Most Appealing TDM Measures

Measure	Employ-ees	%
Subsidy for Transit	153	32%
Subsidy for Vanpool	83	17%
Financial Incentives for Bike/Walk ("Parking Cash-Out")	107	22%
End-of-Trip Facilities for Bike/Walk (Bike Parking, Showers, Lockers)	99	20%
Lower Parking Rates for Carpools	20	4%
Reserved Parking for Carpools	30	6%
Help Finding Transit or Bike Route	44	9%
Help Coordinating a Carpool/Vanpool Partner(s)	81	17%
More Flexible Work Hours	115	24%
Guaranteed Ride Home	112	23%
Prizes, Drawings, or Contests	34	7%
Occasional Free Parking Days	14	3%
None of the Above	87	18%
Other	53	11%
Respondents	**483**	-

3.0 PROJECT PARKING DEMAND ANALYSIS

To assess demand for the proposed project, CHS compared the parking requirement from Emeryville's municipal code to the parking demand estimates calculated from the existing employee commute survey from Section 2.0, and the ITE Parking Generation Manual.

3.1 Emeryville Municipal Code Parking Requirements

Based on the Emeryville Planning Commission Staff Report (April 2021)[6], the City of Emeryville uses a half-and-half criterion of laboratory and office space for R& D facilities, which is consistent with other such projects recently approved by the City. Therefore, the proposed project parking requirement is based on 150,000 square feet of office space and 150,000 square feet of R&D space. The City has not established a minimum parking requirement for these land uses but has established a parking maximum of 10 percent more than the estimated demand, based on pre-established City parking rates for each use. Note that the City did not include the existing uses in their parking analysis, despite the parking structure being planned to accommodate 45 parking spaces for the existing building as well as the new building, for a total of 495 spaces.

The estimated parking ratio for office uses is 2.4 spaces per 1,000 square feet and for R&D uses is 1.5 spaces per 1,000 square feet, excluding the first 1,500 square feet of each use. **Figure 13** shows, based on City calculations, the proposed project would require up to 580 spaces, including 223 spaces[7] for R&D use and 357 spaces[8] for office use. However, the proposed project is located in the Transit Hub Overlay[9], and as such, the parking requirements are reduced by half. Therefore, the proposed project is estimated to generate parking demand for up to 290 spaces, including 112 spaces for R&D use and 178 spaces for office use. Based on the City's maximum permitted parking of 10 percent above the estimated parking demand, the proposed project would be permitted to include a maximum of 319 spaces, including 123 for R&D use and 196 for office use. Therefore, the proposed 495-space parking garage would exceed the City's maximum permitted allotment by 176 spaces.

Figure 13: Municipal Code Permitted Maximum Parking Supply – City Assumptions

Land Use	Size (gsf)	Rate	Permitted Max Parking Supply
R&D	150,000	1.5	223
Office	150,000	2.4	357
	300,000	**-**	**580**
Transit Hub Overlay Reduction (50%)			**290**
Permitted Maximum Parking			**319**

The project sponsor has represented that the proposed project is expected to be occupied by a similar land use mix observed at the existing EmeryStation Campus, as shown in **Figure 1**. Furthermore, the proposed parking garage would include parking for the existing Hollis Street Building, including 35,500 square feet of office, 4,265 square feet of restaurant, 7,463 square feet of warehouse, and 41 dwelling units.

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[6] Emeryville Planning Commission Staff Report – EmeryStation Overland (UPDR21-001), April 15, 2021

[7] (150,000 gsf - 1,500) x 1.5 /1,000 = 223 spaces

[8] (150,000 gsf - 1,500) x 2.4 / 1,000 = 357 spaces

Emeryville Transit Hub Overlay Zone requires parking reductions with a maximum parking allowance of 50 percent of the allowance set forth in Article 4 of Chapter 4 of the Municipal Code. All development proposals shall be subject to applicable provisions of the Emeryville Design Guidelines, including but not limited to those pertaining to Transit Hubs, as required by Article 4 of Chapter 7 of the Municipal Code.

Figure 14 shows, based on these assumptions, the proposed project would be permitted to provide up to 822 spaces, including 421 for Lab, 179 for office, 126 for medical (hospital/clinic), 34 for restaurant, nine for retail, four for warehouse, and 49 for residential.

Applying the Transit Hub Overlay reduction (50 percent) reduces overall permitted supply to 411 spaces, resulting in a maximum permitted parking supply of 452 spaces. Therefore, the proposed project's supply of 495 spaces would exceed the permitted maximum supply by 43 spaces.

Figure 14: Municipal Code Permitted Maximum Parking Supply – Sponsor Assumptions

Land Use	Size (gsf/units)	Rate	Permitted Max Parking Supply
Existing Land Uses			
Office	35,500	2.4	85
Restaurant	4,265	8	34
Warehouse (Storage/Distribution)	7,463	0.5	4
Residential	41	1.2	49
Total Existing			***172***
Transit Hub Overlay Reduction (-50%)			***86***
Total Permitted Maximum Parking Supply (+10%)			***95***
Proposed Land Uses			
Lab (50/50 Office/R&D)	216,000	1.95	421
Office	39,000	2.4	94
Medical (Hospital/Clinic/Lab)	42,000	3	126
Retail	3,000	3	9
Total Proposed			***650***
Transit Hub Overlay Reduction (-50%)			***325***
Total Permitted Maximum Parking Supply (+10%)			***358***
Total Existing and Proposed			**822**
Transit Hub Overlay Reduction (-50%)			***411***
Total Permitted Maximum Parking Supply (+10%)			***452***

3.2 Existing Campus Parking Demand Analysis

The project sponsor has indicated that the average employee density for the proposed project will be between three and four employees per 1,000 square feet, which equates to between 900 and 1,200 employees.[10] For the purposes of a conservative analysis and given the existing EmeryStation Campus accommodates approximately 4.15 employees per 1,000 square feet of occupied floor area, the higher estimate of 1,200 employees is used for this study. Likely parking demand can be estimated based on the existing campus in three ways – either based on the mode share of drivers from the commute survey, the number of parking spaces per occupied floor area, or the existing parking space demand per employee.

Assuming a similar mode share to existing employees based on the employee commute survey, the proposed project would generate demand for up to 804 parking spaces without the implementation of additional TDM measures.[11] Note that there are TDM strategies in use across the existing Campus, including preferential

[10] 300,000 gsf x 3 employees per 1,000 gsf = 900 employees and 300,000 gsf x 4 employees per 1,000 gsf = 1,200 employees

[11] 900 employees x 67 percent drive-alone mode share = 603 spaces and 1,200 employees x 67 percent drive-alone mode share = 804 spaces

carpool/vanpool parking, bicycle end-of-trip facilities (parking, showers, and lockers), carshare pods, and use of the Emery-Go-Round (EGR) last-mile shuttle service. Additionally, some campus tenants have implemented unbundled employee parking[12], but there is not enough available data to incorporate into the existing parking demand analysis. Based on these assumptions, the proposed project's parking demand would exceed the proposed supply of 495 spaces by up to 309 spaces.

Conversely, the proposed project would add approximately 300,000 gsf of floor area to the existing EmeryStation Campus, which currently generates parking demand for approximately 2.21 spaces per 1,000 gsf of occupied floor area. This figure accounts for a nearly 33 percent use of alternative transportation modes, as listed in **Figure 4**. Based on square footage, the proposed project would generate demand for approximately 663 spaces[13], exceeding the proposed supply of 495 spaces by 168 spaces. Adding the 10 percent above demand permitted by Municipal Code (to maintain an effective parking supply), the proposed project would be permitted to provide no more than 729 parking spaces, which is 234 spaces above the proposed supply.

Based on existing employee parking demand of 0.53 spaces per employee, the proposed project's 1,200 employees would generate parking demand for approximately 636 spaces.[14] Adding the 10 percent above demand permitted by Municipal Code (to maintain an effective parking supply), the proposed project would be permitted to provide no more than 700 parking spaces, which is 205 spaces above the proposed supply.
Moderating factors are the current Covid-19 pandemic impacts as well as the results of the employee commute survey, which suggests that employees will travel into work less often and are open to participation in an enhanced TDM program that could reduce the drive-alone mode share and subsequently reduce overall parking demand.

3.3 ITE Parking Demand Analysis

To assess the applicability of the above parking demand estimates, CHS compared the results against average parking demand rates from ITE Parking Generation Manual, 5th Edition. CHS used rates for Dense Multi-Use Urban settings when available, as such, the 50 percent transit overlay reductions were not applied to the resulting ITE parking demand estimate, as the Dense Multi-Use Urban setting already accounts for a projects proximity to transit. However, the 10 percent above average parking demand allotted by Municipal Code was still applied to maintain an effective parking supply and prevent users from circulating to find available parking.

Utilizing the ITE Parking Generation Manual, CHS selected ITE's Land Use Code 710 (General Office Building) for Dense Multi-Use Urban[15] settings to assess the proposed project's office parking demand. This land use exhibited a range in parking demand from 0.97 to 2.33 parking spaces per 1,000 square feet of gross floor area. Employing the average rate of 1.63 spaces per 1,000 square feet, the proposed project would have an office parking demand of 122 spaces (58 spaces for existing office and 64 spaces for proposed office) during a typical weekday midday peak period (11:00 a.m. to 12:00 p.m.).[16]ITE Parking Generation Manual does not have a directly comparable land use designation for the proposed project's lab land use. Because the typical lab use at the EmeryStation campus has a 50/50 mix of office and R&D space, CHS used a combined average rate using ITE Land Use Code 760 (Research and Development Center) and Code 710 (General Office Building) for Dense Multi-Use Urban settings to assess the proposed project's lab land use. ITE does not have available Dense Multi-Use Urban parking data for the

[12] When parking is unbundled, parking is charged separately from office space. If that cost is passed to the employee, it is typically a powerful incentive not to drive. Employers that lease parking and provide it free to employees, are required to provide the equivalent cash value to employees who do not drive.

[13] (300,000 gsf / 1,000) x 2.21 spaces per 1,000 gsf = 663 spaces

[14] 1,200 employees x 0.53 spaces per employee = 636 spaces

[15] ITE defines Dense Multi-Use Urban as a fully developed area (or nearly so), with diverse and complementary land uses, good pedestrian connectivity, and convenient and frequent transit. This area type is typically a well-developed urban area outside of a major metropolitan downtown.

[16] (150,000 gsf - 1,500) x 1.63 = 242 parking spaces

Research and Development Center land use. Therefore, CHS adjusted the General Urban/Suburban[17] rate using the rate of reduction observed between the Dense Multi-Use Urban and General Urban/Suburban rates for the General Office Building use.[18] This land use exhibited a range in parking demand from 1.27 to 3.55 spaces per 1,000 square feet of gross floor area and an average rate of 2.58 spaces per 1,00 square feet. Applying the 32 percent parking demand reduction based on observed rates for General Office Building in the two land use contexts, the resulting average rate of 1.76 spaces per 1,000 square feet of gross floor area was used. Using the combined average for both General Office and Research and Development, the resulting average parking demand rate of 1.69 spaces per 1,000 square feet, the project would have a lab demand of 365 spaces during a typical weekday midday peak period (11:00 a.m. to 12:00 p.m.).

CHS selected ITE's Land Use Code 630 (Clinic) to assess the proposed project's medical parking demand. This land use exhibited a range in parking demand from 2.08 to 5 parking spaces per 1,000 square feet of gross floor area. However, ITE does not have adequate Dense Multi-Use Urban parking data for the Clinic land use. Therefore, CHS used the same adjustment employed for the Research and Development land use, applying a 32 percent parking demand reduction based on observed rates for General Office Building in the two land use contexts. The adjustment results in an average rate of 2.65 spaces per 1,000 square feet of gross floor area. Employing the adjusted average rate, the proposed project would have a medical parking demand of 129 spaces during a typical weekday midday peak period (11:00 a.m. to 12:00 p.m.).

