APPENDIX C

2020 Traffic Count Collection and Traffic Study

iteris®

Spokane International Airport
Traffic Count Collection and Traffic Study

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Submitted to:

Spokane International Airport

Innovating Through Informatics™

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1 INTRODUCTION

The Spokane International Airport and Business Park decided to collect count data at the roadways and intersections near the airport to get a good understanding of the existing traffic condition that will be used for future planning efforts. The count data collection included Average Daily Traffic (ADT), intersection turning movement counts (TMC), and parking counts. **Figure 1-1** illustrates the study roadway segments and intersections as listed **below**.

Study Roadway Segments

1. Airport Drive Inbound between Spotted Road and Flint Road
2. Airport Drive Inbound West of Flint Road
3. Airport Drive Outbound from Parking Garage
4. Airport Drive Outbound from Curbside Dropoff
5. Airport Drive Outbound between Flint Road and Spotted Road
6. Flightline Boulevard North of Geiger Boulevard
7. Flint Road north of Airport Drive

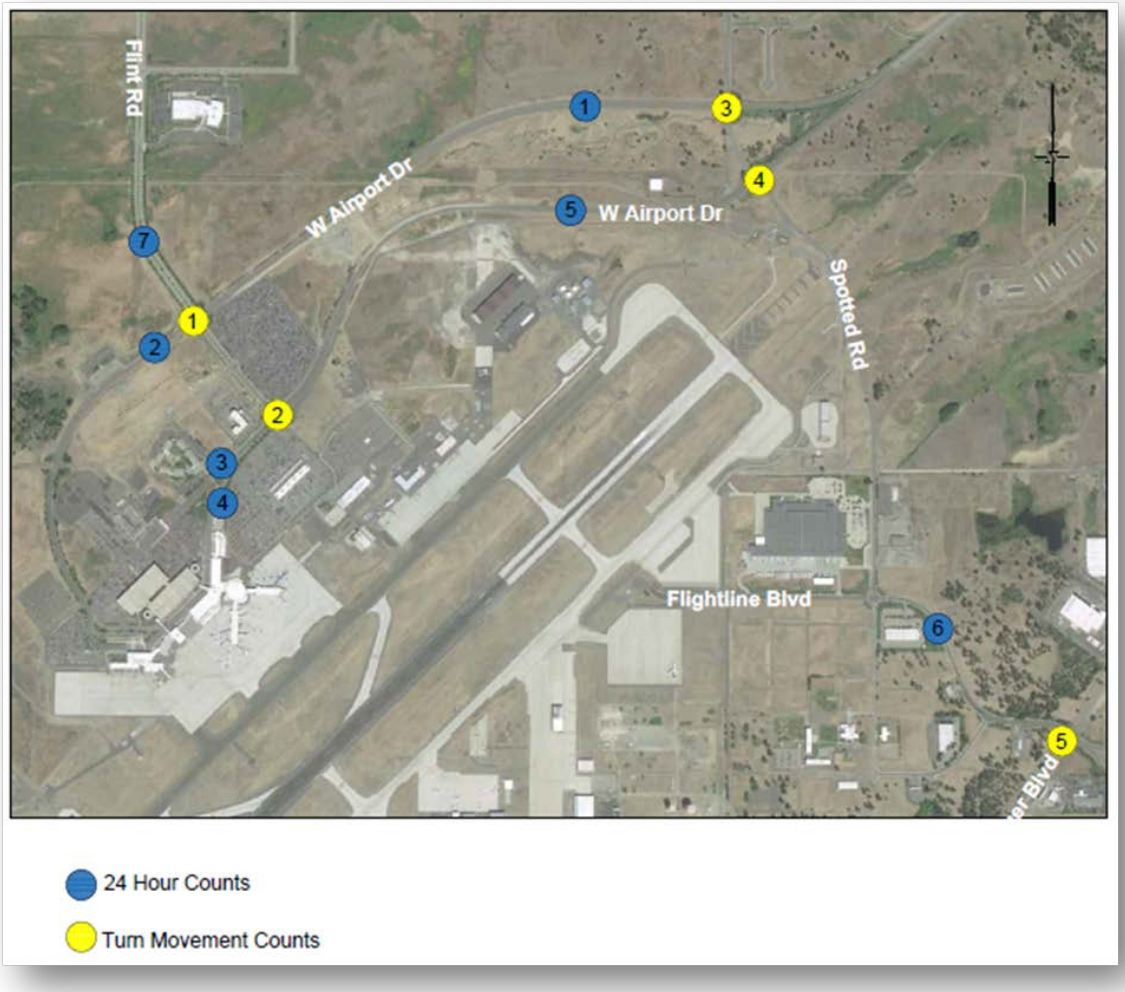
Study intersections

1. Airport Drive Inbound and Flint Road
2. Airport Drive Outbound and Flint Road
3. Airport Drive Inbound and Spotted Road
4. Airport Drive Outbound and Spotted Road
5. Flightline Boulevard and Geiger Boulevard

The data collection was conducted at each of the study location during the three identified time periods as listed **below**, to capture high and low peaks of enplanements and vehicle cargo.

- Sunday, August 4, 2019 to Sunday, August 11, 2019 (Estimated high peak enplanements)
- Sunday October 20, 2019 to Sunday October 27, 2019 (Estimated low peak vehicle cargo)
- Thursday December 5, 2019 to Thursday, December 12, 2019 (Estimated high peak vehicle cargo)
    - *It should be noted that the data collection in the week of December 5, 2019 was original supposed to be done between Sunday, December 8, 2019 through Sunday, December 15, 2019, but inclement weather conditions forced the schedule to change.*
- A fourth data collection was planned to be conducted in the last week of April, which is estimated to have low peak enplanements, but due to the COVID-19 Pandemic it was cancelled.

Figure 1-1. Project Study Area



2 DATA COLLECTION AND ANALYSIS METHODOLOGY

This section discusses data collection method and analytical methodology for evaluating the performance of study intersections and roadway segments. A level of service (LOS) analysis was conducted for the study intersections and roadway segments. The study intersections were analyzed for the AM and PM peak hours, while roadway segments were assessed during both peak periods as well as on a daily basis.

2.1 DATA COLLECTION OVERVIEW

The collected data for this project included intersection tuning movement counts (TMC), roadway segment counts (known as average daily traffic-ADT) including vehicle classification, roadway segment speed, and airport parking data. TMC were collected for 24 hours of a day (as part of the data collection), however, were summarized by total average AM and PM peak periods. Roadway segment counts were collected for 24 hours (from midnight to midnight), and then summarized by total average volume, total average by day of week, average by time-of-day, and vehicle type by time-of-day.

2.2 INTERSECTION PERFORMANCE ANALYSIS

Intersection level of service was evaluated using the intersection capacity utilization (ICU) methodology, which is based on the calculating the critical flow ratio at the intersection. For this analysis, a spreadsheet tool was used to calculate the ICU and respective LOS letter grade. **Table 2-1** presents both the V/C ratio and average delay associated with each LOS grade using the ICU methodology, as well as a qualitative description of intersection operations at that grade.

