APPENDIX M

Transportation Data

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VMT Analysis Guide 11/9/2020

This file contains the Existing Conditions VMT estimates. Please see LRDP Build-out VMT' excel file for the Build-out estimates and a comparison table.

Unique Inputs Unique Outputs (shown in calculation tabs)

			LRDP Project Description (1)		Campus Travel Survey (CTS)				Commuter Residence GIS Database	
Light Gold Tab - Commuter Daily and VMT	Populations (1)	Total Population	Resident Population	Commuter Population	Commute Frequency (% of population on campus daily)	Drive-alone mode split	Carpool mode split	Carpool occupancy	TNC Mode Split	Worker Trip lengths
DAILY_COM_STAFF DAILY_COM_FACULTY DAILY_COM_GRAD DAILY_COM_UNDERGRAD	Staff Faculty Graduate Students Undergraduate Students	LRDP Project Description	"Total Beds" from Project Description	Total Population minus Total Beds	% of population on campus Sun-Sat	% of population that answered "Drive Alone" in CTS	% of population that answered "Carpool" in CTS	Sourced from California Household Travel Survey Info	% of population that answered "Ride-hail (Lyft, Uber)" in CTS	Network distance to campus from address location data set

Gold Tab - Commuter Annual VMT	Populations (1)	From UCB 2020 - 2021 Calendar	From Campus Travel Survey
Gold Tab - Commuter Annual Vivi	ropulations (1)	Work days per year	"Weekend Mode Split" tab
ANN_COM_STAFF	Staff	See calcluations in OK19-	See calculations in
ANN_COM_FACULTY	Faculty	0321.00/Data Collection/Project	N:\Projects\2019\OK19-
ANN_COM_GRAD	Graduate Students	Description/'Project Description	0321.00_UC_Berkeley_LRDP_a
ANN_COM_UNDERGRAD	Undergraduate Students	10/6/20'.	nd_CMP\Analysis\Survey

	Campus Residents	LRDP Project Description	Model (fac) and ITE/ACS (students)	Model
		Number	Daily Trip Rate Weekday	Resident Trip Lengths See left
			Use VMT Rate direct from	
WEEKDAY_RES_FACULTY	Faculty	LRDP Project Description	model TAZ 88, adjusted for	See left
			faculty housing: 7.6 VMT/unit	
			ITE MF Housing=1.84; ACS	
		LRDP Project Description	Driving mode share=0.16.	Model trip length for zones
WEEKDAY_RES_GRAD	Graduate Students	1	1.84X0.16=0.30.	around campus = 2.0
		LRDP Project Description	Same as Grads	Model trip length for zones
WEEKDAY_RES_UNDERGRAD	Undergraduate Students	LRDP Project Description	Same as Grads	around campus = 2.0

TNC Counts	TNC Trip Rate	Owned Car Trips
27	0.020	242

Dark Blue Tab - Resident Annual VMT	Campus Residents	LRDP Project Description	Assume same as weekday (2)	Assume same as weekday (2)	From 2020-2021 Academic Calendar
	campus residents	Number	Daily Trip Rate Weekend	Average Daily Trip Lengths - Weekend	# Resident Days/Year
			Use VMT Rate direct from		
		LRDP Project Description	model TAZ 88, adjusted for	See left	See calcluations in OK19-
ANNUAL_RES_FACULTY	Faculty		faculty housing: 7.6 VMT/unit		0321.00/Data
			ITE MF Housing=1.84; ACS		Collection/Project
		LRDP Project Description	Driving mode share=0.16.	Model trip length for zones	Description/'Project
ANNUAL_RES_GRAD	Graduate Students		1.84X0.16=0.30.	around campus = 2.0	Description10-6-20'.
		LRDP Project Description		Model trip length for zones	Description=10=0=20.
ANNUAL_RES_UNDERGRAD	Undergraduate Students	EKDF Project Description	Same as Grads	around campus = 2.0	

Worsheet Input Data

Unique Inputs Unique Outputs (shown in calculation ta

Unique Output	s (shown in	calculation tabs)

