

# **APPENDIX K**

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## **UPDATED TRAFFIC ANALYSIS**





## DRAFT MEMORANDUM

Date: June 4, 2018  
To: Rebecca Auld, Lamphier-Gregory  
From: Ron Ramos and Sam Tabibnia, Fehr & Peers  
**Subject: Turk Island Landfill Consolidation Project – Updated Phase One Roadway Operations Impact Assessment**

OK16-0140

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Previously, Fehr & Peers assessed the impacts of the Phase One of the Turk Island Landfill Consolidation Project on roadway operations. Our assumptions and results were summarized in the Draft Environmental Report (DEIR) for the project, which was published in March 2018. The analysis found that the estimated truck activity generated by the Phase One of the Turk Island Landfill Consolidation Project would not cause any significant impacts on roadway operations.

Since the publication of the DEIR, the amount of truck trips for the Phase One Project has been updated. Fehr & Peers updated the roadway operations impact assessment for the proposed phase one of the Turk Island Consolidation. The updated project is estimated to increase truck activity by up to 220 percent and would generate up to approximately 1,870 daily and 200 AM and PM peak hours passenger car equivalent trips during the Phase One project. The project trips would not cause any significant impacts on roadway operations. However, the following is recommended to improve peak hour traffic operations around the site:

- **Recommendation TRANS-1: Restriction of Major Fill Truck Activity during Peak Hours.** To avoid the potential for peak fill import truck trips to affect peak hour traffic congestion, major fill import truck activity shall be scheduled to avoid peak traffic hours. Major fill truck activity shall be defined as an hourly average of more than 10 fill trucks (two-way trips into and out of the site), and would be disallowed during peak hours, which are from 7:00 AM to 9:00 AM in the morning and from 4:00 PM to 6:00 PM in the evening. Peak hour fill truck trip constraints shall be specified in construction contracts, with site logs of truck trips provided as frequently as bi-weekly to demonstrate compliance if requested by the City.



The rest of this memorandum provides more details on the assumptions, methodologies and the results of our assessment.

## Project Description

The roadway operations analysis completed for the DEIR assumed that about 70,000 to 80,000 cubic yard (CY) of clean fill would be brought to Parcel C to bring it up to grade after excavation and debris transfer. It is now estimated that about 202,000 CY of clean fill would be brought to the site. All other activity during Phase One of the Project are expected to remain the same as assumed in the Draft EIR.

## Project Trip Generation

Fehr & Peers estimated the Phase One Project trip generation using the same assumptions as the DEIR. Continuing to assume that relatively low-capacity trucks (10 CY) would be used to bring clean fill to the site, it is estimated that approximately 40,400 trips would occur over the six-month backfill period. The applicant has also noted that up to 50 percent more truck trips could occur on peak days.

**Table 1** shows the estimated peak hour and daily trips to and from the site, which would occur when debris transfer and backfill activities coincide. Trip generation is based on the following assumptions:

- Similar to the previous analysis, 20 workers or visitors would travel to and from the site each day, including heavy machinery operators, supervisors, and support staff. This analysis assumes that all 20 workers would arrive at the site during the AM peak hour and leave the site during the PM peak hour. This assumption is conservative because most workers typically travel to and from construction sites outside the peak commute periods.
- Similar to the previous analysis, 10 trucks would travel to and from the site each day to haul debris that cannot be moved by machinery already on-site.
- 158 trucks during a typical day and up to 237 trucks during a peak day would travel to and from the site to bring-in clean fill.
- Similar to the previous analysis, the number of debris removal and earth moving vehicle trips during the peak hours was estimated by assuming that the daily trips would be equally distributed over a ten-hour workday.



**TABLE 1: PHASE ONE VEHICLE TRIP GENERATION**

Vehicle Type	Daily Vehicle Trips			Peak Hour Vehicle Trips				
	Vehicle Trips	PCE Rate	PCE Total Trips	PCE Total Trips	AM		PM	
					In	Out	In	Out
Passenger Vehicles (Workers) <sup>1</sup>	40	1.0	40	20	20	0	0	20
Debris Removal Vehicles (Transfer Activities) <sup>2,4</sup>	20	3.7	74	7	4	3	3	4
Earth-Moving Vehicles (Fill Activities) <sup>3,4</sup>	316	3.7	1,169	117	59	58	58	59
<b>Total During Typical Day</b>	<b>376</b>	<b>--</b>	<b>1,283</b>	<b>144</b>	<b>83</b>	<b>61</b>	<b>61</b>	<b>83</b>
Additional Earth-Moving Vehicles (Fill Activities) during peak days <sup>3,4</sup>	158	3.7	585	59	30	29	29	30
<b>Total During Peak Day</b>	<b>534</b>	<b>--</b>	<b>1,868</b>	<b>203</b>	<b>113</b>	<b>90</b>	<b>90</b>	<b>113</b>

