
APPENDIX 1-3

DOWNTOWN SPECIFIC PLAN VMT STUDY



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TECHNICAL MEMORANDUM

Date: August 31, 2022

To: Karen Gulley, PlaceWorks

From: Brian Marchetti, AICP

Subject: Vehicle Miles Traveled (VMT) Analysis – San Bernardino Downtown Specific Plan

In order to analyze Downtown Specific Plan project impacts under California Environmental Quality Act (CEQA) guidelines using vehicle miles traveled (VMT) metrics, the no-project and Plan land uses were modeled for trip generation and distribution in the San Bernardino Transportation Analysis Model (SBTAM).

The model Transportation Analysis Zones (TAZs) that overlap geographically with the Downtown area were identified and those zones were used to analyze the proposed land use plan. A TAZ map of the Specific Plan area is provided in Figure 1.

VMT numbers per service population were analyzed for the Plan area, the City of San Bernardino, and the County of San Bernardino areas, to review the VMT effects of the Plan versus these area averages, and changes in VMT that would occur due to the Plan. The use of the VMT per service population provides a measure that is consistent with the City guidelines, and it is calculated through the analysis of both employee trips and resident trips. The VMT calculations also include all vehicle trips and trip purposes for these two types of trips. The model has a base year of 2016 and a future buildout year of 2040, and the VMT analysis was conducted for the model buildout year.

Established City guidelines on VMT and CEQA impacts were applied to the analysis to determine significance. The City of San Bernardino *Traffic Impact Analysis Guidelines* of August 2020 define VMT impact thresholds based on baseline values within the City. The thresholds are as follows:

A project would result in a significant project-generated VMT impact if either of the following conditions:

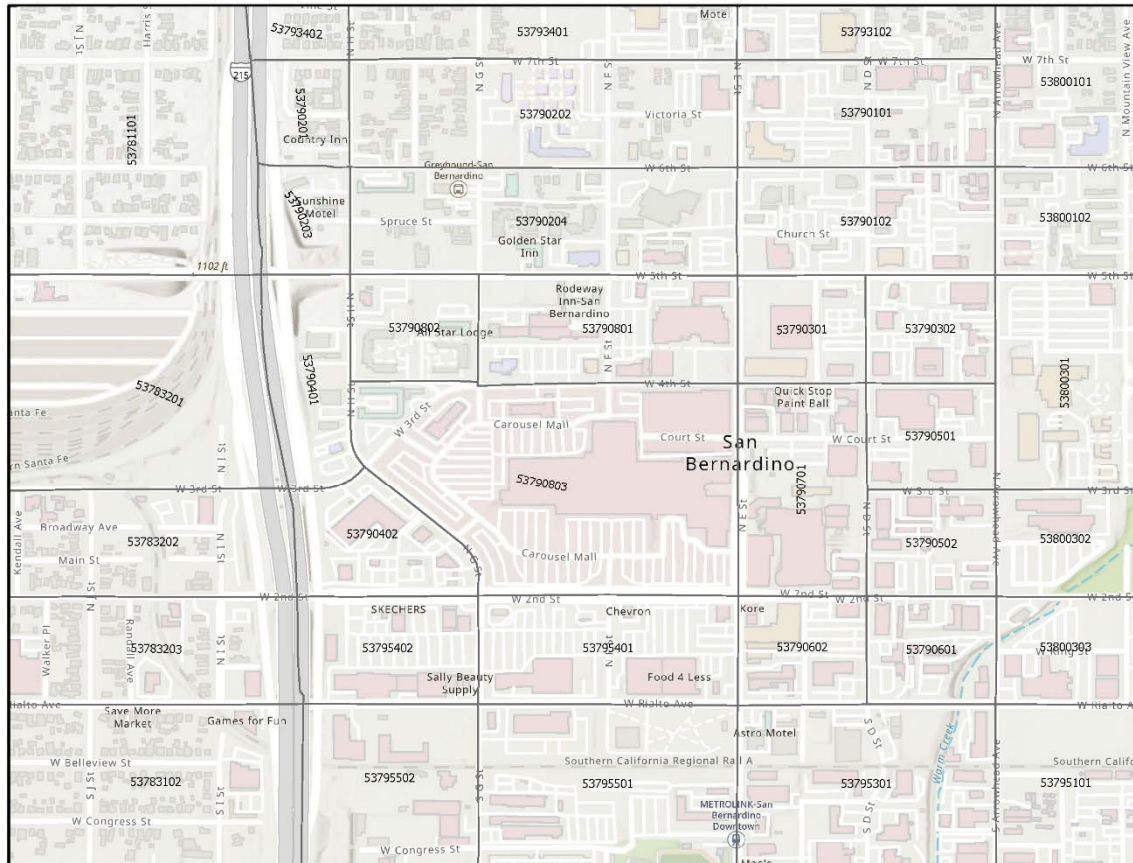
- 1. The baseline project-generated VMT per service population exceeds the City of San Bernardino General Plan Buildout VMT per service population, or*
- 2. The cumulative project-generated VMT per service population exceeds the City of San Bernardino General Plan Buildout VMT per service population.*

The project's effect on VMT would be considered significant if it resulted in [the] following conditions:

1. The cumulative link-level boundary VMT per service population within the City of San Bernardino increases under the plus project condition compared to the no project condition).

