SSFM International

Date: March 7, 2019 SSFM 2018_160.000

SUBJECT: Piilani Promenade Traffic Impact Opinion Letter

A Traffic Impact Analysis Report (TIAR) was prepared in March 1994, and again updated in April 1998, for the development known as the Kaonoulu Industrial Park. The Kaonoulu Industrial Park was an 88-acre light industrial park on the mauka side of Piilani Highway, across from Kaonoulu Street. As a part of the development, a fourth leg would be constructed on the mauka side of the T-intersection of Piilani Highway and Kaonoulu Street to include one through lane in either direction with dedicated left and right turn lanes on all four approaches. The TIAR assumed that Piilani Highway would be widened from its existing two-lanes to be four lanes with the following minimum lane configuration at the intersection with Kaonoulu Street:

- Eastbound – left, through, right;
- Westbound – left, through, right;
- Northbound – left, 2 through, right;
- Southbound – left, 2 through, right.

Conditions of approval for the Kaonoulu Industrial Park entitlements included:

- Provide traffic signals at the intersection of Piilani Highway and Kaonoulu Street, and (applicant) shall submit a warrant study in coordination with Department of Transportation;
- Provide for a frontage road parallel to Piilani Highway and other connector roads within the project area, with the review and approval of Hawaii Department of Transportation (HDOT) and the County of Maui (COM).

As part of an Environmental Impact Statement (EIS), an updated TIAR was prepared in 2016 for a new multi-use development on the original 88-acre parcel that included 530,000 square feet of commercial area, 5 acres of light industrial, and 226 units of one and two-bedroom rental apartments. This development was known as Piilani Promenade. Also included in the TIAR as a part of the background (future without project) conditions was the inclusion of 250 affordable rental units on the adjacent 13-acre parcel that would use Kaonoulu Street to access. As a part of the mixed-use development plans, the intersection of Piilani Highway and Kaonoulu Street was to be signalized, and a fourth leg added. In the project area, Piilani Highway runs northbound-southbound (NB-SB) and Kaonoulu Street runs eastbound-westbound (EB-WB). The intersection was reconfigured to run split signal phasing for the EB-WB approaches with the following lane configuration:

- Eastbound – left, through, right;
- Westbound – 2 left, through, right;
- Northbound – left, 2 through, right;
- Southbound – 2 left, 2 through, right.

The lane configurations include the addition of WB and SB left-turn lanes, from what was shown in the 1998 TIAR.

The EIS for the development included a request to delete the 1995 condition for a frontage road due to an agreement with HDOT, and based upon the 2016 site plan, that it would result in safety and operational issues. This EIS was rejected because it did not follow the land use originally planned for and approved in 1995.

The developer is now pursuing to develop an 88-acre light industrial park as approved in 1995. The Piilani Highway conditions have changed since the 1994 and 1998 TIARs and now include four lanes fronting the development. The intersection of Piilani Highway and Kaonoulu Street currently remains three-legged and unsignalized. As a part of this project, the primary intersection will be signalized and have split phasing for the EB-WB approaches with the same lane configurations as proposed in 2016. The split phasing of the traffic signal helps reduce traffic delays and improve level of service (LOS).

As a part of the latest proposal for development, anticipated trip generation and intersection operations will be compared between four scenarios: (1) 1994 light industrial park TIAR; (2) 1998 light industrial park TIAR; (3) 2016 mixed-use TIAR; (4) Current light industrial park analysis. Due to the proposed light industrial use for the new project, weekend impacts are anticipated to be negligible and so only AM and PM peak hour conditions will be compared. The current analysis used the most recent traffic data and surrounding land use status collected in 2016.

Comparing trip generation for the different scenarios (see Table 1) shows a significant decrease in total PM trips for the current light industrial proposal as compared to the previously proposed mixed-use development. The large 2016 Mixed Use PM volumes can be attributed to a large quantity of planned commercial space (530,000 sq-ft) and a high trip generation for that specific land use. Weekend traffic was also expected to be high, which is also a result of commercial development. Differences in trip generation between the 1994, 1998 and Current light industrial scenarios can be attributed to using different editions of the ITE Trip Generation Manual. The 1994 and 1998 analyses used *Trip Generation Manual, 5th Edition* (ITE, 1991) and *Trip Generation Manual, 6th Edition* (ITE, 1997), respectively, which yielded similar results for the same 88-acres of light industrial land use. The 2016 TIAR used *Trip Generation Manual, 8th Edition* (ITE, 2008) for calculation of trips using a mixed-use land use. The most recent *Trip Generation Manual, 10th Edition* (ITE, 2017) did not provide an equation that used acreage as a variable for light industrial and so the *Trip Generation, 8th Edition* (ITE, 2008) was used.