Table 2-1. Intersection Level-of-Service V/C Definitions (ICU Methodology)

Level of Service	Description	Signalized Intersection Volume-to-Capacity Ratio (V/C)
A	Free flowing, virtually no delay. Minimal traffic.	≤ 0.60
B	Free flow and choice of lanes. Delays are minimal. All cars clear intersection easily.	> 0.60 to 0.70
C	Good operation. Delays starting to become a factor but still within acceptable limits.	> 0.70 to 0.80
D	Approaching unstable flow. Queues at intersection are quite long but most cars clear intersection on their green signal. Occasionally, several vehicles must wait for a second green signal. Congestion is moderate.	> 0.80 to 0.90
E	Severe congestion and delay. Most of the available capacity is used. Many cars must wait through a complete signal cycle to clear the intersection.	> 0.90 to 1.00
F	Excessive delay and congestion. Most cars must wait through more than one on one signal cycle. Queues are very long and drivers are obviously irritated.	> 1.00

2.3 ROADWAY SEGMENT PERFORMANCE ANALYSIS

Roadway segment analysis methodology utilizes the volume-to-capacity (V/C) ratio based on average daily traffic (ADT) and arterial segment daily capacity. **Table 2-2** presents the V/C ratio associated with each LOS grade as well as a qualitative description of intersection operations at that grade.

Table 2-2. Roadway Segment Level-of-Service V/C Definitions

Level of Service	Description	Roadway Segment Volume-to-Capacity Ratio (V/C)
A	Free flowing, virtually no delay. Minimal traffic.	≤ 0.60
B	Free flow and choice of lanes. Delays are minimal. All cars clear intersection easily.	> 0.60 to 0.70
C	Good operation. Delays starting to become a factor but still within acceptable limits.	> 0.70 to 0.80
D	Approaching unstable flow. Queues at intersection are quite long but most cars clear intersection on their green signal. Occasionally, several vehicles must wait for a second green signal. Congestion is moderate.	> 0.80 to 0.90
E	Severe congestion and delay. Most of the available capacity is used. Many cars must wait through a complete signal cycle to clear the intersection.	> 0.90 to 1.00
F	Excessive delay and congestion. Most cars must wait through more than one on one signal cycle. Queues are very long and drivers are obviously irritated.	> 1.00

3 WEEK OF AUGUST 4, 2019

The data collected from Sunday, August 4, 2019 to Sunday, August 11, 2019. This week presented the highest anticipated number of enplanements at the Spokane International Airport during the calendar year. Intersection and roadway segment analysis was completed based on the collected data and using the cited methodology.

3.1 ROADWAY SEGMENT AVERAGE DAILY TRAFFIC ANALYSIS

Roadway segment average daily traffic (ADT) was summarized for six roadway segments (segment 7 was not included in the analysis). Segments 3 and 4 were added together to represent the segment of Airport Drive outbound west of Flint Road. **Table 3-1** summarizes roadway segment ADT. On all segments, weekday ADT is higher than weekend ADT, and Friday resulted in the highest weekend travel.

Table 3-1. Roadway Segment Average Daily Traffic (Week of August 4, 2019)

Segment	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1: Airport Drive Inbound between Spotted Road and Flint Road	7,402	8,191	8,459	8,260	**8,704**	**8,606**	6,690	7,568
2: Airport Drive Inbound West of Flint Road	6,938	7,185	7,489	7,101	**7,597**	**7,165**	5,885	6,733
3&4: Airport Drive Outbound West of Flint Road	8,531	8,730	8,879	8,797	**9,360**	**9,112**	7,514	8,169
3: Airport Drive Outbound from Parking Garage	1,335	1,278	1,281	1,465	**1,623**	**1,588**	1,118	1,200
4: Airport Drive Outbound from Curbside Dropoff	7,196	7,452	7,598	7,332	**7,737**	**7,524**	6,396	6,969
5: Airport Drive Outbound between Flint Road and Spotted Road	7,468	8,062	8,158	8,233	**8,500**	**8,243**	6,695	7,282
6: Flightline Boulevard North of Geiger Boulevard	2,373	3,778	**4,221**	3,988	3,925	**3,973**	2,969	2,417

**Note: Segment 7 was not included in the analysis.*

From the ADT data, the peak hours were identified, as summarized in **Table 3-2** for weekdays and **Table 3-3** for weekends. As a note, Segments 3 and 4 were combined to identify the peak hour traffic for Airport Drive outbound west of Flint Road, and the time period for Segment 4 was used to identify the peak hours, as there is significantly more traffic on Segment 4 than on Segment 3.

Table 3-2. Roadway Segment Weekday Peak Hour Average Daily Traffic (Week of August 4, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	8,704	6:15 - 7:15	4:15 - 5:15
2: Airport Drive Inbound West of Flint Road	7,597	10:15-11:15	12:30-1:30
3&4: Airport Drive Outbound West of Flint Road	9,360	11:00-12:00	1:15- 2:15
3: Airport Drive Outbound from Parking Garage	1,623	10:45-11:45	11:15 - 12:15
4: Airport Drive Outbound from Curbside Dropoff	7,737	11:00-12:00	1:15- 2:15
5: Airport Drive Outbound between Flint Road and Spotted Road	8,500	11:00-12:00	1:15- 2:15
6: Flightline Boulevard North of Geiger Boulevard	3,925	11:15-12:15	5:30-6:30

Table 3-3 Roadway Segment Weekend Peak Hour Average Daily Traffic (Week of August 4, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	8,606	6:00 - 7:00	12:45 - 1:45
2: Airport Drive Inbound West of Flint Road	7,165	10:45 - 11:45	1:00 - 2:00
3&4: Airport Drive Outbound West of Flint Road	9,112	10:15-11:15	1:15- 2:15
3: Airport Drive Outbound from Parking Garage	1,588	12:00-1:00	11:45 - 12:45
4: Airport Drive Outbound from Curbside Dropoff	7,524	10:15-11:15	1:15- 2:15
5: Airport Drive Outbound between Flint Road and Spotted Road	8,243	10:45-11:45	1:15- 2:15
6: Flightline Boulevard North of Geiger Boulevard	3,973	11:00-12:00	5:30-6:30

The analysis for roadway segment level-of-service (LOS) is based on the methodology discussed previously, and is summarized in **Table 3-4**. As shown in **Table 3-4**, all roadway segments operate at LOS A for peak weekday and weekend traffic.

Table 3-4. Roadway Segment Level of Service (Week of August 4, 2019)

Segment	Roadway Segment Capacity	Average Weekday Daily Traffic	Weekday Level of Service	Average Weekend Daily Traffic	Weekend Level of Service
1: Airport Drive Inbound between Spotted Road and Flint Road	18,750	8,704	A	8,606	A
2: Airport Drive Inbound West of Flint Road	18,750	7,597	A	7,165	A
3&4: Airport Drive Outbound West of Flint Road	28,200	9,360	A	9,112	A
3: Airport Drive Outbound from Parking Garage	18,750	1,623	A	1,588	A
4: Airport Drive Outbound from Curbside Dropoff	18,750	7,737	A	7,524	A
5: Airport Drive Outbound between Flint Road and Spotted Road	18,750	8,500	A	8,243	A
6: Flightline Boulevard North of Geiger Boulevard	18,750	4,221	A	3,973	A

**Note: Roadway capacities for segments 1, 2, 3, 4, 5 were assumed to be 2-lanes and divided facilities. The combined segment 3 and 4 was assumed to be a 3-lane undivided facility.*

3.2 Intersection Turning Movement Analysis

The analysis for intersection LOS was calculated for the peak travel period for the airport, which occurred on Thursday between 10:45 AM – 11:45 AM and between 12:30 PM – 1:30 PM. Intersection LOS calculations are summarized in **Table 3-5** for the AM Peak Hour, **Table 3-6** for the PM Peak Hour, and detailed in **Figure 3.1**. As illustrated, all intersections operate at LOS B in both the AM and PM peak hours.