Project VMT that is above these thresholds defines a significant CEQA impact.

FIGURE 1 – AREA TRAFFIC ANALYSIS ZONES FOR MODELING





The proposed land uses of the Specific Plan, across eleven analyzed zones within the Downtown area, constitute the following total intensities. These are net totals, after the application of proposed use and removed existing uses and the difference between those added and removed trips:

- 1,418,372 SF of Retail Space
- 1,180,917 SF of Restaurant Space
- 4,335,571 SF of Office Space (includes government and general office spaces)
- 592,240 SF of Light Industrial Space
- 14,195 Dwelling Units of Multifamily Residential

Attachment A provides a breakdown of the proposed net land uses by Plan zone. This zone data was used as input to the residential and employment trips within each model TAZ. Daily trips are provided as a reference in the attachment, taken from the separate circulation analysis for the Specific Plan Mobility Element.

The VMT analysis provides both the project-generated VMT per service population with a comparison to the impact threshold, and it also provides the Plan effect on VMT in an analysis of how the Plan would directly change VMT on area roadway networks. This second analysis focused on city-wide VMT per service population, sub-regional VMT, and County-wide VMT.

Project-generated VMT was extracted from the travel demand forecasting model using the origin-destination trip matrix and those results were multiplied by the final assignment skims, in order to provide both the number of trips and the length of each trip. The Plan effects on VMT were calculated through the use of local and sub-regional boundaries.

Total VMT was defined as the sum of the residential (home-based) VMT and work (home-based work) VMT. The total VMT was then divided by the total service population (residents plus employees) to determine the VMT per service population.

Table 1 provides the baseline and with-Project conditions analysis for the Plan area, the City, and the County:

- The Downtown area has a future baseline VMT per service population of 44.23, and the City has the lowest value at 34.99.
- The County baseline value is in between these VMT numbers, which is 34.99.
- The Downtown area with the Plan land uses would have a total VMT per service population of 24.15, which is approximately 45 percent lower than the baseline average. This indicates that the mix of Plan land uses would have highly beneficial effects on local trip patterns.
- For the City area, the VMT would be approximately 16 percent lower with the Plan, and within the County the VMT would be 11 percent lower.

TABLE 1 – PROJECT LAND USE PLAN TOTAL AREA VMT EFFECTS

FUTURE (2040) WITHOUT PROJECT CONDITIONS					
Area	Total VMT	Residents	Employees	Service Population	Total VMT/SP
Downtown TAZs	1,108,374	5,421	19,639	25,060	44.23
City of San Bernardino	13,140,295	248,002	127,540	375,542	34.99
San Bernardino County	148,990,732	2,721,775	1,027,872	3,749,647	39.73
FUTURE (2040) WITH PROJECT CONDITIONS					
Area	Total VMT	Residents	Employees	Service Population	Total VMT/SP
Downtown TAZs	2,072,594	45,535	40,299	85,834	24.15
City of San Bernardino	12,398,065	280,829	142,173	423,002	29.31
San Bernardino County	131,817,836	2,727,561	1,031,457	3,759,018	35.07

As the Plan would reduce all VMT values for the analyzed local and regional areas, there would not be significant Plan transportation impacts under CEQA.

Table 2 summarizes the direct effect of the Plan on VMT for the City area, adjacent areas including the City within a 10 mile radius, and the County. For the local area analysis in the first two categories that include the City areas and the radius area, model links were selected within the designated areas and then the number of trips along each of these segments was modeled. The number of trips was then multiplied by the length of each segment to determine the daily VMT occurring along each segment. The VMT was then summed for all of the segments.

TABLE 2 – PROJECT LAND USE PLAN VMT

Analysis Region	Future (2040) Conditions - Roadway VMT		
	Without Project	With Project	Change
City of San Bernardino	4,651,827	4,767,563	115,736
With 10 Miles of San Bernardino Downtown	25,284,451	25,201,771	-82,680
County of San Bernardino	86,491,876	86,357,365	-134,510

The project would result in an increase in the VMT along local City roadways. However, for the VMT change on the roadways for the City plus neighboring areas (within a 10 mile radius of the City's downtown and within San Bernardino County), the project results in a decrease in VMT along these roadways as a whole. Adding the Plan uses will, therefore, increase trips locally within the City but will eliminate longer trips that extend beyond the City's boundary, including overall trips within the County that extend beyond the 10-mile radius. Regionally, the project will cause a reduction in VMT. This result also validates the status of no transportation impacts under CEQA for the Plan.