	Production (A)	LRDP Project Description (1)		Campus Travel Survey					Commuter Residence GIS Database	
Light Gold Tab - Commuter Daily VMT	Populations (1)	Total Population	Resident Population	Commuter Population	Commute Frequency (% of population on campus daily)		Carpool mode split	Carpool occupancy	TNC Mode Split	Worker Trip lengths
DAILY_COM_STAFF	Staff	12,145	-	12,145	92.9%	51%	7%	2.4	1%	14.2
DAILY_COM_FACULTY	Faculty	3,276	32	3,244	90.5%	46%	5%	2.4	1%	6.6
DAILY_COM_GRAD	Graduate Students	9,776	250	9,526	91.9%	7%	1%	2.4	1%	13.7
DAILY_COM_UNDERGRAD	Undergraduate Students	29,932	8,722	21,210	97.0%	4%	0%	2.4	1%	15.1

Gold Tab - Commuter Annual VMT	Populations (1)	LRDP Project Description	Weekend Travel to Campus Compared to Weekday
ANN_COM_STAFF	Staff	12,145	10%
ANN_COM_FACULTY	Faculty	3,244	21%
ANN_COM_GRAD	Graduate Students	9,526	35%
ANN_COM_UNDERGRAD	Undergraduate Students	21,210	68%

Note: Commute days/year is directly entered in the calculation tabs, and is not pulled from this tab.

		LRDP PD	ITE and CHTS	Alameda CTC Model	Alameda CTC Model
Light Blue Tab - Resident Weekday VMT	Campus Residents	Number	Daily Trip Rate Weekday	Resident Trip Lengths	VMT/Unit
WEEKDAY_RES_FACULTY	Faculty	32			7.6
WEEKDAY_RES_GRAD	Graduate Students	250	0.3	2.0	
WEEKDAY_RES_UNDERGRAD	Undergraduate Students	8722	0.3	2.0	

TNC Counts	TNC Trip Rate	Owned Car Trips	Owned Car Trip Rate	Combined Trip Rate
27	0.020	242	0.027	0.047

Dark Plus Tab - Perident Annual VMT	Dark Blue Tab - Resident Annual VMT Campus Residents		Assume same as weekday (2)	Assume same as weekday (2)	Alameda CTC Model
Dark blue rab - Resident Annuar vivi	campus residents	Number	Daily Trip Rate Weekend	Average Daily Trip Lengths - Weekend	VMT/Unit
ANNUAL_RES_FACULTY	Faculty	32	0	0	7.6
ANNUAL_RES_GRAD	Graduate Students	250	0.3	2	
ANNUAL_RES_UNDERGRAD	Undergraduate Students	8,722	0.3	2	

Note: Resident days/year is directly entered in the calculation tabs, and is not pulled from this tab.

Commuter Daily VMT Home-Work trips

VL DAILY_COM_STAFF DAILY_COM_FACULTY DAILY_COM_GRAD DAILY_COM_UNDERGRAD

	Commuter Population	Commute Frequency (% of population on campus daily)	Drive-alone mode split	Carpool mode split	Carpool occupancy	TNC Mode Split	Worker trip lengths	Daily VMT	Daily VMT/Commuter
Staff	12,145	92.95%	0.51	0.07	2.4	0.01	14.2	176,062	14.50
Commuting Faculty	3,244	90.45%	0.46	0.05	2.4	0.01	6.6	19,011	5.8
Commuting Graduate Students	9,526	91.92%	0.07	0.01	2.4	0.01	13.7	20,193	2.12
Commuting Undergraduate Students	21,210	97.02%	0.04	0	2.4	0.01	15.1	31,071	1.46
Total								246,338	

Residential Daily VMT

All Home-Based Trips

VL WEEKDAY_RES_FACULTY WEEKDAY_RES_GRAD WEEKDAY_RES_UNDERGRAD

	Number	Daily Trip Rate Weekday	Resident Trip Lengths	VMT/Faculty Unit Rate	VMT	VMT/Resident
Resident Faculty	32	0	0	7.6	243	7.60
Resident Graduate Students	250	0.3	2		150	0.60
Resident Undergraduate Students	8,722	0.3	2		5,233	0.60
Existing apartments on HP #1 Site	8	10.4	2.1		175	21.84
Total					5,801	