CHS selected ITE's Land Use Code 820 (Shopping Center) to assess the proposed project's retail parking demand. This land use exhibited a range in parking demand from 1.27 to 7.98 parking spaces per 1,000 square feet of gross floor area. Employing the average rate of 1.95 spaces per 1,000 square feet, the proposed project would have a retail parking demand of six spaces during a typical weekday midday peak period (1:00 p.m. to 2:00 p.m.).

CHS selected ITE's Land Use Code 221 (Multi-Family Housing (Mid-Rise) for Dense Multi-Use Urban (less than 0.5 miles to rail transit) settings to assess the existing residential parking demand. This land use exhibited a range in parking demand from 0.17 to 1.50 parking spaces per dwelling unit. Employing the average rate of 0.71 spaces per dwelling unit, the proposed project would have a residential parking demand of 29 spaces during a typical weekday peak period (12:00 a.m. to 4:00 a.m.).[19]CHS selected ITE's Land Use Code 932 (High-Turnover [Sit Down] Restaurant) for Dense Multi-Use Urban settings to assess the existing restaurant parking demand. This land use exhibited a range in parking demand from 3.13 to 12.41 parking spaces per 1,000 square feet. Employing the average rate of 6.47 spaces per 1,000 square feet, the proposed project would have a restaurant parking demand of 28 spaces during a typical weekday peak period (7:00 p.m. to 8:00 p.m.).

CHS selected ITE's Land Use Code 150 (Warehouse) to assess the existing warehouse parking demand. This land use exhibited a range in parking demand from 0.03 to 1.96 parking spaces per 1,000 square feet. Employing the average rate of 0.39 spaces per 1,000 square feet, the proposed project would have a warehouse parking demand of three spaces during a typical weekday peak period (3:00 p.m. to 4:00 p.m.).

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[17] ITE defines General Urban/Suburban as an area associated with almost homogeneous vehicle-oriented access. Nearly all person trips that enter or exit a development site are by personal passenger or commercial vehicle. The area can be fully developed at low-medium density with a mix of residential and commercial uses that are typically concentrated at intersections or along a commercial corridor, often surrounded by low-density, almost entirely residential development. Commercial buildings are typically surrounded by surface parking lots. The mixing of land uses is only in terms of proximity, not in terms of function, typically lacking pedestrian, bicycle, and transit facilities.

[18] The average parking demand rate for general office building is 2.39 spaces per 1,000 square feet for General Urban/Suburban setting and 1.63 spaces per 1,000 square feet for Dense Multi-Use Urban setting, resulting in a 32 percent decrease (= 2.39 - 1.63 / 2.39) in parking demand for Dense Multi-Use Urban.

[19] (150,000 gsf - 1,500) x 1.63 = 242 parking spaces

The proposed project's resulting total parking demand would be 664 spaces, including 118 spaces for existing land uses and 546 spaces for proposed land uses. Applying the 10 percent above total demand allotted by Municipal Code would result in a total permitted parking supply of 730 spaces.

Based on the ITE estimation of average parking demand, the proposed project's 495 spaces would be lower than the estimated demand of 601 spaces during a typical weekday by 185 spaces. See **Appendix B** for complete ITE parking rate data.

Figure 15 compares the proposed project's estimated parking demand from the three aforementioned sources, showing existing EmeryStation parking demand and ITE average parking demand estimates are substantially higher than Municipal Code estimates, but aligned with the Municipal Code demand estimates based on the project sponsor's land use assumptions, parking data, and actual employee travel patterns from the employee survey.

Figure 15: Comparison of Project Parking Demand Estimates

Land Use	Emeryville Municipal Code Requirement[1]		Existing EmeryStation Demand [2]		ITE Demand[7]
	City[3]	Sponsor[4]	Floor Area[5]	Employees[6]	
R&D	196	-	-	-	-
Office	123	99	59	57	122
Lab (50/50 Office & R&D)	-	231	562	541	365
Medical (Hospital/Clinic)	-	69	80	77	111
Retail	-	5	3	3	6
Restaurant	-	19	-	-	28
Residential	-	27	23	22	29
Warehouse	-	2	-	-	3
Max Permitted Supply	**319**	**452**	**729**	**700**	**730**
Proposed Supply	495				
Deficit / Surplus	**176**	**43**	**-234**	**-205**	**-235**

Notes:

1. Based on Emeryville Municipal Code parking demand rates and includes Transit Hub Overlay Reduction of 50%
2. Based on project sponsor provided data for existing EmeryStation Campus and employees
3. Based on City assumptions of 50/50 split of office and R&D floor area; includes 10 percent above demand permitted by Municipal Code.
4. Based on project sponsor assumption of land use mix similar to existing EmeryStation Campus occupied land uses; includes 10 percent above demand permitted by Municipal Code
5. Based on existing EmeryStation demand of 2.21 parking spaces per 1,000 square foot of occupied land uses; includes 10 percent above demand permitted by Municipal Code but does not include demand from existing uses.
6. Based on existing EmeryStation demand of 0.53 parking spaces per employee; includes 10 percent above demand permitted by Municipal Code but does not include demand from existing uses.
7. Based on ITE Trip Generation Manual, 5th Edition; Includes 10 percent above demand permitted by Municipal Code
8. ITE Parking Generation Manual, 5th Edition does not have a directly comparable land use to the project's Lab land use, and thus, the R&D land use (ITE Code 760) was used with adjustments made to account for the Dense Multi-Use Urban setting.

4.0 TRANSPORTATION DEMAND MANAGEMENT (TDM) ANALYSIS

4.1 Proposed Project TDM Applicability

The proposed project is well located near high-quality transit, including the Emeryville Amtrak station and nearby San Pablo Avenue transit corridor. In addition, the Emery-Go-Round (EGR) city-wide bus shuttle system to MacArthur BART station is free and heavily used. The Hollis Street corridor provides frequent EGR service. Based on responses from the employee commute survey, existing employees are open to participating in an enhanced TDM program that would help shift the drive-alone mode share towards alternative modes, such as transit, bicycling, walking, and carpool/vanpool. Employee distributions in the region show that many employees live in locations with good transit accessibility, while others are clustered in locations that could support organized carpools or vanpools. Additionally, employees indicated they would be more willing to use alternative commute modes if programs such as the guaranteed ride home program were available (note that such a program is already available for free via Alameda CTC, only requiring the employer to register). This indicates that a more formal TDM Plan, including marketing measures that educate employees on available TDM programs could help shift commutes away from driving.

4.2 TDM Trip Reduction Assessment Methodology

To estimate the potential reduction in project generated parking demand, CHS used the Bay Area Air Quality Management District (BAAQMD) TDM tool designed to quantify VMT and trip reduction attributable to TDM measures according to project type and location consistent with the California Air Pollution Control Officers Association (CAPCOA) report, *Quantifying Greenhouse Gas Mitigation Measures.*[20]

This TDM tool enables the assessment of measures that a development project can implement to reduce project related VMT, and in turn, greenhouse gas emissions. The tool also quantifies the reduction benefits of broader TDM categories and individual TDM measures. The CAPCOA report and BAAQMD TDM tool assume trip generation rates based on the ITE typical suburban development and associated trip lengths, which provide a basis for measuring the trip-reducing effects of any one or more of the TDM measures. The analysis assumes a half-mile radius from the project site and includes other land uses within that radius as inputs to the design, density, and diversity calculations.

The TDM tool considers the Project's location and applies a location-based cap representing the average and maximum reductions that would be expected in urban, compact infill, suburban center, and suburban locations. For example, projects located in an urban setting would be expected to have greater trip reductions due to surrounding land uses when compared to the same project located in a suburban setting. The TDM tool separates the measures into five separate categories, including Land Use/Location, Neighborhood/Site Enhancements, Parking Policy/Pricing, Transit System Improvements, and Commute Trip Reduction (CTR) Programs. Each category has a maximum trip reduction limit or cap to minimize double counting, which is directly tied to the project's location setting and selection of TDM measures.

For the purposes of this analysis, the Project is considered to be located in an urban setting, as it is located within five miles of the central business district, typical building heights of six stories or more, within a typical street grid pattern with minimal setbacks, constrained on and off-street parking supply, and availability of high-quality transit. The urban setting has a global maximum trip reduction cap of 75 percent for all associated categories. Each category also has a maximum cap to prevent double counting, including a 65 percent reduction cap for Land Use/Location strategies, five percent for Neighborhood/Site Enhancement strategies, 20 percent for Parking

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Source: California Air Pollution Control Officers Association (CAPCOA) August 2010 report, *Quantifying Greenhouse Gas Mitigation Measures – A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*

Policy/Pricing strategies, 10 percent for Transit System Improvement strategies, 25 percent for Commute Trip Reduction (CTR) strategies. Therefore, if the proposed project's TDM plan shows a 65 percent reduction from Land Use/Location strategies and 20 percent reduction from Parking Policy/Pricing strategies, the Project's total trip reduction would be 75 percent instead of 85 percent.

It should be noted that projects located close to transit have a higher risk of double counting trip reductions with CTR measures that were based on transit accessibility literature (where most trip reduction credits were attributed to transit proximity). Therefore, projects located within one-quarter mile of high-frequency transit will not experience much incremental benefit from providing additional CTR strategies, which the BAAQMD TDM tool accounts for and adjusts the maximum trip reduction for CTR strategies based on the inputs selected under the Land Use/Location strategies. BAAQMD TDM tool analysis calculations are provided in **Appendix C**. For the purposes of this study, a one percent reduction in commute trips is equal to a one percent reduction in parking demand, as a shift from drive-alone trips to alternative trips such as transit, bicycling, and walking do not require parking. For the purposes of a conservative analysis, the highest estimated parking demand of 663 spaces is used for the preliminary TDM assessment.

4.3 Preliminary TDM Assessment

To develop a realistic estimate of potential trip reduction for the proposed project, CHS first assessed the trip reduction performance for the existing campus based on location and existing TDM programs and compared it to observed trip generation in practice. Because the location and employee base are essentially the same, this will provide a useful calibration of theoretical trip reduction potential to actual conditions. Then additional

Trip Reduction at the Existing EmeryStation Campus

Figure 16 summarizes the estimated trip reduction for the existing EmeryStation Campus. The trip reduction estimate includes effects due to the location, land use, transportation options, and surrounding land uses of the project (i.e., proximity to transit, density, and design such has enhanced pedestrian network), as well as existing TDM programs such as network, electric vehicle (EV) recharging stations, voluntary commute trip reduction programs[21], and contributions to the Emery-Go-Round shuttle program. Based on the BAAQMD TDM tool assessment, the existing campus should see a reduction in employee trips and parking demand by up to 59.7 percent.

[21] Based on EmeryStation Campus TDM measures, including preferential carpool and vanpool parking, onsite bike share pods, onsite carshare spaces, ride-matching services, and guaranteed ride home program.

Figure 16: Existing Campus Trip Reduction Estimate

Category / TDM Measure	Estimated Trip Reduction
Land Use / Location (65% Cap)	
Density	30%
Design	18%
Diversity	-1.3%
Destination Accessibility	14.5%
Transit Accessibility	5.2%
Category Sub-Total	*66.4%*
Category Sub-Total with Cap	***52.9%***
Neighborhood / Site Enhancements (5% Cap)	
Pedestrian Network	2%
NEV Network	0.5%
Car Share Program (Onsite Carshare Spaces)	1.5%
Category Sub-Total	*4%*
Category Sub-Total with Cap	***4%***
Commute Trip Reduction (CTR) Programs (25% Cap)[1]	
CTR Program (Voluntary)	6.2%
Employer Sponsored Vanpool/Shuttle (Emery-Go-Round)	6.9%
Category Sub-Total	11%
Category Sub-Total with Cap[1]	***10.9%***
Project Total VMT Reduction with Global Cap	**59.7%**

Note: Category sub-totals may differ from the total of each individual measure when added together, as the BAAQMD TDM tool adjusts the category total to avoid double counting of VMT reductions between similar measures.

The Land Use / Location strategies indicate the proposed project's design and location strategies can reduce trips by up to 52.9 percent, which aligns with Emeryville's Transit Hub Overlay assumptions for a 50 percent parking demand reduction. However, based on the employee commute survey, the specific demographic for employees at the EmeryStation Campus do not align with the location assumptions from the BAAQMD TDM tool and Emeryville's Transit Hub Overlay assumptions. Furthermore, given these TDM measures are already in place at the EmeryStation Campus, these reductions were captured in the employee commute survey.