Table 3-5. Intersection Level of Service – AM Peak Hour (Week of August 4, 2019)

AM Peak Hour 10:45 - 11:45 AM														
	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	28	48	0	0	58	40	0	0	0	42	309	130	0.10	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	33	135	18	13	0	16	459	99	0	0	0	0.23	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	16	40	0	0	58	54	0	0	0	7	401	14	0.22	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	49	7	10	94	0	41	442	24	0	0	0	0.23	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	30	77	20	88	83	91	137	49	42	21	52	110	0.33	B

Table 3-6. Intersection Level of Service – PM Peak Hour (Week of August 4, 2019)

PM Peak Hour 1:00 - 2:00 PM														
	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	54	49	0	0	65	38	0	0	0	47	242	106	0.11	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	94	53	40	13	0	11	467	94	0	0	0	0.20	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	29	71	0	0	58	66	0	0	0	3	317	14	0.21	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	75	11	12	104	0	47	478	19	0	0	0	0.24	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	20	107	12	88	110	98	127	41	23	21	37	113	0.35	B

Figure 3-1. Intersection Level of Service Calculations (Week of August 4, 2019)

INTERSECTION 1:	Airport Drive Inbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			40			38	
NBT	1	1800	58	0.05	1,800	65	0.06
NBR			0			0	
SBL			0			0	
SBT	1	1800	48	0.03	1,800	49	0.03
SBR	1	1800	28	0.02	1,800	54	0.03
EBL	1	1800	0	0.00	1,800	0	0.00
EBT	2	3600	0	0.00	3,600	0	0.00
EBR	1	1800	0	0.00	1,800	0	0.00
WBL			130			106	
WBT			309	0.00		242	0.00
WBR			42			47	
		N/S Movements		0.05			0.06
		E/W Movements		0.00			0.00
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.10			0.11
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 2:	Airport Drive Outbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	13	0.02	1,800	13	0.03
NBR			18			40	
SBL	1	1800	135	0.08	1,800	53	0.03
SBT	1	1800	33	0.02	1,800	94	0.05
SBR			0			0	
EBL	1	1800	99	0.06	1,800	94	0.05
EBT	3	5400	459	0.09	5,400	467	0.09
EBR			16			11	
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.09			0.06
		E/W Movements		0.09			0.09
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.23			0.20
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 3:	Airport Drive Inbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			54			66	
NBT	1	1800	58	0.06	1,800	58	0.07
NBR			0			0	
SBL			0			0	
SBT	1	1800	40	0.03	1,800	71	0.06
SBR			16			29	
EBL			0			0	
EBT			0	0.00		0	0.00
EBR			0			0	
WBL	1	1800	14	0.01	1,800	14	0.01
WBT	2	3600	401	0.11	3,600	317	0.09
WBR	1	1800	7	0.00	1,800	3	0.00
		N/S Movements		0.06			0.07
		E/W Movements		0.11			0.09
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.22			0.21
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 4:	Airport Drive Outbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	94	0.05	1,800	104	0.06
NBR	1	1800	10	0.01	1,800	12	0.01
SBL			7			11	
SBT	1	1800	49	0.03	1,800	75	0.05
SBR			0			0	
EBL	1	1800	24	0.01	1,800	19	0.01
EBT	2	3600	442	0.12	3,600	478	0.13
EBR	1	1800	41	0.02	1,800	47	0.03
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.05			0.06
		E/W Movements		0.12			0.13
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.23			0.24
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 5:	Geiger Boulevard (E-W) and Flightline Boulevard (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			91			98	
NBT	1	1800	83	0.15	1,800	110	0.16
NBR			88			88	
SBL			20			12	
SBT	1	1800	77	0.05	1,800	107	0.07
SBR	1	1800	30	0.02	1,800	20	0.01
EBL	1	1800	42	0.02	1,800	23	0.01
EBT	1	1800	49	0.03	1,800	41	0.02
EBR	1	1800	137	0.08	1,800	127	0.07
WBL	1	1800	110	0.06	1,800	113	0.06
WBT	1	1800	52	0.04	1,800	37	0.03
WBR			21			21	
		N/S Movements		0.15			0.16
		E/W Movements		0.09			0.09
		Rt. Turn Component		0.05			0.05
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.33			0.35
LEVEL OF SERVICE (LOS)				B			B

3.3 Classified Count Analysis

Classified count data for all roadway segments was obtained from the ADT data, and is summarized in **Table 3-7** for the peak weekday and in **Table 3-8** for the peak weekend day. Both weekday and weekend classified data is similar, and results in the majority of trips are taken by Class 2 and Class 3 vehicles, which are passenger cars, pickups, and vans. Single-unit 2-axle trucks make up the next group of vehicles, with the highest percentage of single-unit 2-axle trucks on Airport drive inbound west of Flint Road. The majority of other classes make up less than 1% of vehicles, which is minimal.

Table 3-7. Classified Count Analysis (Average Weekday) (Week of August 4, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	76%	18%	<1%	4%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	76%*	20%*	<1%	13%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	76%	20%	<1%	4%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	77%	18%	<1%	5%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	78%	17%	<1%	3%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	64%	21%	3%	6%	1%	<1%

**Note: The Class 2 and Class 3 percentages for location 2 were reported as 35% for Class 2 and 49% for Class 3. Using engineering judgement, it appears that these two values are inaccurate, and are likely due to a reporting error with the tube counter.*

Table 3-8. Classified Count Analysis (Average Weekend) (Week of August 4, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	78%	18%	<1%	3%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	78%*	18%*	<1%	16%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	78%	19%	<1%	3%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	77%	17%	<1%	5%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	80%	17%	<1%	2%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	70%	20%	2%	5%	<1%	<1%

**Note: The Class 2 and Class 3 percentages for location 2 were reported as 12% for Class 2 and 70% for Class 3. Using engineering judgement, it appears that these two values are inaccurate, and are likely due to a reporting error with the tube counter.*

3.4 Average Speed Analysis

In addition to vehicle classification of count data, average speeds were also obtained at each of the roadway segments. **Table 3-9** summarizes the posted speed limit, the average speed, and the 85th percentile speed. The difference between the posted speed limit and the 85th percentile speed is listed as the difference. In all locations, vehicles are typically traveling faster than the posted speed, particularly at the three locations nearest the airport.

Table 3-9. Classified Count Analysis (Week of August 4, 2019)

Segment	Speed Limit (MPH)	Average Speed (MPH)	85th Percentile (MPH)	Difference (MPH)
1: Airport Drive Inbound between Spotted Road and Flint Road	50	49	54	4
2: Airport Drive Inbound West of Flint Road	35	41	47	12
3: Airport Drive Outbound from Parking Garage	20	31	37	17
4: Airport Drive Outbound from Curbside Dropoff	20	26	30	10
5: Airport Drive Outbound between Flint Road and Spotted Road	50	49	53	3
6: Flightline Boulevard North of Geiger Boulevard	30	34	38	8

3.5 Parking and Rideshare

Parking and rideshare data was provided by Spokane International airport on a monthly basis. To understand the relation of parking to enplanements for the week of August 4, 2019, the parking data for the month prior and subsequent month were compared. **Table 3-10** summarizes parking and rideshare transactions for the months of July through September. The average daily parking and rideshare data for the month of August accounts for approximately 32 percent of the highest weekday ADT for the week of August 4, 2019.

Table 3-10. Parking and Rideshare Comparison (Week of August 4, 2019)

	July	August	September	Total Annual (2019)
Parking Transactions	33,853	35,526	38,576	448,277
Rideshare Transactions	48,642	49,894	48,088	553,625
Combined Parking + Rideshare Transactions	82,495	85,420	86,664	1,001,902
Average Daily Parking + Rideshare[1]	2,661	2,755	2,889	2,745
Percent of Annual Average Daily Parking + Rideshare	8.2%	8.5%	8.6%	100.0%
Average Daily Traffic (ADT)[2]	8,500			N/A
Parking Percent of ADT	32%			N/A

[1] July and August are 31 days, September is 30 days, Annual is 365 days.

