Trip and Parking Generation
Data Collection at
Grocery Store with Gas Station and Auto Repair

Final Report

ite at the W UNIVERSITY of WASHINGTON

2011 ITE District 6 - Data Collection Project

Institute of Transportation Engineers Student Chapter at the University of Washington

The University of Washington ITE Student Chapter (ITEUW) conducted a data collection for trip generation and parking utilization analysis at a grocery store with a gas station and an auto repair shop within the Montlake neighborhood in Seattle, Washington. Data collection efforts were performed on February 15th, 16th, and 17th (Tuesday, Wednesday, and Thursday) 2011, with 12 consecutive hours of observations from 7 AM to 7 PM each day and a 15-minute reporting interval. A total of 35 students from the student chapter and the *CEE 412 Transportation Data Management* class gained hands-on traffic data collection experience through participating in this data collection project.

As shown in Figure 1, the study site is at the corner of the intersection of Montlake Blvd E and E Lake Washington Blvd, Seattle, Washington. The land use is a mixture of a grocery store (main), a gas station (secondary), an auto repair shop (secondary), and a parking lot. The total site area takes 39,800 square feet. The grocery store is 9,335 square feet with 10 employees, operating from 6 AM to midnight. The auto repair shop is 1,100 square feet with four mechanics working on three car repair bays, operating from 8 AM to 6 PM, Monday to Friday. There are four self-service gas fueling stations with eight pumps in total. The total floor area of the gas station is 1,700 square feet. The facility is bordered by two main urban streets and the eastbound on/off-ramps of SR 520. A bus stop is also located adjacent to the site, and a residential area is located south of the study site.

For trip generation, cars and trucks were differentiated by whether the vehicle is for passenger transportation or cargo delivery. For this reason, vans and pick-up trucks were counted as "cars." Bus trips were also counted as person trips taking the transit to access the study site. During the study periods, a few vehicular trips were observed to traverse the study site as a shortcut and those trips were excluded from the traffic counts since they were not generated by the study site.

Figure 2 shows the daily profile of the total vehicle trips aggregated hourly by all modes (cars and trucks). The morning peak hour (detailed in Table 1) varied for each of the three days and the average trip rate was 14.69 trips per 1,000 square feet of gross floor area. The afternoon peak hour (Table 2) occurred between 5:00 PM and 6:00 PM each day. The average trip rate during the afternoon peak hour was 12.23 trips per 1,000 square feet. Trip data of the AM and PM peak hours of the generator are summarized in Table 3 and Table 4. Currently in *Trip Generation, 8th Edition: An ITE Informational Report*, there is no data specifically for this specific type of land

use, therefore trip generation of both *Land Use 853 Convenience Market with Gasoline Pumps* and *Land Use 850 Supermarket* were referenced in Table 1 to Table 4, with average trip rates followed by range of rates in bold fonts.

Bus trips were separated from vehicle trips since they represented person trips. Peak hours for bus trips and the numbers of bus trips in these peak periods are reported through Table 1 to Table 4. Note that on February 17th, Thursday, the number of bus trips is significantly lower than previous two days and a miscount may have occurred on this particular day. The mode split for all trips at the grocery store shown in Figure 3 indicates that the majority of the trips were taken by passenger cars, but still some people were using transit to access the land use (the average of bus trips only takes account of the first two days, due to the suspected miscount of bus trips on Thursday).

The land use has 30 parking spots in the dedicated parking lot, as well as 10 street parking spaces surrounding the grocery store. A surveyor dedicated to watching the parking space continuously and recorded maximum parking spaces occupied **every 15 minutes**, counted as the maximum 15-minute parking demand. The maximum parking demand (3-day average) occurred between 12 PM to 1 PM, when approximately two thirds of the available parking was utilized, as shown in Figure 4. Individually, the study site experienced higher parking demand on Tuesday morning (7 AM to 10 AM) than other time periods. The highest observed hourly parking demand is 39, which corresponds to **3.73 vehicles per 1,000 sq. ft**., **slightly lower than the lower bound of the reference range 4.88 – 11.67** given by *Parking Generation, 4th Edition: An ITE Informational Report* for Land Use 853, **almost the same as the higher bound of the reference range 0.74 – 3.74** for Land Use 850 (Urban).

Compared to the reference values, the land use in the project is more similar to LU853. The trip generation data collected are significantly higher than the reported data for LU 850 (Supermarket), mainly due to the traffic volumes attracted by the fueling facilities. Additionally, number of generated trips was slightly higher in the morning than in the evening, because in the morning the grocery store provides a coffee stand for quick breakfast service, and some drivers will stop by on their way to work.

Pedestrians and bicyclists were not counted in this project.