Therefore, in order to further reduce the proposed project's parking demand, additional CTR measures would be required.

Additional Trip Reduction Potential

Because the BAAQMD TDM tool adjusts the CTR program reductions downward to prevent double counting the location assumptions, CHS used the CAPCOA methodologies to manually estimate the potential trip and parking demand reductions for the additional TDM measures that can leverage the proposed project's location. Potential additional TDM measures include, but are not limited to, required CTR program[22], transit fare subsidy, and unbundled parking.

[22] A required CTR program would include a part-time Transportation Coordinator, bicycle end-trip facilities (parking, showers, and lockers), carpool/vanpool ride-matching, preferential carpool/vanpool parking, flexible work hours for carpools, guaranteed ride home program, and annual monitoring and reporting. A required CTR program differs from a voluntary CTR program, as the required CTR program includes regular (typically once per year) monitoring and reporting to the City of Emeryville, whereas a voluntary CTR program does not include monitoring and reporting and only relies on good faith implementation and participation.

Figure 17 summarizes the potential trip and parking demand reductions for additional TDM measures, excluding the existing TDM measures. Based on manual calculations, the additional TDM measures are expected to reduce project generated trips and parking demand by up to 29.8 percent, which would reduce parking demand from 663 spaces to 465 spaces.[23] Applying 10 percent above demand to maintain an effective parking supply would result in a total parking supply of 512 spaces, which is 17 spaces above the proposed supply of 495 spaces.

Figure 17: Preliminary Additional TDM Measure Quantification Estimate

Additional TDM Measure (Effectiveness Range)	Estimated Reduction (%)
Parking Policy / Pricing	
Unbundled Parking (2.6% - 13%)[1, 2]	6.0%
Parking Policy / Pricing Subtotal	***6.0%***
Commute Trip Reduction (CTR) Programs	
CTR Program – Required (4.2% - 21%)[3]	14.8%
Transit Fare Subsidy (0.3% - 20%)[4]	5.0%
TDM Marketing (0.8% - 4%)	4.0%
CTR Program Subtotal	***23.8%***
Total	***29.8%***

Source: *Quantifying Greenhouse Gas Mitigation Measures,* California Air Pollution Control Officers Association (CAPCOA) August 2010; CHS Consulting Group, 2021.

Notes:

1. Assumes minimum $100 per month per unbundled parking space and discounted by 50% assuming existing parking demand already includes some unbundle employee parking provided by existing tenants.
2. It should be noted that California Parking Cash-Out Law would require employers that rent parking spaces and provide them to their employees free of charge, would be required to provide the cash equivalent value to employees who do not drive (source: https://ww2.arb.ca.gov/resources/documents/californias-parking-cash-out-law)
3. Assumes all employees are eligible to participate and discounts reductions from current voluntary CTR program
4. Assumes a transit fare subsidy of 75 cents per day per employee

[23] 663 spaces * 29.8% reduction = 198 space reduction; 663 spaces – 198 space reduction = 465 spaces

5.0 CONCLUSIONS

Based on the Emeryville Planning Commission Staff Report (April 2021), the proposed project would be required to provide no more than 319 parking spaces (196 for office use and 123 for R&D use) without a conditional use permit being granted. Therefore, the proposed project supply of 495 spaces would exceed the permitted maximum by 176 spaces. However, the staff report did not include all project land uses, including existing land uses located in the Hollis Street Building. When the project sponsor's expected land use mix for the proposed project is used, the proposed project would be permitted up to 452 parking spaces. The proposed project's supply of 495 spaces would exceed the maximum permitted supply by 43 spaces. Based on data provided by the project sponsor for the existing EmeryStation Campus and a survey of existing employees, the proposed project would be expected to generate parking demand for up to 663 spaces. Allowing for 10 percent above demand permitted by Municipal Code, the proposed project would need up to 729 spaces, exceeding the proposed supply of 495 spaces by 234 spaces. ITE parking demand data estimates the proposed project would generate parking demand for up to 664 spaces. Allowing for 10 percent above demand, the proposed project would need up to 730 spaces, exceeding the proposed supply of 495 spaces by 235 spaces.

Most analyses and comparisons suggest the proposed project would generate parking demand well above the City's calculated Municipal Code maximum of 319 spaces and the proposed supply of 495 spaces. However, correcting the staff report analysis to include a complete representation of planned land uses results in a maximum permitted supply of 452 spaces, and the proposed supply would generally be aligned with that. Furthermore, the proposed project is well located in an urban setting with good pedestrian, bicycle, and transit access, and employees are open to participating in an expanded employer sponsored TDM program. These two factors could significantly reduce the drive-alone mode share by shifting travel to alternative modes. Employees are also well distributed in the Bay Area region with many living near good public transit and sufficient clustering to support carpool and vanpool programs. Employee commute survey data suggests the project location alone is not enough to incentivize employees to use alternative modes. Based on trip reduction estimates using CAPCOA methodologies, a moderate provision of additional TDM measures could reduce project trips and parking demand by up to 29.8 percent, resulting in a parking demand of 465 spaces.

APPENDIX A

Employee Commute Survey Analysis

Employee Commute Survey

Introduction

The purpose of this survey is to understand how Campus Employees traveled to work prior to the Covid-19 pandemic and shelter-in-place orders. It will be used to identify employee travel patterns for the design of a new employee parking garage. Your input is voluntary and anonymous, but critical to this project. No personal identifying information will be collected or shared. Thank you in advance for your participation!

1. What is your home ZIP Code?

2. What has been your primary mode of commuting to work (prior to the pandemic)?

- ○ Drive Alone
- ○ Transit (e.g., EmeryGoRound, AC Transit, BART, Amtrak Capitol Corridor)
- ○ Bike
- ○ Walk
- ○ Uber/Lyft/Taxi
- ○ Telecommute
- ○ Carpool/Vanpool: how many people participate, including yourself?

3. How frequently did you commute into work during a typical week prior to the pandemic?

4. How frequently do you anticipate commuting into work during a typical week as California opens up post pandemic?

5. What time do you typically arrive to work?

6. What time do you typically depart from work?

7. Besides driving alone, what alternative commute modes would most appeal to you? (Choose all that apply)

- [ ] Bus (e.g., EmeryGoRound, AC Transit)
- [ ] Train (e.g., BART, Amtrak Capitol Corridor)
- [ ] Bicycle
- [ ] Carpool
- [ ] Vanpool
- [ ] Walking
- [ ] None
- [ ] Other (please specify)

8. If you normally use alternative commute modes, what motivates you to do so? (Choose up to 3)

- [ ] Cost Savings
- [ ] Stress Reduction
- [ ] Time Savings
- [ ] Convenience
- [ ] Improve Air Quality/Environmental Reasons
- [ ] Save Wear and Tear on Personal Vehicle
- [ ] Subsidy from Employer
- [ ] Other Cash Incentives or Tax Savings
- [ ] I Don't Use Alternative Commute Modes
- [ ] Other (please specify)

9. If you normally drive alone to work, what are your main reasons for driving alone? (Choose up to 3)

- [ ] Need car at work for my job
- [ ] I need to drop-off children/family on commute
- [ ] No reasonable transit option
- [ ] Poor bicycle and pedestrian access
- [ ] Need car at work for personal use
- [ ] Don't have anyone to carpool with
- [ ] Parking is free or inexpensive
- [ ] Can get home in an emergency
- [ ] Need car to run errands
- [ ] Don't like to depend on others
- [ ] Need to transport my children
- [ ] My car provides me the most flexibility
- [ ] Prefer to drive my own car
- [ ] I don't drive alone
- [ ] Other (please specify)

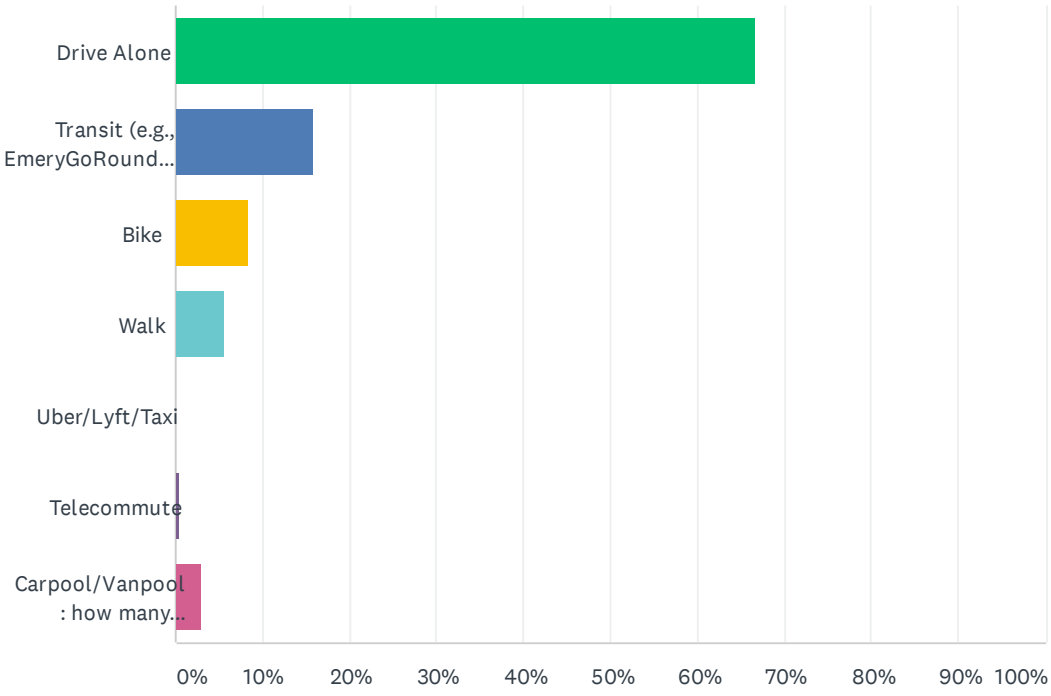
10. What would encourage you to use an alternative commute mode to driving alone? (Choose up to 3)

- [ ] Company subsidy for transit
- [ ] Company subsidy for vanpool
- [ ] Financial incentives for bike/walk (“parking cash out”)
- [ ] End-of-trip facilities for bike/walk (bike parking, showers, and lockers)
- [ ] Lower parking rates for carpools
- [ ] Reserved parking close to building entrances for carpools
- [ ] Help finding a transit or bike route
- [ ] Help coordinating a carpool/vanpool partner(s)
- [ ] More flexible work hours
- [ ] Guaranteed ride home
- [ ] Prizes, drawings, contests
- [ ] Occasional free parking days
- [ ] Other (please specify)

- [ ] None of the above

Q2 What has been your primary mode of commuting to work (prior to the pandemic)?