[2] Highest of weekday ADT during the week of August 4, 2019 on Airport Drive outbound between Flint Road and Spotted Road.

3.6 Conclusions

Based on the results of the count collection and subsequent analysis, the following findings were reached:

- Roadway Segment Annual Daily Traffic (ADT)
  - Friday resulted in the highest ADT for weekend traffic
  - For all segments on Airport Drive, Thursday resulted in the highest ADT for weekday traffic.
  - Tuesday resulted in the highest ADT on Flightline Boulevard
- Roadway segment weekday and weekend AM and PM peak hours vary by day
- All roadway segments operate at LOS B
- Passenger cars, pickups, and vans make up the majority of traffic within the study area
- Average speeds at roadway segments nearest the airport are more than 10 MPH faster than the posted speed limit.
- The combination of parking and rideshare transactions on an average day during the month of August is approximately 2,755 vehicles, which equates to approximately 32% of average daily traffic.

4 WEEK OF OCTOBER 20, 2019

The data collected from Sunday, October 20, 2019 through Sunday, October 27, 2019. This week presented the lowest anticipated amount of cargo enplanement and deplanement at the Spokane International Airport during the calendar year. Intersection and roadway segment analysis was completed based on the collected data and using the cited methodology.

4.1 ROADWAY SEGMENT AVERAGE DAILY TRAFFIC ANALYSIS

Roadway segment average daily traffic (ADT) was summarized for all seven roadway segments. Segments 3 and 4 were added together to represent the segment of Airport Drive outbound west of Flint Road. **Table 4-1** summarizes roadway segment ADT. On all segments, weekday ADT is higher than weekend ADT. The highest weekday varied between days, but primarily was highest on Mondays, and Friday resulted in the highest weekend travel.

Table 4-1 Roadway Segment Average Daily Traffic (Week of October 20, 2019)

Segment	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1: Airport Drive Inbound between Spotted Road and Flint Road	6,740	**8,338**	7,583	7,590	8,332	**8,427**	5,737	6,359
2: Airport Drive Inbound West of Flint Road	5,990	**7,494**	6,598	6,382	7,021	**7,204**	5,277	5,886
3&4: Airport Drive Outbound West of Flint Road	7,643	**9,091**	7,686	7,821	8,575	**8,844**	6,691	7,353
3: Airport Drive Outbound from Parking Garage	1,480	1,669	1,281	1,507	**1,768**	**1,708**	1,285	1,379
4: Airport Drive Outbound from Curbside Dropoff	6,163	**7,422**	6,405	6,314	6,807	**7,136**	5,406	5,974
5: Airport Drive Outbound between Flint Road and Spotted Road	6,804	**8,479**	7,415	7,298	7,895	**8,165**	5,958	6,618
6: Flightline Boulevard North of Geiger Boulevard	2,280	3,777	3,730	3,759	**3,936**	**3,904**	2,664	2,266
7: Flint Road North of Airport Drive	2,291	3,146	3,166	3,377	**3,467**	**3,483**	2,418	2,406

From the ADT data, the peak hours were identified, as summarized in **Table 4-2** for weekdays and **Table 4-3** for weekends. As a note, Segments 3 and 4 were combined to identify the peak hour traffic for Airport Drive outbound west of Flint Road, and the time period for Segment 4 was used to identify the peak hours, as there is significantly more traffic on Segment 4 than on Segment 3.

Table 4-2. Roadway Segment Weekday Peak Hour Average Daily Traffic (Week of October 20, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	8,427	6:00-7:00	1:00 - 2:00
2: Airport Drive Inbound West of Flint Road	7,494	6:00-7:00	12:45-1:45
3&4: Airport Drive Outbound West of Flint Road	9,091	12:45-1:45	1:30-2:30
3: Airport Drive Outbound from Parking Garage	1,768	12:45-1:45	2:00-3:00
4: Airport Drive Outbound from Curbside Dropoff	7,422	12:45-1:45	1:30-2:30
5: Airport Drive Outbound between Flint Road and Spotted Road	8,479	12:45-1:45	1:30-2:30
6: Flightline Boulevard North of Geiger Boulevard	3,936	8:30-9:30	5:15-6:15
7: Flint Road North of Airport Drive	3,483	11:45-12:45	4:45-5:45

Table 4-3. Roadway Segment Weekend Peak Hour Average Daily Traffic (Week of October 20, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	8,427	6:00-7:00	12:45-1:45
2: Airport Drive Inbound West of Flint Road	7,204	6:00-7:00	12:15-1:15
3&4: Airport Drive Outbound West of Flint Road	8,844	11:45-12:45	1:00 - 2:00
3: Airport Drive Outbound from Parking Garage	1,708	12:00-1:00	11:45-12:45
4: Airport Drive Outbound from Curbside Dropoff	7,136	11:45-12:45	1:00 - 2:00
5: Airport Drive Outbound between Flint Road and Spotted Road	8,165	11:45-12:45	1:15- 2:15
6: Flightline Boulevard North of Geiger Boulevard	3,904	11:00-12:00	5:30-6:30
7: Flint Road North of Airport Drive	3,483	11:45-12:45	12:45-1:45

The analysis for roadway segment level-of-service (LOS) is based on the methodology discussed previously, and is summarized in **Table 4-4**. As shown in **Table 4-4**, all roadway segments operate at LOS A for peak weekday and weekend traffic.

Table 4-4. Roadway Segment Level of Service (Week of October 20, 2019)

Segment	Roadway Segment Capacity	Average Weekday Daily Traffic	Weekday Level of Service	Average Weekend Daily Traffic	Weekend Level of Service
1: Airport Drive Inbound between Spotted Road and Flint Road	18,750	8,338	A	8,427	A
2: Airport Drive Inbound West of Flint Road	18,750	7,494	A	7,204	A
3&4: Airport Drive Outbound West of Flint Road	28,200	9,091	A	8,844	A
3: Airport Drive Outbound from Parking Garage	18,750	1,768	A	1,708	A
4: Airport Drive Outbound from Curbside Dropoff	18,750	7,422	A	7,136	A
5: Airport Drive Outbound between Flint Road and Spotted Road	18,750	8,479	A	8,165	A
6: Flightline Boulevard North of Geiger Boulevard	18,750	3,936	A	3,904	A

**Note: Roadway capacities for segments 1, 2, 3, 4, 5 were assumed to be 2-lanes and divided facilities. The combined segment 3 and 4 was assumed to be a 3-lane undivided facility.*

4.2 Intersection Turning Movement Analysis

The analysis for intersection LOS was calculated for the peak travel period for the airport, which occurred on Monday (a weekday) between 6:00 AM – 7:00 AM and between 1:30 PM – 2:30 PM. Intersection LOS calculations are summarized in **Table 4-5** for the AM Peak Hour, **Table 4-6** for the PM Peak Hour, and detailed in **Figure 4-1**. As illustrated, all intersections operate at LOS B in both the AM and PM peak hours.