Notes:

1. Passenger vehicle trips account for 20 workers' access to and from the site. To remain conservative, it is assumed worker trips to and from the site would occur during the peak hours.
2. Daily debris removal vehicle trips account for dump trucks' access to and from the site.
3. Earth-moving vehicle trips assume approximately 40,400 clean fill trips would occur over a six-month period, assuming five-day work weeks.
4. Debris removal and earth-moving vehicles during the peak hours are estimated by assuming that the daily trips would be equally distributed over the ten-hour work day.

Source: Fehr & Peers, 2018.

As shown in **Table 1**, the peak level of activity on a peak day would result in up to approximately 200 PCE AM peak and PM peak hour trips, and 1,870 PCE daily trips added to the study roadway network. The trip generation presented in Table 1 is conservative as noted above. In addition, the trip generation is for the peak construction activity and would be lower at other times.

## Project Trip Distribution

Consistent with the DEIR assumptions, there are two routes by which heavy vehicles could travel to and from the project site during the consolidation and fill processes:

1. Union City Boulevard/Whipple Road/I-880 (Northbound)
2. Union City Boulevard/Ardenwood Boulevard/SR 84

It has not been determined where the clean fill would come from, therefore the project's truck route has not been determined and both routes were analyzed. Both routes are designated truck routes within Union City and Fremont.



## Roadway Operations

During peak operation of Phase One, up to approximately 1,870 PCE daily and 200 PCE peak hour vehicle trips would be added to the study roadways. The large majority of this traffic would be on Union City Boulevard, Dyer Street, and Carmel Way. **Table 2** summarizes the percentage increase in average daily bidirectional vehicles on the study roadway segments. **Appendix A** summarizes the percentage increase in directional peak hour vehicles on study roadway segments.

**TABLE 2: PHASE ONE – STUDY ROADWAY AVERAGE DAILY TRAFFIC INCREASE (PEAK DAYS)**

Study Roadway Segments	Weekday Average Daily Traffic				
	Existing	Route 1 <sup>1</sup>		Route 2 <sup>1</sup>	
		Added PCE <sup>2</sup> Trips	% Increase <sup>3</sup>	Added PCE <sup>2</sup> Trips	% Increase <sup>3</sup>
3. Whipple Road west of I- 880	27,700	1,690	6%	40	<1%
4. Union City Boulevard north of Dyer Street	20,000	1,720	9%	70	<1%
5. Union City Boulevard south of Dyer Street	19,800	70	<1%	1,720	9%
6. Dyer Street west of Union City Boulevard	1,000	1,870	187%	1,870	187%
7. Dyer Street east of Union City Boulevard	6,000	70	1%	70	1%
8. Carmel Way south of Dyer Street	600	1,870	312%	1,870	312%

Notes:

1. Project routes are as described above in "Project Trip Distribution"
2. PCE = passenger car equivalent
3. Percent increase in average daily traffic

Source: Fehr & Peers, 2018.

**Tables 3** summarizes roadway conditions with the addition of Phase One project generated traffic. All study roadway segments are expected to continue to operate at acceptable conditions (LOS D or better) during Phase One of the project. Using the analysis methodology used in the DEIR, project generated traffic would not result in significant impacts on the AM and PM peak hour LOS. **Appendix A** summarizes the directional peak hour roadway conditions for Phase One under Existing Plus Project conditions.

The Phase One project trips would not cause any significant impacts on roadway operations. However, the project is estimated to result in up to 113 PCEs in the peak direction during the peak commute periods on peak days, which could negatively affect intersection traffic operations. Thus, the following is recommended to improve peak hour operations on the roadway network serving the site.



**TABLE 3: PHASE ONE – EXISTING PLUS PROJECT DIRECTIONAL ADT ROADWAY CONDITIONS (PEAK DAYS)**

Study Roadway Segments	Existing		Existing Plus Project			
			Route 1		Route 2	
	ADT	LOS	ADT	LOS	ADT	LOS
1. Whipple Road west of I- 880	27,700	C	29,390	D	27,740	C
2. Union City Boulevard north of Dyer Street	20,000	A	21,720	B	20,070	A
3. Union City Boulevard south of Dyer Street	19,800	A	19,870	A	21,520	A
4. Dyer Street west of Union City Boulevard	1,000	A	2,870	A	2,870	A
5. Dyer Street east of Union City Boulevard	6,000	A	6,070	A	6,070	A
6. Carmel Way south of Dyer Street	600	A	2,470	A	2,470	A

Source: Fehr & Peers, 2018.