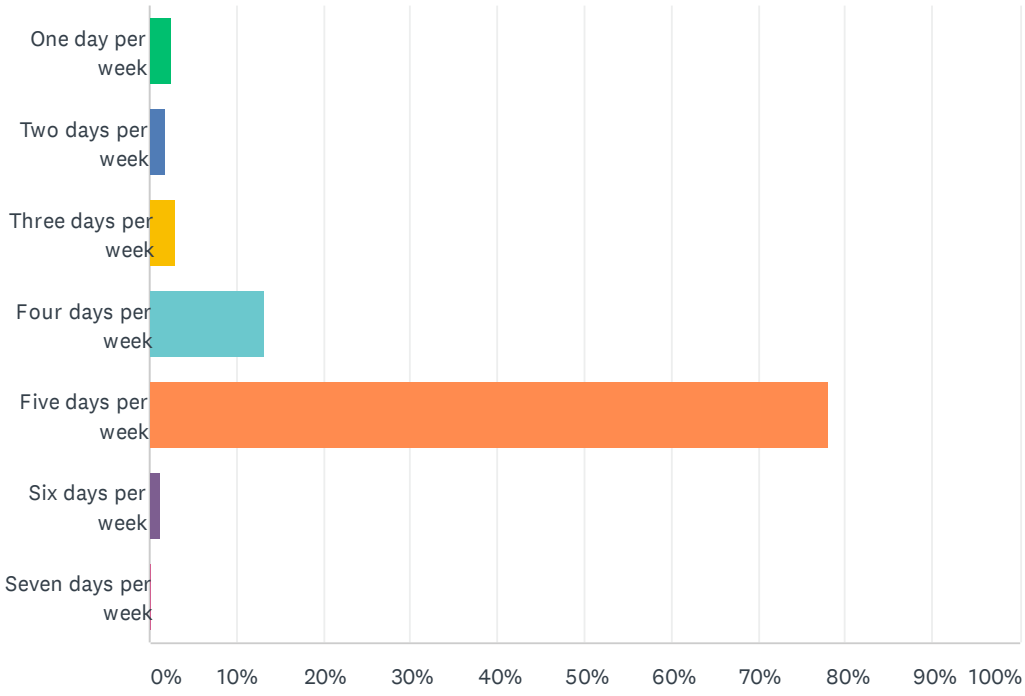
Answered: 523 Skipped: 2



ANSWER CHOICES	RESPONSES	
Drive Alone	66.73%	349
Transit (e.g., EmeryGoRound, AC Transit, BART, Amtrak Capitol Corridor)	15.87%	83
Bike	8.41%	44
Walk	5.74%	30
Uber/Lyft/Taxi	0.00%	0
Telecommute	0.38%	2
Carpool/Vanpool: how many people participate, including yourself?	2.87%	15
TOTAL		523

Q3 How frequently did you commute into work during a typical week prior to the pandemic?

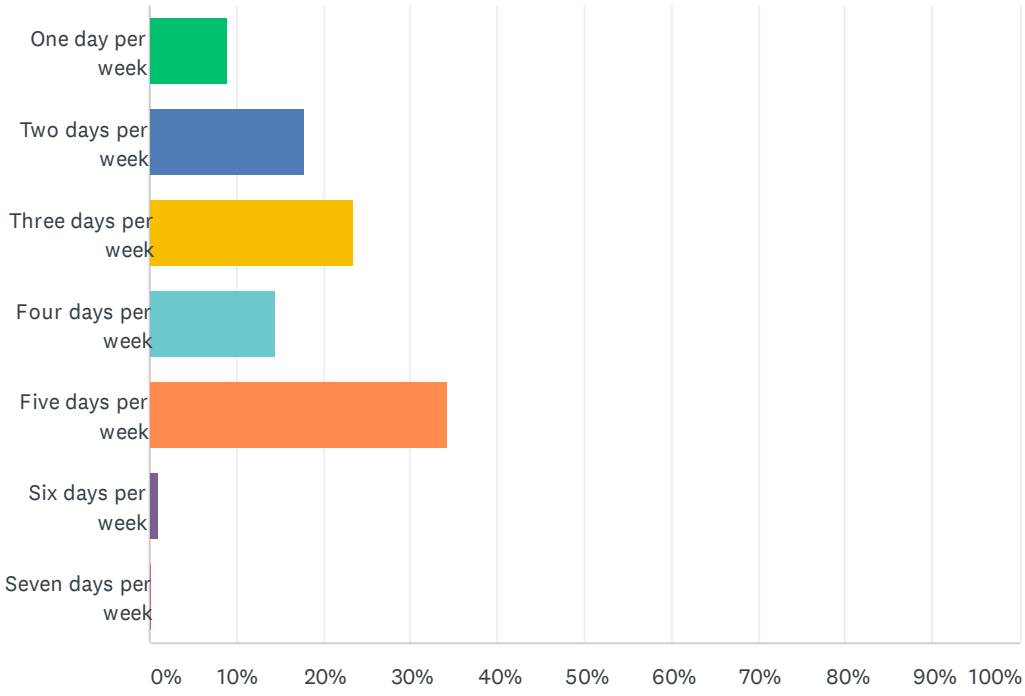
Answered: 513 Skipped: 12



ANSWER CHOICES	RESPONSES	
One day per week	2.53%	13
Two days per week	1.95%	10
Three days per week	2.92%	15
Four days per week	13.26%	68
Five days per week	77.97%	400
Six days per week	1.17%	6
Seven days per week	0.19%	1
TOTAL		513

Q4 How frequently do you anticipate commuting into work during a typical week as California opens up post pandemic?

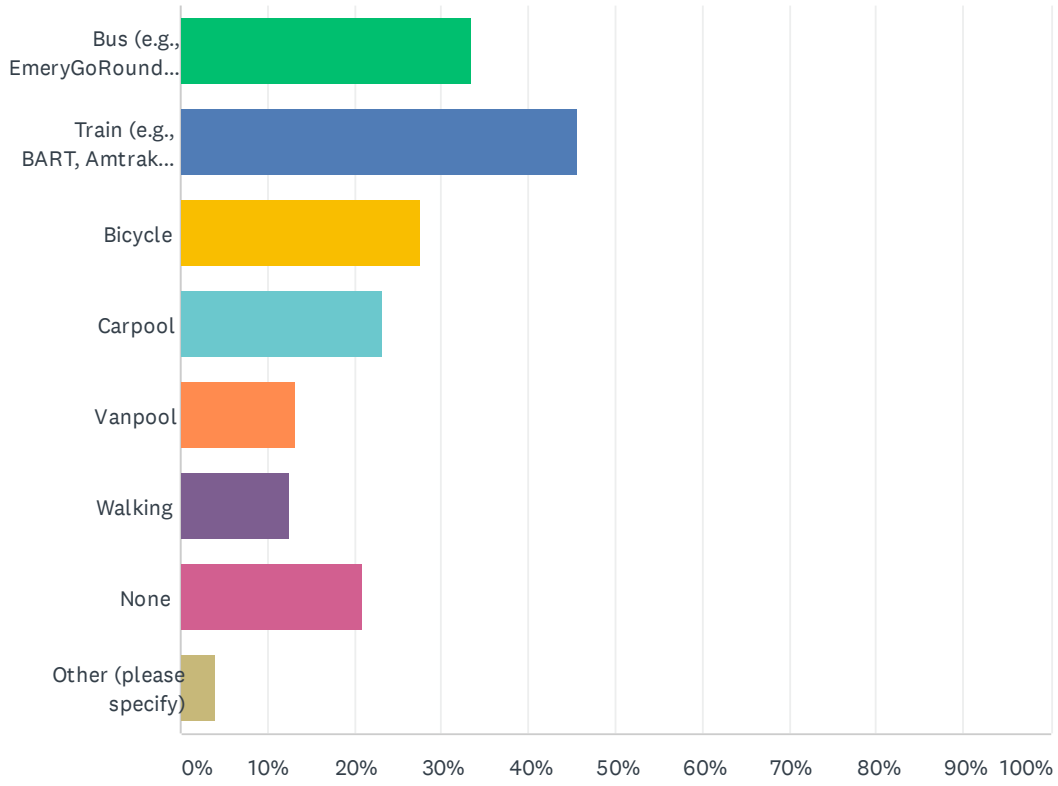
Answered: 522 Skipped: 3



ANSWER CHOICES	RESPONSES	
One day per week	9.00%	47
Two days per week	17.82%	93
Three days per week	23.37%	122
Four days per week	14.37%	75
Five days per week	34.29%	179
Six days per week	0.96%	5
Seven days per week	0.19%	1
TOTAL		522

Q7 Besides driving alone, what alternative commute modes would most appeal to you? (Choose all that apply)

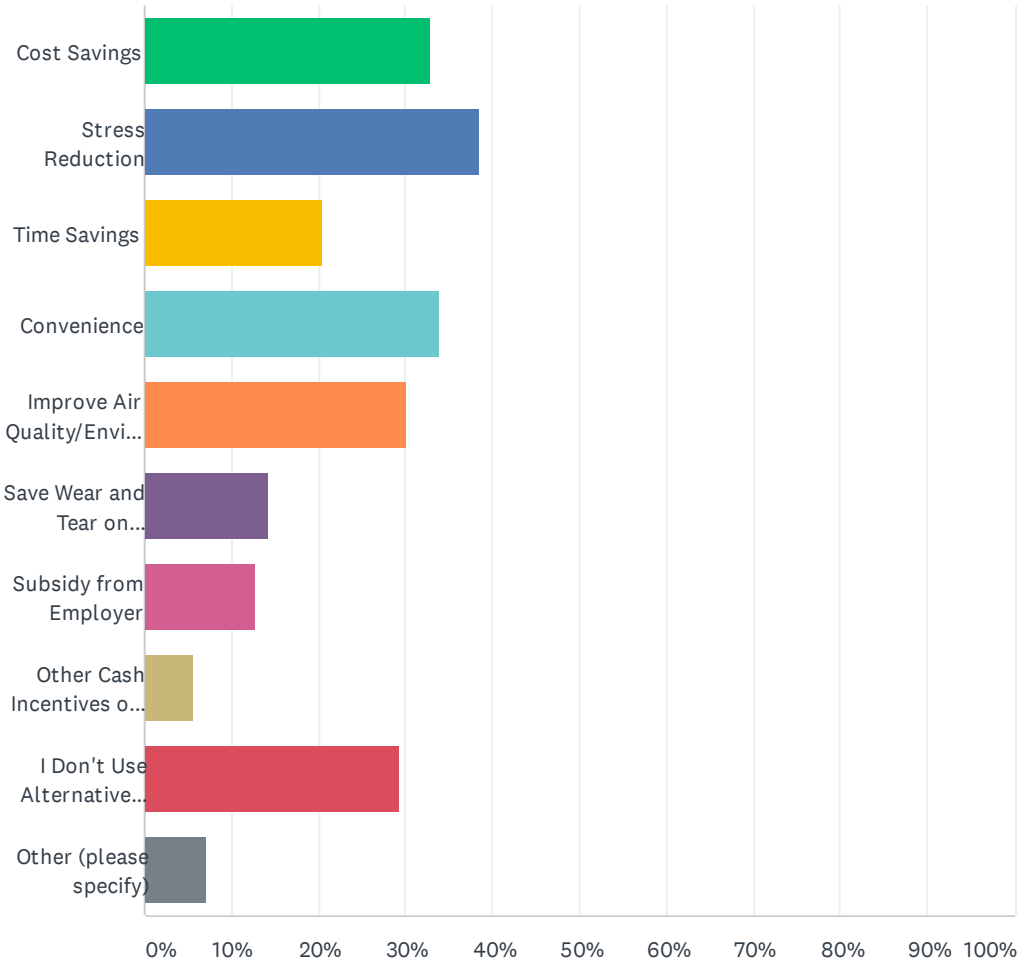
Answered: 515 Skipped: 10



ANSWER CHOICES	RESPONSES	
Bus (e.g., EmeryGoRound, AC Transit)	33.40%	172
Train (e.g., BART, Amtrak Capitol Corridor)	45.63%	235
Bicycle	27.57%	142
Carpool	23.30%	120
Vanpool	13.20%	68
Walking	12.62%	65
None	20.97%	108
Other (please specify)	4.08%	21
Total Respondents: 515		

Q8 If you normally use alternative commute modes, what motivates you to do so? (Choose up to 3)