VMT Generated by Students, Faculty and Staff VMT Metrics

Population	Number	Daily VMT Rate	Rate per	VMT Type	Baseline Daily VMT
Commuters					
Staff	12,145	14.50	Commuter	Home based - work trips	176,062
Faculty	3,244	5.86	Commuter	Home based - work trips	19,011
Graduate Students	9,526	2.12	Commuter	Home based - work trips	20,193
Undergraduate Students	21,210	1.46	Commuter	Home based - work trips	31,071
Total	46,125				246,338
Residents					
Faculty	32	7.6	Residential Unit	Home based trips	243
Graduate Students	250	0.60	Bed	Home based trips	150
Undergraduate Students	8,722	0.60	Bed	Home based trips	5,233
Total Residential VMT	9,004				5,626
Total VMT					251,964

			Existing Camp	us Metrics			
	Metric 1	Metric 1 Metric 2 Metric 3 Metric 4 Me					
	Daily Home-Work VMT per Faculty, Staff and Student Population	Daily Home Based VMT per Resident Student	Daily Home Based VMT per Resident Faculty	Daily VMT per all Students	Daily VMT per all Staff and Faculty	Daily VMT per all Students, Staff and Faculty	
VMT	246,338	5,383	243	56,647	195,317	251,964	
Population	46,125	8,972	32	39,708	15,421	55,129	
VMT/Population	5.34	0.60	7.60	1.43	12.67	4.57	
Regional Average VMT/Population	18.1	19.8	19.8				
Threshold: 15% Below Regional Average	15.4	16.9	16.9	The regional baseline	e thresholds do not ap	oply to Metrics 4 - 6	
Threshold met under Existing Conditions?	Yes (5.34 < 15.4)	Yes (0.60 < 16.9)	Yes (7.60 < 16.9)				
Campus Baseline VMT/Population Threshold: No Worse than Baseline	The campus baseline thresholds do not apply to Metrics 1 - 3 Campus baseline thresholds apply only to the Baseline and Cumulative With Project impact assessm						

VMT Analysis Guide 10/10/2020

This file contains the LRDP Build-Out VMT estimates.

Unique Inputs

Unique Outputs (shown in calculation tabs)

		LRDP Project Description (1)			Campus Travel Survey (CTS)				Commuter Residence GIS Database	
Light Gold Tab - Commuter Daily and VMT	Populations (1)	Total Population	Resident Population	Commuter Population	Commute Frequency (% of population on campus daily)	Drive-alone mode split	Carpool mode split	Carpool occupancy	TNC Mode Split	Worker Trip lengths
DAILY_COM_STAFF DAILY_COM_FACULTY DAILY_COM_GRAD DAILY_COM_UNDERGRAD	Staff Faculty Graduate Students Undergraduate Students	LRDP Project Description	"Total Beds" from Project Description	Total Population minus Total Beds	% of population on campus Sun-Sat	% of population that answered "Drive Alone" in CTS	% of population that answered "Carpool" in CTS	California Household Travel		Network distance to campus from address location data set

Gold Tab - Commuter Annual VMT	Populations (1)	From UCB 2020 - 2021 Calendar
Gold Tab - Commuter Annual Vivi	Populations (1)	Work days per year
ANN_COM_STAFF	Staff	See calcluations in OK19-
ANN_COM_FACULTY	Faculty	0321.00/Data Collection/Project
ANN_COM_GRAD	Graduate Students	Description/'Project Description
ANN_COM_UNDERGRAD	Undergraduate Students	10/6/20'.

Light Blue Tab - Resident Weekday VMT	Campus Residents	LRDP Project Description	Model (fac) and ITE/ACS (students)	Model
		Number	Daily Trip Rate Weekday	Resident Trip Lengths
WEEKDAY_RES_FACULTY	Faculty	LRDP Project Description	Use VMT Rate direct from model TAZ 88, adjusted for faculty housing: 7.6 VMT/unit	See left
WEEKDAY_RES_GRAD	Graduate Students	LRDP Project Description	Driving mode share=0.16. 1 84X0 16=0 30 Note this	Model trip length for zones around campus = 2.0. Note this applies to partners as well.
WEEKDAY_RES_UNDERGRAD	Undergraduate Students	LRDP Project Description		Model trip length for zones around campus = 2.0

