memorandum

DATE: October 7, 2020

TO: Meghan Macias, TE, EPD Solutions

FROM: Sandipan Bhattacharjee, PE, TE, AICP, ENV-SP

SUBJECT: Iris Park – VMT Analysis

Translutions, Inc. (Translutions) is pleased to provide this memorandum discussing the Vehicle Miles Traveled (VMT) evaluation for the proposed Iris Park residential project (the Project). This report is intended to satisfy the requirements for a VMT analysis established by the City of Moreno Valley *Traffic Impact Analysis Guidelines* (June 2020), as well as the requirements for the disclosure of potential impacts and mitigation measures per the California Environmental Quality Act (CEQA). The proposed project site is located on the south side of Iris Avenue east of Perris Boulevard in the City of Moreno Valley. The project proposes the construction of 81 single family homes.

BACKGROUND AND GUIDANCE

Senate Bill 743 (SB-743), which was codified in Public Resources Code section 21099, was signed by the Governor in 2013 and directed the Governor's Office of Planning and Research (OPR) to identify alternative metrics for evaluating transportation impacts under CEQA. Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Recently adopted changes to the CEQA Guidelines in response to Section 21099 include a new section (15064.3) that specifies that Vehicle Miles Traveled (VMT) is the most appropriate measure of transportation impacts. A separate Technical Advisory issued by OPR provides additional technical details on calculating VMT and assessing transportation impacts for various types of projects.

The City of Moreno Valley has prepared updated *Traffic Impact Analysis Guidelines* (Guidelines) for Land Use Projects in June 2020 to address changes to CEQA pursuant to SB-743 to include VMT analysis methodology and thresholds. The City recommends using VMT per capita for home-based trips for residential projects. Based on the Guidelines, a project would result in a significant project generated VMT impact under either of the following conditions:

1. A project would have a significant VMT impact if, in the Existing Plus Project scenario, its net VMT per capita (for residential projects) or per employee (for office and industrial projects) exceeds the average VMT for Moreno Valley. For all other uses, a net increase in VMT would be considered a significant impact.
2. If a project is consistent with the regional RTP/SCS, then the cumulative impacts shall be considered less than significant subject to consideration of other substantial evidence. If it is not consistent with the RTP/SCS, then it would have a significant VMT impact if:
    a. For residential projects its net VMT per capita exceeds the average VMT per capita for Moreno Valley in the RTP/SCS horizon-year.
    b. For office and industrial projects its net VMT per employee exceeds the average VMT per employee for Moreno Valley in the RTP/SCS horizon-year
    c. For all other land development project types, a net increase in VMT in the RTP/SCS horizon-year would be considered a significant impact.

While the City doesn't specify impact thresholds for project effect on VMT, the Guidelines require disclosure of the cumulative link-level boundary VMT per service population within City of Moreno Valley increases under the plus project condition compared to the no project condition.

Analysis Methodology. The VMT analysis was conducted using two steps. First, the Per Capita VMT was calculated from the Riverside Transportation Analysis Model (RivTAM). Since the project includes several project characteristics which reduce VMT but cannot be evaluated using the RivTAM, those calculations were conducted off-model. The methodology for the analysis is discussed below.