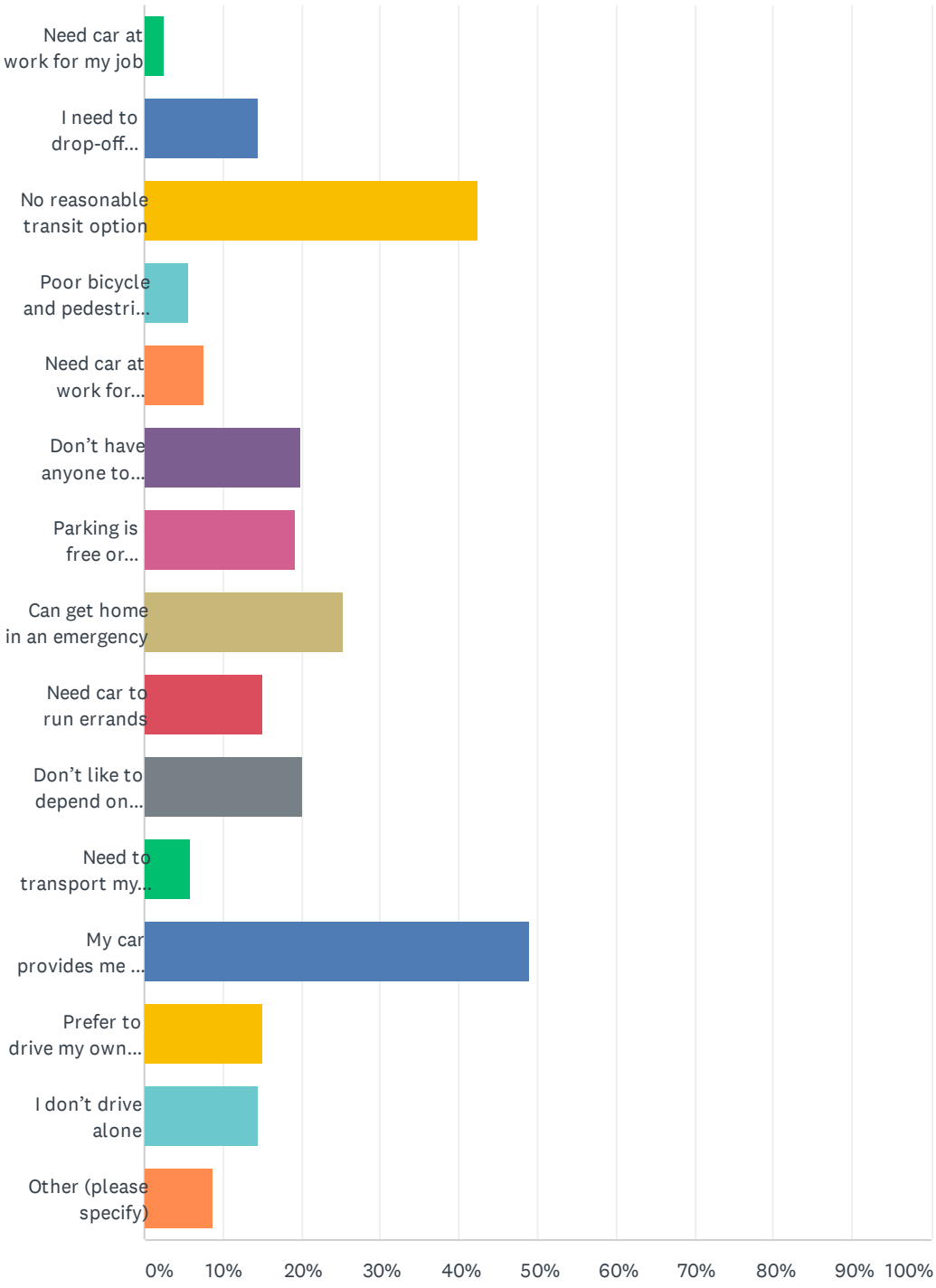
Answered: 466 Skipped: 59



ANSWER CHOICES	RESPONSES	
Cost Savings	32.83%	153
Stress Reduction	38.41%	179
Time Savings	20.60%	96
Convenience	33.91%	158
Improve Air Quality/Environmental Reasons	30.04%	140
Save Wear and Tear on Personal Vehicle	14.16%	66
Subsidy from Employer	12.66%	59
Other Cash Incentives or Tax Savings	5.58%	26
I Don't Use Alternative Commute Modes	29.18%	136
Other (please specify)	7.08%	33
Total Respondents: 466		

Q9 If you normally drive alone to work, what are your main reasons for driving alone? (Choose up to 3)

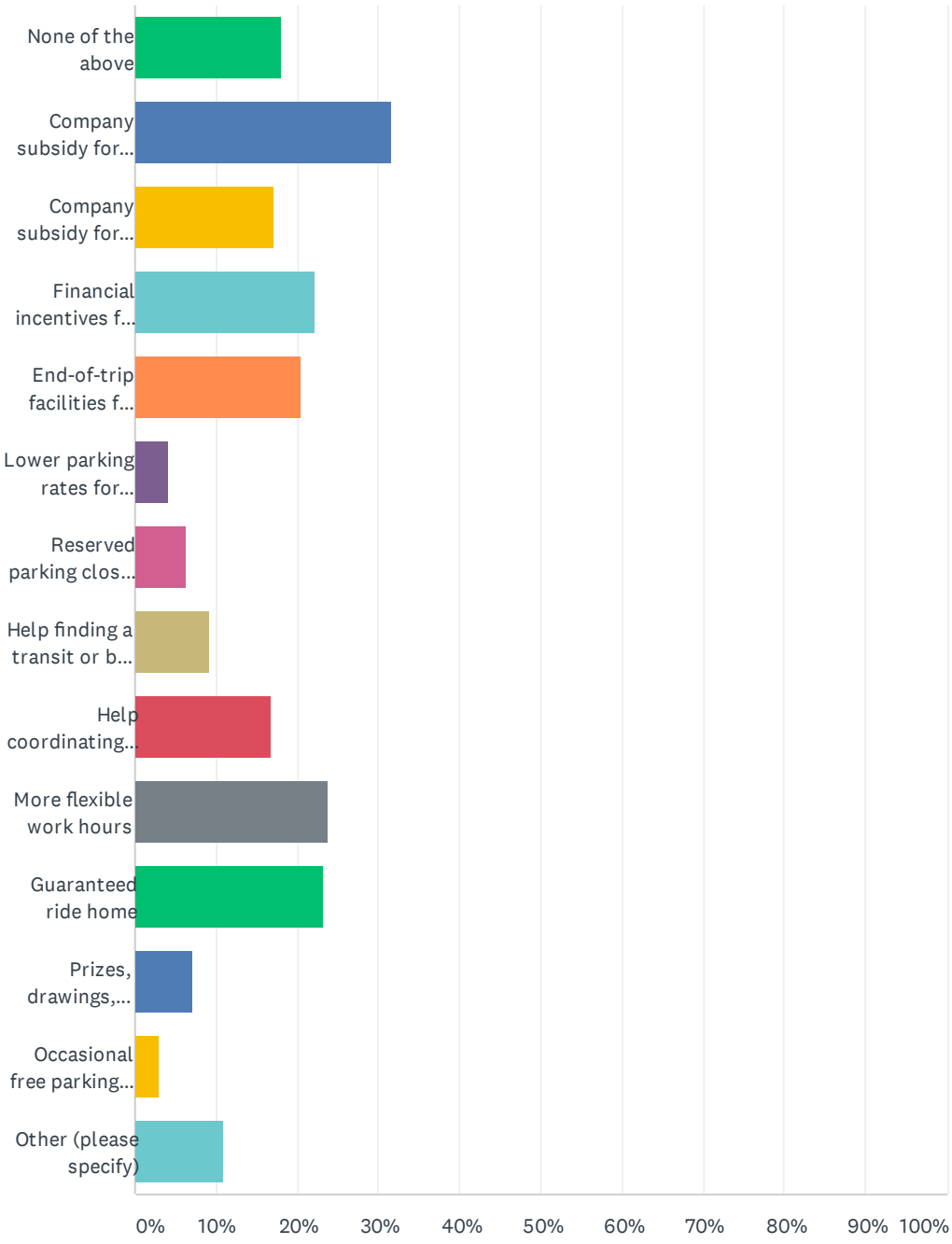
Answered: 492 Skipped: 33



ANSWER CHOICES	RESPONSES	
Need car at work for my job	2.44%	12
I need to drop-off children/family on commute	14.43%	71
No reasonable transit option	42.48%	209
Poor bicycle and pedestrian access	5.69%	28
Need car at work for personal use	7.52%	37
Don’t have anyone to carpool with	19.92%	98
Parking is free or inexpensive	19.31%	95
Can get home in an emergency	25.41%	125
Need car to run errands	15.04%	74
Don’t like to depend on others	20.12%	99
Need to transport my children	5.89%	29
My car provides me the most flexibility	48.98%	241
Prefer to drive my own car	15.04%	74
I don’t drive alone	14.43%	71
Other (please specify)	8.74%	43
Total Respondents: 492		

Q10 What would encourage you to use an alternative commute mode to driving alone? (Choose up to 3)

Answered: 483 Skipped: 42



ANSWER CHOICES	RESPONSES	
None of the above	18.01%	87
Company subsidy for transit	31.68%	153
Company subsidy for vanpool	17.18%	83
Financial incentives for bike/walk (“parking cash out”)	22.15%	107
End-of-trip facilities for bike/walk (bike parking, showers, and lockers)	20.50%	99
Lower parking rates for carpools	4.14%	20
Reserved parking close to building entrances for carpools	6.21%	30
Help finding a transit or bike route	9.11%	44
Help coordinating a carpool/vanpool partner(s)	16.77%	81
More flexible work hours	23.81%	115
Guaranteed ride home	23.19%	112
Prizes, drawings, contests	7.04%	34
Occasional free parking days	2.90%	14
Other (please specify)	10.97%	53
Total Respondents: 483		

APPENDIX B

Office and R&D Parking Rates, Parking Generation Manual, 5th Edition, Institute of Transportation Engineers

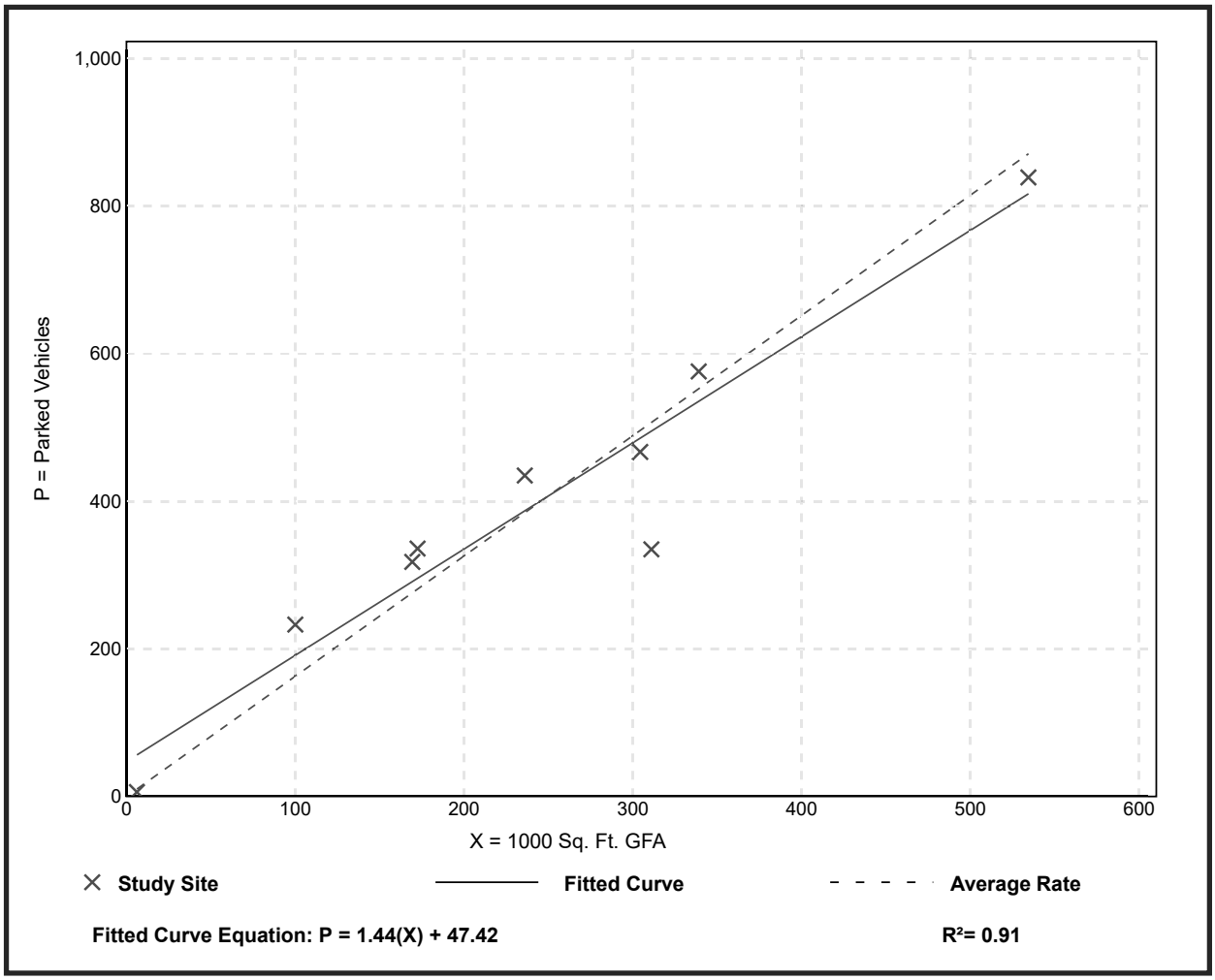
General Office Building
(710)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **Dense Multi-Use Urban**
Peak Period of Parking Demand: **9:00 a.m. - 4:00 p.m.**
Number of Studies: 9
Avg. 1000 Sq. Ft. GFA: 241