Table 4-5. Intersection Level of Service – AM Peak Hour (Week of October 20, 2019)

AM Peak Hour 6:00 - 7:00 AM	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	75	56	0	0	85	44	0	0	0	44	465	127	0.13	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	123	44	52	15	0	11	555	115	0	0	0	0.22	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	16	61	0	0	40	61	0	0	0	10	612	18	0.28	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	71	10	9	80	0	42	585	12	0	0	0	0.26	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	20	106	29	81	77	107	123	19	26	17	32	131	0.34	B

Table 4-6. Intersection Level of Service – PM Peak Hour (Week of October 20, 2019)

PM Peak Hour 1:30 - 2:30 PM	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	57	42	0	0	83	27	0	0	0	58	295	110	0.12	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	115	36	53	23	0	9	457	88	0	0	0	0.20	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	13	60	0	0	57	61	0	0	0	4	400	20	0.23	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	80	4	104	18	0	26	389	138	0	0	0	0.25	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	24	94	16	62	104	99	125	35	17	25	33	115	0.33	B

Figure 4-1. Intersection Level of Service Calculations (Week of October 20, 2019)

INTERSECTION 1:	Airport Drive Inbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			44			27	
NBT	1	1800	85	0.07	1,800	83	0.06
NBR			0			0	
SBL			0			0	
SBT	1	1800	56	0.03	1,800	42	0.02
SBR	1	1800	75	0.04	1,800	57	0.03
EBL	1	1800	0	0.00	1,800	0	0.00
EBT	2	3600	0	0.00	3,600	0	0.00
EBR	1	1800	0	0.00	1,800	0	0.00
WBL			127			110	
WBT			465	0.00		295	0.00
WBR			44			58	
		N/S Movements		0.07			0.06
		E/W Movements		0.00			0.00
		Rt. Turn Component		0.01			0.01
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.13			0.12
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 2:	Airport Drive Outbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	15	0.04	1,800	23	0.04
NBR			52			53	
SBL	1	1800	44	0.02	1,800	36	0.02
SBT	1	1800	123	0.07	1,800	115	0.06
SBR			0			0	
EBL	1	1800	115	0.06	1,800	88	0.05
EBT	3	5400	555	0.10	5,400	457	0.09
EBR			11			9	
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.07			0.06
		E/W Movements		0.10			0.09
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.22			0.20
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 3:	Airport Drive Inbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			61			61	
NBT	1	1800	40	0.06	1,800	57	0.07
NBR			0			0	
SBL			0			0	
SBT	1	1800	61	0.04	1,800	60	0.04
SBR			16			13	
EBL			0			0	
EBT			0	0.00		0	0.00
EBR			0			0	
WBL	1	1800	18	0.01	1,800	20	0.01
WBT	2	3600	612	0.17	3,600	400	0.11
WBR	1	1800	10	0.01	1,800	4	0.00
		N/S Movements		0.06			0.07
		E/W Movements		0.17			0.11
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.28			0.23
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 4:	Airport Drive Outbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	80	0.04	1,800	18	0.01
NBR	1	1800	9	0.01	1,800	104	0.06
SBL			10			4	
SBT	1	1800	71	0.05	1,800	80	0.05
SBR			0			0	
EBL	1	1800	12	0.01	1,800	138	0.08
EBT	2	3600	585	0.16	3,600	389	0.11
EBR	1	1800	42	0.02	1,800	26	0.01
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.05			0.05
		E/W Movements		0.16			0.11
		Rt. Turn Component		0.00			0.05
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.26			0.25
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 5:	Geiger Boulevard (E-W) and Flightline Boulevard (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			107			99	
NBT	1	1800	77	0.15	1,800	104	0.15
NBR			81			62	
SBL			29			16	
SBT	1	1800	106	0.08	1,800	94	0.06
SBR	1	1800	20	0.01	1,800	24	0.01
EBL	1	1800	26	0.01	1,800	17	0.01
EBT	1	1800	19	0.01	1,800	35	0.02
EBR	1	1800	123	0.07	1,800	125	0.07
WBL	1	1800	131	0.07	1,800	115	0.06
WBT	1	1800	32	0.03	1,800	33	0.03
WBR			17			25	
		N/S Movements		0.15			0.15
		E/W Movements		0.08			0.08
		Rt. Turn Component		0.06			0.05
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.34			0.33
LEVEL OF SERVICE (LOS)				B			B

4.3 Classified Count Analysis

Classified count data for all roadway segments was obtained from the ADT data, and is summarized in **Table 4-7** for the peak weekday and in **Table 4-8** for the peak weekend day. Both weekday and weekend classified data is similar, and results in the majority of trips are taken by Class 2 and Class 3 vehicles, which are passenger cars, pickups, and vans. Single-unit 2-axle trucks make up the next group of vehicles, with the highest percentage of single-unit 2-axle trucks on Airport drive inbound west of Flint Road. The majority of other classes make up less than 1% of vehicles, which is minimal.

Table 4-7. Classified Count Analysis (Average Weekday) (Week of October 20, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	81%	15%	<1%	2%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	71%	22%	<1%	6%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	64%	26%	<1%	9%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	67%	24%	<1%	8%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	76%	17%	<1%	4%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	62%	22%	5%	7%	1%	3%
7: Flint Road North of Airport Drive	<1%	72%	20%	2%	3%	<1%	<1%

Table 4-8. Classified Count Analysis (Average Weekend) (Week of October 20, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	81%	16%	<1%	2%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	71%	23%	<1%	5%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	63%	28%	<1%	9%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	65%	26%	<1%	8%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	77%	17%	<1%	4%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	60%	23%	4%	7%	1%	4%
7: Flint Road North of Airport Drive	<1%	76%	19%	1%	3%	<1%	<1%

4.4 Average Speed Analysis

In addition to vehicle classification of count data, average speeds were also obtained at each of the roadway segments. **Table 4-9** summarizes the posted speed limit, the average speed, and the 85th percentile speed. The difference between the posted speed limit and the 85th percentile speed is listed as the difference. In all locations, vehicles are typically traveling faster than the posted speed, particularly at the two locations nearest the airport (Airport Drive outbound from the parking garage and Airport Drive outbound from the curbside dropoff) as well as on Flightline Boulevard north of Geiger Boulevard.

Table 4-9. Average Segment Speed Analysis (Week of October 20, 2019)

Segment	Speed Limit (MPH)	Average Speed (MPH)	85th Percentile (MPH)	Difference (MPH)
1: Airport Drive Inbound between Spotted Road and Flint Road	50	47	51	1
2: Airport Drive Inbound West of Flint Road	35	37	43	8
3: Airport Drive Outbound from Parking Garage	20	33	40	20
4: Airport Drive Outbound from Curbside Dropoff	20	25	30	10
5: Airport Drive Outbound between Flint Road and Spotted Road	50	50	55	5
6: Flightline Boulevard North of Geiger Boulevard	30	35	40	10

4.5 Parking and Rideshare

Parking and rideshare data was provided by Spokane International airport on a monthly basis. To understand the relation of parking to enplanements for the week of October 20, 2019, the parking data for the month prior and subsequent month were compared. **Table 4-10** summarizes parking and rideshare transactions for the months of September through November. The average daily parking and rideshare data for the month of October accounts for approximately 37 percent of the highest weekday ADT for the week of October 20, 2019.

Table 4-10. Parking and Rideshare Comparison (Week of October 20, 2019)

	September	October	November	Total Annual (2019)
Parking Transactions	38,576	43,116	37,800	448,277
Rideshare Transactions	48,088	53,276	44,433	553,625
Combined Parking + Rideshare Transactions	86,664	96,392	82,233	1,001,902
Average Daily Parking + Rideshare[1]	2,796	3,109	2,741	2,745
Percent of Annual Average Daily Parking + Rideshare	8.6%	9.6%	8.2%	100.0%
Average Daily Traffic (ADT)[2]	8,479			N/A
Parking Percent of ADT	37%			N/A

[1] September is 30 days, October is 31 days, November is 30 days, Annual is 365 days.