TNC Counts	TNC Counts TNC Trip Rate	
27	0.020	242

Dark Blue Tab - Resident Annual VMT	Campus Residents	LRDP Project Description	Assume same as weekday (2)	Assume same as weekday (2)	From 2020-2021 Academic Calendar
Dark blue Tab - Kesident Annual Vivi	Campus Residents	Number	Daily Trip Rate Weekend	Average Daily Trip Lengths - Weekend	# Resident Days/Year
			Use VMT Rate direct from		
		LRDP Project Description	model TAZ 88, adjusted for	See left	
ANNUAL_RES_FACULTY	Faculty		faculty housing: 7.6 VMT/unit		See calcluations in OK19-
			ITE MF Housing=1.84; ACS		0321.00/Data
			Driving mode share=0.16.	Model trip length for zones	Collection/Project
		LRDP Project Description	1.84X0.16=0.30. Note this	around campus = 2.0. Note this	Description/'Project
ANNUAL_RES_GRAD	Graduate Students		applies to partners as well.	applies to partners as well.	Description10-6-20'.
				Model trip length for zones	
ANNUAL_RES_UNDERGRAD	Undergraduate Students	LRDP Project Description	Same as Grads	around campus = 2.0	

Worsheet Input Data

Unique Inputs Unique Outputs (shown in calculation tabs)

			LRDP Project Description (1)			Campus Travel Survey				
Light Gold Tab - Commuter Daily and VMT	Populations (1)	Total Population	Resident Population	Commuter Population	Commute Frequency (% of population on campus daily)		Carpool mode split	Carpool occupancy	TNC Mode Split	Worker Trip lengths
DAILY_COM_STAFF	Staff	14,800	-	14,800	92.9%	51%	7%	2.4	1%	14.2
DAILY_COM_FACULTY	Faculty	4,200	581	3,619	90.5%	46%	5%	2.4	1%	6.6
DAILY_COM_GRAD	Graduate Students	13,200	2,315	10,885	91.9%	7%	1%	2.4	1%	13.7
DAILY_COM_UNDERGRAD	Undergraduate Students	35,000	17,730	17,270	97.0%	4%	0%	2.4	1%	15.1

Gold Tab - Commuter Annual VMT	Populations (1)	LRDP Project Description	Weekend Travel to Campus Compared to Weekday
ANN_COM_STAFF	Staff	14,800	10%
ANN_COM_FACULTY	Faculty	3,619	21%
ANN_COM_GRAD	Graduate Students	10,885	35%
ANN_COM_UNDERGRAD	Undergraduate Students	17,270	68%

Note: Commute days/year is directly entered in the calculation tabs, and is not pulled from this tab.

		LRDP PD	ITE and CHTS	Alameda CTC Model	Alameda CTC Model
Light Blue Tab - Resident Weekday VMT	Campus Residents	Number	Daily Trip Rate Weekday	Resident Trip Lengths	VMT/Unit
WEEKDAY_RES_FACULTY	Faculty	581			7.6
WEEKDAY_RES_GRAD	Graduate Students	2315	0.3	2.0	
WEEKDAY RES UNDERGRAD	Undergraduate Students	17730	0.3	2.0	

TNC Counts	TNC Trip Rate	Owned Car Trips	Owned Car Trip Rate	Combined Trip Rate
27	0.020	242	0.027	0.047

Dark Blue Tab - Resident Annual VMT	Campus Residents	LRDP PD	Assume same as weekday (2)	Assume same as weekday (2)	Alameda CTC Model	
	Campus Residents	Number	Daily Trip Rate Weekend	Average Daily Trip Lengths - Weekend	VMT/Unit	
ANNUAL_RES_FACULTY	Faculty	581	0	0	7.6	
ANNUAL_RES_GRAD	Graduate Students	2,315	0.3	2		
ANNUAL RES UNDERGRAD	Undergraduate Students	17,730	0.3	2		

Note: Resident days/year is directly entered in the calculation tabs, and is not pulled from this tab.