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.63	0.97 - 2.33	1.55 / 2.14	***	0.32 (20%)

Data Plot and Equation



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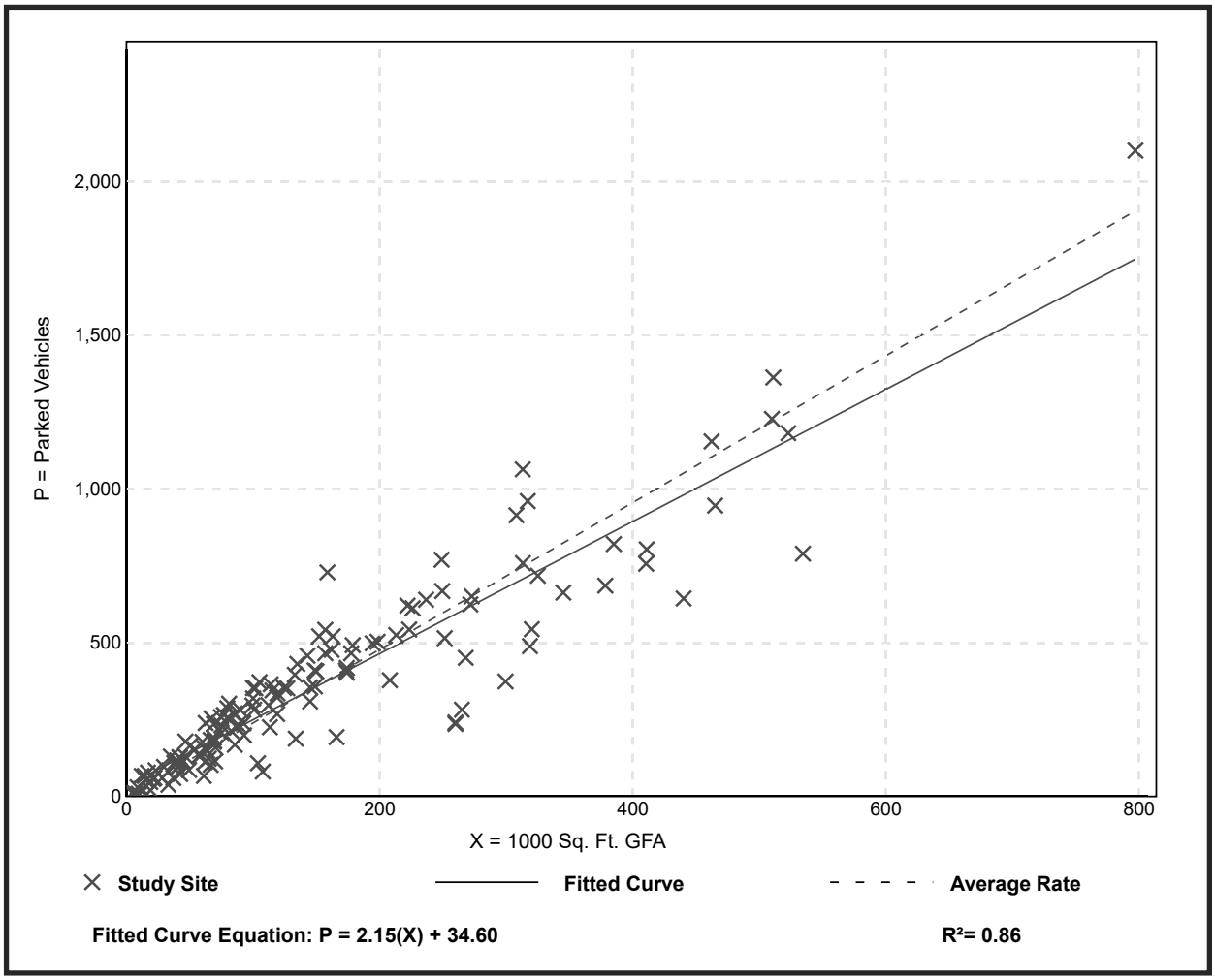
General Office Building
(710)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Peak Period of Parking Demand: **9:00 a.m. - 3:00 p.m.**
Number of Studies: 148
Avg. 1000 Sq. Ft. GFA: 145

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.39	0.50 - 5.58	2.30 / 3.30	2.28 - 2.50	0.69 (29%)

Data Plot and Equation



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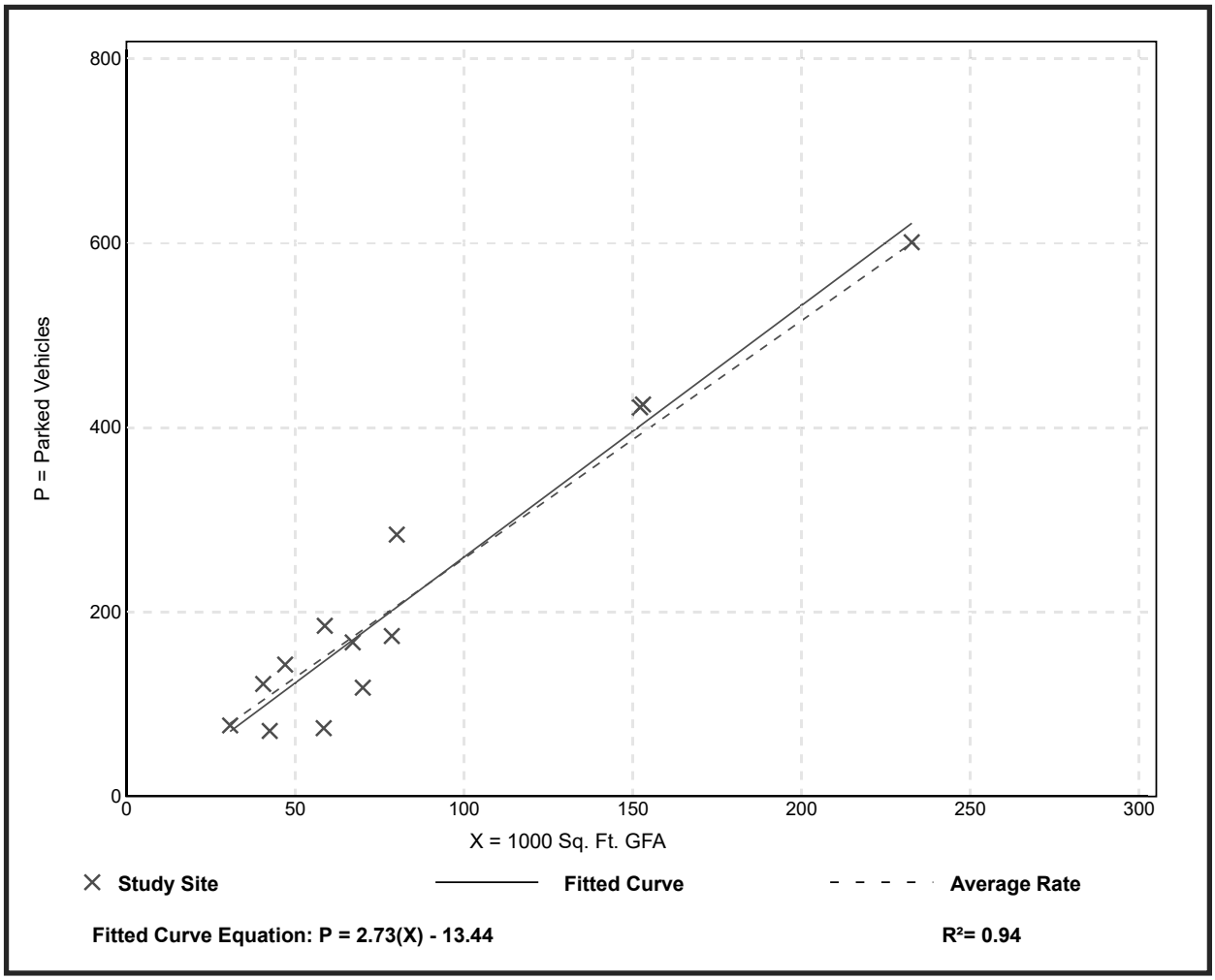
Research and Development Center
(760)

Peak Period Parking Demand vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday (Monday - Friday)**
Setting/Location:	**General Urban/Suburban**
Peak Period of Parking Demand:	**8:00 a.m. - 4:00 p.m.**
Number of Studies:	13
Avg. 1000 Sq. Ft. GFA:	85

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.58	1.27 - 3.55	2.39 / 3.14	***	0.56 (22%)

Data Plot and Equation



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Clinic
(630)

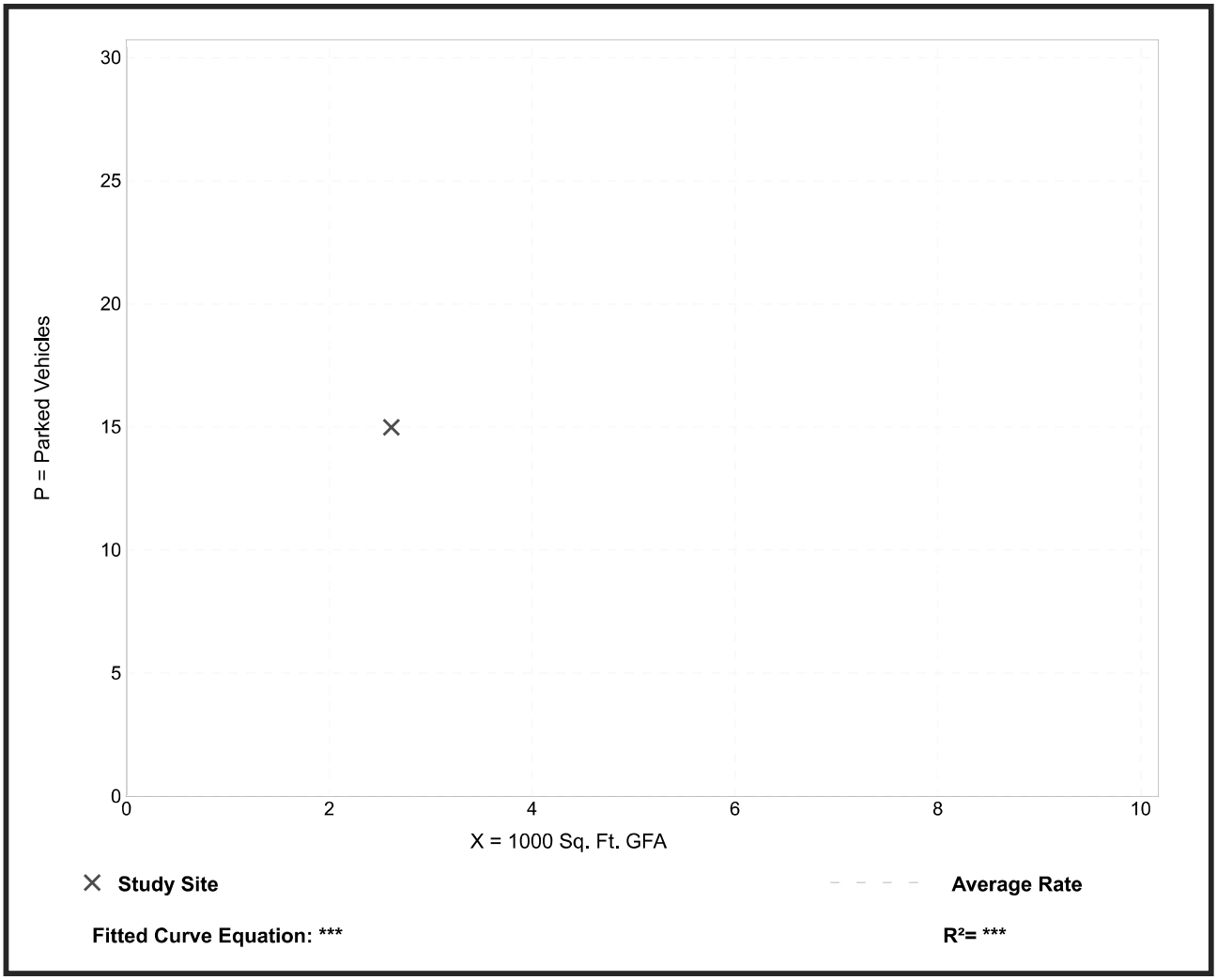
Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **Dense Multi-Use Urban**
Peak Period of Parking Demand: **9:00 a.m. - 3:00 p.m.**
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 2.6