[2] Highest of weekday ADT during the week of October 20, 2019 on Airport Drive outbound between Flint Road and Spotted Road.

4.6 Conclusions

Based on the results of the count collection and subsequent analysis, the following findings were reached:

- Roadway Segment Annual Daily Traffic (ADT)
  - Friday resulted in the highest ADT for weekend traffic
  - For all segments on Airport Drive, Monday resulted in the highest ADT for weekday traffic.
  - Thursday resulted in the highest ADT on Flightline Boulevard
- Roadway segment weekday and weekend AM and PM peak hours vary by day
- All roadway segments operate at LOS B
- Passenger cars, pickups, and vans make up the majority of traffic within the study area
- Average speeds at roadway segments nearest the airport are more than 10 MPH faster than the posted speed limit.
- The combination of parking and rideshare transactions on an average day during the month of October is approximately 3,109 vehicles, which equates to approximately 37% of average daily traffic.

5 WEEK OF DECEMBER 5, 2019

The data collected from Thursday, December 5, 2019 through Thursday, December 12, 2019. This week was expected to present a highest level of cargo enplanements at the Spokane International Airport due in part to the impending holiday season. Intersection and roadway segment analysis was completed based on the collected data and using the cited methodology.

Due to snowy road conditions, 24-hour count equipment was removed from all study locations after obtaining the AM peak hour counts on Tuesday, December 10, 2019 and later replaced in time for the PM peak hour counts on Wednesday, December 11, 2019. Snowy weather presents challenges when collecting 24-hour count data such as reduced driving speeds, potentially skewing results, as well as the possibility of snow plows damaging the count equipment. However, it was not necessary to remove the traffic cameras at this time, as this equipment was installed in such a way that snow plows offered no risk of damaging the equipment.

In addition, the 24-hour count equipment located on Airport Drive immediately downstream from the terminal experienced a malfunction on Thursday, December 12, 2019, resulting in an incomplete count for this day at that location. The data used in place was taken from the Monday, December 9, 2019 counts due to the highest similarity in ADT value for the weekday counts at this location. The counts have been marked accordingly to denote this change.

5.1 Roadway Segment Average Daily Traffic Analysis

Roadway segment average daily traffic (ADT) was summarized for all seven roadway segments. Segments 3 and 4 were added together to represent the segment of Airport Drive outbound west of Flint Road. **Table 5-1** summarizes roadway segment ADT. On all segments, the greatest weekday ADT is higher than the greatest weekend ADT. The highest weekday varied between days, but primarily was highest on Thursdays, while Friday resulted in the highest weekend travel.

Table 5-1. Roadway Segment Average Daily Traffic (Week of December 5, 2019)

Segment	Thursday*	Friday	Saturday	Sunday	Monday	Tuesday*	Wednesday*	Thursday
1: Airport Drive Inbound between Spotted Road and Flint Road	3,934	**7,271**	5,122	5,890	7,138	5,200	2,875	**8,508**
2: Airport Drive Inbound West of Flint Road	3,174	**6,082**	4,691	5,432	6,305	4,613	2,230	**7,099**
3&4: Airport Drive Outbound West of Flint Road	4,626	**7,448**	5,993	6,904	**7,668**	4,919	3,412	3,705
3: Airport Drive Outbound from Parking Garage	1,227	**1,738**	1,262	1,424	1,438	822	888	**1,784**
4: Airport Drive Outbound from Curbside Dropoff	3,399	**5,710**	4,731	5,480	**6,230**	4,097	2,524	1,921
5: Airport Drive Outbound between Flint Road and Spotted Road	4,306	**6,885**	5,308	6,194	7,165	4,730	3,200	**7,981**
6: Flightline Boulevard North of Geiger Boulevard	2,361	**3,984**	2,712	2,288	3,770	2,791	1,616	**4,241**
7: Flint Road North of Airport Drive	1,899	**3,415**	2,256	2,147	2,977	1,915	791	**2,989**

**indicates a day of partial data collection (see Traffic Count Collection)*

From the ADT data, the peak hours were identified, as summarized in **Table 5-2** for weekdays and **Table 5-3** for weekends. As a note, Segments 3 and 4 were combined to identify the peak hour traffic for Airport Drive outbound west of Flint Road, and the time period for Segment 4 was used to identify the peak hours, as there is significantly more traffic on Segment 4 than on Segment 3.

Table 5-2. Roadway Segment Weekday Peak Hour Average Daily Traffic (Week of December 5, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	8,508	5:15 - 6:15	12:30 - 1:30
2: Airport Drive Inbound West of Flint Road	7,099	5:15 - 6:15	12:45 - 1:45
3&4: Airport Drive Outbound West of Flint Road	7,668	11:45 - 12:45	1:30 - 2:30
3: Airport Drive Outbound from Parking Garage	1,784	12:45 - 1:45	10:45 - 11:45
4: Airport Drive Outbound from Curbside Dropoff	6,230	11:45 - 12:45	1:30 - 2:30
5: Airport Drive Outbound between Flint Road and Spotted Road	7,981	11:45 - 12:45	5:15 - 6:15
6: Flightline Boulevard North of Geiger Boulevard	4,241	8:45 - 9:45	5:30 - 6:30

Table 5-3. Roadway Segment Weekend Peak Hour Average Daily Traffic (Week of December 5, 2019)

Segment	Average Daily Traffic	AM Peak Hour (Traffic Volume)	PM Peak Hour Traffic Volume)
1: Airport Drive Inbound between Spotted Road and Flint Road	7,271	5:30 - 6:30	12:15 - 1:15
2: Airport Drive Inbound West of Flint Road	6,082	5:15 - 6:15	12:30 - 1:30
3&4: Airport Drive Outbound West of Flint Road	7,448	11:30 - 12:30	1:15 - 2:15
3: Airport Drive Outbound from Parking Garage	1,738	12:45 - 1:45	10:15 - 11:15
4: Airport Drive Outbound from Curbside Dropoff	5,710	11:30 - 12:30	1:15 - 2:15
5: Airport Drive Outbound between Flint Road and Spotted Road	6,885	11:30 - 12:30	1:15 - 2:15
6: Flightline Boulevard North of Geiger Boulevard	3,984	9:30 - 10:30	4:45 - 5:45

The analysis for roadway segment level-of-service (LOS) is based on the methodology discussed previously, and is summarized in **Table 5-4**. As shown in **Table 5-4**, all roadway segments operate at LOS A for peak weekday and weekend traffic.

Table 5-4. Roadway Segment Level of Service (Week of December 5, 2019)

Segment	Roadway Segment Capacity	Average Weekday Daily Traffic	Weekday Level of Service	Average Weekend Daily Traffic	Weekend Level of Service
1: Airport Drive Inbound between Spotted Road and Flint Road	18,750	8,508	A	7,271	A
2: Airport Drive Inbound West of Flint Road	18,750	7,099	A	6,082	A
3&4: Airport Drive Outbound West of Flint Road	28,200	7,668	A	7,448	A
3: Airport Drive Outbound from Parking Garage	18,750	1,784	A	1,738	A
	18,750	6,230	A	5,710	A
4: Airport Drive Outbound from Curbside Dropoff	18,750	7,981	A	6,885	A
5: Airport Drive Outbound between Flint Road and Spotted Road	18,750	4,241	A	3,984	A
6: Flightline Boulevard North of Geiger Boulevard	37,500	2,989	A	3,415	A

**Note: Roadway capacities for segments 1, 2, 3, 4, 5 were assumed to be 2-lanes and divided facilities. The combined segment 3 and 4 was assumed to be a 3-lane undivided facility.*

5.2 Intersection Turning Movement Analysis

The analysis for intersection LOS was calculated for the peak travel period for the airport, which occurred on Thursday (a weekday) between 11:45 AM – 12:45 PM and between 12:45 PM – 1:45 PM. Intersection LOS calculations are summarized in **Table 5-5** for the AM Peak Hour, **Table 5-6** for the PM Peak Hour, and detailed in **Figure 5-1**. As illustrated, all intersections operate at LOS B in both the AM and PM peak hours.