Commuter Daily VMT Home-Work trips

VL DAILY_COM_STAFF DAILY_COM_FACULTY DAILY_COM_GRAD DAILY_COM_UNDERGRAD

	Commuter Population	Commute Frequency (% of population on campus daily)	Drive-alone mode split	Carpool mode split	Carpool occupancy	TNC Mode Split	Worker trip lengths	2040 Factor	Daily VMT	Daily VMT/ Commuter
Staff	14,800	92.95%	0.51	0.07	2.4	0.01	14.2	1.00	214,551	14.50
Commuting Faculty	3,619	90.45%	0.46	0.05	2.4	0.01	6.6	1.00	21,209	5.86
Commuting Graduate Students	10,885	91.92%	0.07	0.01	2.4	0.01	13.7	1.00	23,074	2.12
Commuting Undergraduate Students	17,270	97.02%	0.04	0	2.4	0.01	15.1	1.00	25,299	1.46
Total									284,133	
	Commuting Faculty Commuting Graduate Students Commuting Undergraduate Students	Population Staff 14,800 Commuting Faculty 3,619 Commuting Graduate Students 10,885 Commuting Undergraduate Students 17,270	Commuter Population Frequency (% of population on campus daily) Staff 14,800 92.95% Commuting Faculty 3,619 90.45% Commuting Graduate Students 10,888 91.92% Commuting Undergraduate Students 17,270 97.02%	Commuter Population Frequency population campus daily 3 (51) (% of population population campus daily 3 (51) Drive-alone mode split Staff Population (% of population on campus daily 3 (51) Drive-alone mode split Staff Population (% of population on campus daily 3 (51) 0 0 Staff 14,800 92.95% 0.51 0.46 Commuting Graduate Students 10,885 91.92% 0.07 Commuting Undergraduate Students 17,270 97.02% 0.04	Commuter Population Frequency population campus daily Drive-alone mode split Carpool mode split Staff 14,800 92.95% 0.51 0.07 Commuting Faculty 3,619 90.45% 0.46 0.05 Commuting Graduate Students 10,885 91.92% 0.007 0.01 Commuting Undergraduate Students 17,270 97.02% 0.04 0	Commuter Population Frequency population on campus daily) Drive-alone mode split Carpool mode split Carpool occupancy Staff 14,800 92.95% 0.51 0.07 2.4 Commuting Faculty 3,619 90.45% 0.46 0.05 2.4 Commuting Graduate Students 10,885 91.92% 0.07 0.01 2.4 Commuting Undergraduate Students 17,270 97.02% 0.04 0 2.4	Commuter PopulationFrequency (% of population on campus daily)Drive-alone mode splitDrive-alone mode splitCarpool occupancyTNC Mode SplitStaff14,80092.95%0.510.0072.40.01Commuting Faculty3,61990.45%0.460.052.40.01Commuting Graduate Students10,88591.92%0.070.012.40.01Commuting Undergraduate Students17,27097.02%0.0402.40.01	Commuter PopulationFrequency (% of population on campus daily)Drive-alone mode splitCarpool mode splitCarpool occupancyTNC Mode SplitWorker trip lengthsStaff14,80092.95%0.510.072.40.0114.2Commuting Faculty3,61990.45%0.460.052.40.0116.6Commuting Graduate Students17,27097.02%0.0402.40.0113.7	Commuter PopulationFrequency opulationOrive-alone mode spitCarpool mode spitCarpool occupancyTNC Mode SpitWorker trip lengths2040 FactorStaff14,80092.95%0.0510.072.40.0114.21.00Commuting Faculty3,61990.45%0.060.052.40.0114.21.00Commuting Graduate Students10,85591.92%0.000.012.40.0113.71.00Commuting Undergraduate Students17,27097.02%0.0402.40.0115.11.00	Commuter PopulationFrequency (% of population on campus daily)Drive-alone mode splitDrive-alone mode splitCarpool occupancyTNC Mode SplitWorker trip lengths2040 FactorDaily VMTStaff14,80092.95%0.0510.0072.40.0114.21.00214,551Commuting Faculty3,61990.45%0.460.052.40.0116.61.0021,209Commuting Graduate Students10,88591.92%0.070.012.40.0113.71.0023,074Commuting Undergraduate Students17,27097.02%0.0402.40.0115.11.0025,299

Residential Daily VMT

All Home-Based Trips

VL WEEKDAY_RES_FACULTY WEEKDAY_RES_GRAD WEEKDAY_RES_UNDERGRAD

	Number	Daily Trip Rate Weekday	Resident Trip Lengths	VMT/Faculty Unit Rate	2040 Factor	VMT	VMT/Resident or Unit
Resident Faculty	581	0	0	7.6	1.00	4,416	7.60
Resident Graduate Students and Partners*	3,348	0.3	2		1.00	2,009	0.60
Resident Undergraduate Students	17,730	0.3	2		1.00	10,638	0.60
Existing apartments on HP #1 Site	(8)	10.4	2.1		1.00	(175)	21.84
Supportive Housing at HP #2	125	0.3	2		1.00	75	0.6
Total						16,962	

* Incorporates 0.5 partners per new graduate student bed, based on UCB direction.