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
5.74	5.74 - 5.74	*** / ***	***	***

Data Plot and Equation

Caution – Small Sample Size



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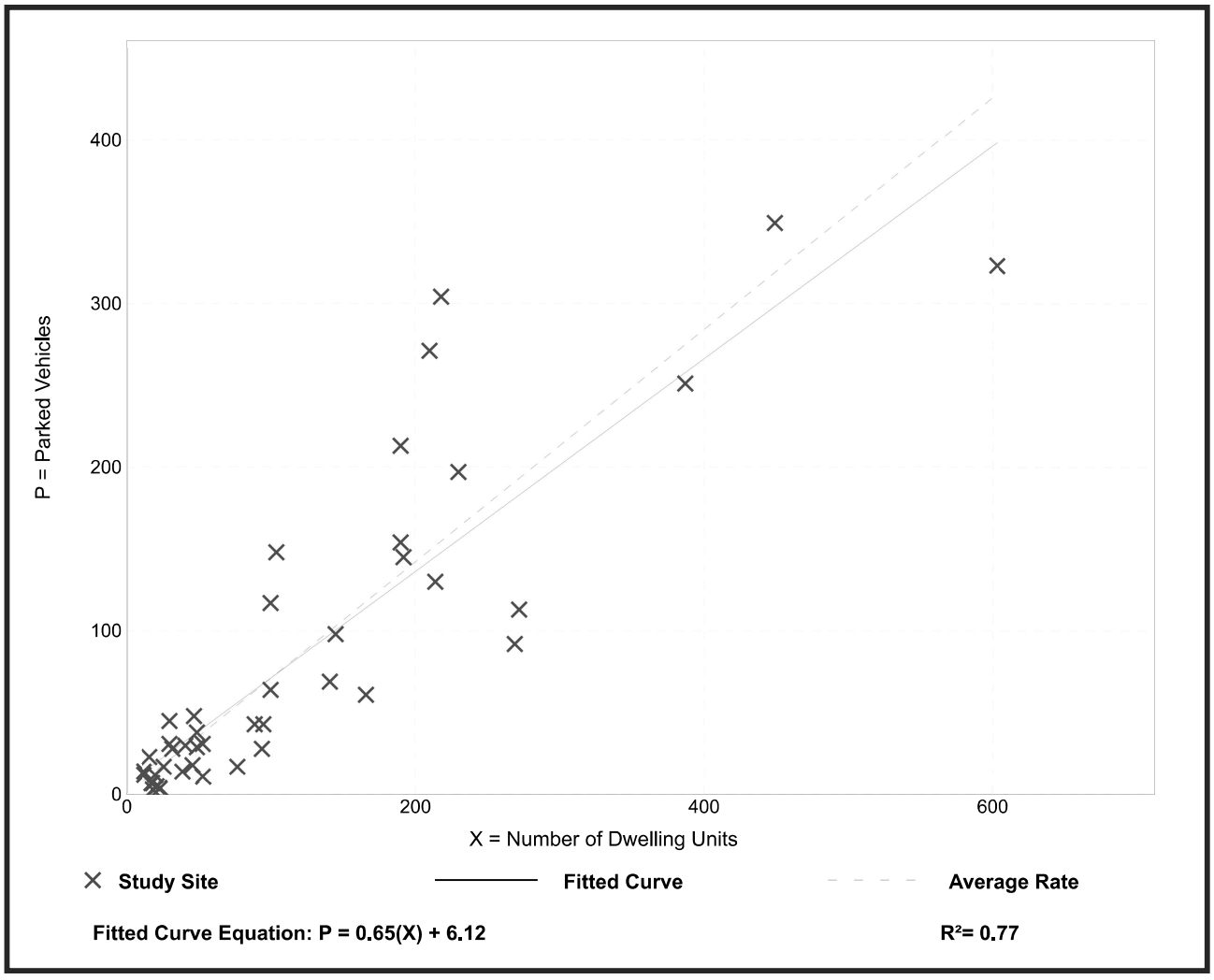
Multifamily Housing (Mid-Rise)
(221)

Peak Period Parking Demand vs: **Dwelling Units**
On a: **Weekday (Monday - Friday)**
Setting/Location: **Dense Multi-Use Urban (< 1/2 mile to rail transit)**
Peak Period of Parking Demand: **10:00 p.m. - 5:00 a.m.**
Number of Studies: 43
Avg. Num. of Dwelling Units: 121

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.71	0.17 - 1.50	0.47 / 1.17	0.61 - 0.81	0.32 (45%)

Data Plot and Equation



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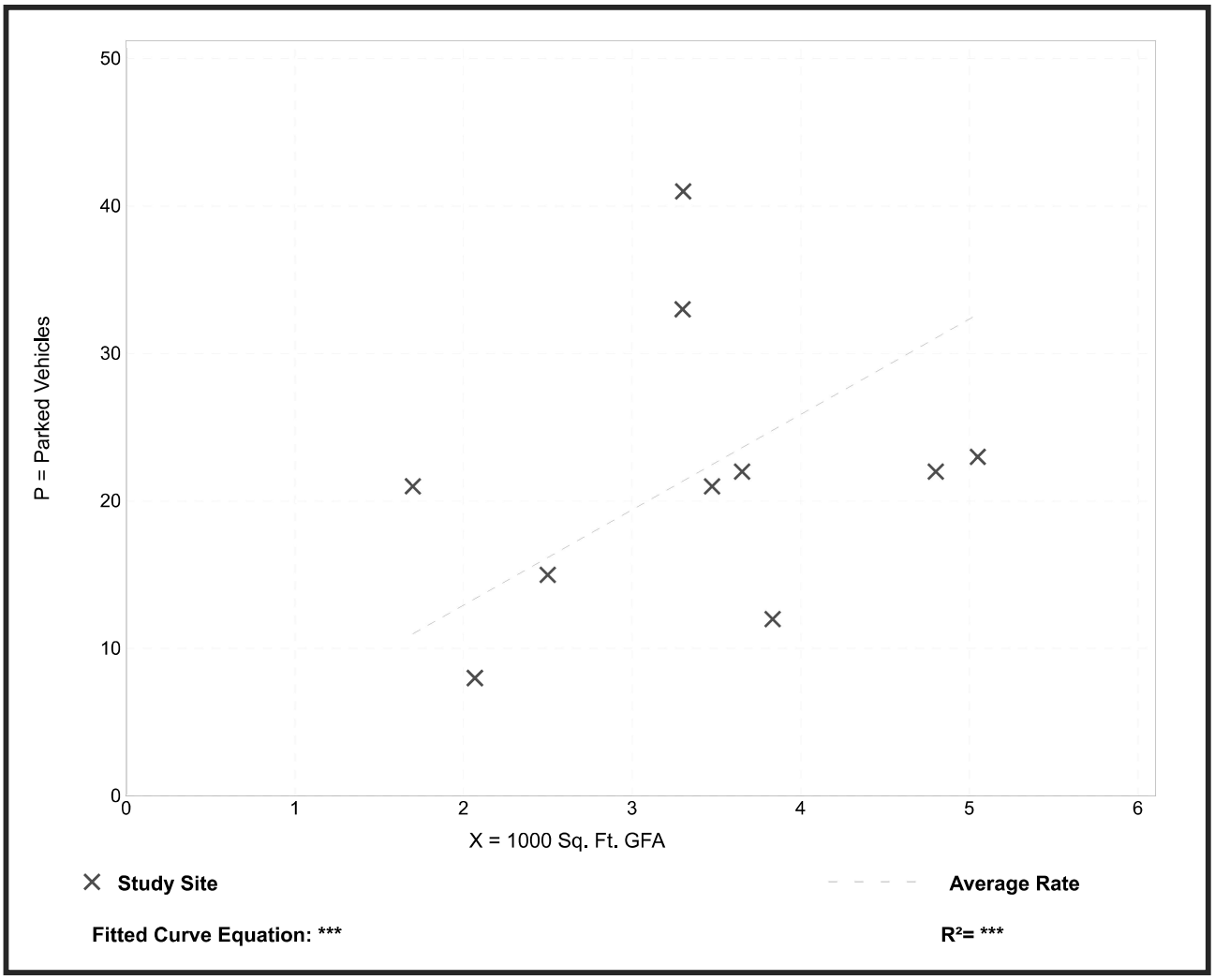
High-Turnover (Sit Down) Restaurant - Family
(932)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Thursday)**
Setting/Location: **Dense Multi-Use Urban**
Peak Period of Parking Demand: **12:00 - 1:00 p.m.; 6:00 - 8:00 p.m.**
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 3.3

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
6.47	3.13 - 12.41	4.57 / 12.37	***	3.20 (49%)

Data Plot and Equation



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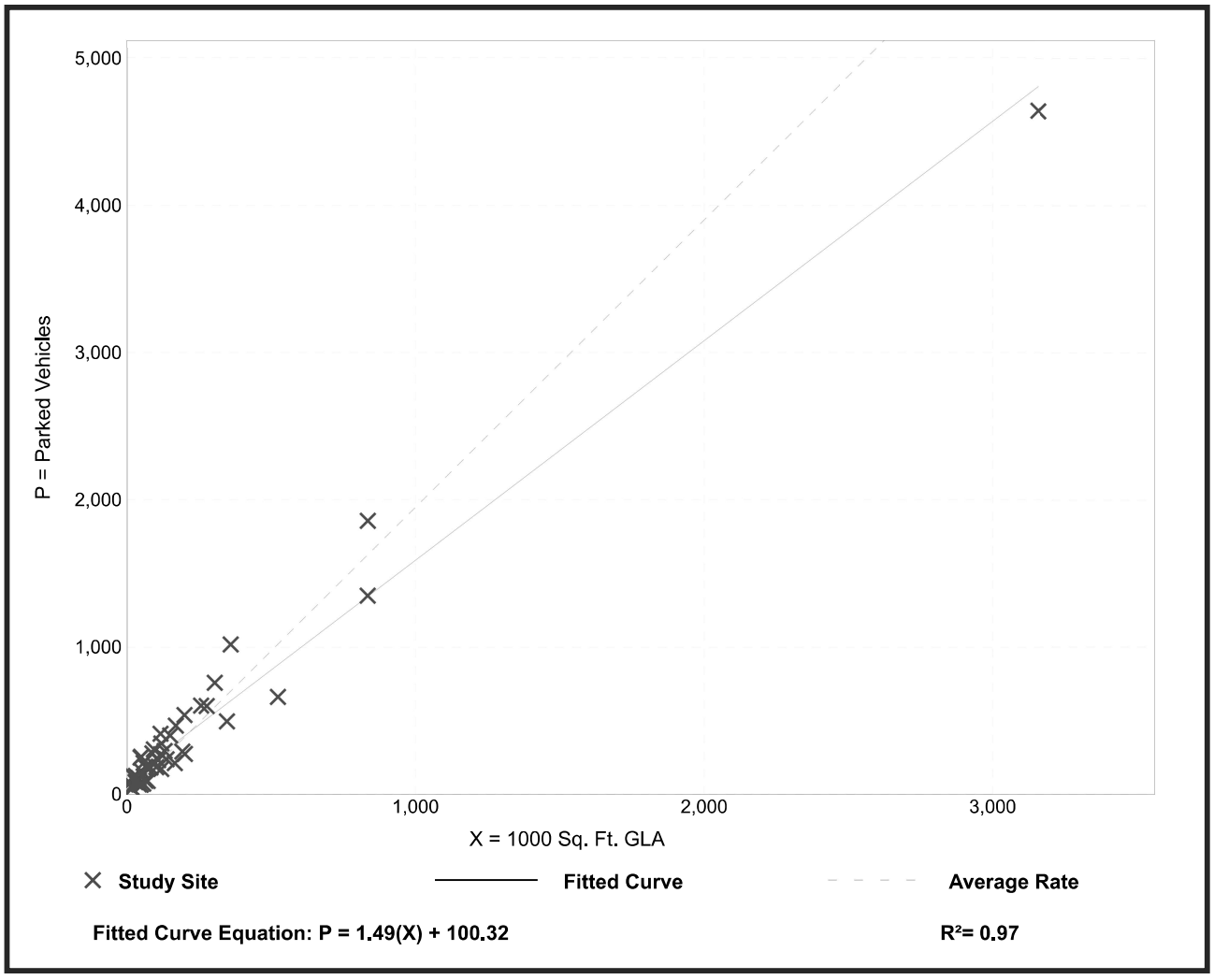
Shopping Center - Non-December
(820)