Table 1. Trip Generation:

Project Scenario (Trip Generation Reference)	**Trip Generation**					
	AM			**PM**		
	Enter	**Exit**	**Total**	**Enter**	**Exit**	**Total**
(1)1994 Light Industrial (*TGM, 5th Ed.*)	610	134	744	152	574	726
(2)1998 Light Industrial (*TGM, 6th Ed.*)	623	128	751	152	572	724
(3)2016 Mixed-Use (*TGM, 8th Ed.*)	306	258	564	1,202	1,280	2,482
(4)Current Light Industrial (*TGM, 8th Ed.*)	583	80	663	59	397	456

The 1994 TIAR provided highway LOS analysis of Piilani Highway as a two-lane and four-lane highway (see Table 2). This was analyzed for two future years (2000 and 2010) that included project development, corresponding to planned phased construction. For analysis, LOS D or better was considered acceptable while LOS E or F were considered poor and are bolded in the tables. Phase 1 results showed poor LOS E/F for two-lane conditions and acceptable LOS B/B for four-lane conditions while Phase 2 results showed poor LOS F/F for two-lane conditions and acceptable LOS C/D for four-lane conditions. It was concluded that the widening to four lanes would be needed and ultimately the intersection of Piilani Highway and Kaonoulu Street may need to be signalized.

Table 2. 1994 TIAR Piilani Highway LOS:

Project Scenario	Piilani # of Lanes	Phase 1		Phase 2	
		AM	PM	AM	PM
(1) 1994 Light Industrial	Two Lanes	**E**	**F**	**F**	**F**
	Four Lanes	B	B	C	D

The 1998 TIAR analyzed future with project conditions at the intersection of Piilani Highway and Kaonoulu Street for future with project Phase 2 (year 2010) but not for Phase 1 (year 2000). The analysis was for conditions that included four lanes along Piilani Highway and a traffic signal at the intersection with Kaonoulu Street. Results (see Table 3) for AM/PM conditions were acceptable LOS D/D which is comparable to the 1994 TIAR analysis results of Piilani Highway as a four-lane road. The 2016 TIAR analyzed future with mixed use project Phase 1 and 2 conditions for years 2025 and 2032 respectively. The analysis assumed a four lane Piilani Highway and optimized traffic signal phasing with dedicated turn lanes at the intersection with Kaonoulu Street. AM/PM results for the mixed use scenario resulted in acceptable LOS C/C for Phase 1 and poor LOS D/F for Phase 2. The current analysis of light industrial land use resulted in acceptable LOS D/D for Phase 1 and acceptable LOS D/D for Phase 2. This aligns with the results from the 1994 and 1998 TIARs which shows a comparable impact with similar mitigation at the intersection of Piilani Highway and Kaonoulu Street.

Table 3. Future With Project LOS at Piilani Highway and Kaonoulu Street:

Project Scenario	Piilani # of Lanes	Phase 1		Phase 2	
		AM	PM	AM	PM
(2) 1998 Light Industrial	Four Lanes	N/A	N/A	D	D
(3) 2016 Mixed-Use		C	C	D	**F**
(4) Current Light Industrial		D	D	D	D

In conclusion, a development with 88-acres of light industrial at the project location will have a similar future year impact as was analyzed and approved in the 1994 and 1998 TIARs. The proposed mitigation that results in equivalent intersection operations includes:

- Construct the east leg of Kaonoulu Street as a two-lane travel-way with dedicated left and right-turn lanes at intermediate unsignalized intersections;
- Signalize the intersection of Piilani Highway and Kaonoulu Street and run split phase timing;
- Widen the intersection of Piilani Highway and Kaonoulu Street to include the following lane configuration:
    - Eastbound: left, through, right
    - Westbound: 2 left, through, right
    - Northbound: left, 2 through, right
    - Southbound: 2 left, 2 through, right

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