Table 5-5. Intersection Level of Service – AM Peak Hour (Week of December 5, 2019)

AM Peak Hour 11:45 AM – 12:45 PM														
	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	54	51	0	0	75	37	0	0	0	40	362	97	0.11	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	94	42	28	22	0	11	454	106	0	0	0	0.19	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	13	44	0	0	58	57	0	0	0	7	425	12	0.23	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	46	8	15	96	0	52	453	17	0	0	0	0.23	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	15	36	87	110	34	19	59	88	88	22	89	17	0.25	B

Table 5-6. Intersection Level of Service – PM Peak Hour (Week of December 5, 2019)

PM Peak Hour 1:30 - 2:30 PM														
	North Leg			South Leg			West Leg			East Leg			Level of Service	
Weekday ADT and Peak Hour	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left	ICU	LOS
1: Airport Drive Inbound (E-W) and Flint Road (N-S)	54	51	0	0	75	37	0	0	0	43	18	97	0.11	B
2: Airport Drive Outbound (E-W) and Flint Road (N-S)	0	111	24	43	19	0	5	247	47	0	0	0	0.16	B
3: Airport Drive Inbound (E-W) and Spotted Road (N-S)	11	54	0	0	32	52	0	0	0	2	254	21	0.17	B
4: Airport Drive Outbound (E-W) and Spotted Road (N-S)	0	68	7	12	75	0	29	275	9	0	0	0	0.17	B
5: Geiger Boulevard (E-W) and Flightline Boulevard (N-S)	18	25	73	101	29	18	65	97	59	25	89	14	0.23	B

Figure 5-1. Intersection Level of Service Calculations (Week of December 5, 2019)

INTERSECTION 1:	Airport Drive Inbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			57			36	
NBT	1	1800	81	0.08	1,800	70	0.06
NBR			0			0	
SBL			0			0	
SBT	1	1800	51	0.03	1,800	34	0.02
SBR	1	1800	62	0.03	1,800	57	0.03
EBL	1	1800	0	0.00	1,800	0	0.00
EBT	2	3600	0	0.00	3,600	0	0.00
EBR	1	1800	0	0.00	1,800	0	0.00
WBL			129			91	
WBT			476	0.00		287	0.00
WBR			49			47	
		N/S Movements		0.08			0.06
		E/W Movements		0.00			0.00
		Rt. Turn Component		0.01			0.01
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.13			0.12
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 2:	Airport Drive Outbound (E-W) and Flint Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	82	0.08	1,800	70	0.06
NBR			55			37	
SBL	1	1800	65	0.04	1,800	60	0.03
SBT	1	1800	58	0.03	1,800	38	0.02
SBR			0			0	
EBL	1	1800	50	0.03	1,800	47	0.03
EBT	3	5400	486	0.12	5,400	291	0.07
EBR			139			97	
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.11			0.09
		E/W Movements		0.12			0.07
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.28			0.21
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 3:	Airport Drive Inbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			76			45	
NBT	1	1800	63	0.08	1,800	52	0.05
NBR			0			0	
SBL			0			0	
SBT	1	1800	54	0.04	1,800	43	0.03
SBR			15			12	
EBL			0			0	
EBT			0	0.00		0	0.00
EBR			0			0	
WBL	1	1800	11	0.01	1,800	15	0.01
WBT	2	3600	551	0.15	3,600	356	0.10
WBR	1	1800	3	0.00	1,800	5	0.00
		N/S Movements		0.08			0.05
		E/W Movements		0.15			0.10
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.28			0.20
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 4:	Airport Drive Outbound (E-W) and Spotted Road (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			0			0	
NBT	1	1800	119	0.07	1,800	83	0.05
NBR	1	1800	10	0.01	1,800	8	0.00
SBL			6			6	
SBT	1	1800	58	0.04	1,800	52	0.03
SBR			0			0	
EBL	1	1800	20	0.01	1,800	17	0.01
EBT	2	3600	436	0.12	3,600	483	0.13
EBR	1	1800	48	0.03	1,800	41	0.02
WBL			0			0	
WBT			0	0.00		0	0.00
WBR			0			0	
		N/S Movements		0.07			0.05
		E/W Movements		0.12			0.13
		Rt. Turn Component		0.00			0.00
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.24			0.23
LEVEL OF SERVICE (LOS)				B			B

INTERSECTION 5:	Geiger Boulevard (E-W) and Flightline Boulevard (N-S)						
		AM PEAK HOUR			PM PEAK HOUR		
MOVEMENT	LANES	CAPACITY	VOLUME	V/C	CAPACITY	VOLUME	V/C
NBL			84			84	
NBT	1	1800	117	0.14	1,800	102	0.13
NBR			56			56	
SBL			21			16	
SBT	1	1800	96	0.07	1,800	83	0.06
SBR	1	1800	0	0.00	1,800	1	0.00
EBL	1	1800	86	0.05	1,800	22	0.01
EBT	1	1800	31	0.02	1,800	35	0.02
EBR	1	1800	25	0.01	1,800	92	0.05
WBL	1	1800	23	0.01	1,800	98	0.05
WBT	1	1800	35	0.07	1,800	24	0.02
WBR			87			13	
		N/S Movements		0.14			0.13
		E/W Movements		0.12			0.07
		Rt. Turn Component		0.00			0.03
		Yellow Clearance		0.05			0.05
TOTAL CAPACITY UTILIZATION				0.31			0.29
LEVEL OF SERVICE (LOS)				B			B

5.3 Classified Count Analysis

Classified count data for all roadway segments was obtained from the ADT data, and is summarized in **Table 5-7** for the peak weekday and in **Table 5-8** for the peak weekend day. Both weekday and weekend classified data is similar, and results in the majority of trips are taken by Class 2 and Class 3 vehicles, which are passenger cars, pickups, and vans. Single-unit 2-axle trucks make up the next group of vehicles, with the highest percentage of single-unit 2-axle trucks on Airport drive outbound from the Airport Parking Garage. The majority of other classes generally make up less than 1% of vehicles, which is minimal.

Table 5-7. Classified Count Analysis (Average Weekday) (Week of December 5, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	81%	15%	<1%	2%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	71%	22%	<1%	6%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	64%	26%	<1%	9%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	67%	24%	<1%	8%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	76%	17%	<1%	4%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	62%	22%	5%	7%	1%	3%
7: Flint Road North of Airport Drive	<1%	72%	20%	2%	3%	<1%	<1%

Table 5-8. Classified Count Analysis (Average Weekend) (Week of December 5, 2019)

Segment	Class 1: Motorcycle	Class 2: Passenger Cars	Class 3: Pickups, Panels, and Vans	Class 4: Busses	Class 5: Single-Unit 2-Axle Trucks	Class 6: Single Unit 3-Axle Trucks	Class 7+: Multi-Axle Heavy-Duty Trucks
1: Airport Drive Inbound between Spotted Road and Flint Road	<1%	81%	16%	<1%	2%	<1%	<1%
2: Airport Drive Inbound West of Flint Road	<1%	71%	23%	<1%	5%	<1%	<1%
3: Airport Drive Outbound from Parking Garage	<1%	63%	28%	<1%	9%	<1%	<1%
4: Airport Drive Outbound from Curbside Dropoff	<1%	65%	26%	<1%	8%	<1%	<1%
5: Airport Drive Outbound between Flint Road and Spotted Road	<1%	77%	17%	<1%	4%	<1%	<1%
6: Flightline Boulevard North of Geiger Boulevard	<1%	60%	23%	4%	7%	1%	4%
7: Flint Road North of Airport Drive	<1%	76%	19%	1%	3%	<1%	<1%

5.4 Average Speed Analysis

In addition to vehicle classification of count data, average speeds were also obtained at each of the roadway segments. **Table 5-9** summarizes the posted speed limit, the average speed, and the 85th percentile speed. The difference between the posted speed limit and the 85th percentile speed is listed as the difference. In all locations, vehicles are typically traveling faster than the posted speed, particularly at the two locations on Airport Drive outbound, from both the parking garage and curbside dropoff locations.