- **RivTAM Calculations.** The RivTAM uses a base year of 2012 and a future year of 2040. Both the base year and future year models were run for the without and with project scenarios. VMT outputs are included in Attachment A. Consistent to the Guidelines, the baseline (2020) conditions VMT was calculated by interpolating between the Base Year (2012) and Future Year (2040) RivTAM runs. As with the Baseline Without Project Conditions, the Project Baseline (2020) conditions were calculated by interpolating between the Base Year (2012) and Future Year (2040) RivTAM runs. The base and future year "plus project" conditions VMT was derived by adding the project land use to a separate TAZ and full model runs were performed to isolate the VMT for the project. The project generated VMT was extracted from the RivTAM using the production-attraction (P/A) trip matrix to isolate the VMT related to home-based-trips to isolate the residential VMT.
- **Off-Model Calculations.** The RivTAM is not very responsive to some land use inputs such as increased density, bicycle and pedestrian connections, and proximity to transit (for example, TAZs are typically large which precludes the 0.25-mile transit accessibility radius). VMT reductions from such inputs are typically conducted outside the model. This section discusses the methodology applied for project characteristics that cannot be adequately evaluated in the model. The project includes the following Project Design Features (PDFs) that the RivTAM is not responsive to:
    - The project will participate is the construction and maintenance of a trail along its westerly edge which will connect to the existing trail south of the project site. There will be two pedestrian access points to the trail through the wall on the western boundary. This trail will provide easy access to the retail uses adjacent to the project site as well as a bike/pedestrian connection to Val Verde Academy, also located adjacent to the project site. This trail completion will also connect Iris Avenue to other development to the south of the project. Due to the fact that the RivTAM does not adequately account for active transportation modes, VMT reductions due to the trail completion was based on percentage reduction in VMT based on annual VMT under a business as usual (no trail scenario) and reductions under "with trail" conditions from the California Emissions Estimator Model (CalEEMod). It should be noted that since only percentage reductions were used, trip parameters in the CalEEMod were not changed.
    - The project is located adjacent to a Riverside Transit Agency bus stop (Route 19). RTA Roue 19 operates with 15-minute headways during peak hours of operation and at less than 30-minute headways during other times in each direction. The bus stop is steps away from the main project entrance on Iris Avenue. Due to the fact that the RivTAM does not adequately evaluate diversion to transit, the modeled project VMT was based on a business as usual (no transit scenario). Reductions in VMT from adjacent transit were calculated using CalEEMod. Again, since only percentage reductions were used, trip parameters in the CalEEMod were not changed.
    - The existing General Plan designation allows for a maximum density of 5 DU/Acre. The project proposes General Plan Amendment to allow a density of 7.57 DU/Acre. Since the RivTAM does not account for density, VMT reductions due to increased density was based on guidance provided in the California Air Pollution Control Officers Association (CAPCOA) Table 6-2. According to the CAPCOA Guidance, VMT reductions between 1.5% and 30% can occur due to increased density. Site specific reduction percentages were calculated based on the CAPCOA Quantification Document by multiplying the percentage increase in density by the density elasticity (0.07) from the *Cervero & Ewing*[1].

PROJECT ANALYSIS

RivTAM Analysis. As stated earlier, the first part of the VMT analysis was conducted using the RivTAM. Table A summarizes the findings of the Base Year (2012) model runs while Table B summarizes the findings of the Future Year (2040) model runs respectively. As seen on Table B, the Future Year (2040) project VMT per Capita is 11.8 miles, which is less than the City of Moreno Valley VMT/Capita of 13.7 miles, showing a less than significant impact under cumulative conditions.

[1] Ewing R, Cervero R. Travel and the Built Environment: A Meta-Analysis. *Journal of the American Planning Association*. 2010;76(3):265-294. doi:10.1080/01944361003766766

Table A - Base Year (2012) Model VMT Summary

	Homebased VMT	Total Households	Total Population	VMT/Capita
Iris Park (Project)	4,937	81	343	14.4
City of Moreno Valley *				12.8

*From WRCOG

Table B - Future Year (2040) Model VMT Summary

	Homebased VMT	Total Households	Total Population	VMT/Capita
Iris Park (Project)	4,039	81	343	11.8
City of Moreno Valley *				13.7

*From WRCOG

Based on the City's Guidelines, Baseline VMT was calculated by interpolating between the model base and future years. Table C shows the resulting VMT for the City and the Project. As seen on Table C, the project VMT per Capita is 13.6 miles, which is 4.58% greater than the City of Moreno Valley VMT/Capita of 13.0 miles.

Table B - Future Year (2040) Model VMT Summary

	Homebased VMT	Total Households	Total Population	VMT/Capita
Iris Park (Project)	4,681	81	343	13.6
				13.0
Project VMT as a Percentage of City				**104.58%**

*From WRCOG

The City also requires analysis of project effect on VMT within the City's roadways for disclosure although no thresholds are specified. This analysis was based on the RivTAM. Tables D, E, and F show the results of the analysis for the Base Year (2012), Future Year (2040), and Baseline Year (2020) conditions. As seen from the table, the project reduces per capita VMT within the City limits under all scenarios.

Table D - City of Moreno Valley - Project Effect on VMT (Base Year 2012)

	Without Project	With Project
Roadway VMT	1,717,720	1,716,263
Service Population	225,662	226,005
VMT/Service Population	7.61	7.59

Table E - City of Moreno Valley - Project Effect on VMT (Future Year 2040)

	Without Project	With Project
Roadway VMT	2,783,726	2,759,709
Service population	307,007	307,350
VMT/Service population	**9.07**	**8.98**

Table F - City of Moreno Valley - Project Effect on VMT (Baseline Year 2020)

	Without Project	With Project
Roadway VMT	2,022,293	2,014,391
Service population	248,903	249,246
VMT/Service population	**8.12**	**8.08**

Off-Model Analysis. As stated earlier, specific project design features that cannot be conducted using the RivTAM were calculated separately using CalEEMod and CAPCOA guidelines. Table G shows the calculations for these reductions. CalEEMod worksheets are included in Attachment B.