Figure 1. Aerial Photo of Study Site

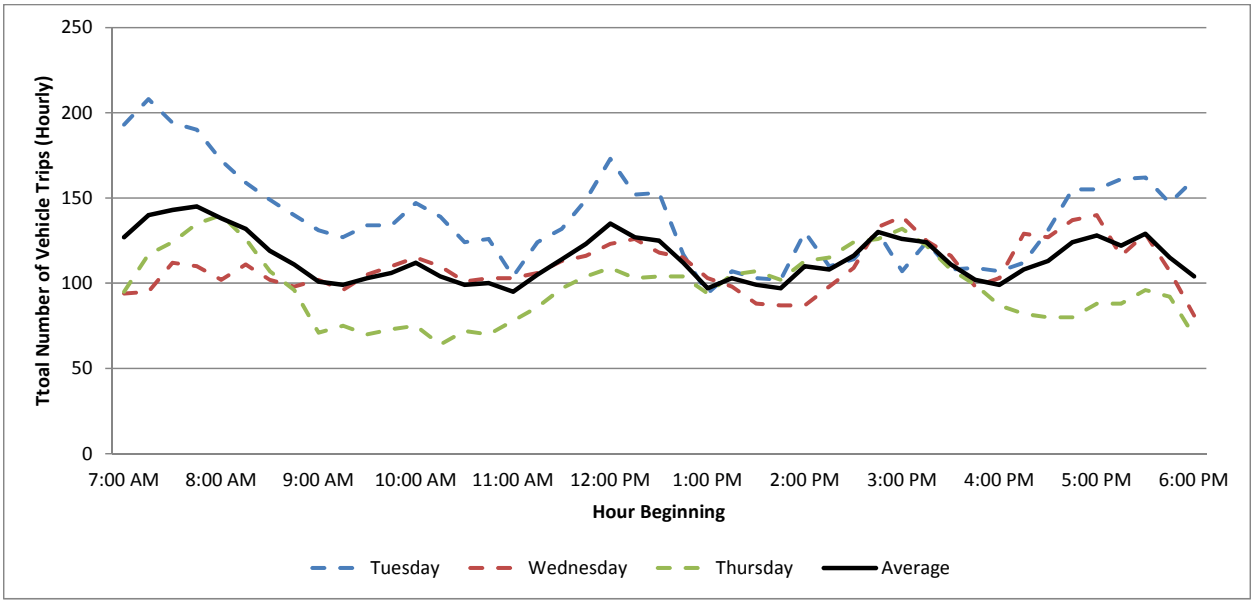

Figure 2. Total Number of Vehicle Trips (Hourly)