Table 5-9. Average Segment Speed Analysis (Week of December 5, 2019)

Segment	Speed Limit (MPH)	Average Speed (MPH)	85th Percentile (MPH)	Difference (MPH)
1: Airport Drive Inbound between Spotted Road and Flint Road	50	50	54	4
2: Airport Drive Inbound West of Flint Road	35	37	42	7
3: Airport Drive Outbound from Parking Garage	20	30	36	16
4: Airport Drive Outbound from Curbside Dropoff	20	26	30	10
5: Airport Drive Outbound between Flint Road and Spotted Road	50	52	57	7
6: Flightline Boulevard North of Geiger Boulevard	30	34	38	8

5.5 Parking and Rideshare

Parking and rideshare data was provided by Spokane International airport on a monthly basis. To understand the relation of parking to enplanements for the week of December 5, 2019, the parking data for the month prior and subsequent month were compared. **Table 5-10** summarizes parking and rideshare transactions for the months of November through January. The average daily parking and rideshare data for the month of December accounts for approximately 34 percent of the highest weekday ADT for the week of December 5, 2019.

Table 5-10. Parking and Rideshare Comparison (Week of December 5, 2019)

	November	December	January	Total 12-Month Time Period (February 2019-January 2020)
Parking Transactions	37,800	37,872	35,312	448,771
Rideshare Transactions	44,433	46,931	41,001	558,449
Combined Parking + Rideshare Transactions	82,233	84,803	76,313	1,007,220
Average Daily Parking + Rideshare[1]	2,653	2,736	2,544	2,760
Percent of Annual Average Daily Parking + Rideshare	8.2%	8.4%	7.6%	100.0%
Average Daily Traffic (ADT)[2]	7,981			N/A
Parking Percent of ADT	34%			N/A

[1] November is 30 days, December and January are 31 days, Annual is 365 days.

[2] Highest of weekday ADT during the week of December 5, 2019 on Airport Drive outbound between Flint Road and Spotted Road.

5.6 Conclusions

Based on the results of the count collection and subsequent analysis, the following findings were reached:

- Roadway Segment Annual Daily Traffic (ADT)
  - Friday resulted in the highest ADT for weekend traffic
  - For most segments, Thursday resulted in the highest ADT for weekday traffic.
  - Monday resulted in the highest ADT on two segments of Airport Drive.
- Roadway segment weekday and weekend AM and PM peak hours vary by day
- All roadway segments operate at LOS B
- Passenger cars, pickups, and vans make up the majority of traffic within the study area
- Average speeds at roadway segments nearest the airport are more than 10 MPH faster than the posted speed limit.
- The combination of parking and rideshare transactions on an average day during the month of December is approximately 2,736 vehicles, which equates to approximately 34% of average daily traffic.

6 COMPARISON

The collected data and associated analytical results will be compared in this section to get a general understanding of the existing traffic condition pertinent to the intersection performance, roadway segment performance, and vehicle classification during the highest and lowest anticipated passenger and cargo enplanements. The data collection was conducted during three weeks as listed below:

- **Sunday, August 4, 2019 to Sunday, Aguste 11, 2019**: The highest anticipated number of enplanements at the Spokane International Airport during the calendar year.
- **Sunday, October 20, 2019 to Sunday, October 27, 2019**: The lowest anticipated amount of cargo enplanement and deplanement at the Spokane International Airport during the calendar year.
- **Thursday, December 5, 2019 to Thursday, December 12, 2019**: Passenger and cargo enplanements may be affected by the upcoming holiday season.

The highlighted findings of this project are listed below and summarized in **Table 6-1**, and summarized in **Appendix E** in a power-point that was presented to the Spokane International Airport on October 2, 2020.

- Each of the weeks collected had the highest weekend day of Friday.
- The peak AM and PM hours were not strong peaks, and were often observed in the mid-day time period (between 10:45 AM – 2:15 PM).
- For all roadway segments analyzed it was found that every segment operates at LOS A for the peak weekday and weekend days for both weeks.
- All AM and PM intersection operations for both time periods operate at LOS B.
- Passenger vehicles are primarily made up of class 2 (automobile) and class 3 (pickup truck) vehicles.
- Class 5 (single-unit 2-axle trucks) make up the majority of commercial freight vehicles on the roadway segments for both weeks of data collection.
- The week with the highest percentage of parking and rideshare to average daily traffic was the week with the lowest estimated cargo.

Table 6-1. Traffic Count Collection Period Comparison

Analysis	August 4 to August 11 2019 High Enplanements	October 20 to October 27 2019 Low Cargo	December 5 to December 12 2019 High Cargo
Highest Weekday ADT	Thursday	Monday	Thursday
Highest Weekend ADT	Friday	Friday	Friday
Airport Drive AM Peak Hour	10:45 AM – 11:45 AM	11:45 AM – 12:45 PM	11:45 AM – 12:45 PM
Airport Drive PM Peak Hour	12:30 PM – 01:30 PM	01:15 PM – 02:15 PM	12:45 PM – 01:45 PM
Roadway Segment Weekday and Weekend LOS	A (For All Segments)	A (For All Segments)	A (For All Segments)
AM and PM Peak Hour Intersection LOS	B (For All Intersections)	B (For All Intersections)	B (For All Intersections)
Classified Count Analysis	Personal vehicles are primarily Class 2 & Class 3. Freight vehicles are primarily Class 5.	Personal vehicles are primarily Class 2 & Class 3. Freight vehicles are primarily Class 5.	Personal vehicles are primarily Class 2 & Class 3. Freight vehicles are primarily Class 5.
Average Roadway Speeds	10-17 MPH over speed limit	8-20 MPH over speed limit	7-16 MPH over speed limit
Average Daily Parking and Rideshare Transactions	2,755	3,109	2,736
Percentage of Average Daily Parking and Rideshare Transactions to Average Daily Traffic	32%	37%	34%

7 RECOMMENDATIONS

Going forward with future growth at the airport, it is recommended that this study be used and built upon to continue to grasp current conditions around the airport. The benefit of understanding traffic related to growth will allow the airport to forecast operations into the future.

Recommendations for moving forward include:

- Ensuring roadway and intersection counts are obtained after new developments are completed
- Ensure any future traffic counts include Thursday through Monday counts, preferably Wednesday through Monday to capture regular weekday and peak weekday and weekend conditions
- Develop a standard intersection operation of LOS C or better, and ensure that operation with each new development or change in airport operations
- Continue efforts to monitor speeds and calm traffic on Airport Drive to achieve speeds closer to posted speed, in an effort to enhance safety for all users of the roadway
- Continue to obtain parking and ridesharing transaction information to study strategies for encouraging rideshare opportunities
- Updating this traffic analysis with new information when available