Table G - VMT Reductions due to Project Design Features

	Annual VMT	% Reduction	Source
BAU VMT	2,669,967		CalEEMod
Pedestrian Connections Off Site	2,616,568	2.00%	CalEEMod
Proximity to Transit	2,536,469	5.00%	CalEEMod
Increase Density (Compared to GP)		3.60%	LUT 1 (CAPCOA)
Mitigated VMT	2,387,004		
Reduction Due to PDFs	**89.40%**	**10.60%**	

Table H shows the project generated VMT after accounting for these project features. As shown on Table H, the project VMT is lower than the City VMT for both the baseline and cumulative conditions. Therefore, the project will have less than significant VMT impacts under CEQA.

Table H - Project VMT Including Project Design Features

	Project VMT/Capita	% of City VMT
Baseline (2020) Project VMT/Capita (from RivTAM)	13.6	104.58%
Baseline (2020) Project VMT/Capita After PDF	**12.2**	**93.50%**
Cumulative (2040) Project VMT/Capita (from RivTAM)	11.8	86.15%
Cumulative (2040) Project VMT/Capita (after PDFs)	**10.5**	**80.67%**

CONCLUSION

The project generated VMT is under baseline conditions is 12.2 miles which is less than the City average of 13.0 miles. The project generated VMT under cumulative conditions is 10.5 miles, which is less than the City average of 13.7 miles. Therefore, the project has a less than significant VMT impact under CEQA. The "with project" VMT per service population on City roadways under the baseline and cumulative conditions are less than those under "without project" conditions.

Enclosures:

- Attachment A – RivTAM Outputs
- Attachment B – CalEEMod Reduction Worksheets

2012 (With Project)

Iris Park

[seq #]	1	3800
TAZ_ID	1	404190680
District	1	4
POP	1	343
RES	1	343
HH	1	81
Tot_emp	1	0
MS_HBWA_VMT	1	0
MS_HBP_VMT	1	4,937
MS_TotP_VMT	1	5,186
MS_TotA_VMT	1	1,074
OD_CarP_VMT	1	5,773
OD_CarA_VMT	1	6,498
OD_CarP_Trps	0	
OD_CarA_Trps	0	
OD_TrkP_VMT	1	66
OD_TrkA_VMT	1	66
OD_TrkP_Trps	0	
OD_TrkA_Trps	0	
OD_TotP_VMT	1	5,839
OD_TotA_VMT	1	6,564

Tot HBP_VMT	4,937
TotHBWA_VMT	-
TotPA_VMT	6,259
TotOD_VMT	12,403
Tot_SerPop	343
VMT/Cap	14.4
VMT/Emp	#DIV/0!
PAVMT/Serpop	18.2
ODVMT/Serpop	36.2

City of Moreno Valley

no project run

[seq #]	76	290786	
TAZ_ID	76	30718493666	
District	76	304	
POP	76	195,012	194,669
RES	76	194,477	194,134
HH	76	51119	
Tot_emp	76	30993	
MS_HBWA	76	346288.913	
MS_HBP_V	76	2579312.307	
MS_TotP_\	76	3156409.734	
MS_TotA_\	76	1693070.496	
OD_CarP_\	76	2548752.618	
OD_CarA_\	76	2587049.795	
OD_CarP_T	0		
OD_CarA_T	0		
OD_TrkP_\	76	99754.30709	
OD_TrkA_\	76	99688.2399	
OD_TrkP_T	0		
OD_TrkA_T	0		
OD_TotP_\	76	2648506.925	
OD_TotA_\	76	2686738.035	

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Tot HBP_VMT	2,579,312	2,575,208
TotHBWA_VMT	346,289	
TotPA_VMT	4,849,480	
TotOD_VMT	5,335,245	
Tot_SerPop	226,005	
VMT/Cap	13.3	13.3
VMT/Emp	11.2	
PAVMT/Serpop	21.5	
ODVMT/Serpop	23.6	

with project	dy_vmt	644	1,716,263
	dy_vmt/serpop		7.59
no project	dy_vmt	644	1,717,720
	dy_vmt/serpop		7.61

2040 (With Project)

Iris Park

[seq #]	1	3800
TAZ_ID	1	404190680
District	1	4
POP	1	343
RES	1	343
HH	1	81
Tot_emp	1	-
MS_HBWA_VMT	1	-
MS_HBP_VMT	1	4,039
MS_TotP_VMT	1	4,238
MS_TotA_VMT	1	1,095
OD_CarP_VMT	1	6,657
OD_CarA_VMT	1	7,413
OD_CarP_Trps	0	
OD_CarA_Trps	0	
OD_TrkP_VMT	1	537
OD_TrkA_VMT	1	537
OD_TrkP_Trps	0	
OD_TrkA_Trps	0	
OD_TotP_VMT	1	7,194
OD_TotA_VMT	1	7,950