**Recommendation TRANS-1: Restriction of Major Fill Truck Activity during Peak Hours.** To avoid the potential for peak fill import truck trips to affect peak hour traffic congestion, major fill import truck activity shall be scheduled to avoid peak traffic hours. Major fill truck activity shall be defined as an hourly average of more than 10 fill trucks (two-way trips into and out of the site), and would be disallowed during peak hours, which are from 7:00 AM to 9:00 AM in the morning and from 4:00 PM to 6:00 PM in the evening. Peak hour fill truck trip constraints shall be specified in construction contracts, with site logs of truck trips provided as frequently as bi-weekly to demonstrate compliance if requested by the City.

Please contact Ron with questions or comments.

## ATTACHMENTS

Appendix A: Directional Peak Hour Analysis



**APPENDIX A:  
DIRECTIONAL PEAK HOUR ANALYSIS**





**TABLE A-1: PHASE ONE - STUDY ROADWAY BIDIRECTIONAL PEAK HOUR TRAFFIC INCREASE (PEAK DAYS)**

Study Roadway Segments	Peak Hour	Existing		Route 1				Route 2			
		NB/EB	SB/WB	NB/EB		SB/WB		NB/EB		SB/WB	
				PCE <sup>1</sup>	% <sup>2</sup>	PCE <sup>1</sup>	% <sup>2</sup>	PCE <sup>1</sup>	% <sup>2</sup>	PCE <sup>1</sup>	% <sup>2</sup>
1. Whipple Road west of I- 880	AM	630	1,410	81	13%	102	7%	2	<1%	2	<1%
	PM	1,230	740	102	8%	81	11%	2	<1%	2	<1%
2. Union City Boulevard north of Dyer Street	AM	630	1,290	83	13%	104	8%	3	<1%	4	<1%
	PM	1,360	550	104	8%	83	15%	4	<1%	3	<1%
3. Union City Boulevard south of Dyer Street	AM	730	1,070	4	<1%	3	<1%	104	14%	83	8%
	PM	1,460	590	3	<1%	4	<1%	83	6%	104	18%
4. Dyer Street west of Union City Boulevard	AM	100	20	90	90%	113	565%	90	90%	113	565%
	PM	40	50	113	283%	90	180%	113	283%	90	180%
5. Dyer Street east of Union City Boulevard	AM	230	220	0	<1%	4	2%	0	<1%	4	2%
	PM	550	140	4	<1%	0	<1%	4	<1%	0	<1%
6. Carmel Way south of Dyer Street	AM	60	20	90	150%	113	565%	90	150%	113	565%
	PM	30	30	113	377%	90	300%	113	377%	90	300%

Notes:

1. PCE = passenger car equivalent vehicle addition
2. Percent increase in directional peak hour trips.

Source: Fehr & Peers, 2018.



**TABLE A-2: PHASE ONE – EXISTING PLUS PROJECT BIDIRECTIONAL PEAK HOUR ROADWAY CONDITIONS (PEAK DAYS)**

Study Roadway Segments	Peak Hour	Existing				Existing Plus Project							
						Route 1				Route 2			
		NB/EB	LOS	SB/WB	LOS	NB/EB	LOS	SB/WB	LOS	NB/EB	LOS	SB/WB	LOS
1. Whipple Road west of I- 880	AM	630	A	1,410	C	711	A	1,512	D	632	A	1,412	C
	PM	1,230	B	740	A	1,332	C	821	A	1,232	B	742	A
2. Union City Boulevard north of Dyer Street	AM	630	A	1,290	C	713	A	1,394	C	633	A	1,294	C
	PM	1,360	C	550	A	1,464	D	633	A	1,364	C	553	A
3. Union City Boulevard south of Dyer Street	AM	730	A	1,070	A	734	A	1,073	A	834	A	1,153	B
	PM	1,460	D	590	A	1,463	D	594	A	1,543	D	694	A
4. Dyer Street west of Union City Boulevard	AM	100	A	20	A	190	A	133	A	190	A	133	A
	PM	40	A	50	A	153	A	140	A	153	A	140	A
5. Dyer Street east of Union City Boulevard	AM	230	A	220	A	230	A	224	A	230	A	224	A
	PM	550	A	140	A	554	A	140	A	554	A	140	A
6. Carmel Way south of Dyer Street	AM	60	A	20	A	150	A	133	A	150	A	133	A
	PM	30	A	30	A	143	A	120	A	143	A	120	A

Source: Fehr & Peers, 2018.