Peak Period Parking Demand vs: **1000 Sq. Ft. GLA**
On a: **Weekday (Monday - Thursday)**
Setting/Location: **General Urban/Suburban**
Peak Period of Parking Demand: **12:00 - 6:00 p.m.**
Number of Studies: 46
Avg. 1000 Sq. Ft. GLA: 218

Peak Period Parking Demand per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.95	1.27 - 7.98	1.99 / 3.68	1.73 - 2.17	0.75 (38%)

Data Plot and Equation



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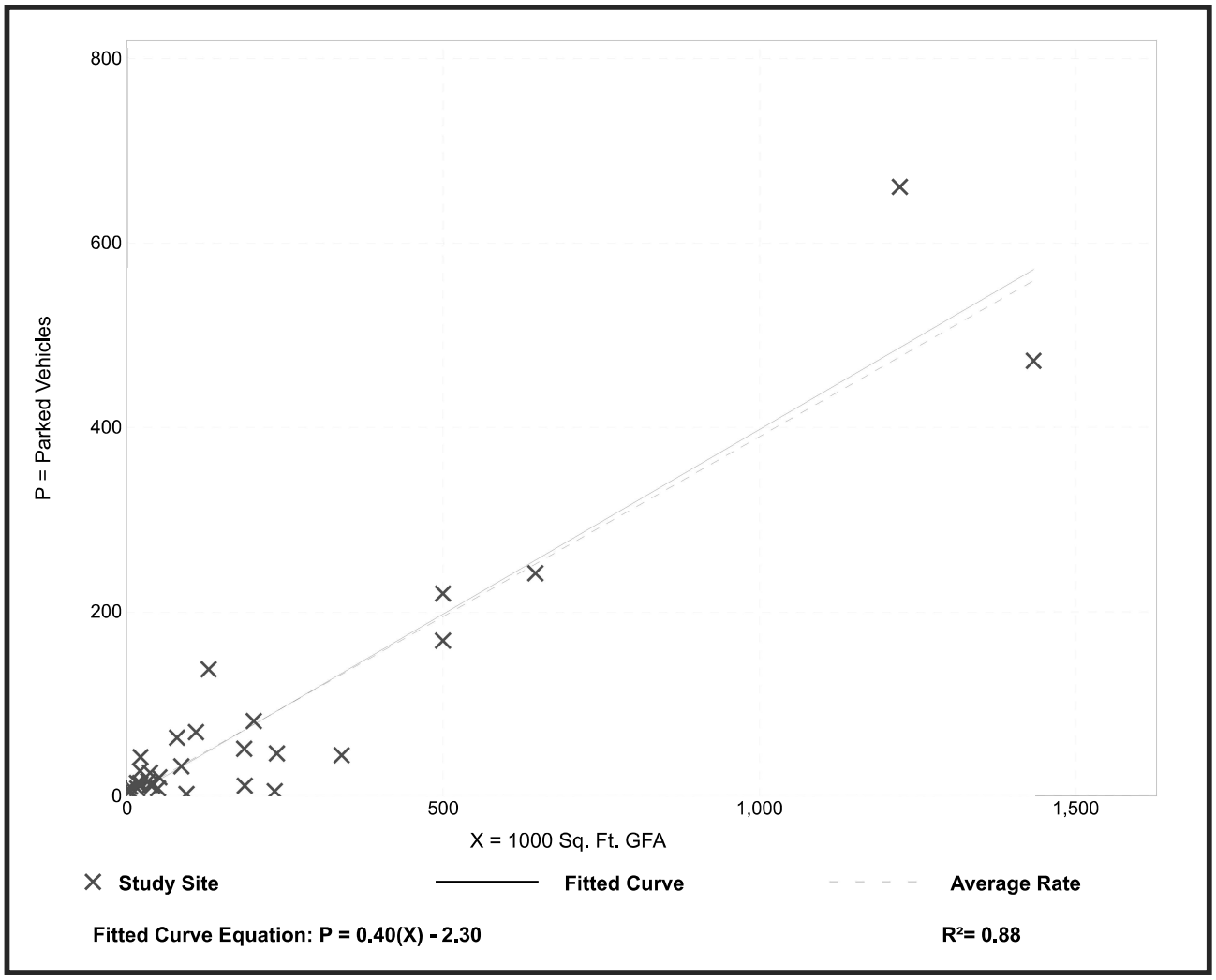
Warehousing
(150)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Peak Period of Parking Demand: **11:00 a.m. - 4:00 p.m.**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 212

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.39	0.03 - 1.96	0.34 / 1.11	0.31 - 0.47	0.22 (56%)

Data Plot and Equation



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APPENDIX C

Transportation Demand Management (TDM) Analysis

= input
= calculation

Input Page

General Inputs

urban	Project Location
22,080	Total Project Unmitigated VMT
100%	Percentage of work related VMT[1]

Land Use / Location Strategies

yes	Implementing strategy?
230	# of … jobs per job acre

Density

yes	Implementing strategy?
90	# of intersections per square mile

Design

yes	Implementing strategy?
	% of each land use type in the project
0%	single family residential
0%	multifamily residential
100%	commercial
0%	industrial
0%	institutional
0%	park
100%	Total

Diversity

yes	Implementing strategy?
3.3	distance (in miles) to downtown or major job center

Destination Accessibility

yes	Implementing strategy?
0.86	distance (in miles) to transit station

Transit Accessibility

no	Implementing strategy?
30%	percentage of units that are deed-restricted BMR housing

Below Market Rate (BMR) Housing

yes	Implementing strategy?
within project and connecting off-site	extent of pedestrian accommodations

Pedestrian Network

no	Implementing strategy?
50%	percentage of streets within project with traffic calming improvements
75%	percentage of intersections within project with traffic calming improvements

Traffic Calming

yes	Implementing strategy?
1 NEV per 25	# of households

*25 = low penetration, 10 = medium, 1 = high

NEV Network

yes	Implementing strategy?
suburban + commuter rail	project setting

Carshare Program

Neighborhood / Site Enhancements Strategies

no	Implementing strategy?
503	ITE parking provision for the project site
495	Actual parking provision for the project site

Parking Supply Limits

no	Implementing strategy?
$ 150	monthly parking cost for the project site

Unbundle Parking Costs

no	Implementing strategy?
30%	increase in on-street parking prices (min 25%, max 50%)

On-Street Market Pricing

Parking Policy / Pricing Strategies

no	Implementing strategy?
50%	percentage increase of transit network coverage
5%	existing transit mode share (as a % of total daily trips)

Network Expansion

no	Implementing strategy?
50%	percentage reduction in headways (increase in frequency)
17%	existing transit mode share (as a % of total daily trips)
>=50% of lines (within project) improved	level of implementation

Service Frequency/Speed

no	Implementing strategy?
17%	existing transit mode share (as a % of total daily trips)
25%	percentage of lines serving project converted to BRT

Bus Rapid Transit

Transit System Improvements Strategies

no	Implementing strategy?
100%	percentage of employees eligible

CTR Program - Required

yes	Implementing strategy?
100%	percentage of employees eligible

CTR Program - Voluntary

no	Implementing strategy?
80%	percentage of employees eligible
$ 0.75	amount of transit subsidy per passenger (daily equivalent)

Transit Fare Subsidy

no	Implementing strategy?
100%	percentage of employees eligible

Employee Parking Cash-Out

no	Implementing strategy?
$ 6.00	daily parking charge
100%	percentage of employees subject to priced parking

Workplace Parking Pricing

no	Implementing strategy?
25%	percentage of employees participating
1.5 days of telecommuting	strategy implemented

Alternative Work Schedules and Telecommute Program

no	Implementing strategy?
100%	percentage of employees eligible

CTR Marketing

yes	Implementing strategy?
low	degree of implementation
	*low (< 10 vans), medium (<30 vans), large (>30 vans)
large	employer size
	*small (< 100 employees), medium (< 500), large (>500)
100%	percentage of employees eligible

Employer Sponsored Vanpool/Shuttle

no	Implementing strategy?
100%	percentage of employees eligible

Ride-Share Program

no	Implementing strategy?
low	degree of implementation
	low = contact list covering <50% of all students
	medium = contact list covering 75% of all students
	high = contact list covering majority of students and active coordinator

School Pool

no	Implementing strategy?
50%	percent of families expected to use school bus program

School Bus

Commute Trip Reduction (CTR) Programs Strategies

1. 22% work trips represents a mixed-used site (SF Bay Area Travel Survey). See Assumptions Tab for more detail.

Pulldown menu data hidden here:

Global Max Reduction (all VMT):
59.7%
or
13,182

Cross-Category Max Reduction (all VMT):
54.8%
or
12,090

Max Reduction (all VMT):
10.9%
or
2,414

Land Use/ Location	Neighborhood/ Site Enhancements	Parking Policy/ Pricing	Transit System Improvements	Commute Trip Reduction (CTR) Progams (assuming mixed-use development)
Category Reduction (all VMT): 52.9%	Category Reduction (all VMT): 4.0%	Category Reduction (all VMT): 0.0%	Category Reduction (all VMT): 0.0%	Category Reduction (work VMT): 11%
Density 30.0%	**Pedestrian Network** 2.0%	**Parking Supply Limits** 0.0%	**Network Expansion** 0.0%	**CTR Program - Required** (work VMT) 0.0%
Design 18.0%	**Traffic Calming** 0.0%	**Unbundled Parking Costs** 0.0%	**Service Frequency/Speed** 0.0%	**CTR Program - Voluntary** (work VMT) 6.2%
Diversity -1.3%	**NEV Network** 0.5%	**On-Street Market Pricing** 0.0%	**Bus Rapid Transit** 0.0%	**Transit Fare Subsidy** (work VMT) 0.0%
Destination Accessibility 14.5%	**Car Share Program** 1.5%			**Employee Parking Cash-Out** (work VMT) 0.0%
Transit Accessibility 5.2%				**Workplace Parking Pricing** (work VMT) 0.0%
BMR Housing 0.0%				**Alternative Work Schedules and Telecommute Program** (work VMT) 0.0%
				CTR Marketing (work VMT) 0.0%
				Employer-Sponsored Vanpool/Shuttle (work VMT) 6.9%
				Ride Share Program (work VMT) 0.0%
				School Pool (school VMT) 0.0%
				School Bus (school VMT) 0.0%