Table 3 provides the baseline and with-Project alternative conditions analysis, for the Plan area, the City, and the County:

- The future baseline numbers are the same as those used for the main Plan analysis in Table 1.
- A single TAZ is analyzed here, as the project alternative is based on the analysis of just the former Carousel Mall site. With the Plan alternative land uses, the mall site VMT per service population would be reduced from 45.17 to 19.71.
- The Downtown area with the Plan alternative land uses would have a total VMT per service population of 33.81, which is approximately 24 percent lower than the baseline average. This indicates that the mix of Plan alternative land uses would have highly beneficial effects on local trip patterns.
- For the City area, the VMT would be approximately 10 percent lower with the Plan, and within the County the VMT would be 11 percent lower.

**TABLE 3 – PROJECT LAND USE PLAN ALTERNATIVE
TOTAL AREA VMT EFFECTS**

FUTURE (2040) WITHOUT PROJECT CONDITIONS					
Area	Total VMT	Residents	Employees	Service Population	Total VMT/SP
Former Mall Site (TAZ 53790803)	83,557	0	1,850	1,850	45.17
Downtown TAZs	1,108,374	5,421	19,639	25,060	44.23
City of San Bernardino	13,140,295	248,002	127,540	375,542	34.99
San Bernardino County	148,990,732	2,721,775	1,027,872	3,749,647	39.73
FUTURE (2040) WITH PROJECT CONDITIONS					
Area	Total VMT	Residents	Employees	Service Population	Total VMT/SP
Former Mall Site (TAZ 53790803)	182,141	7,463	1,780	9,243	19.71
Downtown TAZs	1,096,573	12,862	19,571	32,433	33.81
City of San Bernardino	11,950,072	254,089	127,508	381,597	31.32
San Bernardino County	132,221,424	2,722,846	1,027,887	3,750,733	35.25

Table 4 summarizes the direct effects on VMT of the analyzed Plan alternative for the City area, adjacent areas including the City within a 10 mile radius, and the County. The method used to calculate these values is the same as that applied to the analysis in Table 2 for the entire Plan land use area.



TABLE 4 – PROJECT ALTERNATIVE LAND USE PLAN VMT

Analysis Region	Future (2040) Conditions - Roadway VMT		
	Without Project	With Project	Change
City of San Bernardino	4,651,827	4,669,123	17,296
With 10 Miles of San Bernardino Downtown	25,284,451	25,305,034	20,583
County of San Bernardino	86,491,876	86,530,957	39,081

The analyzed project alternative would result in an increase in the VMT along local City roadways, but also would result in an increase in the VMT along regional travel routes. Regionally, the project alternative would cause an increase in VMT. This would cause a potential VMT impact under CEQA if the analyzed Plan alternative is pursued.



ATTACHMENT A – LAND USE DATA BY PLAN ZONE

Zone	Land Use	Units	Intensity	Daily Total
1 West	Shopping Center	KSF	-98.466	-9304
	Restaurant	KSF	-32.822	-3188
	Multifamily (Mid-Rise)	DU	489	2220
	Total		358	-10272

Zone	Land Use	Units	Intensity	Daily Total
1 East	Shopping Center	KSF	39.222	3706
	Restaurant	KSF	13.074	1270
	Multifamily (Mid-Rise)	DU	464	2107
	Total		516	7083

Zone	Land Use	Units	Intensity	Daily Total
2	Shopping Center	KSF	176.174	16647
	Restaurant	KSF	75.503	7334
	Multifamily (Mid-Rise)	DU	1505	6833
	Total		1757	30814

Zone	Land Use	Units	Intensity	Daily Total
3	Shopping Center	KSF	46.888	4430
	Restaurant	KSF	109.406	10628
	Multifamily (Mid-Rise)	DU	44	200
	Total		200	15258

Zone	Land Use	Units	Intensity	Daily Total
4	Shopping Center	KSF	393.025	37137
	Restaurant	KSF	393.025	38178
	General Office	KSF	786.05	8521
	Multifamily (Mid-Rise)	DU	5872	26659
	Total		7444	110495

Zone	Land Use	Units	Intensity	Daily Total
5	Shopping Center	KSF	754.245	71269
	Restaurant	KSF	301.698	29307
	General Office	KSF	1961.307	21261
	Multifamily (Mid-Rise)	DU	3768	17107
	Total		6785	138943

Zone	Land Use	Units	Intensity	Daily Total
6	Government Office	KSF	847.54	19146
	Total		848	19146

Zone	Land Use	Units	Intensity	Daily Total
7	Shopping Center	KSF	107.284	10137
	Restaurant	KSF	42.914	4169
	General Office	KSF	278.939	3024
	Multifamily (Mid-Rise)	DU	1184	5375
	Total		1613	22705

Zone	Land Use	Units	Intensity	Daily Total
8	Restaurant	KSF	253.817	24656
	Light Industrial	KSF	592.24	2884
	Multifamily (Mid-Rise)	DU	262	1189
	Total		1108	28729

Zone	Land Use	Units	Intensity	Daily Total
9	Restaurant	KSF	24.302	2361
	General Office	KSF	461.735	5005
	Multifamily (Mid-Rise)	DU	607	2756
	Total		1093	10122