VMT Generated by Students, Faculty and Staff LRDP Build-Out

Population	Number	Daily VMT Rate	Rate per	VMT Type	2040 + Project Daily VMT	2019 + Project Daily VMT
Commuters						
Staff	14,800	14.50	Commuter	Home based - work trips	214,551	214,551
Faculty	3,619	5.86	Commuter	Home based - work trips	21,209	21,209
Graduate Students	10,885	2.12	Commuter	Home based - work trips	23,074	23,074
Undergraduate Students	17,270	1.46	Commuter	Home based - work trips	25,299	25,299
Total	46,574				284,133	284,133
Residents						
Faculty	581	7.60	Residential Unit	Home based trips	4,416	4,416
Graduate Students	2,315	0.60	Bed	Home based trips	2,009	2,009
Undergraduate Students	17,730	0.60	Bed	Home based trips	10,638	10,638
Total Residential VMT	20,626				17,062	17,062
Total VMT					301,195	301,195

		Existing (Baseline) With Project Metrics						
		Metric 1	Metric 2	Metric 3	Metric 4	Metric 5	Metric 6	
ly VMT		Daily Home-Work VMT per Faculty, Staff and Student Population	Daily Home Based VMT per Resident Student	Daily Home Based VMT per Resident Faculty	Daily VMT per all Students	Daily VMT per all Staff and Faculty	Daily VMT per all Students, Staff and Faculty	
	VMT	284,133	12,647	4,416	61,020	240,175	301,195	
	Population	46,574	20,045	581	48,200	19,000	67,200	
14,551	VMT/Population	6.10	0.63	7.60	1.27	12.64	4.48	
21,209	Regional Average VMT/Population	18.1	19.8	19.8				
23,074	Threshold: 15% Below Regional Average	15.4	16.9	16.9	The regional ba	seline thresholds do not apply	to Metrics 4 - 6	
25,299	Threshold met under Baseline With Project Conditions?	Yes (6.10 < 15.4)	Yes (0.63< 16.9)	Yes (7.60 < 16.9)				
84,133	Campus Baseline VMT/Population				1.43	12.67	4.57	
	Threshold: No Worse than Baseline	eline thresholds do not apply	to Metrics 1 - 3	1.43	12.67	4.57		
	Threshold Met under Baseline With Project Conditions?				Yes (1.27 < 1.43)	Yes (12.64 < 12.67)	Yes (4.48 < 4.57)	
2,009 10,638 17,062				Cumulative (2040)	With Project Metrics		1	
17,002		Metric 1	Metric 2	Metric 3	Metric 4	Metric 5	Metric 6	
01,195		Daily Home-Work VMT per Faculty, Staff and Student Population		Daily Home Based VMT per Resident Faculty	Daily VMT per all Students	Daily VMT per all Staff and Faculty	Daily VMT per all Students, Staff and Faculty	
	VMT	284,133	12,647	4,416	61,020	240,175	301,195	
	Population	46,574	20,045	581	48,200	19,000	67,200	
	VMT/Population	6.10	0.63	7.60	1.27	12.64	4.48	
	Regional Average VMT/Population	18.3	19.1	19.1				
	Threshold: 15% Below Regional Average	15.5		16.2				
	Threshold met under Baseline With Project Conditions?	Yes (6.10 < 15.5)	Yes (0.63 < 16.2)	Yes (7.6 < 16.2)				
	Campus Baseline VMT/Population				1.43	12.67	4.57	
	Threshold: No Worse than Baseline	The campus bas	eline thresholds do not apply	to Metrics 1 - 3	1.43	12.67	4.57	
	Threshold Met under Baseline With Project Conditions?				Yes (1.27 < 1.43)	Yes (12.64 < 12.67)	Yes (4.48 < 4.57)	

1.43 1.43 Yes (1.27 < 1.43)