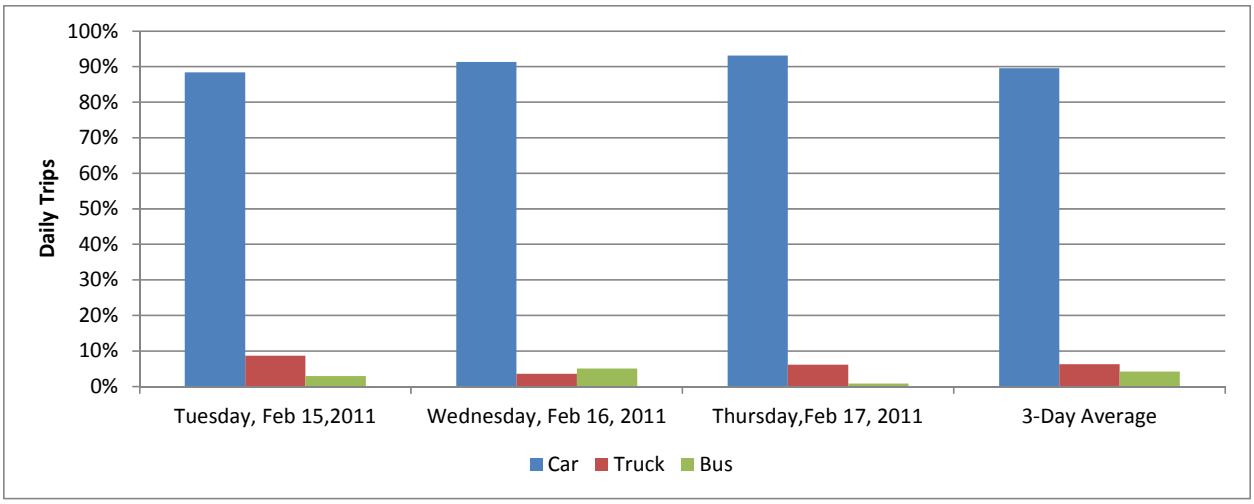

Figure 3. Mode Split of Daily Trips

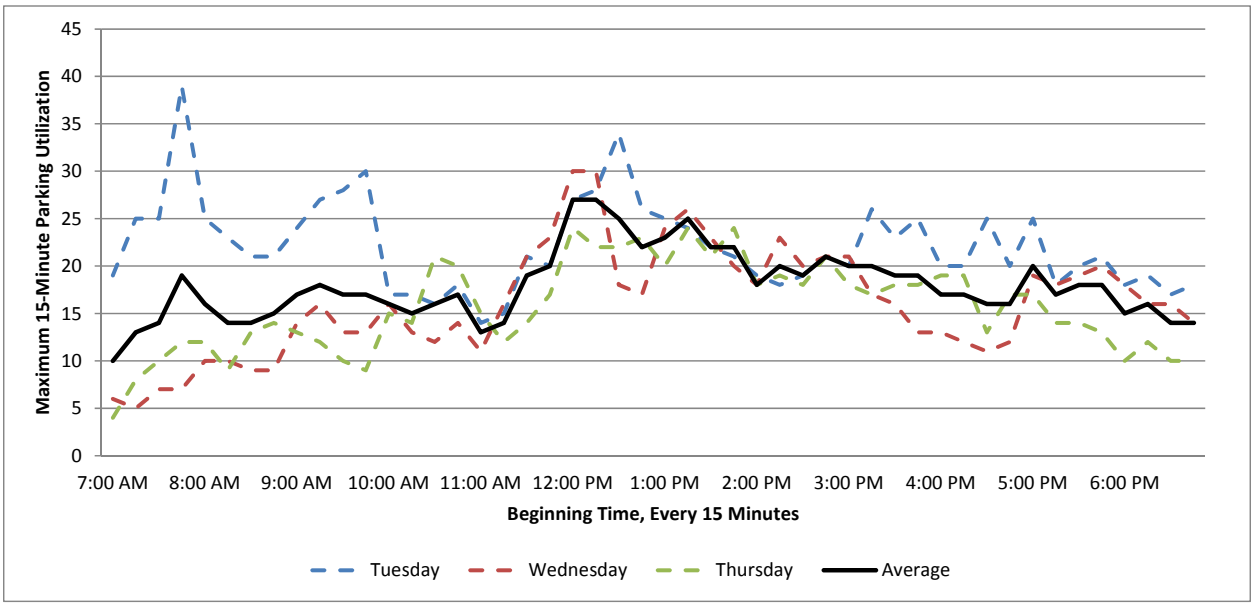

Figure 4. Maximum 15-Minute Parking Utilization

Table 1. AM Peak Hour of Adjacent Street Traffic (7 AM to 9 AM) Trip Data

Variable	Tuesday	Wednesday	Thursday	3-Day Average	Reference Values	
	Feb 15,2011	Feb 16,2011	Feb 17,2011		LU583	LU580
Peak Hour	7:15 - 8:15 AM	7:30 - 8:30 AM	8:00 - 9:00 AM	N/A		
All Motor Vehicles	208	112	140	153		
Trucks	20	7	5	11		
Trip Rates per 1,000 GSF	19.93	10.73	13.42	14.69	16.57	3.59
					5.40 - 47.00	1.00 - 7.78
% Entering	51%	49%	61%	54%		
% Exiting	49%	51%	39%	46%		
Bus Trip Peak Hour	7:30 - 8:30 AM	7:00 - 8:00 AM	8:00 - 9:00 AM	N/A		
Peak Hour Bus Trips	9	2	3	5		

Table 2. PM Peak Hour of Adjacent Street Traffic (4 PM to 6 PM) Trip Data

Variable	Tuesday	Wednesday	Thursday	3-Day Average	Reference Values	
	Feb 15,2011	Feb 16,2011	Feb 17,2011		LU583	LU580
Peak Hour	5:00 - 6:00 PM	5:00 - 6:00 PM	5:00 - 6:00 PM	5:00 - 6:00 PM		
All Motor Vehicles	155	140	88	128		
Trucks	2	3	1	2		
Trip Rates per 1,000 GSF	14.85	13.42	8.43	12.23	19.07	10.5
					5.53 - 75.50	5.15 - 20.29
% Entering	54%	54%	50%	53%		
% Exiting	46%	46%	50%	47%		
Bus Trip Peak Hour	5:00 - 6:00 PM	5:00 - 6:00 PM	4:30 - 5:30 PM	N/A		
Peak Hour Bus Trips	7	37	2	15		

Table 3. AM Peak Hour of Generator Trip Data

Variable	Tuesday	Wednesday	Thursday	3-Day Average	Reference Values	
	Feb 15,2011	Feb 16,2011	Feb 17,2011		LU583	LU580
Peak Hour	7:15 - 8:15 AM	7:30 - 8:30 AM	8:00 - 9:00 AM	N/A		
All Motor Vehicles	208	112	140	153		
Trucks	20	7	5	11		
Trip Rates per 1,000 GSF	19.93	10.73	13.42	14.69	17.03	10.05
					6.92 – 47.00	5.94 - 12.67
% Entering	51%	49%	61%	54%		
% Exiting	49%	51%	39%	46%		
Bus Trip Peak Hour	7:30 - 8:30 AM	7:00 - 8:00 AM	8:00 - 9:00 AM	N/A		
Peak Hour Bus Trips	9	2	3	5		

Table 4. PM Peak Hour of Generator Trip Data

Variable	Tuesday	Wednesday	Thursday	3-Day Average	Reference Values	
	Feb 15,2011	Feb 16,2011	Feb 17,2011		LU583	LU580
Peak Hour	12:00 - 1:00 PM	5:00 - 6:00 PM	3:00 - 4:00 PM	N/A		
All Motor Vehicles	173	140	132	148		
Trucks	28	3	0	10		
Trip Rates per 1,000 GSF	16.58	13.42	12.65	14.21	19.98	11.85
					7.60 – 75.50	6.50 - 18.62
% Entering	54%	54%	40%	49%		
% Exiting	46%	46%	61%	51%		
Bus Trip Peak Hour	1:45 -2:45 PM	5:00 - 6:00 PM	4:30 - 5:30 PM	N/A		
Peak Hour Bus Trips	12	37	2	17		

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Trip Generation Data Form (Part 1)

Land Use/Building Type:[1]	Grocery Store with Gas Station and Auto Repair		ITE Land Use Code:
Source:			Source No. (*ITE use only*):
Name of Development:	Hop-in Market		Day of the Week: Tuesday
City: Seattle	State/Province: WA	Zip/Postal Code: 98112	Day: 15 Month: February Year: 2011
Country: USA			Metropolitan Area: Seattle, Washington

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area:

☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural
☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural)
☐ (7) Not Given

Independent Variable: (include data for as many as possible)[2]	Actual	Estimated
14 (1) Employees (#)	☒	☐
_____ (2) Persons (#)	☐	☐
_____ (3) Total Units (#) (indicate unit:_____)	☐	☐
_____ (4) Occupied Units (#) (indicate unit:_____)	☐	☐
10,435 (5) Gross Floor Area (gross sq. ft.)	☐	☒
(% of development occupied _____)		
_____ (6) Net Rentable Area (sq. ft.)	☐	☐
_____ (7) Gross Leasable Area (sq. ft.)	☐	☐
(% of development occupied _____)		
_____ (8) Total Acres (% developed: _____)	☐	☐
40 (9) Parking Spaces (% occupied: _____)	☒	☐
_____ (10) Beds (% occupied: _____)	☐	☐
_____ (11) Seats (#)	☐	☐
_____ (12) Servicing Positions/Vehicle Fueling Positions	☐	☐
_____ (13) Shopping Center % Out-parcels/pads	☐	☐
_____ (14) A.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
_____ (15) P.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
8 (16) Other Number of Gas Pumps	☐	☐
3 (17) Other Number of Car Repair Bays	☐	☐

Detailed Description of Development:[3]

The land use is a mixture of a grocery store (main), a gas station (secondary), an auto repair shop (secondary), and a parking lot. The total site area takes 39,800 square feet. The grocery store is 9,335 square feet with 10 employees, operating from 6 AM to midnight. The auto repair shop is 1,100 square feet with four mechanics working on three car repair bays, operating from 8 AM to 6 PM, Monday to Friday. There are four self-service gas fueling stations with eight pumps in total. The total floor area of the gas station is 1,700 square feet.

2. Definitions for several independent variables can be found in the *Trip Generation*, Second Edition, *User's Guide* Glossary.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data:

Vehicle Occupancy (#):
_____ A.M. _____ P.M. _____ 24-hour %

Percent by Transit:
_____ A.M. % _____ P.M. % _____ 24-hour %

Percent by Carpool/Vanpool:
_____ A.M. % _____ P.M. % _____ 24-hour %

Employees by Shift:

	Start Time	End Time	Employees (#)
First Shift:	_____	_____	_____
Second Shift:	_____	_____	_____
Third Shift:	_____	_____	_____

Parking Cost on Site: Hourly 0 Daily 0

Transportation Demand Management (TDM) Information:

At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway?

☒ No

☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary)

☐ (1) Transit Service
☐ (2) Carpool Programs
☐ (3) Vanpool Programs
☐ (4) Bicycle/Pedestrian Facilities and Site Improvements
☐ (5) Employer Support Measures
☐ (6) Preferential HOV Treatments
☐ (7) Transit and Ridesharing Incentives
☐ (8) Parking Supply and Pricing Management
☐ (9) Tolls and Congestion Pricing
☐ (10) Variable Work Hours/Compressed Work Weeks
☐ (11) Telecommuting
☐ (12) Other _____

Please Complete Form on Other Side

Institute of Transportation Engineers

Trip Generation Data Form (Part 2)

Survey conducted by:

Name:	Runze Yu
Organization:	University of Washington ITE Student Chapter
Address:	More Hall 101, University of Washington
City/State/Zip:	Seattle/WA/98195
Telephone #:	206-543-7827
Fax #:	206-543-1543
E-mail:	ite@uw.edu

Summary of Driveway Volumes							
Tuesday Feb 15 2011		Average Weekday (M - F)					
		Enter		Exit		Total	
		All	Trucks	All	Trucks	All	Trucks
AM Peak Hour of Adjacent Street Traffic (7 – 9) Time:	7:15 - 8:15	108	11	100	9	208	20
PM Peak Hour of Adjacent Street Traffic (4 – 6) Time:	5: 00 - 6:00	84	1	71	1	155	2
AM Peak Hour Generator Time:	7:15 - 8:15	108	11	100	9	208	20
PM Peak Hour Generator Time:	12:00 - 1:00	98	16	75	12	173	28

Hourly Driveway Volumes- Average Weekday (M-F)						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 8:00	101	10	92	8	193	18
7:15 - 8:15	108	11	100	9	208	20
7:30 - 8:30	95	12	99	11	194	23
7:45 - 8:45	90	12	100	13	190	25
8:00 - 9:00	84	8	88	11	172	19
8:15 - 9:15	78	6	81	7	159	13
8:30 - 9:30	77	5	72	6	149	11
8:45 - 9:45	76	5	64	5	140	10
9:00 - 10:00	68	5	63	4	131	9
9:15 - 10:15	67	5	60	5	127	10
9:30 - 10:30	71	5	63	4	134	9
9:45 - 10:45	68	3	66	3	134	6

10:00 - 11:00	76	3	71	2	147	5
10:15 - 11:15	69	3	70	2	139	5
10:30 - 11:30	64	2	60	1	124	3
10:45 - 11:45	68	2	58	1	126	3
11:00 - 12:00	55	2	49	1	104	3
11:15 - 12:15	71	7	53	2	124	9
11:30 - 12:30	75	10	57	4	132	14
11:45 - 12:45	83	13	66	9	149	22
12:00 - 1:00	98	16	75	12	173	28
12:15 - 1:15	81	14	71	10	152	24
12:30 - 1:30	80	12	73	11	153	23
12:45 - 1:45	60	10	57	6	117	16
1:00 - 2:00	47	9	47	4	94	13
1:15 - 2:15	56	6	51	6	107	12
1:30 - 2:30	50	9	53	5	103	14
1:45 - 2:45	52	9	50	7	102	16
2:00 - 3:00	66	10	64	9	130	19
2:15 - 3:15	55	10	55	8	110	18
2:30 - 3:30	60	9	54	7	114	16
2:45 - 3:45	64	11	66	9	130	20
3:00 - 4:00	55	10	52	8	107	18
3:15 - 4:15	61	10	63	12	124	22
3:30 - 4:30	53	8	55	12	108	20
3:45 - 4:45	58	5	51	8	109	13
4:00 - 5:00	54	4	53	7	107	11
4:15 - 5:15	58	3	54	2	112	5
4:30 - 5:30	68	2	63	1	131	3
4:45 - 5:45	83	2	72	1	155	3
5:00 - 6:00	84	1	71	1	155	2
5:15 - 6:15	87	1	74	1	161	2
5:30 - 6:30	90	2	72	2	162	4
5:45 - 6:45	77	2	70	2	147	4
6:00 - 7:00	81	2	80	2	161	4

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Trip Generation Data Form (Part 3)

Detailed Driveway Volumes						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 7:15	18	2	16	3	34	5
7:15 - 7:30	29	1	26	1	55	2
7:30 - 7:45	25	2	21	0	46	2
7:45 - 8:00	29	5	29	4	58	9
8:00 - 8:15	25	3	24	4	49	7
8:15 - 8:30	16	2	25	3	41	5
8:30 - 8:45	20	2	22	2	42	4
8:45 - 9:00	23	1	17	2	40	3
9:00 - 9:15	19	1	17	0	36	1
9:15 - 9:30	15	1	16	2	31	3
9:30 - 9:45	19	2	14	1	33	3
9:45 - 10:00	15	1	16	1	31	2
10:00 - 10:15	18	1	14	1	32	2
10:15 - 10:30	19	1	19	1	38	2
10:30 - 10:45	16	0	17	0	33	0
10:45 - 11:00	23	1	21	0	44	1
11:00 - 11:15	11	1	13	1	24	2
11:15 - 11:30	14	0	9	0	23	0
11:30 - 11:45	20	0	15	0	35	0
11:45 - 12:00	10	1	12	0	22	1
12:00 - 12:15	27	6	17	2	44	8
12:15 - 12:30	18	3	13	2	31	5
12:30 - 12:45	28	3	24	5	52	8
12:45 - 1:00	25	4	21	3	46	7
1:00 - 1:15	10	4	13	0	23	4
1:15 - 1:30	17	1	15	3	32	4
1:30 - 1:45	8	1	8	0	16	1
1:45 - 2:00	12	3	11	1	23	4
2:00 - 2:15	19	1	17	2	36	3
2:15 - 2:30	11	4	17	2	28	6
2:30 - 2:45	10	1	5	2	15	3
2:45 - 3:00	26	4	25	3	51	7
3:00 - 3:15	8	1	8	1	16	2

3:15 - 3:30	16	3	16	1	32	4
3:30 - 3:45	14	3	17	4	31	7
3:45 - 4:00	17	3	11	2	28	5
4:00 - 4:15	14	1	19	5	33	6
4:15 - 4:30	8	1	8	1	16	2
4:30 - 4:45	19	0	13	0	32	0
4:45 - 5:00	13	2	13	1	26	3
5:00 - 5:15	18	0	20	0	38	0
5:15 - 5:30	18	0	17	0	35	0
5:30 - 5:45	34	0	22	0	56	0
5:45 - 6:00	14	1	12	1	26	2
6:00 - 6:15	21	0	23	0	44	0
6:15 - 6:30	21	1	15	1	36	2
6:30 - 6:45	21	0	20	0	41	0
6:45 - 7:00	18	1	22	1	40	2

Institute of Transportation Engineers

Trip Generation Data Form (Part 1)

Land Use/Building Type:[1]	Grocery Store with Gas Station and Auto Repair		ITE Land Use Code:
Source:			Source No. (*ITE use only*):
Name of Development:	Hop-in Market		Day of the Week: Wednesday
City: Seattle	State/Province: WA	Zip/Postal Code: 98112	Day: 16 Month: February Year: 2011
Country: USA			Metropolitan Area: Seattle, Washington

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area:

☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural
☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural)
☐ (7) Not Given

Independent Variable: (include data for as many as possible) [2]	Actual	Estimated
14 (1) Employees (#)	☒	☐
_____ (2) Persons (#)	☐	☐
_____ (3) Total Units (#) (indicate unit:_____)	☐	☐
_____ (4) Occupied Units (#) (indicate unit:_____)	☐	☐
10,435 (5) Gross Floor Area (gross sq. ft.)	☐	☒
(% of development occupied _____)		
_____ (6) Net Rentable Area (sq. ft.)	☐	☐
_____ (7) Gross Leasable Area (sq. ft.)	☐	☐
(% of development occupied _____)		
_____ (8) Total Acres (% developed: _____)	☐	☐
40 (9) Parking Spaces (% occupied: _____)	☒	☐
_____ (10) Beds (% occupied: _____)	☐	☐
_____ (11) Seats (#)	☐	☐
_____ (12) Servicing Positions/Vehicle Fueling Positions	☐	☐
_____ (13) Shopping Center % Out-parcels/pads	☐	☐
_____ (14) A.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
_____ (15) P.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
8 (16) Other Number of Gas Pumps	☐	☐
3 (17) Other Number of Car Repair Bays	☐	☐

Detailed Description of Development:[3]

The land use is a mixture of a grocery store (main), a gas station (secondary), an auto repair shop (secondary), and a parking lot. The total site area takes 39,800 square feet. The grocery store is 9,335 square feet with 10 employees, operating from 6 AM to midnight. The auto repair shop is 1,100 square feet with four mechanics working on three car repair bays, operating from 8 AM to 6 PM, Monday to Friday. There are four self-service gas fueling stations with eight pumps in total. The total floor area of the gas station is 1,700 square feet.

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3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data:

Vehicle Occupancy (#):
_____ A.M. _____ P.M. _____ 24-hour %

Percent by Transit:
_____ A.M. % _____ P.M. % _____ 24-hour %

Percent by Carpool/Vanpool:
_____ A.M. % _____ P.M. % _____ 24-hour %

Employees by Shift:

	Start Time	End Time	Employees (#)
First Shift:	_____	_____	_____
Second Shift:	_____	_____	_____
Third Shift:	_____	_____	_____

Parking Cost on Site: Hourly 0 Daily 0

Transportation Demand Management (TDM) Information:

At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway?

☒ No

☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary)

☐ (1) Transit Service
☐ (2) Carpool Programs
☐ (3) Vanpool Programs
☐ (4) Bicycle/Pedestrian Facilities and Site Improvements
☐ (5) Employer Support Measures
☐ (6) Preferential HOV Treatments
☐ (7) Transit and Ridesharing Incentives
☐ (8) Parking Supply and Pricing Management
☐ (9) Tolls and Congestion Pricing
☐ (10) Variable Work Hours/Compressed Work Weeks
☐ (11) Telecommuting
☐ (12) Other _____

Please Complete Form on Other Side

Institute of Transportation Engineers

Trip Generation Data Form (Part 2)

Survey conducted by:

Name:	Runze Yu
Organization:	University of Washington ITE Student Chapter
Address:	More Hall 101, University of Washington
City/State/Zip:	Seattle/WA/98195
Telephone #:	206-543-7827
Fax #:	206-543-1543
E-mail:	ite@uw.edu

Summary of Driveway Volumes							
Wednesday Feb 16 2011		Average Weekday (M - F)					
		Enter		Exit		Total	
		All	Trucks	All	Trucks	All	Trucks
AM Peak Hour of Adjacent Street Traffic (7 – 9) Time:	7:30 - 8:30	59	3	53	4	112	7
PM Peak Hour of Adjacent Street Traffic (4 – 6) Time:	5: 00 - 6:00	75	2	65	1	140	3
AM Peak Hour Generator Time:	7:30 - 8:30	59	3	53	4	112	7
PM Peak Hour Generator Time:	5: 00 - 6:00	75	2	65	1	140	3

Hourly Driveway Volumes- Average Weekday (M-F)						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 8:00	47	2	47	4	94	6
7:15 - 8:15	51	3	44	2	95	5
7:30 - 8:30	59	3	53	4	112	7
7:45 - 8:45	56	3	54	4	110	7
8:00 - 9:00	51	3	51	3	102	6
8:15 - 9:15	56	4	55	4	111	8
8:30 - 9:30	53	4	49	2	102	6
8:45 - 9:45	49	3	49	3	98	6
9:00 - 10:00	52	4	50	3	102	7
9:15 - 10:15	49	2	47	2	96	4
9:30 - 10:30	52	1	53	3	105	4
9:45 - 10:45	57	3	53	2	110	5

10:00 - 11:00	59	2	56	3	115	5
10:15 - 11:15	55	2	55	3	110	5
10:30 - 11:30	53	4	48	4	101	8
10:45 - 11:45	55	2	48	3	103	5
11:00 - 12:00	54	3	49	3	103	6
11:15 - 12:15	60	3	46	3	106	6
11:30 - 12:30	57	1	56	1	113	2
11:45 - 12:45	57	1	59	1	116	2
12:00 - 1:00	61	1	62	0	123	1
12:15 - 1:15	62	2	64	0	126	2
12:30 - 1:30	61	3	57	0	118	3
12:45 - 1:45	58	3	57	1	115	4
1:00 - 2:00	52	2	51	2	103	4
1:15 - 2:15	47	3	51	2	98	5
1:30 - 2:30	43	2	45	4	88	6
1:45 - 2:45	45	2	42	3	87	5
2:00 - 3:00	46	3	41	3	87	6
2:15 - 3:15	47	1	51	4	98	5
2:30 - 3:30	53	1	56	2	109	3
2:45 - 3:45	62	1	71	2	133	3
3:00 - 4:00	65	0	74	1	139	1
3:15 - 4:15	60	0	65	0	125	0
3:30 - 4:30	56	0	60	0	116	0
3:45 - 4:45	51	1	47	0	98	1
4:00 - 5:00	53	1	50	1	103	2
4:15 - 5:15	68	2	61	1	129	3
4:30 - 5:30	67	3	60	2	127	5
4:45 - 5:45	72	2	65	2	137	4
5:00 - 6:00	75	2	65	1	140	3
5:15 - 6:15	62	1	54	1	116	2
5:30 - 6:30	69	0	60	2	129	2
5:45 - 6:45	52	0	55	2	107	2
6:00 - 7:00	37	0	44	2	81	2

Institute of Transportation Engineers

Trip Generation Data Form (Part 3)

Detailed Driveway Volumes						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 7:15	10	0	15	2	25	2
7:15 - 7:30	10	1	10	0	20	1
7:30 - 7:45	14	1	10	1	24	2
7:45 - 8:00	13	0	12	1	25	1
8:00 - 8:15	14	1	12	0	26	1
8:15 - 8:30	18	1	19	2	37	3
8:30 - 8:45	11	1	11	1	22	2
8:45 - 9:00	8	0	9	0	17	0
9:00 - 9:15	19	2	16	1	35	3
9:15 - 9:30	15	1	13	0	28	1
9:30 - 9:45	7	0	11	2	18	2
9:45 - 10:00	11	1	10	0	21	1
10:00 - 10:15	16	0	13	0	29	0
10:15 - 10:30	18	0	19	1	37	1
10:30 - 10:45	12	2	11	1	23	3
10:45 - 11:00	13	0	13	1	26	1
11:00 - 11:15	12	0	12	0	24	0
11:15 - 11:30	16	2	12	2	28	4
11:30 - 11:45	14	0	11	0	25	0
11:45 - 12:00	12	1	14	1	26	2
12:00 - 12:15	18	0	9	0	27	0
12:15 - 12:30	13	0	22	0	35	0
12:30 - 12:45	14	0	14	0	28	0
12:45 - 1:00	16	1	17	0	33	1
1:00 - 1:15	19	1	11	0	30	1
1:15 - 1:30	12	1	15	0	27	1
1:30 - 1:45	11	0	14	1	25	1
1:45 - 2:00	10	0	11	1	21	1
2:00 - 2:15	14	2	11	0	25	2
2:15 - 2:30	8	0	9	2	17	2
2:30 - 2:45	13	0	11	0	24	0
2:45 - 3:00	11	1	10	1	21	2
3:00 - 3:15	15	0	21	1	36	1

3:15 - 3:30	14	0	14	0	28	0
3:30 - 3:45	22	0	26	0	48	0
3:45 - 4:00	14	0	13	0	27	0
4:00 - 4:15	10	0	12	0	22	0
4:15 - 4:30	10	0	9	0	19	0
4:30 - 4:45	17	1	13	0	30	1
4:45 - 5:00	16	0	16	1	32	1
5:00 - 5:15	25	1	23	0	48	1
5:15 - 5:30	9	1	8	1	17	2
5:30 - 5:45	22	0	18	0	40	0
5:45 - 6:00	19	0	16	0	35	0
6:00 - 6:15	12	0	12	0	24	0
6:15 - 6:30	16	0	14	2	30	2
6:30 - 6:45	5	0	13	0	18	0
6:45 - 7:00	4	0	5	0	9	0

Institute of Transportation Engineers

Trip Generation Data Form (Part 1)

Land Use/Building Type:[1]	Grocery Store with Gas Station and Auto Repair		ITE Land Use Code:
Source:			Source No. (*ITE use only*):
Name of Development:	Hop-in Market		Day of the Week: Thursday
City: Seattle	State/Province: WA	Zip/Postal Code: 98112	Day: 17 Month: February Year: 2011
Country: USA			Metropolitan Area: Seattle, Washington

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area:

☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural
☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural)
☐ (7) Not Given

Independent Variable: (include data for as many as possible)[2]	Actual	Estimated		Actual	Estimated
14 (1) Employees (#)	☒	☐	40 (9) Parking Spaces (% occupied: _____)	☒	☐
_____ (2) Persons (#)	☐	☐	_____ (10) Beds (% occupied: _____)	☐	☐
_____ (3) Total Units (#) (indicate unit:_____)	☐	☐	_____ (11) Seats (#)	☐	☐
_____ (4) Occupied Units (#) (indicate unit:_____)	☐	☐	_____ (12) Servicing Positions/Vehicle Fueling Positions	☐	☐
10,435 (5) Gross Floor Area (gross sq. ft.) (% of development occupied _____)	☐	☒	_____ (13) Shopping Center % Out-parcels/pads	☐	☐
_____ (6) Net Rentable Area (sq. ft.)	☐	☐	_____ (14) A.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
_____ (7) Gross Leasable Area (sq. ft.) (% of development occupied _____)	☐	☐	_____ (15) P.M. Peak Hour Volume of Adjacent Street Traffic	☐	☐
			8 (16) Other Number of Gas Pumps	☐	☐
_____ (8) Total Acres (% developed: _____)	☐	☐	3 (17) Other Number of Car Repair Bays	☐	☐

Detailed Description of Development:[3]

The land use is a mixture of a grocery store (main), a gas station (secondary), an auto repair shop (secondary), and a parking lot. The total site area takes 39,800 square feet. The grocery store is 9,335 square feet with 10 employees, operating from 6 AM to midnight. The auto repair shop is 1,100 square feet with four mechanics working on three car repair bays, operating from 8 AM to 6 PM, Monday to Friday. There are four self-service gas fueling stations with eight pumps in total. The total floor area of the gas station is 1,700 square feet.

2. Definitions for several independent variables can be found in the *Trip Generation*, Second Edition, *User's Guide* Glossary.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data:

Vehicle Occupancy (#):
_____ A.M. _____ P.M. _____ 24-hour %

Percent by Transit:
_____ A.M. % _____ P.M. % _____ 24-hour %

Percent by Carpool/Vanpool:
_____ A.M. % _____ P.M. % _____ 24-hour %

Employees by Shift:

	Start Time	End Time	Employees (#)
First Shift:	_____	_____	_____
Second Shift:	_____	_____	_____
Third Shift:	_____	_____	_____

Parking Cost on Site: Hourly 0 Daily 0

Transportation Demand Management (TDM) Information:

At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway?

☒ No

☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary)

☐ (1) Transit Service
☐ (2) Carpool Programs
☐ (3) Vanpool Programs
☐ (4) Bicycle/Pedestrian Facilities and Site Improvements
☐ (5) Employer Support Measures
☐ (6) Preferential HOV Treatments
☐ (7) Transit and Ridesharing Incentives
☐ (8) Parking Supply and Pricing Management
☐ (9) Tolls and Congestion Pricing
☐ (10) Variable Work Hours/Compressed Work Weeks
☐ (11) Telecommuting
☐ (12) Other _____

Please Complete Form on Other Side

Institute of Transportation Engineers

Trip Generation Data Form (Part 2)

Survey conducted by:

Name:	Runze Yu
Organization:	University of Washington ITE Student Chapter
Address:	More Hall 101, University of Washington
City/State/Zip:	Seattle/WA/98195
Telephone #:	206-543-7827
Fax #:	206-543-1543
E-mail:	ite@uw.edu

Summary of Driveway Volumes							
Thursday Feb 17 2011		Average Weekday (M - F)					
		Enter		Exit		Total	
		All	Trucks	All	Trucks	All	Trucks
AM Peak Hour of Adjacent Street Traffic (7 – 9) Time:	8:00 - 9:00	72	4	68	1	140	5
PM Peak Hour of Adjacent Street Traffic (4 – 6) Time:	5: 00 - 6:00	35	0	53	0	88	0
AM Peak Hour Generator Time:	8:00 - 9:00	72	4	68	1	140	5
PM Peak Hour Generator Time:	3:00 - 4:00	59	0	73	0	132	0

Hourly Driveway Volumes- Average Weekday (M-F)						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 8:00	56	1	39	1	95	2
7:15 - 8:15	63	2	54	1	117	3
7:30 - 8:30	63	2	61	2	124	4
7:45 - 8:45	68	2	67	2	135	4
8:00 - 9:00	72	4	68	1	140	5
8:15 - 9:15	66	4	60	3	126	7
8:30 - 9:30	58	4	49	2	107	6
8:45 - 9:45	53	4	43	2	96	6
9:00 - 10:00	38	1	33	2	71	3
9:15 - 10:15	41	0	34	1	75	1

9:30 - 10:30	39	1	31	1	70	2
9:45 - 10:45	39	2	34	2	73	4
10:00 - 11:00	41	2	34	2	75	4
10:15 - 11:15	34	2	30	1	64	3
10:30 - 11:30	35	1	37	2	72	3
10:45 - 11:45	37	4	33	2	70	6
11:00 - 12:00	38	4	40	4	78	8
11:15 - 12:15	45	5	41	5	86	10
11:30 - 12:30	53	5	44	5	97	10
11:45 - 12:45	57	1	47	4	104	5
12:00 - 1:00	61	2	48	3	109	5
12:15 - 1:15	60	4	43	5	103	9
12:30 - 1:30	60	5	44	5	104	10
12:45 - 1:45	55	7	49	8	104	15
1:00 - 2:00	52	9	42	8	94	17
1:15 - 2:15	54	10	51	10	105	20
1:30 - 2:30	54	12	53	13	107	25
1:45 - 2:45	52	10	50	12	102	22
2:00 - 3:00	56	12	57	13	113	25
2:15 - 3:15	58	8	57	8	115	16
2:30 - 3:30	61	5	63	4	124	9
2:45 - 3:45	62	5	64	2	126	7
3:00 - 4:00	59	0	73	0	132	0
3:15 - 4:15	54	0	68	0	122	0
3:30 - 4:30	48	0	60	0	108	0
3:45 - 4:45	45	0	54	0	99	0
4:00 - 5:00	46	1	41	0	87	1
4:15 - 5:15	41	1	41	0	82	1
4:30 - 5:30	38	1	42	0	80	1
4:45 - 5:45	34	1	46	1	80	2
5:00 - 6:00	35	0	53	1	88	1
5:15 - 6:15	36	0	52	1	88	1
5:30 - 6:30	40	0	56	1	96	1
5:45 - 6:45	41	0	51	0	92	0
6:00 - 7:00	29	0	40	0	69	0

Detailed Driveway Volumes						
	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks
7:00 - 7:15	9	0	7	0	16	0
7:15 - 7:30	15	0	8	0	23	0
7:30 - 7:45	11	0	9	0	20	0
7:45 - 8:00	21	1	15	1	36	2
8:00 - 8:15	16	1	22	0	38	1
8:15 - 8:30	15	0	15	1	30	1
8:30 - 8:45	16	0	15	0	31	0
8:45 - 9:00	25	3	16	0	41	3
9:00 - 9:15	10	1	14	2	24	3
9:15 - 9:30	7	0	4	0	11	0
9:30 - 9:45	11	0	9	0	20	0
9:45 - 10:00	10	0	6	0	16	0
10:00 - 10:15	13	0	15	1	28	1
10:15 - 10:30	5	1	1	0	6	1
10:30 - 10:45	11	1	12	1	23	2
10:45 - 11:00	12	0	6	0	18	0
11:00 - 11:15	6	0	11	0	17	0
11:15 - 11:30	6	0	8	1	14	1
11:30 - 11:45	13	4	8	1	21	5
11:45 - 12:00	13	0	13	2	26	2
12:00 - 12:15	13	1	12	1	25	2
12:15 - 12:30	14	0	11	1	25	1
12:30 - 12:45	17	0	11	0	28	0
12:45 - 1:00	17	1	14	1	31	2
1:00 - 1:15	12	3	7	3	19	6
1:15 - 1:30	14	1	12	1	26	2
1:30 - 1:45	12	2	16	3	28	5
1:45 - 2:00	14	3	7	1	21	4
2:00 - 2:15	14	4	16	5	30	9
2:15 - 2:30	14	3	14	4	28	7
2:30 - 2:45	10	0	13	2	23	2
2:45 - 3:00	18	5	14	2	32	7
3:00 - 3:15	16	0	16	0	32	0
3:15 - 3:30	17	0	20	0	37	0
3:30 - 3:45	11	0	14	0	25	0
3:45 - 4:00	15	0	23	0	38	0
4:00 - 4:15	11	0	11	0	22	0
4:15 - 4:30	11	0	12	0	23	0

4:30 - 4:45	8	0	8	0	16	0
4:45 - 5:00	16	1	10	0	26	1
5:00 - 5:15	6	0	11	0	17	0
5:15 - 5:30	8	0	13	0	21	0
5:30 - 5:45	4	0	12	1	16	1
5:45 - 6:00	17	0	17	0	34	0
6:00 - 6:15	7	0	10	0	17	0
6:15 - 6:30	12	0	17	0	29	0
6:30 - 6:45	5	0	7	0	12	0
6:45 - 7:00	5	0	6	0	11	0

Parking Demand Survey Form

Institute of Transportation Engineers

*(fill in all highlighted cells - * are required data)*

Land Use Code*	N/A				
Name of Site	Hop-in Market				
Brief Description of Site	Grocery store with gas stations and auto repair				
Transit*	Yes				
Area*	Urban Non-CBD	**City**	Seattle		
TMP*	No	**State**	WA	**Country**	USA
Parking Price*	$0 Daily Rate		$0 Hourly Rate		

Site Size*	**10,435**	**Units***	sq. ft	**Occupancy***	100%	**Land Use**
Site Size		**Units**		**Occupancy**		
Site Size		**Units**		**Occupancy**		
Site Size		**Units**		**Occupancy**		

Number of Parking Spaces Provided at Site 40

Highest Observed Parking Demand for the following hours of the day *(hour beginning)**

Date	2/15/2011	2/16/2011	2/17/2011				
Day	Tuesday	Wednesday	Thursday				
12 Mid							
1:00 AM							
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
6:00 AM							
7:00 AM	39	7	12				
8:00 AM	25	10	14				
9:00 AM	30	16	13				
10:00 AM	18	16	21				
11:00 AM	21	23	17				
12 Noon	34	30	24				
1:00 PM	25	26	24				
2:00 PM	21	23	21				
3:00 PM	26	21	18				
4:00 PM	25	13	19				
5:00 PM	25	20	17				
6:00 PM	19	18	12				
7:00 PM							
8:00 PM							
9:00 PM							
10:00 PM							
11:00 PM							

Person	Runze Yu	**Organization**	University of Washington ITE Student Chapter
Phone	206-543-7827		
Fax	206-543-1543		
Email	ite@uw.edu		
Notes			

Enter data on the web at www.ite.org Comments to: ite_staff@ite.org

IF not entered on web site, please mail to:

Institute of Transportation Engineers, 1627 Eye Street, NW Suite 600; Washington, DC 20006

Form version 1.4