Tot HBP_VMT	4,039
TotHBWA_VMT	-
TotPA_VMT	5,334
TotOD_VMT	15,143
Tot_SerPop	343
VMT/Cap	11.8
VMT/Emp	#DIV/0!
PAVMT/Serpop	15.5
ODVMT/Serpop	44.1

City of Moreno Valley

no project run

[seq #]	76	290786	
TAZ_ID	76	30718493666	
District	76	304	
POP	76	247,284	246941
RES	76	246,624	246,281
HH	76	71,527	
Tot_emp	76	60,066	
MS_HBWA	76	741,364	
MS_HBP_V	76	3,360,590	
MS_TotP_\	76	4,210,184	
MS_TotA_\	76	2,794,036	
OD_CarP_\	76	3,713,061	
OD_CarA_\	76	3,782,958	
OD_CarP_T	0		
OD_CarA_T	0		
OD_TrkP_V	76	177,362	
OD_TrkA_\	76	177,315	
OD_TrkP_T	0		
OD_TrkA_T	0		
OD_TotP_\	76	3,890,424	
OD_TotA_\	76	3,960,273	

Tot HBP_VMT		3,360,590	3,366,152
TotHBWA_VMT		741,364	
TotPA_VMT		7,004,220	
TotOD_VMT		7,850,697	
Tot_SerPop		307,350	
VMT/Cap		13.6	13.7
VMT/Emp		12.3	
PAVMT/Serpop		22.8	
ODVMT/Serpop		25.5	
dy_vmt	849	2,759,709	
dy_vmt/serpop		8.98	

no project

dy_vmt	849	2,783,726	
dy_vmt/serpop		9.06	

Iris Park

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	82.00	Dwelling Unit	16.40	164,549.00	343

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area & Site Acreage from Site Plan
Population from RivTAM

Mobile Land Use Mitigation -

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	147,600.00	164,549.00
tblLandUse	LotAcreage	26.62	16.40
tblLandUse	Population	235.00	343.00
tblProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.8000e-004	1.8300e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4626	0.4626	2.0000e-005	0.0000	0.4629
Total	**1.3000e-004**	**1.8000e-004**	**1.8300e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4626**	**0.4626**	**2.0000e-005**	**0.0000**	**0.4629**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3934	1.3003	4.4402	0.0140	0.9924	0.0218	1.0142	0.2652	0.0201	0.2853	0.0000	984.4853	984.4853	0.0292	0.0000	985.0973
Unmitigated	0.3960	1.3230	4.5027	0.0143	1.0127	0.0222	1.0349	0.2706	0.0204	0.2911	0.0000	1,004.0198	1,004.0198	0.0297	0.0000	1,004.6433

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	784.74	826.56	719.14	2,669,967	2,616,568
Total	784.74	826.56	719.14	2,669,967	2,616,568

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.457065	0.068684	0.178597	0.172280	0.046891	0.007460	0.012475	0.043976	0.000902	0.001056	0.006515	0.000828	0.003272

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Iris Park

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	82.00	Dwelling Unit	16.40	164,549.00	343

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area & Site Acreage from Site Plan
Population from RivTAM

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Table Name	Column Name	Default Value	New Value
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tblLandUse	Population	235.00	343.00
tblProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.8000e-004	1.8300e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4626	0.4626	2.0000e-005	0.0000	0.4629
Total	**1.3000e-004**	**1.8000e-004**	**1.8300e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4626**	**0.4626**	**2.0000e-005**	**0.0000**	**0.4629**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3895	1.2661	4.3463	0.0136	0.9621	0.0211	0.9832	0.2571	0.0195	0.2766	0.0000	955.1835	955.1835	0.0283	0.0000	955.7784
Unmitigated	0.3960	1.3230	4.5027	0.0143	1.0127	0.0222	1.0349	0.2706	0.0204	0.2911	0.0000	1,004.0198	1,004.0198	0.0297	0.0000	1,004.6433

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	784.74	826.56	719.14	2,669,967	2,536,469
Total	784.74	826.56	719.14	2,669,967	2,536,469

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.457065	0.068684	0.178597	0.172280	0.046891	0.007460	0.012475	0.043976	0.000902	0.001056	0.006515	0.000828	0.003272

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy