

November 26, 2021

Our File: 2341-21328-0

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## Re: 1177 Foothills Blvd. Seniors Apartment Traffic Summary

Peter Wise plans to develop a 127-unit, six-storey seniors apartment complex at 1177 Foothills Boulevard, Prince George, BC. The site is currently undeveloped and is proposed to be accessed from Foothills Boulevard, across from the existing intersection with Ochakwin Crescent (S). The property is currently in the process of being rezoned from RM4 (Multiple Residential) to RM6 (Mid-Rise Residential).

This Traffic Summary will provide a review of the existing traffic volumes on Foothills Boulevard, an estimate of development traffic volumes, a review of the proposed development access, and an identification of any potential impacts caused by the development.

### SITE CONTEXT

Near the project site, Foothills Boulevard is a four-lane arterial with shoulder cycling lanes divided by a 9m wide raised median with a posted speed of 50km/h. At the proposed site access there is an opening in the median approximately 16m wide. Approximately 60 metres south of the proposed site access is an existing crosswalk along a residential walkway. The proposed development is shown below in Figure 1 with the proposed access location highlighted in red.



Figure 1: Site Location

## ACCESS CONFIGURATION

The proposed access will connect to Foothills Boulevard near the southeast corner of the property. The site access is proposed as a full movement access at the existing median opening. The proposed site plan is shown in Figure 2.

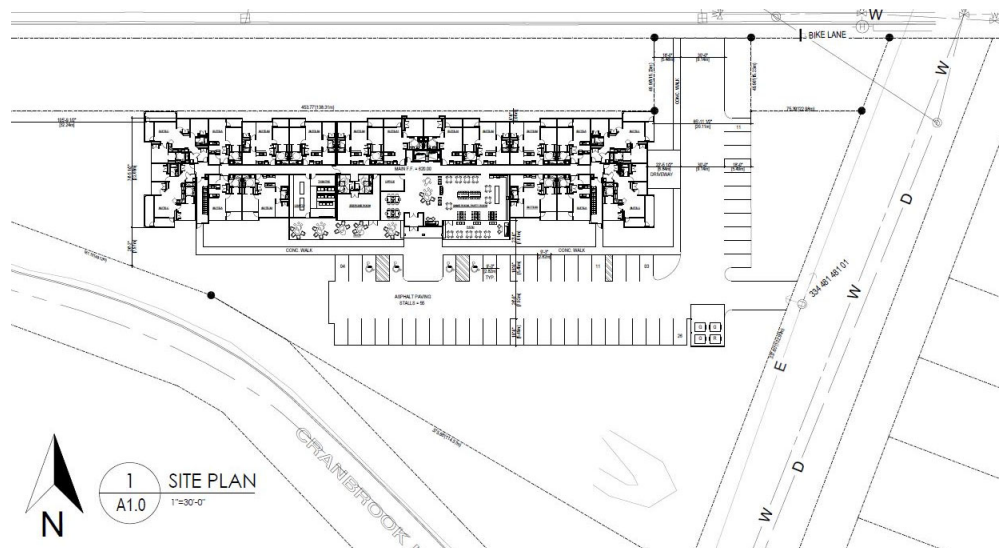


Figure 2: Proposed Site Plan

On Foothills Boulevard the southern median nose has a symmetrical rounded geometry, as opposed to the northern median nose which includes a tapered geometry to favour southbound left turns onto Ochakwin Crescent. There is also an existing BC Hydro transmission pole near the end of the southern median nose which would impede the development improved geometry for northbound left turn movements.

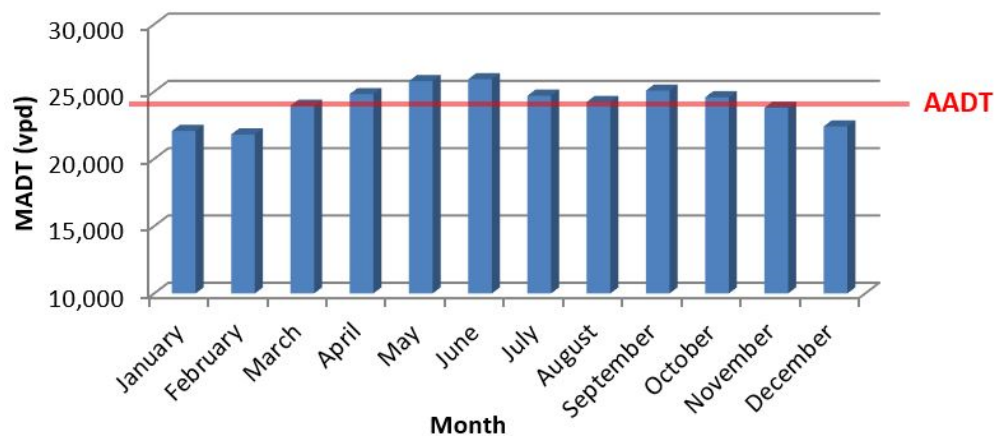
Despite these limitations, larger vehicles can be accommodated with the current geometry. The northbound left turning movement was reviewed with the AutoTURN 11 software and found to accommodate all design vehicles from the Transportation Association of Canada without overtracking into the outside northbound lane. Concurrent opposing left turn movements can only be made by passenger vehicles. For larger vehicles, concurrent opposing left turn movements would not be possible; however, with the traffic volumes and the expected vehicle types accessing the property, this situation would be very uncommon outside of construction. The site access itself has not yet been designed, but the intersection should be designed to accommodate right-in and right-out movements from the expected design vehicles.

Guidelines from the Transportation Association of Canada suggest that full movement intersections on arterial roads should be at a minimum spacing of 200m to help separate the turning movements within the functional area of each intersection, and to facilitate the development of back-to-back left turn lanes between the accesses. The access location is approximately 230m from the intersection of Cranbrook Hill Road and 270m from the intersection of Cascade Avenue.

## EXISTING TRAFFIC VOLUMES

A traffic count (attached) was completed at the intersection of 15<sup>th</sup> Avenue and Foothills Boulevard on Wednesday, November 10, 2021, from 07:00 to 09:00, and 15:00 to 18:00. The peak hours identified from the counts were found to be from 07:45 to 8:45, and 16:30 to 17:30.

To determine seasonal variations in the region, a 12-month period of data was used from the Ministry's permanent count station at the Highway 97 / Highway 16 intersection (P-42-1). The 2019 annual counts were used for this study due to the COVID-19 pandemic which has caused traffic volumes anomalies in the 2020 data set. The local traffic volumes in 2019 were found to be highest in the month of June. Using the Monthly Average Daily Traffic (MADT) volumes from the count station (Figure 3), the count data was scaled accordingly to the yearly maximum. The scale factor was found to be 8.9% for November.



*Figure 3: Monthly Average Daily Traffic Variations on Highway 97, Prince George*  
Source: Ministry Count Station P-42-1NS (2019)

Since spring 2020, the COVID19 pandemic has caused widespread impacts to BC businesses, industries, schools, recreation, and services. The result has been a general reduction in traffic patterns related to personal travel and commuting, which has fluctuated throughout the year with severity of provincial travel restrictions. The effects to traffic volumes were substantial in March to May of 2020 (decreasing traffic volumes as much as 35%), but the volumes have normalized somewhat recently.

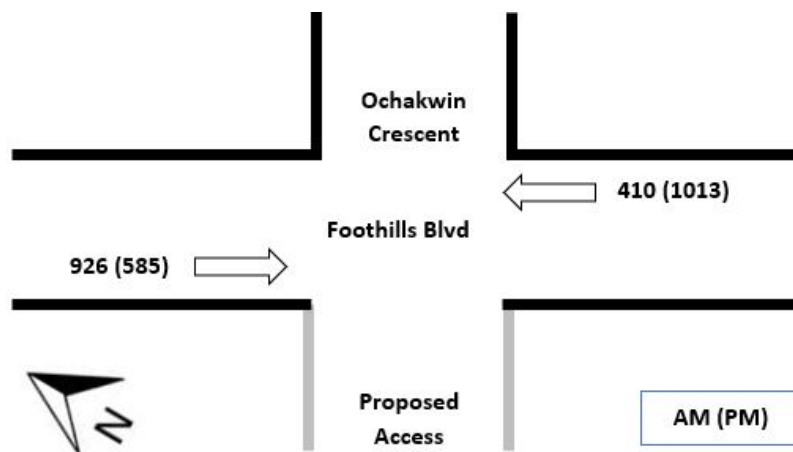
To estimate the extent to which these impacts are likely to have affected the traffic volumes counted in Fall 2021, the latest three months of MADT volumes were compared to the pre-pandemic (2019) traffic volumes counted during the same months as derived from the traffic volumes counted at the nearest MOTI highway count station on Highway 97 (P-42-1). The comparison of traffic volumes is shown in Table 1.

*Table 1: Covid Traffic Comparison*

	2019 MADT	2020 MADT	Scale Factor
<b>October</b>	24584	23156	1.061669
<b>November</b>	23802	21859	1.088888
<b>December</b>	22412	20292	1.104475
		<b>Average</b>	<b>1.085</b>

The average reduction in traffic volumes through the most recent three months of data was approximately 8.5%. This decrease is assumed to be due to the COVID19 pandemic. Therefore, to estimate non-pandemic traffic conditions in 2021, the traffic volumes were increased by a scale factor of 1.09.

The 2021 Adjusted Background Traffic Volumes are shown in Figure 4



*Figure 4: 2021 Adjusted Background Traffic Volumes (Counted November 10, 2021)*

## TRIP GENERATION AND DISTRIBUTION

The trips generated by the proposed development were estimated based on 10<sup>th</sup> Edition of the ITE Trip Generation Manual and the site plans provided by EFG Architects Inc. The proposed development would be classified as “Senior Adult Housing - Attached” (Code 252). The trips were calculated based on the number of occupied dwelling units in the proposed buildings, as shown in Table 2. Over the six floors of the building, there are a total of 127 dwelling units which are assumed to be fully occupied for the analysis.

*Table 2: Trip Generation for Proposed Site*

Peak Hour	Use Type	ITE Category	Rate	Directional Distribution		Total Trips (vph)	New Trips	
			Trips/Dwelling	Entering (%)	Exiting (%)		Entering (vph)	Exiting (vph)
AM	Senior Adult Housing - Attached	252	0.19	35	65	24	8	16
PM	Senior Adult Housing - Attached	252	0.23	60	40	29	17	12

The proposed development is expected to generate a total of 24 vehicles in the AM peak hour and 29 vehicles in the PM peak hour. The directional distribution would be 35% entering/ 65% exiting in the AM, and 60% entering/ 40% exiting in the PM. The generated traffic volumes are about 1/3 of the volume that would warrant a formal Traffic Impact Study.

The site trip distribution was estimated by observing the turning movements for the nearby subdivision at Cascade Avenue, 270m south of the development. The turning movements were observed on November 23, 2021 from 14:30 to 15:30, and on November 24 from 07:00 to 08:00. The observed trip distributions are shown in Table 3.

*Table 3: Trip Distribution at Cascade Avenue*

Peak Hour	Entering from (vph)		Entering from (%)		Exiting to (vph)		Exiting to (%)	
	North	South	North	South	North	South	North	South
AM	2	2	50	50	7	8	47	53
PM	9	4	69	31	4	6	40	60

Although some behavioral differences are expected between a typical subdivision and a seniors apartment, the observed distributions at Cascade Avenue are expected to be similar to those of the development.



The expected development peak hour traffic volumes at the proposed access are shown in Figure 5.

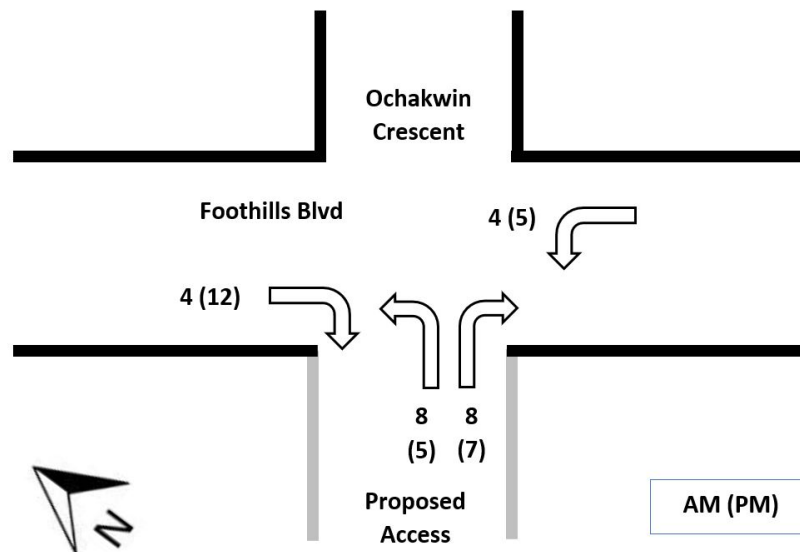


Figure 5: Development Peak Hour Traffic Volumes

The Ochakwin Crescent peak hour turning volumes are not shown, but are expected to be less than 40 vph on any movement, based on the adjacent land use and road network.

## COMBINED TRAFFIC VOLUMES

As a conservative assumption, the peak hours for the development and Foothills Boulevard were assumed to be concurrent for the analysis.

The combined traffic volumes were calculated by adding the background traffic volumes to the estimated traffic generated by the proposed development. The combined traffic volumes are shown in Figure 6.

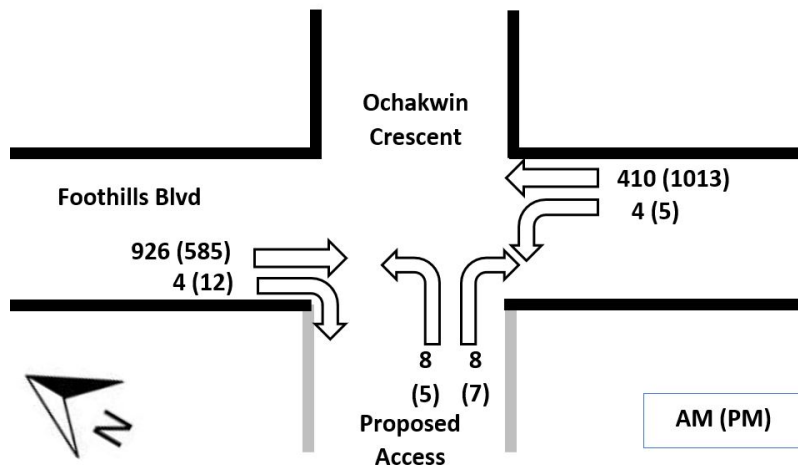


Figure 6: 2021 Combined Traffic Volumes

The estimated volumes at the intersection of Foothills Boulevard and proposed development are not expected to warrant any additional improvements or cause any significant delays. The opening in the median island is expected to be sufficient to accommodate the storage for the minor volume of estimated northbound left turns. A stop condition at the site access is expected to operate with minimal delays during peak hours, especially due to the gaps in northbound traffic created by the upstream signal at 15<sup>th</sup> Avenue. Furthermore, the site access is expected to operate well with one shared outbound lane (for left, right and through movements), as the low volume of outbound traffic is not likely to cause any queuing issues.



## SIGHT DISTANCE EVALUATION

The access sight distances were measured on November 23, 2021 as approximately 350m looking north and 450m looking south. The sightlines at the proposed access are shown in Figure 7 and 8.



Figure 7: Sight Distance Looking North



Figure 8: Sight Distance Looking South

The sight distances at the proposed access exceed the Transportation Association of Canada (TAC) sight distance criteria for 50 km/h roads as shown in Table 4.

Table 4: Sight Distance Criteria

Criteria	Sight Distance Criteria (m)	Satisfied Looking North?	Satisfied Looking North?
Minimum Stopping Sight Distance	65	Yes	Yes
Decision Sight Distance Condition A: Stop	75	Yes	Yes
Decision Sight Distance Condition C: Speed/Path Change	145	Yes	Yes
Intersection Turning Sight Distance (i.e., looking for approaching vehicles in lane being entered)	160	Yes	Yes

## ALTERNATE MODES OF TRANSPORTATION

To ensure connectivity to pedestrian routes in the area, it is recommended that a sidewalk route connect from the development to the crosswalk on Foothills Boulevard by extending the existing sidewalk on the west side of Foothills Boulevard to the proposed sidewalk on the north side the site access. This would also allow convenient access to the transit stop on the east side of Foothills Boulevard immediately north of the crosswalk. Existing cycling lanes are in place on both shoulders of Foothills Boulevard. Convenient and secure bicycle storage should be considered near or inside the front entrance of the development to encourage cycling by residents and/or visitors.



## CONCLUSION

In reviewing the proposed site access, the additional traffic generated from the proposed development will be accommodated effectively with a stop-controlled access and one shared outbound lane (for left, right and through movements) assuming the trip generation rate is similar to the ITE rates for Seniors Housing. The site access should be designed to accommodate right-in and right-out movements from the expected design vehicles

At the median break, large vehicles making a northbound left turn can be accommodated with the current geometry, although concurrent opposing left turn movements would not be possible. Concurrent opposing left turns by passenger vehicles can easily be accommodated. The sight distances at the proposed access were determined to exceed all criteria from the Transportation Association of Canada.

To ensure connectivity to pedestrian routes in the area, it is recommended that a sidewalk route connect from the development to the crosswalk on Foothills Boulevard by extending the existing sidewalk on the west side of Foothills Boulevard to the proposed sidewalk on the north side the site access. Convenient and secure bicycle storage should be considered near or inside the front entrance of the development to encourage cycling by residents and visitors

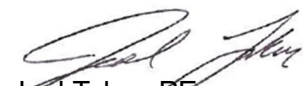
## IN CLOSING

This traffic summary has been prepared by McElhanney Ltd. (McElhanney) for the benefit of Peter Wise and the City of Prince George. The information and data contained herein represent McElhanney's best professional judgment in light of the knowledge and information available to McElhanney at the time of preparation.


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Yours truly,

McElhanney Ltd.



Joel Taker, PEng  
Transportation Engineer



Glenn Stanker PEng PTOE  
Senior Transportation Engineer

Attachment: Traffic Count Data



Peak Hour Traffic Count Data -15th Avenue and Foothills Boulevard

Direction Start Time	Foothills Blvd Southbound							15th Ave Westbound							Foothills Blvd Northbound							University Way Eastbound							Int Total
	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	
2021-11-10 07:45:00	57	105	68	0	230	0	0	21	51	1	0	73	0	0	12	29	5	0	46	0	0	6	29	26	0	61	0	0	410
2021-11-10 08:00:00	75	65	54	0	194	1	1	31	73	7	0	111	1	0	6	32	14	0	52	4	1	2	20	42	0	64	4	0	421
2021-11-10 08:15:00	75	69	64	0	208	1	0	18	98	3	0	119	0	0	5	24	15	1	45	0	0	4	50	39	0	93	0	0	465
2021-11-10 08:30:00	51	64	38	0	153	0	2	37	66	2	0	105	0	3	9	29	4	0	42	0	0	2	35	20	0	57	0	0	357
Grand Total	258	303	224	0	785	2	3	107	288	13	0	408	1	3	32	114	38	1	185	4	1	14	134	127	0	275	4	0	1653
% Approach	32.9%	38.6%	28.5%	0.0%				26.2%	70.6%	3.2%	0.0%				17.3%	61.6%	20.5%	0.5%				5.1%	48.7%	46.2%	0.0%				
% Total	15.6%	18.3%	13.6%	0.0%	47.5%			6.5%	17.4%	0.8%	0.0%	24.7%			1.9%	6.9%	2.3%	0.1%	11.2%			0.8%	8.1%	7.7%	0.0%	16.6%			
PHF (7:45 AM - 8:45 AM)	0.86	0.721	0.824	0	0.853			0.723	0.732	0.464	0	0.855			0.667	0.891	0.633	0.25	0.889			0.583	0.67	0.756	0	0.739			0.888
Motorcycles	0	0	0	0	0			0	0	0	0	0			0	0	0	0	0			0	0	0	0	0			0
% Motorcycles	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%
Lights	253	294	208	0	755			95	283	10	0	388			29	110	37	1	177			14	130	124	0	268			1588
% Lights	98.1%	97.0%	92.9%	0.0%	96.2%			88.8%	98.3%	76.9%	0.0%	95.1%			90.6%	96.5%	97.4%	100.0%	95.7%			100.0%	97.0%	97.6%	0.0%	97.5%			96.1%
Single-Unit Trucks	3	8	10	0	21			6	0	1	0	7			1	3	1	0	5			0	0	2	0	2			35
% Single-Unit Trucks	1.2%	2.6%	4.5%	0.0%	2.7%			5.6%	0.0%	7.7%	0.0%	1.7%			3.1%	2.6%	2.6%	0.0%	2.7%			0.0%	0.0%	1.6%	0.0%	0.7%			2.1%
Articulated Trucks	2	1	4	0	7			1	0	0	0	1			0	0	0	0	0			0	0	1	0	1			9
% Articulated Trucks	0.8%	0.3%	1.8%	0.0%	0.9%			0.9%	0.0%	0.0%	0.0%	0.2%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.8%	0.0%	0.4%			0.5%
Buses	0	0	2	0	2			5	4	2	0	11			2	1	0	0	3			0	4	0	0	4			20
% Buses	0.0%	0.0%	0.9%	0.0%	0.3%			4.7%	1.4%	15.4%	0.0%	2.7%			6.3%	0.9%	0.0%	0.0%	1.6%			0.0%	3.0%	0.0%	0.0%	1.5%			1.2%
Bicycles on Road	0	0	0	0	0			0	1	0	0	1			0	0	0	0	0			0	0	0	0	0			1
% Bicycles on Road	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.3%	0.0%	0.0%	0.2%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.1%
Pedestrians						2	3						1	3						4	1					4	0		
% Pedestrians						100.0%	100.0%						100.0%	100.0%						100.0%	100.0%					100.0%	0.0%		
Bicycles on Crosswalk						0	0						0	0						0	0					0	0		
% Bicycles on Crosswalk						0.0%	0.0%						0.0%	0.0%						0.0%	0.0%					0.0%	0.0%		

Direction Start Time	Foothills Blvd Southbound							15th Ave Westbound							Foothills blvd Northbound							University Way Eastbound							Int Total
	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	App Total	Peds CW	Peds CCW	
2021-11-10 16:30:00	52	45	39	0	136	0	1	66	42	15	0	123	0	0	4	122	8	0	134	0	0	11	47	73	0	131	0	2	524
2021-11-10 16:45:00	56	56	21	0	133	0	0	54	63	14	0	131	1	1	7	90	5	0	102	0	1	10	47	49	0	106	0	0	472
2021-11-10 17:00:00	43	53	16	0	112	1	1	61	66	20	0	147	0	1	10	95	4	0	109	0	0	6	45	53	0	104	1	1	472
2021-11-10 17:15:00	34	54	27	0	115	0	1	64	49	13	0	126	0	1	10	82	5	0	97	1	2	5	57	50	0	112	1	1	450
Grand Total	185	208	103	0	496	1	3	245	220	62	0	527	1	3	31	389	22	0	442	1	3	32	196	225	0	453	2	4	1918
% Approach	37.3%	41.9%	20.8%	0.0%				46.5%	41.7%	11.8%	0.0%				7.0%	88.0%	5.0%	0.0%				7.1%	43.3%	49.7%	0.0%				
% Total	9.6%	10.8%	5.4%	0.0%	25.9%			12.8%	11.5%	3.2%	0.0%	27.5%			1.6%	20.3%	1.1%	0.0%	23.0%			1.7%	10.2%	11.7%	0.0%	23.6%			
PHF (4:30 PM - 5:30 PM)	0.821	0.929	0.66	0	0.917			0.938	0.833	0.775	0	0.895			0.775	0.797	0.688	0	0.825			0.727	0.86	0.771	0	0.865			0.918
Motorcycles	0	0	0	0	0			0	0	0	0	0			0	0	0	0	0			0	0	0	0	0			0
% Motorcycles	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%
Lights	184	202	93	0	479			240	216	57	0	513			25	383	22	0	430			32	192	220	0	444			1866
% Lights	99.5%	97.1%	90.3%	0.0%	96.6%			98.0%	98.2%	91.9%	0.0%	97.3%			80.6%	98.5%	100.0%	0.0%	97.3%			100.0%	98.0%	97.8%	0.0%	98.0%			97.3%
Single-Unit Trucks	0	6	6	0	12			1	0	3	0	4			4	6	0	0	10			0	0	4	0	4			30
% Single-Unit Trucks	0.0%	2.9%	5.8%	0.0%	2.4%			0.4%	0.0%	4.8%	0.0%	0.8%			12.9%	1.5%	0.0%	0.0%	2.3%			0.0%	0.0%	1.8%	0.0%	0.9%			1.6%
Articulated Trucks	0	0	2	0	2			0	0	0	0	0			0	0	0	0	0			0	0	1	0	1			3
% Articulated Trucks	0.0%	0.0%	1.9%	0.0%	0.4%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.4%	0.0%	0.2%			0.2%
Buses	0	0	2	0	2			3	4	2	0	9			2	0	0	0	2			0	4	0	0	4			17
% Buses	0.0%	0.0%	1.9%	0.0%	0.4%			1.2%	1.8%	3.2%	0.0%	1.7%			6.5%	0.0%	0.0%	0.0%	0.5%			0.0%	2.0%	0.0%	0.0%	0.9%			0.9%
Bicycles on Road	1	0	0	0	1			1	0	0	0	1			0	0	0	0	0			0	0	0	0	0			2
% Bicycles on Road	0.5%	0.0%	0.0%	0.0%	0.2%			0.4%	0.0%	0.0%	0.0%	0.2%			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%			0.1%
Pedestrians						1	3						1	3						1	3					2	4		
% Pedestrians						100.0%	100.0%						100.0%	100.0%						100.0%	100.0%					100.0%	100.0%		
Bicycles on Crosswalk						0	0						0	0						0	0				0	0			0
% Bicycles on Crosswalk						0.0%	0.0%						0.0%	0.0%						0.0%	0.0%				0.0%	0.0%			0